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The present volume is the thirty-seventh of this series.

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Assistant Secretary, Smithsonian Institution,
In charge of the United States National Museum.

SEPTEMBER 27, 1910.

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TRAGULUS NAPU

THE MOUSE DEER OF THE RHIO-LINGA ARCHIPELAGO: A STUDY OF SPECIFIC DIFFERENTIATION UNDER UNIFORM ENVIRONMENT.

By Gerrit S. Miller, Jr.

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The mouse deer are small Ungulates forming a special group, the *Tragulidæ*, somewhat intermediate in anatomical characters between the deer, camels, and pigs. Two living genera are known, the Indian and Malayan *Tragulus* and the West African *Hyomoschus*. In appearance the larger members of the family show some resemblance to the musk deer; while the smaller species of *Tragulus*, which scarcely exceed a rabbit in size, suggest an Agouti with unusually long legs. Among the Malayan members of the family two groups of species are found, the larger napus and the smaller kanchils, distinguished from each other by differences in size comparable to that between hares and rabbits, and by certain other slight peculiarities. On the Malay Peninsula and the larger islands members of these two groups appear everywhere to occur together, but on the smaller islands either may be absent. At no single locality have two forms of the same group yet been found.[a]

In habits as well as in appearance the Malayan *Tragulidæ* show a curious analogy to the South American agoutis. They are nocturnal and they live in jungle, where, owing to the denseness of the undergrowth, they are seldom seen, but where they may be readily caught with snares set in their runways. So perfectly protected from observation are these animals that I have been unable to find any detailed published account of their habits. Even the field notes of Dr. W. L. Abbott, to whose explorations of the Malay Archipelago most of our knowledge of the species is due, contain no definite observations, a fact that becomes especially significant when it is recalled that his col-

[a] With the single exception of Pulo Mansalar, Tapanuli Bay, western Sumatra, where two species of napus, *Tragulus amœnus* and *T. jugularis*, apparently occur together.

Proceedings U. S. National Museum, Vol. 37.—No. 1695.

lections now contain about 550 specimens of *Tragulus*. Owing to this secluded mode of life the Malayan members of the family are subjected to an essentially uniform environment throughout their

FIG. 1.—MAP OF RHIO-LINGA ARCHIPELAGO SHOWING DISTRIBUTION OF TRAGULUS NAPU GROUP, MEMBERS OF WHICH HAVE BEEN TAKEN ON ISLANDS SHADED.

range. Absence of any special tendency toward specific differentiation would be anticipated to result from such conditions. It is found as regards the animals inhabiting the large land masses of Sumatra

FIG. 2.—MAP OF A PART OF THE MALAY REGION SHOWING RELATIVE SIZE OF RHIO-LINGA ARCHIPELAGO.

and the Malay Peninsula,[a] on which the number of known forms is only four or five. On the smaller islands of the archipelago, however, both kanchils and napus, but especially the latter, show an excessive tendency to differentiate into local forms, no less than 41 of which are now known.[b] A particularly striking example of this tendency is furnished by the napus of the Rhio-Linga Archipelago.

The Rhio-Linga Archipelago is a series of small islands extending southeastward along the east coast of Sumatra from the southern extremity of the Malay Peninsula (see map, fig. 1). The northernmost of the islands, Karimon, Batam, and Bintang are separated from the mainland by the narrow Malacca Strait on the west and Singapore Strait on the east, the average width of which is only about 10 miles. Singapore Strait contains a mass of small islands on the north side, west of Singapore, which narrows the open water at that point to 5 miles. The easternmost, Karimon, Kundur, and Durei, are equally near the coast of Sumatra. From Karimon, the northwesternmost of the group, to the south shore of Sinkep, the southernmost, is a distance of about 150 miles, while that from Karimon east to Panjang is about 125 miles. Near the middle the archipelago is partly divided by the Rhio Strait into two main groups, the Rhio[c] Archipelago proper at the north and the Linga Archipelago at the south. The principal islands of the Rhio Archipelago, the main axis of which extends east and west, are: Karimon, Kundur, Durei, Durian, Sugi, Chombol, Bulang, Batam, Rempang, Galong, Bintang, and Panjang. Of the Linga Archipelago, the main axis of which is nearly north and south, the more important islands are Sebang, Bakong, Linga, and Sinkep. In addition to these, the largest of which, Bintang, Linga, and Sinkep, are from 25 to 35 miles across, and roughly some 500 to 700 square miles in area, the archipelago contains an almost infinite number of smaller islands and islets. The entire group lies in shallow water, mostly within the 20-fathom line, though Malacca and Singapore straits reach a depth of about 30 fathoms, while an isolated sounding of 49 fathoms is recorded between Singapore Island and Batam. The average depth of the water between the archipelago and Sumatra is less than in the straits, that separating the Linga group from the larger island nowhere exceeding 20 fathoms, while that between the Rhio group and the coast scarcely reaches 10 fathoms. The size of the archipelago as compared with that of Sumatra and the Malay Peninsula is difficult to

[a] Perhaps of Java and Borneo, also; but the material from these islands is at present unsatisfactory.

[b] All but nine of the described forms of *Tragulus* have been discovered by Doctor Abbott.

[c] The spelling Rhio is found on most German, English, and American maps; according to the Dutch authorities it should be Riouw.

estimate exactly (see map, fig. 2), but the total area which it covers, land and water together, is approximately one-thirtieth of the former and one-twentieth of the latter. Estimating the land area of the archipelago as one-third of the whole and the relative amount of jungle suited to the needs of *Tragulí* as the same on the large land masses and the islets of the archipelago, the area inhabited on the archipelago would be about one-ninetieth that on Sumatra and one-sixtieth that on the peninsula, or only one one-hundred-and-fiftieth of the two combined. Physical conditions on the islands are remarkably uniform. Lying under the equator they are subjected to no seasonal variations of temperature; while the small extent of the group, the uniformity in depth of the surrounding water, and the absence of all influence of great ocean currents preclude the possibility of regional differences. The surface of the islands is mostly rather high, though not sufficiently so to produce altitudinal contrasts of temperature. In his notes Doctor Abbott makes frequent allusion to the uniformity of vegetation and general conditions from island to island. Slight local changes have been made here and there by cultivation, but never to an extent sufficient to alter the conditions under which the *Tragulí* exist.

Notwithstanding its geographic insignificance and its lack of climatic or other contrasts, the archipelago is inhabited by no less than eight distinct species of napu; while from the whole of Sumatra, as well as of that part of the Malay Peninsula extending north to Tenasserim, the napus are, so far as known, essentially of a single type.[a] The characters of these animals, some of the more conspicuous of which are figured in Plates 1 to 3, are briefly as follows:[b]

[a] The common peninsular *Tragulus cancscens* differs very slightly, if at all, from the Sumatran *T. napu*. In naming it I was under the misapprehension that the napu of Linga Island (*T. pretiosus*) represented the Sumatran animal. The little-known *Tragulus stanleyanus*, from the interior of the Malay Peninsula, may for the present be disregarded as perhaps not strictly a member of the *napu* group.

[b] Detailed descriptions of the recently discovered species of *Tragulus* will be found in the following papers:

Bonhote, Ann. and Mag. Nat. Hist., 7th ser., vol. 11, pp. 291–296 (*hosei, everetti, pierrei=ravus* Miller.)

Lyon, Proc. U. S. Nat. Mus., vol. 31, pp. 576–581, (*bancanus, billitonus, luteicollis*); idem, vol. 34, pp. 628–632 (*longipes, fulvicollis*).

Matschie, Sitz.-Ber. Gesellschaft Naturforsch. Freunde, Berlin, 1897, p. 157 (*annæ*).

Miller, Proc. Washington Acad. Sci., vol. 2, pp. 227–228 (*rufulus*); Proc. Biol. Soc. Washington, vol. 13, pp. 185–186 (*cancscens*); idem, pp. 191–192 (*umbrinus*); Proc. Washington Acad. Sci., vol. 3, pp. 113–117 (*bunguranensis, pallidus*); Proc. Acad. Nat. Sci. Philadelphia, 1902, pp. 144–147 (*pretiosus, nigricollis*); Proc. Biol. Soc. Washington, vol. 15, pp. 173–175 (*ravus, borneanus*); Proc. U. S. Nat. Mus., vol. 26, pp. 439–446 (*amœnus, jugularis, brevipes, russeus*); Proc. Biol.

TRAGULUS NAPU (F. Cuvier). The wide-ranging form of Sumatra and the Malay Peninsula (Plate 1).

Upper parts orange-buff, clouded with blackish, the dark clouding not in excess of under color in general effect; sides noticeably grayish, in marked contrast with back; nape with a fairly well defined median dark stripe; throat markings normal, the outer dark band essentially concolor with sides of neck. Average and extremes of nine adults from eastern Sumatra: Head and body, 572 (550–600) mm.; tail, 94 (83–110); hind foot, including hoofs, 149 (145–156).

TRAGULUS PRETIOSUS Miller. Linga (Plate 2, upper figure).

Colors much richer and more yellow than in *Tragulus napu*, but pattern in no way abnormal; ground color of back orange-ochraceous, darkening toward ochraceous-rufous on sides of neck and outer surface of legs, and lightening to orange-buff on sides of body. Back uniformly clouded, the black slightly in excess of the under color; sides inconspicuously "lined" with black. Nape stripe blackish, normal in extent, sharply defined. Dark throat stripes a mixture of black and dull ochraceous-rufous. White throat stripes normal. Average and extremes of five adults: Head and body, 566 (545–580) mm.; tail, 88 (80–95); hind foot, including hoofs, 141 (140–142).

TRAGULUS PRETIELLUS Miller. Bakong and Sebang.

Color as in *Tragulus pretiosus*, but size less and teeth relatively larger. Average and extremes of eight adults from Pulo Bakong: Head and body, 501 (473–515) mm.; tail, 77 (65–90); hind foot, including hoofs, 122.7 (119–126).

TRAGULUS FORMOSUS Miller. Bintang.

Size and general appearance as in *Tragulus pretiosus*, but color even more reddish, particularly on sides of neck, and dark nape stripe narrower and less well defined. Average and extremes of seven adults: Head and body, 549 (530–593) mm.; tail, 82 (75–100); hind foot, including hoofs, 141.7 (137–145).

TRAGULUS LUTESCENS Miller. Sugi Bava, Jan.

Color pattern normal, the nape stripe clear black, well defined; size scarcely larger than in *Tragulus pretiellus;* ground color paler than in the three preceding species, the back orange-buff, fading rather abruptly on sides through straw-yellow to cream-color; clouding due to black hair tips, essentially as in *T. pretiosus* or somewhat less. Average and extremes of seven adults (two from Sugi Bava, the others from Jan): Head and body, 508 (488–540) mm.; tail, 78 (72–90); hind foot, including hoofs, 130 (128–133).

Soc. Washington, vol. 16, pp. 31–44 (*lutescens, flavicollis, formosus, focalinus, virgicollis=hosei* Bonhote, *natunæ=everetti* Bonhote, *subrufus, rubeus, ravulus, lancavensis, lampensis*); Smithsonian Misc. Coll., vol. 44, pp. 2–4 (*batuanus, russulus*); Proc. U. S. Nat. Mus., vol. 31, pp. 55–57 (*carimatæ*); idem, pp. 250–255 (*nigrocinctus, perflavus, pretiellus*).

Thomas, Ann. and Mag. Nat. Hist., 6th ser., vol. 9, p. 254 (*nigricans*).

TRAGULUS FLAVICOLLIS Miller. Sugi.

General color about as in *Tragulus lutescens*, but nape stripe absent, its position barely indicated by a few dark hairs; throat markings normal, the dark stripes scarcely mixed with black; size probably greater than in *T. lutescens*: Head and body (type, not fully adult), 55 mm.; tail, 80; hind foot, including hoofs, 132.

TRAGULUS PERFLAVUS Miller. Batam, Bulan, Galong, Setoko (Plate 2, lower figure).

In general like *Tragulus flavicollis*, but even more yellow, the nape without dark hairs; dark throat stripes clear, brownish, ochraceous-buff, noticeably encroaching on area of white markings; size rather large. Average and extremes of six specimens from Batam: Head and body, 605 (583–635) mm.; tail, 80 (77–85); hind foot, including hoofs, 131 (127–137).

TRAGULUS NIGRICOLLIS Miller. Singkep (Plate 3, upper figure).

Back as in *Tragulus pretiosus*, but more clouded with black; sides a light buff much like that of *T. lutescens;* entire neck black, clear above, sprinkled with yellowish-brown annulations at sides, especially along edge of lateral white stripes; throat markings normal, the dark stripes black, speckled with brown like sides of neck. Size large, average and extremes of five adults: Head and body, 566 (540–590) mm.; tail, 81.4 (77–85); hind foot, including hoofs, 143.8 (138–148).

TRAGULUS NIGROCINCTUS Miller. Kunder, Great Karimon (Plate 3, lower figure).

Back and sides rich and dark, essentially as in *Tragulus pretiosus*, but black shading heavier, almost completely obscuring the under color along mid-dorsal region; neck and throat clear black, the throat stripes absent; no white on under parts, the lower side of tail yellowish brown, a character unique among the species occurring in the archipelago. Size medium, average and extremes of ten adult males from Kunder: Head and body, 502 (490–520) mm.; tail, 86.5 (80–100); hind foot, including hoofs, 136 (132–142).

The only general feature in which the insular species differ from *Tragulus napu* is their tendency toward richer, less grayish coloration, especially of the sides of body. In other respects they show great diversity. In fact, among them are presented the extreme phases of a tendency manifest throughout the *napu* group for each local species to assume a type of marking referable to some phase in one of the two lines of variation most readily[a] followed in diverging from the primitive type represented by the continental form. The

[a] A mere inspection of the manner in which the colors are combined in the normal pattern is sufficient to show that the two courses followed are mechanically the most feasible; this is further shown by the fact that the not very extensive individual variations in a large series of Sumatran *Tragulus napu* can nearly all be referred to the earliest stages of divergence of the same two lines.

main characters of this primitive type are: (1) Neck mixed brown and black, the black concentrating along nape to form an evident nape stripe; (2) throat with a median white longitudinal stripe, on each side of which is a similar but somewhat oblique stripe, the three meeting in a broad white mass covering posterior portion of interramial region; space between median and lateral stripe brown like side of neck or somewhat darker; a brown transverse band or collar separates the stripes from white of chest. The two lines of variation are (1) toward predominance of yellowish brown and (2) toward predominance of black.

Variants of the primitive stage are shown by *Tragulus pretiosus* (color rich, pattern normal, size normal), *T. pretiellus* (like the last, but size reduced), and *T. lutescens* (size reduced, color yellowish, pattern normal). In *T. formosus* the first step is taken toward predominance of brown. The black nape stripe is narrower and less well defined than in the normal phase, though the throat markings retain their usual character. A further advance in the same direction is shown by *T. flavicollis*, in which the nape stripe has disappeared, all but a few scattered dark hairs, but in which the throat markings remain normal. The extreme of this tendency, so far as now known, is presented by *T. perflavus*. Here the entire neck is yellowish brown without trace of dark hairs, and the white throat-stripes are noticeably narrowed by encroachment of the contiguous brown areas. The final stage, with white completely replaced by brown, has not yet been discovered, though there is little reason to doubt that it exists.

The first steps in the series leading toward dominance of black are not shown by any of the Rhio-Linga species. In *T. umbrinus* of Pulo Lankawi, off the west coast of the Malay Peninsula, the dark nape stripe has become diffuse, spreading over entire neck, though not to the exclusion of the brown. A further stage is represented by *T. amœnus* of Pulo Mansalar, Tapanuli Bay, west Sumatra. Here the neck is definitely black, though with much brown speckling at sides. Returning to the Rhio-Linga Archipelago, we find that in *T. nigricollis* the neck is black, slightly speckled with brown laterally; throat pattern normal. The next stage, in which the black begins to encroach on white of throat (corresponding to that represented by *T. perflavus* in the brown series), is represented by *T. bunguranensis* of Bunguran Island, North Natunas, and *T. nigricans* of Balabac. In *T. jugularis* of Pulo Mansalar the white is obliterated, but the position of the light markings is indicated by brown annulations on the hairs of the region normally occupied by the white stripes. The final stage is represented by a Rhio-Linga species, *T. nigrocinctus*, in which the entire neck and throat are clear black.

Allusion to the uniformity of environment under which the mouse deer exist has already been made. The geographic distribution of the various forms is a further indication that the characters of the species can not be explained as the result of local conditions. Linga and Singkep are only 7 miles apart, but the napu of the former has retained the primitive color pattern, while that of the latter is well advanced toward the dark extreme. The species representing intermediate stages are found 400 and 500 miles away, on the coasts of the Malay Peninsula and west Sumatra. Similarly the phase that lies between the Sinkep form and the extreme represented by that of Kunder and Great Karimon occurs in the North Natuna Islands, at a distance of 300 miles, and on Balabac, more than twice as far away. On the other hand, the islands of Great Karimon and Bulang, within 25 miles of each other, are inhabited, respectively, by the most extreme black form and brown form now known.

The only conclusion that seems justified is that the *Tragulus napu* group consists of a series of local species whose color pattern, probably for some physiological reason, is varying along two main lines of divergence, both of which are independent of external conditions as ordinarily understood. Each series is equally incapable of explanation by the hypotheses of Lamarck, Darwin, or De Vries. On the larger land masses such changes as may be taking place are uniform over wide areas and relatively slow, while in the regions which, by submergence, have become divided into small land areas separated by water the changes are irregular and rapid, though progressing on different islands at a very unequal rate.[a]

[a] A somewhat parallel series of color changes in the African monkeys of the genus *Colobus* has recently been described (Lydekker, Proc. Zool. Soc. London, vol. 2, 1905, pp. 325–329).

TRAGULUS PRETIOSUS

TRAGULUS PERFLAVUS

TRAGULUS NIGRICOLLIS

TRAGULUS NIGROCINCTUS

CARBONIFEROUS AIR-BREATHING VERTEBRATES OF THE UNITED STATES NATIONAL MUSEUM.

By Roy L. Moodie,

Of the University of Kansas, Lawrence.

The writer has been engaged for some months investigating the structure of the earliest air-breathing vertebrates. Through the kindness of the Secretary of the Smithsonian Institution, Dr. Charles D. Walcott, he was given the privilege of studying the collection of the U. S. National Museum, which contains remains of these forms. This collection is a small one but of great interest, and is unique in containing the only examples known of scaled amphibians from North America, as well as the only known specimen of a Carboniferous reptile from the Allegheny series.

The specimen of the reptile is so important in the light of the present discussions concerning the origin of the Reptilia that it is considered worthy of an extended description, although it has been previously described by Cope, Williston, and the writer. None of these authors has, however, dealt with the anatomy of the animal as a whole, and, although Williston published an excellent photograph (here reproduced) which corrected some of the errors of Cope's original drawing, yet even a photograph is lacking in details. The relations of the pelvic region and the structure of the vertebral column are especially indistinct, so that an outline drawing of the skeleton has been introduced in Plate 5.

ISODECTES PUNCTULATUS Cope.

Plates 4 and 5.

Tuditanus punctulatus Cope, Amer. Naturalist, 1896, p. 303.—Hay, Cat. Foss. Vert. N. A., 1902, p. 415.

Isodectes punctulatus Cope, Proc. Amer. Phil. Soc., vol. 36, 1897, p. 88, pl. 3, fig. 3; Syllabus of Lectures on the Vertebrata, 1898, p. 61.

Isodectes copei Williston, Journ. Geol., vol. 16, 1908, p. 395.—Moodie, Trans. Kans. Acad. Sci., 1909. [Refers to *Isodectes copei* Williston in connection with the proposed new classification of the Amphibia]; Amer. Naturalist, vol. 45, p. 122.—Holland, 11th Annual Report of the Carnegie Museum, 1908, p. 32.

The specimen of *Isodectes punctulatus* Cope, which is less than 6 inches in length, consists of the following parts: A nearly complete

vertebral column, including the terminal caudal centrum (45 centra preserved); portions of 27 pairs of ribs; three distal carpalia of the left hand; first digit of the left hand entire, and others represented by scattered phalanges, four digits in all; left foot nearly entire, lacks only terminal phalanx for digit III; right foot complete but elements scattered, both legs otherwise complete; portion of pelvis.

The reptile, to which the remains pertain, must have been an aquatic, or at least a semiaquatic form, if one may judge from the expanded foot, although the limbs show no adaptive modifications for aquatic conditions. The dimensions of the foot, as preserved, however, show a broad surface, which may be given the same interpretation as McGregor has given the foot of *Mesosaurus brasiliensis* McGregor,[a] from the Permian of South America.

The long tail in the present species would tend to support the idea of the aquatic habit of the animal, although there is not the slightest evidence of lateral flattening, nor are elongate spines and chevrons present as in *Mesosaurus brasiliensis* McGregor. The stout, elongate femur in the present species is in strong contrast with the crocodile-like femur of *Mesosaurus*. The femur resembles, in its proportions, that of *Sauravus costei* Thevenin, from the Carboniferous of France.[b] In view of the character of the beds from which *Isodectes* comes and the aquatic nature of the Microsauria which were associated with *Isodectes*, it will not be far wrong to assume an aquatic habit of life for *Isodectes* for at least a part of the time. The clawed phalanges are to be looked on as indicating a partial adaptation to land dwelling.

The form of the body of *Isodectes punctulatus* Cope is remarkably lizard-like and resembles in its proportions some of the larger species of *Iguana* without the great length of tail. The vertebral column in *Isodectes* was solidly built and its limbs were strong, being supported, in the pelvic region at least, by a strong arch.

It is extremely unfortunate that the entire skeleton of the reptile was not preserved, since there is no doubt that it was all embedded in the coal if we may judge from the nature of the fracture extending across the anterior region of that portion of the skeleton which is preserved, but in the violent processes of mining the anterior portion of the body was lost. As a matter of coincidence the same accident may be mentioned as having occurred in the case of *Sauravus costei* Thevenin. The vertebral column in *Isodectes* consists of biconcave centra with possibly rudimentary intercentra, although no definite evidence is to be had on this head. The spines of the vertebræ were low and almost rudimentary. The notochord was probably

[a] J. H. McGregor, Relatorio Final Commissao de Estudos das Minas de Carvao do Brazil, 1908, p. 303.

[b] A. Thevenin. Annales de Paleontologie, vol. 1, 1903, pl. 2.

persistent judging from the fractured portion of the most anterior centrum preserved. There are evidences of 21 presacral vertebræ, and there may have been 7 or 8 more, thus bringing the number of presacrals near 30, agreeing exactly in this instance with the vertebral column of *Mesosaurus* from Brazil and also agreeing with *Sauravus* from France, so far as can be determined. There are two sacral vertebræ in *Isodectes*. Twenty-two caudal vertebræ are preserved. They are very stout near the base of the tail but taper gradually until, at the tip, the size is reduced to near one-half. There are two lengths in the caudal vertebræ, as may be seen by referring to Plates 4 and 5. The sixth vertebra from the tip is nearly one-third as long again as the succeeding one. There is another long vertebra four vertebræ above this one. Just what the meaning of this condition is I can not determine, since it has not been observed, so far as I know, in any other early reptile. In *Mesosaurus* the vertebræ are apparently of uniform length. The neural canal is plainly visible in some of the distal vertebræ of the tail and this sinks quite deeply into some of the vertebræ, so that one is led to conclude that there are represented the two unconnected halves of the vertebræ; or, in other words, we have here a primitive condition of the persistence of the pleurocentra such as is paralleled in the developing vertebræ of the chick of thirteen days' incubation[a] and also in the vertebræ of some lizards.

There are evidences of 27 pairs of ribs. They are all intercentral in position, agreeing in this respect with the condition in all the Microsauria so far studied from the Carboniferous of North America, and also with the condition in *Sauravus*. In *Mesosaurus* the ribs have migrated backward from the intercentral position. Twenty-four pairs of presacral ribs are preserved. They are all strongly recurved exactly as in *Sauravus*, and are stoutly built. They are not distally expanded and are progressively shorter backward. The ribs are apparently single-headed as in *Sauravus*, there being no evidence of the bicipital condition, although this may be indicated by the expansion of the heads. The three pairs of caudal ribs preserved are short and more strongly recurved than the presacral ribs. The presence of sacral ribs can not be determined.

The left hand is of such a size that we may safely conjecture that the fore limbs were of some strength, but further than this nothing can be said. The carpus as preserved consists of three distal carpalia, being the carpal elements for digits II, III, and IV. There are two small ossicles lying beside the phalanx of digit III, which may be other carpalia. The first digit is preserved entire and the metacarpals of the other digits are also preserved. The phalangeal elements are all alike in the absence of any great amount of endochondrium. There are three elements in the first digit, the metacarpal

[a] Lillie, Development of the Chick, 1908, p. 426, fig. 242.

and the two phalanges. The elements of the other three digits are scattered so it is impossible to determine exactly the phalangeal formula for the hand, though it may have been 2–2–3–2.

The pelvis is represented by portions of the ilia which are exposed. The ischia and pubes are not visible. The ilium of the left side is the better preserved. It is seen to be an elongate, flattened plate slightly curved to accommodate the head of the femur. Two sacral vertebræ gave support to the ilia, possibly through the intervention of sacral ribs.

The hind limbs are very strong, with the foot much expanded and the tarsus well developed and bony. The femur is especially strong, and recalls in its proportions some of the higher reptiles. Its head is a little obscured through crushing, but the articular surface for the ilium seems to have been quite large, covering at least an arc of 40°, and thus indicating a wide range of movement for the leg. The two ends of the bone are expanded, but there are no tuberosities for muscular attachment nor should we expect any. The articular surface of the distal end is divided into two clearly marked facets for articulation with the tibia and fibula, recalling in this respect the femur of the plesiosaurs. The tibia has a triangular head, a contracted distal end, and a slender shaft. The fibula is slightly curved with the ends expanded. The distal end is wider than the proximal.

The tarsus, as preserved, in the left foot is composed of eight elements—two proximal and six distal tarsalia, one of which may be a sesamoid or a fractured portion of "t 5." The astragalus (tibiale) and calcaneum (fibulare) are both rounded, but with articular facets for the accommodation of the tibia, fibula, and distal tarsalia. There is no evidence of a *centrale carpi* or intermedium. The carpus is quite regular, and shows more specialized characters than do the later Cotylosauria, in which the *centrale* is still present, in one species of *Labidosaurus* at least.

The digits of the foot are long and slender, with a progressive increase in length from the first to the fourth. The fourth and fifth are nearly equal in length. The metacarpals of all five digits are long and exhibit full ossification, though no evidences of epiphyses are present. The terminal phalanges are pointed. The phalangeal formula of the foot is 2–3–4–5–4, a typical reptilian arrangement. In closing his discussion of this species Cope says: "This specimen is of importance as pertaining to the oldest known reptile, and the only one which has thus far been positively identified from the Coal Measures. I announced this identification in the American Naturalist, 1896, page 303."

The absence of ventral ribs is an assured character in *Isodectes*. I have searched for them under high power of magnification, and have

even flaked off portions of the soft coal on which the animal is embedded, without detecting at any point the slightest trace of an abdominal armature. The absence of scutellæ is complete, since there is no reason why they should not have been preserved, as the skeletal elements are in place and undisturbed by any post-mortem shifting.

The relationships of this peculiar reptile are not known. Its close affinities with the Microsauria is firmly established by many structural resemblances, but to what group of reptiles it may be related is uncertain. There are but few characters preserved on which a relationship could be established. The two sacral vertebræ, the phalangeal formula, and the ossified carpus and tarsus are the only true reptilian characters present in the specimen. Too much stress has been laid on the phalangeal formula as a basis for relationship, and a study of the Microsauria has shown that the presence or absence of ventral armature is of no particular importance, as has been shown to be the case with epiphyses, on which two groups of reptiles have been related. No member of the genus *Tuditanus* possesses abdominal ribs or scutellæ, but in closely related forms, like *Saurerpeton*, *Sauropleura*, and *Ctenerpeton*, the abdominal ribs or scutæ are present in great profusion and with well-marked characters, which have been taken as generic landmarks.

The morphology of the ventral armature still remains in mystery. Its origin is not to be explained on the basis of the structures found in any Carboniferous air-breathing vertebrate. The earliest branchiosaurians possess ventral scutes, and the earliest microsaurians possess them. Their origin and function are to be explained with the solution of the problem of the origin of the Amphibia from their piscian ancestor, which has not yet been discovered.

Measurements of Isodectes punctulatus Cope.

	mm.
Length of entire specimen, as preserved	132
Width across body, in middle of dorsal region	18
Length of digit I of the hand	11
Width of ulnare	2
Length of metacarpal, second digit	4
Length of rib in dorsal region	9
Width of same rib	.75
Length of dorsal vertebra	4
Width of same	3
Length of presacral region preserved	60
Length of sacral region	8
Length of ilium	9
Greatest width of the ilium	3
Length of femur	15
Proximal width of the femur	5
Median width of femur	2
Distal width of femur	4
Length of tibia	8

	mm.
Proximal width of tibia	3
Median width of tibia	1.50
Distal width of tibia	2
Length of radius	8
Proximal width of radius	2.50
Median width of radius	1.50
Distal width of radius	3
Length of tibiale	4
Width of same	2
Length of radiale	3.50
Width of same	2.50
Width of the distal tarsalia	1.50–2
Length of metatarsal of the fourth digit	5
Length of the first digit of the foot	8
Length of second digit	14
Length of third digit	18(?)
Length of fourth digit	19
Length of fifth digit	15
Length of the tail, as preserved	62
Width of tail at base	5
Width of tail at tip, as preserved	1.50
Length of distal vertebra of tail	3–5

The specimen, a part of the Lacoe collection, is Cat. No. 4457 of the U. S. National Museum. It was collected by Mr. Samuel Huston at Linton, Ohio.

TUDITANUS WALCOTTI, new species.

Plate 6, fig. 1; plate 7, fig. 1.

A small species of Microsauria is preserved as a smooth impression on a block of soft coal from Linton, Ohio. Nearly the entire form of the body is discernible. The specimen is especially interesting and valuable as exhibiting for the first time among the Linton forms the shape of the body of the small microsaurians of the *Tuditanus* type. It differs so markedly in the form of the skull from others of the genus that it is regarded as new, and the name *Tuditanus walcotti* is proposed for it as an expression of the writer's indebtedness to the secretary of the Smithsonian Institution for the use of the material among which the present form was included.

The specimen includes, besides the body impression, the complete skull, a right clavicle with portions of the left, a left humerus, 12 cervical and dorsal vertebræ, 10 pairs of ribs somewhat disturbed as to position, and a portion of the mandible. There are no portions of ventral scutellæ nor are there any traces of body scales in the smooth impression of the carbonized skin. One would expect at least to find impressions of the ventral scutæ in this specimen if they were present. Cope remarked on the apparent absence of scutellæ from members of the genus *Tuditanus* as they were known to him, and no contrary

evidence has since been brought to light. Until such evidence is forthcoming the absence of scutes will be taken as one of the generic characters of the genus *Tuditanus*. Under a magnification of 50 diameters the carbonized skin shows folds and wrinkles like muscle fibers in some places; in others no traces of the muscular structure can be detected. The wrinkles may be impressions of the internal musculature of the body wall of the abdomen. It is especially well preserved in the pelvic and pygal regions. Sections of the coal were made, but nothing definite could be determined as to the character of the impressions, as they were too poorly preserved and the coal too soft to bear much handling.

The specimen is preserved on the belly with the dorsum of the skull uppermost. It has been practically impossible to determine the arrangement of any of the cranial elements except the frontals, parietals, and the supraoccipitals which have the relations indicated in Plate 7, fig. 1. A median suture is clearly evident, with the pineal foramen well back in this suture. The bones of the skull are marked with faint, radiating lines. It is in the form of the skull and the position of the orbits that the specific characters are found. These are the backward position of the eyes and in the oval, pointed shape of the skull. The species is closely related to *Tuditanus minimus* Moodie from the Cannelton slates of Pennsylvania, and serves further to connect the forms from the Ohio and Pennsylvania localities. It differs from the last-named species in the position and form of the orbits, these structures being more oval in the present form and placed farther back. The shape of the skull differs also in the almost entire absence of the posterior table. The median points of the orbits occupy the line which bisects the skull. The interorbital width is less than the length of the orbit. The mandible is heavy and appears to have borne sharp pleurodont teeth.

The vertebral column is little more than a mold of the form of the vertebræ, so that little can be said of its character. The individual vertebræ are short and hour-glass shaped. The ribs are borne intercentrally, as in all the microsaurians which have been studied from the Linton deposits. The ribs are rather long and somewhat heavy, slightly curved and expanded at the proximal end as though an incipient bicipital condition were present.

The right clavicle, which is preserved as an impression, is entire. Its impression shows this element to have been ornamented on its ventral surface with radiating grooves and ridges which started at the lower angle of the bone. The element is distinctly triangular, which is characteristic of the genus *Tuditanus*, so far as known. The fragment of the left clavicle adds nothing to our knowledge of the element.

The left humerus recalls in a striking way that of *Tuditanus longipes* Cope, and it was once entertained as a possibility that the present form might be a member of that species, since the skull is lacking in *T. longipes*. Sufficient specific differences were found, however, in the ribs, which, in *T. longipes*, are very long, slightly curved, and delicate, but which, in the present form, are comparatively heavy. Other characters sufficiently diagnostic are found in the form assumed by the vertebræ in the two forms.

Measurements of the type of Tuditanus walcotti.

	mm.
Length of specimen	70
Length of skull	20
Width of skull, posterior	14
Width of skull, anterior to orbits	10
Length of orbit	4
Width of orbit	2
Interorbital width	3
Length of clavicle	9
Greatest width of clavicle	4
Length of vertebral column, as preserved	50
Length of a vertebra	1.75
Width of a vertebra	.50
Width of body impression	15
Length of humerus	6
Median width of humerus	.50
Width at end of humerus	2
Length of rib	8
Width of rib	.25

This specimen was collected by Mr. R. D. Lacoe, of Pittston, Pennsylvania, from Linton, Ohio.

A second individual (Plate 6, fig. 2; Plate 7, fig. 2) of this species (*Tuditanus walcotti*) is indicated by a rather poorly preserved specimen on a slab of soft coal from the Linton mines. The following portions of the animal have been detected and will be discussed: Partial impression of the skull, with a fragment of a minute jaw, in which are minute teeth; right clavicle; part of the impression of the body; nearly entire left hind limb; impressions of about a dozen vertebræ, very indistinct.

The impression of the skull is distinct only in a favorable light, and even then the boundaries of the cranium are a little uncertain. For this reason no representation of the form will be attempted. The sculpturing on the parietals is, however, distinct enough to show relationship with the previously described specimen, and the form of the body impression, the absence of abdominal scutes, the shape of the clavicle and its sculpture, and the proportions of the hind limb all agree with the characters which have been assigned to the genus *Tuditanus*. The fragment of the jaw is interesting as giving the first information as to the character of the mandible in the genus *Tudi-*

tanus. It is very slender and of uniform width so far as preserved. The teeth are short, blunt cones, apparently pleurodont.

The clavicle is of the typical *Tuditanus* form, with the sculpturing lines radiating out from the angle. The impression of the body adds nothing to that already described for the type-specimen. The nearly entire hind limb is of great interest as adding another example of the phalangeal formula. The foot is almost perfectly preserved, and the formula was probably 2–2–3–3–2. The endochondrium of the limb bones is not highly developed. About a dozen vertebrae are represented by molds in the soft coal, but nothing of their structure can be determined.

The sharp, reptile-like claws in which the toes end recall those of *Isodectes* and of *Tuditanus minimus* Moodie. It is another link in the chain of the suggested relationship between the microsaurians and the early reptiles.

Measurements of the second specimen of Tuditanus walcotti Moodie. (Cat. No. 4481, U.S.N.M.)

	mm.
Length of entire body impression	75
Width across belly, maximum	16
Length of skull	?17
Posterior width of skull	?14
Length of fragment of jaw	4
Width of fragment of jaw	1.5
Length of tooth in jaw	.25
Length of clavicle	8
Width of clavicle, maximum	4
Length of hind limb	22
Length of femur	8
Length of tibia (?)	6
Length of metatarsal	2
Length of first digit	6

Genus ODONTERPETON, new genus.

The generic characters may be found in the triangular shape of the skull, the large size of the teeth, the shape of the vertebrae, the small size of the orbits and their anterior position as shown in the type.

The name of the genus is derived from the remarkable size of the teeth compared with the size of the skull, and it was through them that the specimen was first recognized as a skull.

Genotype.—Odonterpeton triangularis.

ODONTERPETON TRIANGULARIS, new species.

Plate 6, fig. 3.

By this name may be known the smallest of all microsaurians hitherto described. *Orthocosta microscopica* Fritsch, from the Carboniferous of Bohemia, is a rival of the present form as to size, but the form described by Fritsch belongs among the Aistopoda, while the present form shows clear affinities with the Microsauria.

As may be seen by referring to the list of measurements, the skull of the present form measures only 6½ mm. in length. The form may possibly be larval, though I do not think so, if I may judge from the well-developed condition of the skull bones and the complete ossification of the vertebræ. The sides of the skull are equal and the base is a straight table, so that the skull forms almost an exact equilateral triangle. The orbits are very small and are placed well forward. The interorbital space is four times that of the diameter of the orbit, a very unusual character and in itself is almost worthy of ranking as a generic character. The median suture of the skull is zigzag, and incloses the minute parietal foramen near the posterior end of the skull. The relations of the elements of the skull, with the exception of those of the frontals and parietals, can not be determined with accuracy, although there are here and there indications of sutures. The characters exhibited by the cranial elements, so far as they can be determined, are those of the family Tuditanidæ, and the form may, for the present, be regarded as a member of that group. The teeth are very long, slender, and sharp, and are placed close together. There is no indication of fluting on the teeth. They are slightly curved inward.

There are thirteen vertebræ present. The centra are hour-glass shaped, and are apparently phyllospondylous, with the notochord largely persistent. The vertebral centra are unusually long and slender, with the ends rounded. The humerus of the right side is preserved. It it a long, slender bone with expanded extremities. There is no evidence of abdominal armature nor of ribs.

The discovery of this form in the Linton deposits is of considerable interest as indicating a wide range in size and character of the fauna of the time. The forms now known from Linton range from the *Odonterpeton* to the form designated *Macrerpeton huxleyi* Cope, with a skull possibly 8 inches in length and whose body may have attained some feet in length. The large rib described below undoubtedly indicates a large form of the ancient Amphibia from Linton, as do the vertebræ described by Marsh in 1863 from Nova Scotia.

Measurements of the type Odonterpeton triangularis Moodie.

	mm.
Length of animal, as preserved	18
Length of skull	6.5
Posterior width of skull	5.5
Length of side of skull	6.5
Diameter of orbit	.65
Interorbital width	2
Length of tooth	.25
Length of vertebra	1.45
Width of vertebra	.35
Length of humerus	2.25
Distal width of humerus	.35

The specimen is embedded on a small slab of soft coal from Linton, Ohio. It is Cat. No. 4465 of the U. S. National Museum collection.

ERPETOSAURUS MINUTUS, new species.

Plate 8, fig. 1.

The genus *Erpetosaurus* will be more fully characterized elsewhere. Suffice it to say here that it is erected to include certain members of the genus *Tuditanus*. The species *Erpetosaurus minutus* is the smallest of the genus so far known. The specimen on which the species is based is composed of the greater portion of a small skull preserved in the hard shale from Cannelton, Pennsylvania, and was collected by Mr. R. D. Lacoe, of Pittston, Pennsylvania. The characters of the specimen had not been previously determined, since the museum label and number had partially obscured the snout of the skull. The skull is very small, but has the form assumed by other members of the genus. At first sight the specimen looks like a broken scute of some large form. Closer inspection, however, revealed the two impressions representing the orbits, and a Zeiss binocular revealed the characters. The enlarged photograph plate 8 (fig. 1, × 5) shows the structure of the skull. The large size and anterior position of the orbits, the character of the sculpturing, the presence of a slight posterior table to the skull, as in *Erpetosaurus* (*Tuditanus*) *tabulatus* Cope, are the characters on which a specific diagnosis is possible. The specific characters which distinguish this form from the *E. tabulatus* Cope, are the slight development of the posterior table, the more delicate form of the sculpturing, the more posterior position of the orbits, and the varying shape assumed by the parietals in the two species. Any one of these characters would be valid as a specific character. The pineal eye is indistinct, but is observed to lie in the broken tract in the median line of the skull in the middle of the portion posterior to the orbits. The interorbital width is equal to the width of each orbit. The orbits themselves are slightly oval and not round as in the case of *E. tabulatus* Cope.

The skull elements are sculptured with sharp radiating grooves and ridges, and on the supraoccipitals and epiotics the grooves take the form of pits in a row, which undoubtedly represent the occipital cross-commissure of the lateral line system first observed by Andrews in the skull of *Ceraterpeton galvani* Huxley. The supraorbital canal is represented by a slight elongate depression observable over each orbit and extending, in one case, for some 5 mm. The presence of the circular arrangement of the lateral line canals in the jugal region is suggested by the depression on the left of the photograph on the posterior edge of the squamosal.

The portion of the skull anterior to the orbits is wanting, curiously enough, just as it is in *Erpetosaurus tabulatus* Cope. In the re-

mainder of the skull the supraoccipitals, the epiotics, the parietals, the squamosals, and a portion of the right frontal can be detected, although the boundaries of but three can be accurately defined. The depression bounding the anterior outline of the skull is taken to be the impress of the mandible, in which case this structure would be of some depth, as in the case of the mandible associated with *E. tabulatus* Cope, to be described elsewhere.

The present specimen is of interest in respect to the presence of the lateral line canals, its small size, and its generic identity with forms from Ohio. There is still another form known from the Cannelton slates *Erpetosaurus* (*Tuditanus*) *sculptilis* Moodie. It is No. 12315 of the University of Chicago collection.

Measurements of Erpetosaurus minutus Moodie.

	mm.
Length of skull	18
Posterior width of skull	17
Width of skull across orbits	14
Length of orbit	4.5
Width of orbit	3.5
Interorbital width	3.5

This specimen forms part of the Lacoe collection and is Cat. No. 4545 of the U. S. National Museum.

Pectoral girdle provisionally associated with *Erpetosaurus sculptilis* Moodie.

The present specimen is preserved on a block of slate from Cannelton, Pennsylvania. It is associated with the previously described *Erpetosaurus* (*Tuditanus*) *sculptilis* Moodie on account of its size and the character of the sculpture. It may pertain to an unknown species. There are preserved on the block of slate, besides the three element of the pectoral girdle, other remains, but they are, for the most part, too imperfectly preserved for recognition. Some of them are phalanges, and I believe I detect a scapula in the rounded curved plate lying near the right clavicle. The three pectoral elements, the interclavicle and the two clavicles, are preserved intact with the ventral surface uppermost. There are no evidences of pectoral elements other than the scapula.

The specimen is particularly important as furnishing further evidence of the simplicity of the microsaurian pectoral girdle, which has been regarded by Jaekel as being extremely complex, in one species at least, *Diceratosaurus punctolineatus* Cope. The three elements are broken, but either the elements or their impressions are present, so that identification is possible. The elements are sculptured with radiating grooves and ridges as in so many of the Microsauria. The interclavicle is spatulate and bears a general resemblance to the same element of *Metoposaurus fraasi* Lucas from the

Triassic of Arizona. The clavicles are triangular, with rounded angles, and the hypothenuse occupies the interior border.

Measurements of the pectoral girdle.

	mm.
Width across the entire girdle	17
Length of interclavicle	15
Width of interclavicle	10
Length of clavicle	11
Width of clavicle, maximum	6

The specimen is Cat. No. 4539 of the U. S. National Museum (Lacoe collection).

TUDITANUS MINIMUS Moodie.

Plate 8, fig. 2.

A nearly complete skeleton (Cat. No. 4555 U.S.N.M.) forms the basis of this species, which has already been described and an outline of the skeleton published.[a] A photograph of the specimen on which the species is based is published herewith. The form is interesting as showing an advanced type of endochondral formation of the limb bones, and also in the complete preservation of the hand and foot.

EOSERPETON TENUICORNE Cope.

The new genus *Eoserpeton* has been erected for the reception of the species formerly described by Cope as *Ceraterpeton tenuicorne*. The characters of the new genus are found in the skull, which is represented by a nearly perfect specimen belonging to Columbia University. The skull was excellently supplemented by a nearly complete skeleton in the collection of the U. S. National Museum (Cat. Nos. 4472, 4473, U.S.N.M.), which shows characters of the skull which vary somewhat from the type. The horns are more slender in the National Museum specimen, and are more curved, and the form of the skull varies slightly in the two specimens. A restoration of the form has been attempted.[b] Since the specimen has already been described by Cope a redescription will be reserved.

SAURERPETON LATITHORAX Cope.

Plate 9.

The new genus *Saurerpeton* has been proposed[c] for the reception of the species described by Cope as *Sauropleura latithorax*. The characters on which the new genus was based were the broad ventral elements of the abdomen and the arrangement and form of the cranial

[a] Moodie, Journ. Geol., vol. 17, 1909, p. 56, fig. 10.
[b] Idem, p. 77.
[c] Idem, p. 80.

elements. An outline of the cranial elements has already been given, and a photograph of the complete specimen is given herewith to correct some of the inaccuracies of Cope's original drawing. It ought to be said, in justice to that brilliant author, that he did not see the proofs of the article in which the form was described. A fuller discussion and redescription of the species will be reserved.

ICHTHYERPETON SQUAMOSUM Moodie.

A remarkable form of amphibian was described[a] under this name from material in the collection of the U. S. National Museum (Cat. Nos. 4476, 4459). The species was only tentatively assigned to the genus *Ichthyerpeton* Huxley. Its closer definition must await future discoveries. It is, however, *the only evidence of a completely scaled amphibian known from the Carboniferous of North America.* That the specimens are amphibians and not fishes is evidenced in the well-developed ventral scutellation.

CTENERPETON ALVEOLATUM Cope.

Plate 10.

An examination of the type (Cat. No. 4475, U.S.N.M.) of this peculiar form has not resulted in the discovery of any new characters. A photograph is given in Plate 10 to correct Cope's original drawing, which was inaccurate as to details. The form is interesting as furnishing another illustration of the diversity of types assumed by the ventral scutellation in the Carboniferous amphibians. In the genus *Tuditanus* no evidence has ever been detected of a ventral scutellation, while in the genera *Sauropleura*, *Saurerpeton*, and *Ctenerpeton* the scutellation of the abdomen has assumed a well developed and characteristic form.

PTYONIUS PECTINATUS Cope.

Plate 8, fig. 3.

There are four specimens of this species in the collection (Cat. Nos. 4514, 4458, 4463, 4464, U.S.N.M.). The most perfect one, shown on Plate 8, fig. 3, is interesting as giving an idea of the form of the body, which was long, slender, and snake-like. In this specimen there are no evidences of pectoral plates, although these are present on a specimen of another species of this genus in the collection of the American Museum of Natural History in New York City. The skull of *Ptyonius* is long and attenuated. The morphology of the skull has not yet been determined, but it is hoped that this may be possible from a close study of the material at hand, which includes six skulls and various portions of the body. From the form of the vertebræ

[a] Moodie, Journ. Geol., vol. 17, 1909, p. 69.

in *Ptyonius* we may conclude that the body was flattened from side to side and that the caudal region was provided with a membraneous fin, such as is found in the recent *Petromyzon* and its allies.

Ptyonius is a typical member of the Aistopoda, the chief character of which group is the absence of limbs. With this character are, however, associated a concomitant lengthening and attenuation of the facial region, a recession of the orbits, an elongation and an attenuation of the body, a tendency to flattening from side to side in the vertebræ, an increase in the length of the tail, and the production of a peculiar type of abdominal armature, consisting of small rods arranged in a chevron pattern, ranging from just back of the skull in the pectoral region probably to the anus.

In other species of the genus *Ptyonius* the pectoral plates are more highly developed than in *P. pectinatus* Cope and especially in *P. nummifer* Cope. This is to my mind almost conclusive evidence that the Aistopoda are a degenerate branch of the Microsauria, to which they are closely related in most respects. The order Aistopoda may be retained for the present, however, until future discoveries teach us differently.

DICERATOSAURUS PUNCTOLINEATUS Cope.

It is with much gratification that a second specimen (Cat. No. 4461, U.S.N.M.) of this peculiar species is to be recorded from the collections in the U. S. National Museum. It supplements in a beautiful manner the type specimen, as well as those described by Jækel from the collections in Europe. In the present specimen the head is lacking. There are nineteen vertebræ preserved, and nine pairs of ribs. The ilium is present as a mold in the soft coal, and the femur and tibia(?) of the hind limb are preserved. The principal new characters which are added to the knowledge of the species by this specimen are the presence of the peculiar ilium and the large leg.

The vertebræ have the same character as the type. The ribs are intercentral and do not differ from the type as to structure or form. They are but slightly curved and are of an almost uniform width, with the head large. The mold of the ilium is hourglass shaped. It was evidently in the shape of a flattened plate with a rounded short shaft. It apparently attaches to the seventeenth vertebræ in the series as preserved. Since there are very probably two or three vertebræ gone from the cervical region, the sacral was probably the nineteenth or twentieth vertebræ of the series. The body of the animal was stout, as is evidenced by the dimensions of the skeleton.

There are no traces of ventral scutellæ. These structures are scantily preserved in the type specimen, and Jækel did not find them at all in the forms studied by him. The dimensions of the entire leg are those of *Pelion lyelli* Wyman, and at first sight it was thought that

the specimen pertained to that species. Closer examination of the vertebræ and ribs, however, revealed typical diceratosaurian characters. The femur is very long and quite stout, with the shaft long and the extremities expanded. The dimensions of the tibia are not definitely ascertained, but it has a structure essentially similar to the femur, with slender shaft and expanded ends.

The relationship of *Diceratosaurus* to *Ceraterpeton galeani* Huxley is a close one. The peculiar form of the scapula, the number of the dorsal vertebræ, the regular arrangement of the pectoral elements, the length of the tail, the form of the vertebræ and ribs in the two forms are indicative of a close relationship. The two genera both find a place in the family *Crocodylida*, as defined by Lydekker.[a] The generic character which separates the two forms in the position of the horn, which in *Ceraterpeton* is epiotic, and in *Diceratosaurus* supratemporal.

Measurements of Diceratosaurus punctolineatus Cope.

	mm.
Length of specimen	94
Length of rib	9
Width of rib	1.5
Length of vertebræ	5
Width of vertebræ	4.5
Length of femur	27
Proximal width of femur	6
Median width of femur	3
Distal width of femur	7
Length of tibia (?)	18
Distal width of tibia	4
Median width of tibia	2
Length of ilium	12
Proximal width of ilium	7
Median width of ilium	3
Distal width of ilium	6

Scutes of AMPHIBIAN, SAUROPLEURA SCUTELLATA Newberry.

Associated with certain specimens of the above-mentioned species are sometimes found peculiar scute-like elements (Cat. No. 4513, U.S.N.M.) which have been regarded as pertaining to the Amphibia and possibly to some species of *Sauropleura* itself. The position of the scutes on the body is uncertain. They range in size from 5 or 6 mm. to 30 mm. in length. They are always somewhat fan-shaped, with one end abruptly acute.

[a] Lydekker, Cat. Fos. Rept. and Amphibia Brit Mus., pt. 4, p. 196.

The measurements of the present specimens are as follows:

	mm.
Length of larger scute	30
Maximum width of scute	13
Minimum width of scute	4
Length of smaller scute	22
Maximum width of scute	8
Minimum width of scute	6

THYRSIDIUM FASCICULARE Cope.

The specimens designated as Cat. Nos. 4480, 4462, U.S.N.M., correspond very closely with the figures of that species.[a] The specimens consist of ribs, vertebræ, and scutellæ of the abdomen. On one of the slabs of No. 4480 there is an impression of a small patch of rounded scales and carbonized skin. These scales occur about two in a length of a millimeter. They are rounded and without markings. Whether the scales covered the entire body, as is the case in *Ichthyerpeton squamosum* Moodie, can not be determined.

MOLGOPHIS BREVICOSTATUS Cope.

The specimen (Cat. No. 4477, U.S.N.M.) resembles very much the one figured by Cope on plate 44, fig. 1 of the above-mentioned work.[a] It consists of vertebræ, ribs, and ventral scutellæ, and adds nothing to our knowledge of the form.

ŒSTOCEPHALUS REMEX Cope.

The species is represented by two specimens (Cat. Nos. 4511, 4460, 4478, U.S.N.M.). They offer characters which vary somewhat from the type, but the remains are too imperfectly preserved to give definite data for specific separation. They consist of vertebræ, ribs, and many ventral scutellæ which are in some cases disassociated, so that one can with ease determine the separate rod-like form of the ventral armature. The vertebræ in the present specimens are larger than in the type and do not have the wide expansions of the chevron and spine.

PLEUROPTYX CLAVATUS Cope.

The specimen designated (Cat. No. 4509, U.S.N.M.) possibly belongs to this species, as defined by Cope, although it yet remains to be proven that the genus *Pleuroptyx* is distinct from *Molgophis*. The specimen corresponds very closely with the one figured by Cope on plate 44, fig. 2, of the Ohio report for 1875. It is of interest to note that Udden[b] has recorded remains from the Des Moines limestone of Iowa which have been identified by Eastman as pertaining to this species.

[a] Cope. Geol. Surv. Ohio, Pal., vol. 2, 1875, pl. 42, fig. 3.

[b] Udden, Iowa Geological Survey, vol. 12, 1902, p. 406.

LARGE RIB.

Plate 8, fig. 4.

There is preserved on a block of soft coal a portion of a very large rib, which, with its impress (Cat. Nos. 4489, 4490, U.S.N.M.), represents the possible presence of a labyrinthodont type of animal in the Linton beds. The rib is very strong, slightly grooved, and is curved. There is a tendency to a bicipital condition but the extreme head is lost. The bone is solid and well formed and resembles no fish rib with which the writer is acquainted. It may be tentatively associated with the skull described elsewhere[a] as *Macrerpeton huxleyi* Cope.

I am under obligations to Mr. G. Dallas Hanna, of the University of Kansas, for the line drawings of Plates 2 and 4.

EXPLANATIONS OF PLATES.

PLATE 4.

The type specimen of *Isodectes punctulatus* Cope, Cat. No. 4457, U.S.N.M., about natural size. After Williston.

PLATE 5.

Outline drawing of the skeleton of *Isodectes punctulatus* Cope, shown in pl. 4. About natural size.

PLATE 6.

Fig. 1. Type specimen of *Tuditanus walcotti* Moodie Cat. No. 4474, U.S.N.M. Natural size.

2. Second specimen of *Tuditanus walcotti* Moodie, Cat. No. 4481, U.S.N.M. Natural size. *T*=tarsus.

3. Type of *Odonterpeton triangularis* Moodie, Cat. No. 4465, U.S.N.M. × 3.

PLATE 7.

Fig. 1. Outline drawing of the type of *Tuditanus walcotti* Moodie showing the impression of the body and the muscle structure at "*M*." × 2.5.
Cl=clavicle; *F*=frontal; *Fe*=femur; *H*=humerus; *n*=nostril; *O*=orbit; *p*=parietal; *R*=rib; *S*=supra-occipital; *V*=vertebra; *y*=pineal foramen.

2. The left leg of the second specimen of *Tuditanus walcotti* Moodie. × 3.

PLATE 8.

Fig. 1. Type (Cat. No. 4545, U.S.N.M.) of *Erpetosaurus minutus* Moodie. × 5.

2. Type (Cat. No. 4555, U.S.N.M.) of *Tuditanus minimus* Moodie. × 1.

3. The skeleton (Cat. No. 4458, U.S.N.M.) of *Ptyonius pectinatus* Cope. × 1.

4. Large rib. × 1. (Cat. Nos. 4489, 4490, U.S.N.M.)

PLATE 9.

The skeleton of *Saurerpeton latithorax* Cope. × 1.5. (Cat. No. 4471, U.S.N.M.)

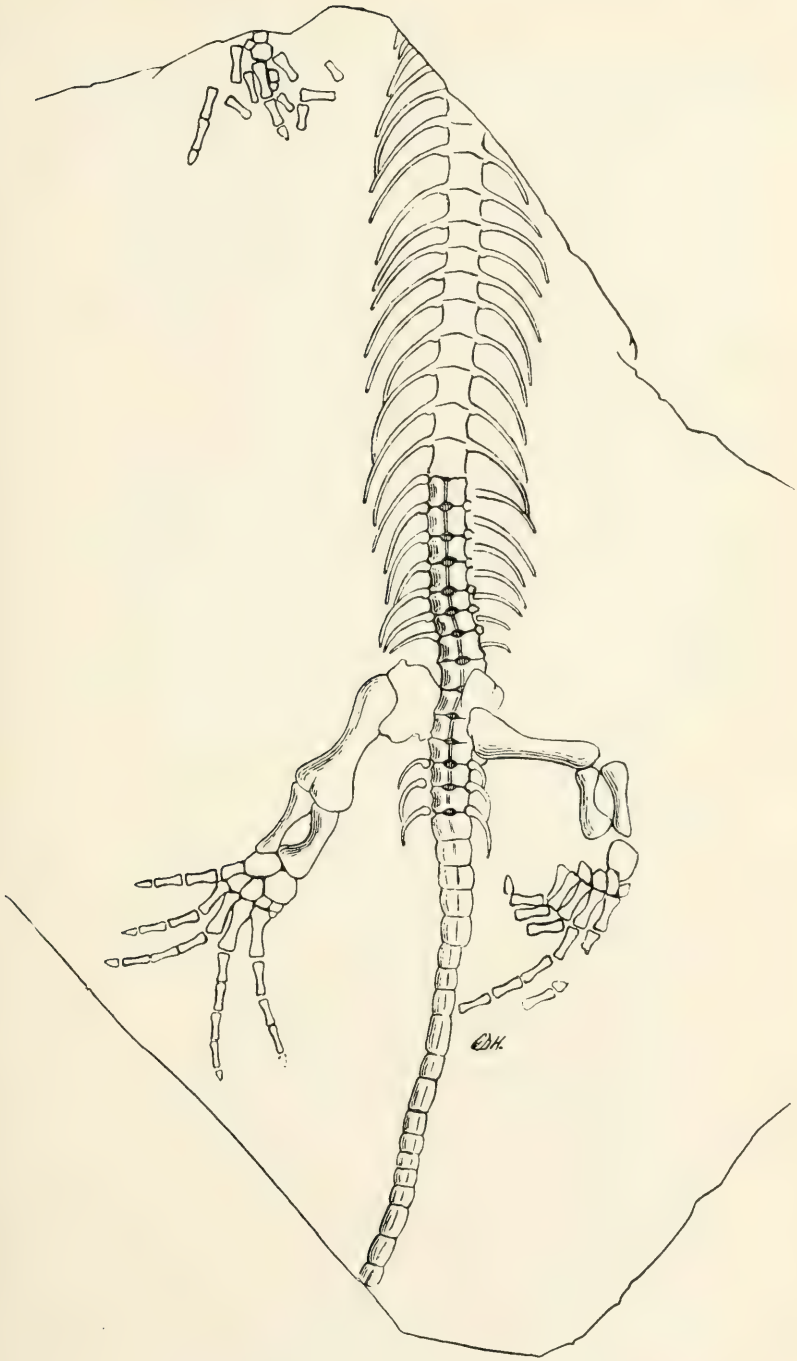
PLATE 10.

The skeleton of *Ctenerpeton alveolatum* Cope. × 1. (Cat. No. 4475, U.S.N.M.)

[a] Moodie, Journ. Geol., vol. 17, 1909, p. 72.

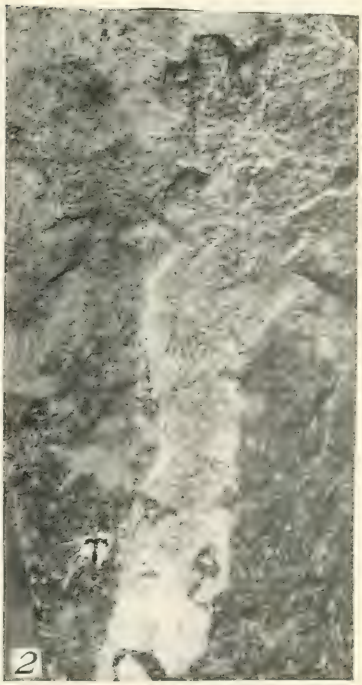
TYPE-SPECIMEN OF ISODECTES PUNCTULATUS.

FOR EXPLANATION OF PLATE SEE PAGE 28.



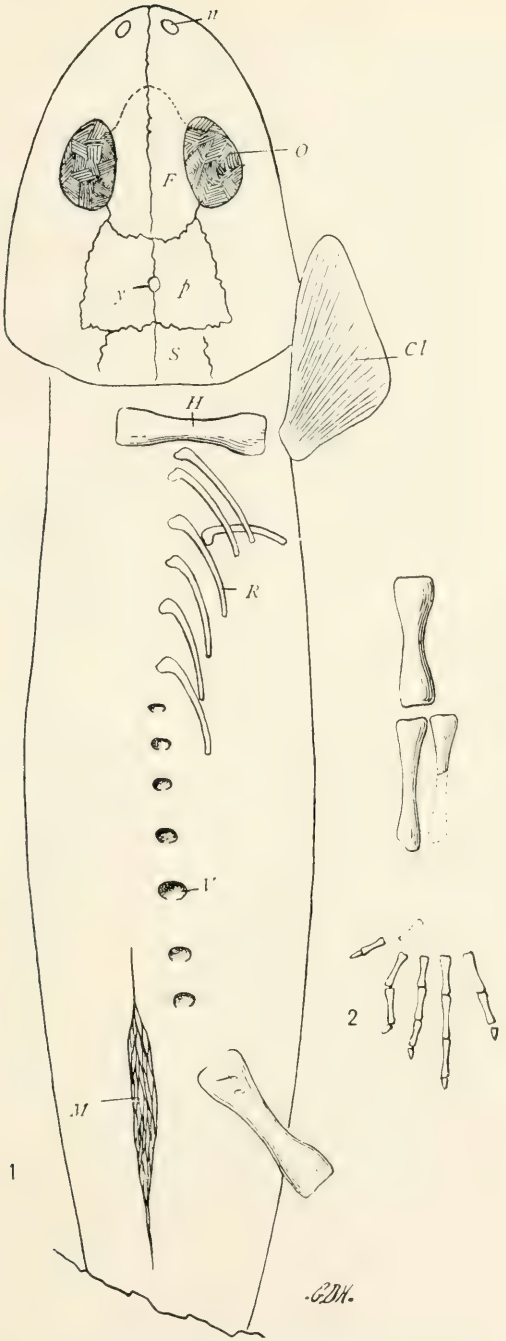
OUTLINE DRAWING OF ISODECTES PUNCTULATUS.

FOR EXPLANATION OF PLATE SEE PAGE 28.



SPECIMENS OF TUDITANUS WALCOTTI AND ODONTERPETON TRIANGULARIS.

FOR EXPLANATION OF PLATE SEE PAGE 28.



OUTLINE DRAWING OF TUDITANUS WALCOTTI.

FOR EXPLANATION OF PLATE SEE PAGE 28.

SPECIMENS OF ERPETOSAURUS MINUTUS, TUDITANUS MINIMUS, AND PTYONIUS PECTINATUS.

FOR EXPLANATION OF PLATE SEE PAGE 28.

SKELETON OF SAU

FOR EXPLANATION

ETON LATITHOROX.

ATE SEE PAGE 28.

SKELETON OF CTENERPETON ALVEOLATUM.

FOR EXPLANATION OF PLATE SEE PAGE 28.

FIVE NEW SPECIES OF RECENT UNSTALKED CRINOIDS.

By Austin Hobart Clark,

Collaborator, Division of Marine Invertebrates, U. S. National Museum.

From time to time crinoids have been received at the U. S. National Museum which were evidently new species, but which have been left undescribed because of the absence of related species with which to make comparisons. One by one these missing species have come to hand and the relationships of previously obscure forms have been cleared up. In the present paper five species are described, the affinities of which have been brought out through the study of material recently received.

Family COMASTERIDÆ.

Genus COMANTHUS A. H. Clark.

Subgenus COMANTHUS A. H. Clark.

Group BENNETTIA A. H. Clark.

COMANTHUS (COMANTHUS) PINGUIS, new species.

Centro-dorsal large and hemispherical, with a concave polar area, as in *C.* (*C.*) *bennetti*, 10 mm. to 12 mm. in diameter.

Cirri large and stout as in *C.* (*C.*) *bennetti*, usually XXXV–XLV, 28–34, 30 mm. to 40 mm. long, the joints in the proximal half squarish or slightly longer than broad, in the distal becoming about twice as broad as long; at about the twelfth the distal dorsal edge of the joints begins to project, and later the dorsal surface becomes carinate, so that in lateral view the cirri appear to have well-developed dorsal spines.

Division series all 4 (3+4), IIBr and IIIBr regularly, IVBr rarely, present, very broad and massive, the IIBr series nearly in apposition laterally.

Usually thirty-five to forty arms 100 mm. to 140 mm. long, the brachials slightly overlapping.

Disk very large, 30 mm. to 42 mm. in diameter, naked; anal tube large, central or subcentral; mouth variable, radial.

P_D very stout basally but tapering rather rapidly as far as the ventral surface of the disk, 35 mm. to 40 mm. long; P_P less stout basally, 30 mm. long; P_1 25 mm. long; P_2 small, weak, and slender, 10 mm. to 12 mm. long; P_3 and P_4 similar, 7 mm. and 6 mm. long, respectively; P_5 and following pinnules 5 mm. long, without terminal combs, increasing slowly to 12 mm. distally.

Type-specimen.—Cat. No. 25517, U.S.N.M., from Sagami Bay, Japan.

This is the most common comasterid along the shores of southern Japan, where it appears to represent *C.* (*C.*) *bennetti* of the East Indian littoral. It may be at once distinguished from that species by the great breadth of the division series, the short distal cirrus joints, which bear dorsal processes, and the much smaller number of arms. Carpenter's *Actinometra robustipinna* appears to be a synonym of Müller's *Alecto bennetti*.

COMANTHUS (COMANTHUS) SAMOANA, new species.

Centro-dorsal small, discoidal, the bare polar area flat, 2 mm. or 3 mm. in diameter; cirrus sockets arranged in a single more or less irregular marginal row.

Cirri short, but comparatively stout XVIII–XXIII, usually 13–14, 10 mm. long; fourth and fifth joints about twice as long as broad, the seventh and following about one-third broader than long; fifth and following joints with the distal dorsal edge somewhat thickened, this thickening gradually narrowing distally and increasing in height, appearing in lateral view as a slight subterminal tubercle; third, fourth, and fifth joints "dice-box shaped" with enlarged ends, the following rather strongly flattened laterally so that in lateral view the cirri appear to increase in diameter distally.

Radials and usually all of the IBr_1 concealed; IIBr 4 (3+4) well separated laterally.

Fifteen to twenty-one arms 60 mm. to 70 mm. long, rather slender, resembling those of *C.* (*C.*) *trichoptera*, the brachials in the proximal half with rather strongly overlapping distal edges.

Pinnules essentially as in *C.* (*C.*) *trichoptera*, but remarkable for the great development of spines on the dorsal surface of the joints.

Type-specimen.—Cat. No. 25514, U.S.N.M., from Samoa; collected by C. N. E. Eliot.

The stout and numerous cirri of this little species render it very readily distinguishable from *C.* (*C.*) *rotalaria*, while the slender and thread-like cirri of *C.* (*C.*) *trichoptera* at once differentiate that species from it.

Family HIMEROMETRIDÆ.

Genus CRASPEDOMETRA A. H. Clark.

CRASPEDOMETRA ALIENA, new species.

Centro-dorsal thick-discoidal, the bare polar area flat, 2 mm. to 4 mm. in diameter; cirrus sockets arranged in a single or partially double alternating marginal row.

Cirri XV–XVII, 29–36 (usually 35 or 36), 30 mm. long, moderately stout basally, but tapering very gradually to a slender tip; first joint short, the following gradually increasing in length to the fourth or fifth, which is squarish, the remainder being slightly longer than broad; the terminal ten to fourteen may have a slight dorsal carination; opposing spine small but prominent, terminal or subterminal, about equal to one-third the diameter of the penultimate joint in height; terminal claw somewhat longer than the penultimate joint, slender and slightly curved; joints in the distal half or two-thirds of the cirri with purple saddle-shaped markings, as in *C. acuticirra*.

Radials entirely concealed in the median line, or equal to half the IBr_1 in length; IBr_1 oblong, short, five or six times as broad as long, united laterally; IBr_2 (axillary) short, almost or quite triangular, two and one-half to three times as broad as long; IIBr4 (3+4) (twice 2 in one specimen) in apposition and flattened laterally; IIIBr2, but only once present in two specimens, developed internally.

Fifteen to twenty arms, 140 mm. long, long, slender, and evenly tapering; first two brachials subequal, slightly wedge-shaped, between three and four times as broad as long in the median line; third and fourth brachials (syzygial pair) oblong, two and one-half or three times as broad as long; next five brachials approximately oblong, nearly four times as broad as long in the median line; following brachials triangular, somewhat over twice as broad as long, the longer side somewhat convex, after the proximal fourth of the arm becoming wedge-shaped, about three times as broad as long, and slightly longer terminally. Syzygies occur between the third and fourth brachials, again between the fourteenth and fifteenth to twenty-ninth and thirtieth, and distally at intervals of from eleven to nineteen oblique muscular articulations.

P_D small and weak, about 6 mm. long, with thirteen to sixteen joints, all of which are about as long as broad; P_1 similar, slightly larger, 7 mm. or 8 mm. long; P_2 9 mm. to 12 mm. long, with eighteen joints, much stouter and stiffer than the preceding pinnules, ending somewhat abruptly with a stiffened tip, as in *Stephanometra*, and not a long delicate flagellate tip, as in the other species of the genus; first two joints not so long as broad, the third squarish, the remainder longer than broad, becoming twice as long as broad distally; the pin-

nule may be slightly carinate basally, and after the second or third joint the distal dorsal ends of the joints become thickened and project strongly, forming "lateral processes," as in *Amphimetra variipinna;* P_3 slightly stouter and slightly longer than P_2, usually with a few less joints, but similar to it; P_1 9 mm. long, comparatively slender, without lateral processes; the joints becoming squarish on the fourth or fifth and about twice as long as broad terminally; following similar, gradually increasing to 10 mm. in length and then becoming more slender and slowly decreasing to 8 mm. in length.

Color (in spirits). White, the cirrus joints with purple saddle-shaped markings in the distal half or two-thirds of the cirri.

Type-specimen.—Cat. No. 25516, U.S.N.M., from *Albatross* station 5157, west of Sumalac Island (Tataan group, Philippine Archipelago); 18 fathoms.

Genus AMPHIMETRA A. H. Clark.

AMPHIMETRA PARILIS, new species.

Centro-dorsal thick-discoidal, the bare polar area flat, 2.5 mm. in diameter; cirrus sockets arranged in one and a partial second crowded marginal row.

Cirri XII, 30–33, 25 to 30 mm. long, moderately stout; joints subequal, all broader than long, at first very short, then slowly increasing to the seventh or eighth, which, with the three or four following, is about half again as broad as long, then very slowly decreasing, so that the joints in the distal half of the cirri are about twice as broad as long; twelfth and following joints with prominent median dorsal spines, which are directed anteriorly; opposing spine longer than the spines on the preceding joints, sharp, triangular, rather slender, the apex median, rising to a height about equal to half the diameter of the penultimate joint; terminal claw longer than the penultimate joint, slender, more strongly curved proximally than distally.

Radials just visible in the median line, forming a low triangle in the angles of the calyx, the lateral corners slightly swollen; IBr_1 oblong, four times as broad as long, almost entirely united laterally; IBr_2 (axillary) almost or quite triangular, somewhat over twice as broad as long, in apposition and laterally flattened.

Ten arms 150 mm. long, tapering rather less rapidly than in *A. discoidea* and *A. formosa;* first two brachials short, wedge-shaped, the second slightly the longer exteriorly, but tapering almost to a point interiorly, the first entirely united interiorly; third and fourth brachials (syzygial pair) oblong, two and one-half or three times as broad as long; next seven or eight brachials oblong, very short, about four times as broad as long or even shorter, then becoming wedge-shaped, about the same length, and in the distal half of the arm oblong and very short. In the proximal third of the arm the proximal edge of

the brachials is somewhat raised, but the remainder of the arm is perfectly smooth. Syzygies occur between the third and fourth brachials, again between the ninth and tenth or fourteenth and fifteenth (if the former, another occurs between the fourteenth and fifteenth or fifteenth and sixteenth), and thence at intervals of from seven to seventeen oblique muscular articulations up to about the middle of the arm, beyond which point syzygies are rare or entirely lacking.

P_1 9 mm. long with thirty joints, broad basally but tapering rapidly and slender and flagellate in its outer half; first eight joints broader than long, very considerably so at first, the remainder squarish; P_2 13 mm. long with thirty joints, stout like P_1 in its basal third but tapering rapidly and slender and flagellate distally; first six joints broader than long, the remainder squarish; the broad lower joints, as in P_1, are carinate; P_3 19 mm. long, much stouter than P_1 or P_2, but of the same general shape, stout basally, becoming gradually slender distally with a flagellate tip, with thirty joints; P_4 20 mm. long, stouter and stiffer than P_3, with about twenty-five joints, the first ten broader than long, the following squarish, becoming slightly longer than broad distally; like P_3, P_4 is carinate in its basal half and has a low lateral keel in its outer two-thirds; P_5 10 mm. long, about as stout basally as P_2, but not tapering so rapidly, with seventeen joints, the first six longer than broad, the remainder squarish; first seven joints strongly carinate; P_6 and following pinnules 7 mm. long with sixteen joints, slender, about as stout as P_1 proximally, but not tapering so rapidly, the first five or six joints broader than long and strongly carinate, then squarish, and finally slightly longer than broad; distal pinnules 10 mm. long, moderately slender; the carination of the lower pinnule joints gradually dies away at the end of the proximal fourth of the arm.

Color (in spirits).—Greenish yellow, the cirri purple in the outer two-thirds; disk mottled green and brown; brachial and pinnule perisome light blue.

Type-specimen.—Cat. No. 25515, U.S.N.M., from *Albatross* station 5147; off Balinpongpong Island (south of Jolo), Philippines; 21 fathoms.

Family TROPIOMETRIDÆ.

Genus PTILOMETRA A. H. Clark.

PTILOMETRA SPLENDIDA, new species.

Centro-dorsal columnar, 4 mm. long and 3 mm. in diameter, the center of the dorsal pole concave and surrounded by five broad low tubercles radially situated; cirrus sockets arranged in ten evenly spaced columns, usually three to a column.

Cirri XXX, 86, 50 mm. long, very long and slender, slightly tapering distally; first joint short, second twice as broad as long, the following gradually increasing in length to the fifth or sixth, which is squarish, and still further increasing to the thirteenth or seventeenth, which is about half again as broad as long, or sometimes slightly longer, after the nineteenth to twenty-sixth decreasing rather rapidly in length, soon becoming twice as broad as long, and even shorter terminally; joints from about the seventh or eighth to twenty-fifth with the median portion of the ventral edge produced into a long slender curved overlapping spine, as in *P. trichopoda*, this reaching a maximum size on the tenth to the thirteenth joints and then gradually dying away distally; as the ventral spines on the cirrus joints die away, a slight prominence begins to appear on the distal edge in the median line which gradually becomes a prominent tubercle, and encroaches more and more upon the dorsal surface of the joints, becoming the broad, high, curved, carinate dorsal spine characteristic of the terminal joints of the cirri in all the species of this genus.

Ends of the basal rays visible as small dorso-ventrally elongate tubercles in the angles of the calyx; radials short, of equal height all around the calyx, four or five times as broad as long, with a trace of a broad median tubercle; IBr_1 oblong, four times as broad as long, laterally united in the basal half; IBr_2 (axillary) very broadly pentagonal, two and one-half times as broad as long, with a slightly produced lateral border, and, like the IBr_1, faintly carinate; IIBr2; IIIBr2, developed exteriorly; division series externally with slightly produced ventro-lateral edges.

Thirty arms, 80 mm. long, resembling in general those of *P. trichopoda*, but somewhat more compressed and deeper proximally, and sharply rounded instead of carinate distally.

Pinnules essentially as in *P. trichopoda*, but slightly stouter.

In general shape this species is unique in the genus, resembling such species of *Pachylometra* as *P. angusticalyx;* very narrow at the radials and IBr_1 (5 mm.), the width increases rather rapidly to about the seventh brachial (20 mm.), giving the dorsal part of the animal the appearance of being strongly constricted and disproportionately small.

Type-specimen.—Cat. No. 25518, U.S.N.M., from *Albatross* station 5179; between Tablas and Romblon, Philippine Islands; 37 fathoms.

A NEW RHYNCHOCEPHALIAN REPTILE FROM THE JURASSIC OF WYOMING, WITH NOTES ON THE FAUNA OF "QUARRY 9."

By Charles W. Gilmore,
Custodian of Fossil Reptiles, U. S. National Museum.

The specimens upon which the present paper is based were collected by parties of the U. S. Geological Survey, working under the direction of the late Prof. O. C. Marsh. Although fragmentary, several of the forms discussed have not hitherto been recognized in the Morrison fauna, and are of additional interest from the fact that they were found in association with the mammal remains from these beds.

All of the specimens considered in this article are from "Quarry 9," Como Bluff, Albany County, Wyoming, and are now preserved in the vertebrate paleontological collections of the U. S. National Museum.

OPISTHIAS, new genus.

The characters of this genus are included in the description that follows of *Opisthias rarus*, the type-species.

OPISTHIAS RARUS, new species.

Plate 11.

Holotype.—The nearly complete left dentary with teeth. Cat. No. 2860, U.S.N.M.

Paratype.—A second dentary from the left side of a somewhat smaller and apparently younger individual. Cat. No. 2858, U.S.N.M.

In the collection there are parts of seven other dentaries pertaining to this form, but the description to follow is based upon the two specimens mentioned above.

Description.—The left dentary of the holotype measures 34.5 mm. in length, and appears to be complete with the exception of a small part of the coronoid process. Although somewhat smaller in size, its great resemblance to the dentary of the living *Sphenodon* is most striking.

Viewed from above, the tooth border is straight, but there is a twist in the lower part of the dentary which throws the anterior ventral border in toward the median line. The anterior end presents a sudden incurvature toward the symphysis, and, as in *Sphenodon*, the rami of the mandible appear to have been united by ligament at their anterior extremities only.

The inner and superior angle of the symphysial end of each ramus appears to have been separated from its fellow by a slight interspace above the symphysis. On the superior surface of the dentary at this part there is a well-developed subconical incisor, the base of which appears to be embedded in the substance of the dentary. The ventral border of the dentary is sinuous. Just posterior to the symphysial end it has a vertical depth of 5 mm. Posteriorly the bone gradually widens, reaching its maximum depth below the second tooth from the last of the dental series. There is a well-developed coronoid process, as shown in fig. 1. The dorsal portion of this process is missing from the specimen, but its outline is indicated from the impression left in the matrix which originally inclosed the specimen.

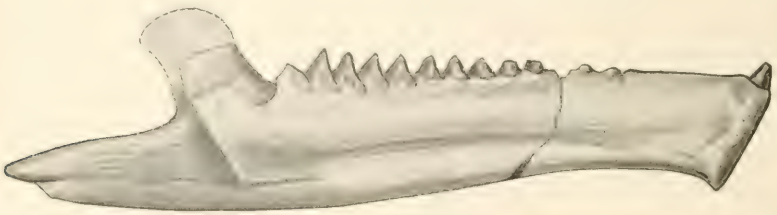


FIG. 1.—LEFT DENTARY OF OPISTHIAS RARUS. CAT. NO. 2860 U.S.N.M. ×3 VIEWED FROM THE INTERNAL SIDE.

Posterior to the coronoid process the dentary tapers to a thin pointed end, which articulated with the posterior elements of the mandible. The external surface of the dentary is gently rounded from above downward. Below the dental border, on this side, runs a low, curved, longitudinal ridge (fig. 1, pl. 11), probably for the attachment of the lip.

On the internal side (fig. 1) is a pronounced mandibular groove extending forward from below the coronoid process nearly to the symphysis, where it fades out.

The teeth are acrodont (i. e., ankylosed to the summit of the jaw), as in *Sphenodon*.

In the holotype there are, besides the incisor mentioned, 12 teeth, preserved. A fracture of the bone appears to have destroyed one tooth, so that in this individual there were 14 teeth present in the mandible. In the paratype (Cat. No. 2858) the complete dental series appears to be present, and I am able to distinguish 19 teeth in all. Günther has found an equal number in the dentary of *Sphenodon*.

The position of the incisor in *Opisthias rarus* at the extreme anterior angle of the alveolar border, aside from other differences, would at once distinguish this form from *Sphenodon*.

For a distance of 5.5 mm. the incisor is followed by a sharp alveolar border without teeth. Following this edentulous portion, the preserved teeth are regular, and steadily increase in height from the front toward the back, reaching their maximum size in the tooth next to the last, which again diminishes. Viewed from above, the unworn teeth are pyramidal in shape, the anterior face being slightly concave, transversely.

The larger of the posterior teeth of the series have a single faint, median, vertical depression on both the outer and inner surfaces. Those on the outer surface reach nearly to the apex of the teeth.

The dental series of the paratype shows but slight evidence of wear, and the anterior edentulous portion is much shorter than in the type specimen. The apices of the anterior teeth of the holotype are much worn, only the two next to the last having the acutely pointed apices of the teeth of the younger individual (Cat. No. 2858), all of which are sharp. The most anterior of the dental series in the paratype are mere denticles barely distinguishable to the naked eye.

As in *Sphenodon*, it appears that as the anterior teeth are worn down, their function is performed by the sharp border of the dentary, and also, as in that genus, the teeth wear down more rapidly in front than behind.

Discussion.—It is impossible, from so little of the skeleton, to say much of the animal's relationships, but the close resemblance of the specimens just described to the living *Sphenodon* (compare fig. 1 with fig. 2, pl. 11) would indicate without question their rhynchocephalian nature, and therefore they may be very properly assigned to the family Sphenodontidæ until more is known of the skeleton.

On account of the meagerness of the evidence, and wishing to avail myself of his wide knowledge of the reptilia, the specimens were submitted to Dr. S. W. Williston, who was generous enough to give me an opinion on them. In part he writes me as follows:

> Your rhynchocephalian comes the nearest, I think, of any described form to that described by H. v. Meyer long ago as *Homæosaurus* from the Solenhoefn beds and the Kimeridge, but no closer than it does to the living *Sphenodon*. There can be no doubt, I believe, but that you have in these jaws the first representative in America of a true terrestrial rhynchocephalian.

Geological horizon.—The deposit from which the specimens discussed in the preceding pages were obtained, was designated by Marsh's collectors as "Quarry 9." It was from this quarry that most of the Jurassic mammals described by Professor Marsh were found, and on that account the contemporaneous reptilian fauna is of added interest. In 1901 Dr. F. B. Loomis published a[a] stratigraphic sec-

[a] Bull. Amer. Mus. Nat. Hist., vol. 14, 1901, pl. 27, fig. 2.

tion of Como Bluff, and the bed containing the fossils discussed in this paper is described as follows:[a]

In the Como Bluff, this layer [No. 24 of his section] has sandwiched into it a 4-foot bed of sandstone (24b). The sandstone is of interest as marking the horizon at which the few Jurassic mammals were found. The mammal layer is the 6 inches of clay underlying this sandstone. Most of the American Jurassic mammal remains thus far found have come from one quarry, worked most successfully by Marsh and later by the American Museum. This pocket seems to be exhausted.

The mammal layer, as measured by Loomis, is 80 feet below the overlying Dakota, and 22 feet below the level where the American Museum parties collected skeletons of *Brontosaurus* and *Diplodocus*.

While the mammal remains are distinctive of this layer, it is evident that the reptilian forms found associated with them are also important as horizon indicators.

NOTES ON THE FAUNA OF "QUARRY 9."

Although large collections of fossil remains have been made from the Jurassic of this country, the meagerness of our knowledge concerning the stratigraphic succession of the forms found has often been a subject of comment. That as our knowledge of the fauna grows it will be found to be sufficiently diversified to separate the formation into well-defined faunal zones appears quite certain, and any evidence obtainable toward that end is most important.

It is with that idea in mind that the following list of fossils from this one layer in Quarry 9 has been compiled:

List of type specimens from Quarry 9, Como Bluff, Albany County, Wyoming.

Mammals.—*Allodon fortis* Marsh.
laticeps Marsh.
Asthenodon segnis Marsh.
Ctenacodon nanus Marsh.
potens Marsh.
serratus Marsh.
Diplocynodon victor Marsh.
Docodon striatus Marsh.
Dryolestes arcuatus Marsh.
gracilis Marsh.
obtusus Marsh.
priscus Marsh.
* *vorax* Marsh.
* *Ennacodon affinis* (Marsh.)
* *crassus* (Marsh.)

[a] Bull. Amer. Mus. Nat. Hist., vol. 14, 1901, p. 194.

* Those marked with an asterisk indicate type-specimens in the paleontological collections of the U. S. National Museum. All others, unless otherwise designated, are now preserved in the Yale Museum.

* *Laodon venustus* Marsh.
* *Menacodon rarus* Marsh.
* *Paurodon valens* Marsh.
Priacondon ferox Marsh.
* *Stylacodon gracilis* Marsh.
validus Marsh.
Tinodon bellus Marsh.
ferox Marsh.
lepidus Marsh.
robustus Marsh.
Triconodon bisulcus Marsh.

Reptiles.—*Glyptops ornatus* Marsh=*Glyptops plicatulus* (Cope).
Macelognathus vagans Marsh.
Pterodactylus montanus=*Dermodactylus montanus* (Marsh).
* *Opisthias rarus* Gilmore.
† *Laosaurus gracilis* Marsh.
† *Coelurus fragilis* Marsh.
† *Goniopholis*, sp. undet.

Like the mammals, the reptilian remains from "Quarry 9" consist of scattered and disassociated bones. The great variety and

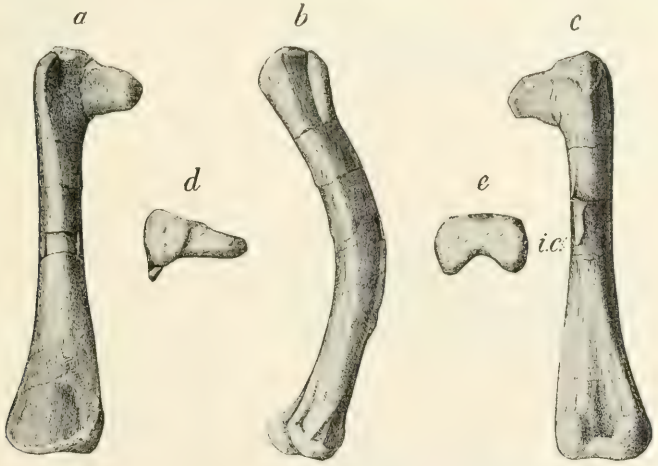


FIG. 2.—RIGHT FEMUR OF LAOSAURUS GRACILIS MARSH. CAT. NO. 5808 U.S.N.M. NAT. SIZE. *a*, FRONT VIEW; *b*, SIDE VIEW; *c*, BACK VIEW; *d*, VIEW OF PROXIMAL END; *e*, VIEW OF DISTAL END; *i. c.*, INNER TROCHANTER.

abundance (particularly of the smaller forms) show there was a big fauna of which at this time we know only a small part.

Among the fossils from this quarry was the small femur from the right side shown in fig. 2. The curved shaft and the positions of

* Those marked with an asterisk indicate type-specimens in the paleontological collections of the U. S. National Museum. All others, unless otherwise designated, are now preserved in the Yale Museum.

† The type-specimens of these forms are from other quarries.

the inner and lesser trochanters show at once that the femur pertains to a member of the Orthopoda. The situation of the inner trochanter wholly upon the proximal half of the shaft at once separates it from the Camptosauridæ. On account of its small size and the fact that no specimen of *Dryosaurus* of these dimensions has been described, it is unhesitatingly referred to the genus *Laosaurus*, and provisionally to *L. gracilis*, the most diminutive species of that genus. Except it differs in a few minor details and is much smaller in size, this bone closely resembles the femur figured[a] by Professor Marsh as *Nanosaurus rex*, and which he says "may perhaps belong to the genus *Laosaurus*." That this was the proper disposition of the specimen has been recently pointed out by von Huene and Lull.[b]

The chief interest in the above specimen is its occurrence in the mammal layer, a discovery considered worthy of record.

Measurements.

	mm.
Greatest length of femur	55
Greatest width of proximal end of femur	13.5
Greatest width of distal end of femur	12
Height of lower edge of inner trochanter above distal end of femur	29

The femur is Cat. No. 5808, U.S.N.M., and was collected by Mr. Ed. Kennedy in "Quarry 9," Como Bluff, Albany County, Wyoming, in 1884.

Several isolated caudal vertebræ I am unable to distinguish from *Coelurus fragilis* Marsh, and Mr. Barnum Brown writes me that he "remembers finding *Coelurus* vertebræ in this layer, although none were saved."

While two other American species of this genus have been described, *C. gracilis* is only known from the Potomac of Maryland, and *C. agilis* from the Morrison of Colorado.

I find among old drawings made for Professor Marsh unpublished figures of the caudal vertebræ which are here reproduced as further elucidating the characters displayed by these bones. (See fig. 3). The type specimen of *Coelurus fragilis* is from Quarry 13, which has been tentatively correlated with beds from 20 to 25 feet higher in the formation than those of "Quarry 9."

Figs. 3 and 4, pl. 11, are presented as illustrating forms new to the Morrison fauna, but too fragmentary for satisfactory types, and on that account I have deferred naming them.

Fig. 4, pl. 11, is a portion of the left ramus of a small reptile. The slender jaw is thickly studded with delicate, round, pointed teeth placed in a single row on the dentary. The anterior teeth are

[a] 16th Ann. Rept. U. S. Geological Survey, for 1894–95, pt. 1, 1896, p. 200, figs. 44 to 48.

[b] Neuen Jahrbuch, 1908, p. 142.

slightly smaller than the posterior. The fragment, which is incomplete at both ends, is 21 mm. long and at the deepest part measures 3 mm. in width.

A portion of the upper mandible of an animal doubtfully reptilian is shown in pl. 11, fig. 3. The dentigerous border is thickly studded with minute, sharply pointed teeth. The preserved fragment measures 13 mm. in length.

The presence in this fauna of the larger members of the dinosauria, both carnivorous and herbivorous (*Opisthocœlia*), is indicated by a few teeth, vertebræ, and foot bones. Fragmentary parts of turtle

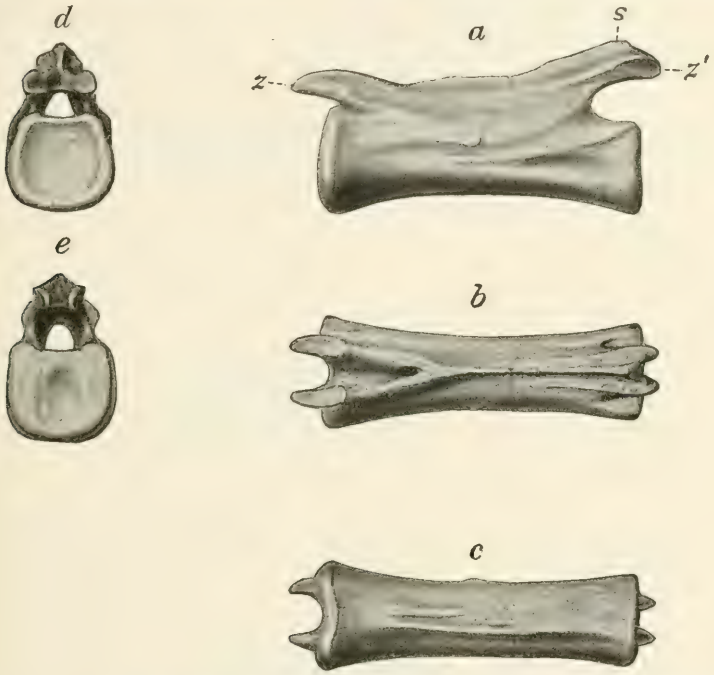


FIG. 3.—CAUDAL VERTEBRA OF CŒLURUS FRAGILIS MARSH. CAT. NO. 1992, YALE MUSEUM. NAT. SIZE. *a*, SIDE VIEW; *b*, TOP VIEW; *c*, VENTRAL VIEW; *d*, FRONT VIEW; *e*, BACK VIEW; *s*, NEUTRAL SPINE; *z*, ANTERIOR ZYGAPOPHYSIS; *z'*, POSTERIOR ZYGAPOPHYSIS. AFTER MARSH OR DRAWN UNDER HIS DIRECTION.

and crocodile skeletons are common, and all are probably referable to the genera *Glyptops* (*Compsemys*) and *Goniophilus* (*Diplosaurus*), respectively.

There are a few fragments that Professor Marsh apparently believed to represent amphibians, as shown by a label in his handwriting, found in one of the trays, which reads as follows: "Amphibians from Quarry 9 (almost everything, but not everything.)" I fail to find remains sufficiently characteristic to verify their presence.

A large number of fish vertebræ were found intermingled with the other specimens, but were too fragmentary to admit of identification.

It will be observed that of the seven identified species of reptiles, only two (*Glyptops ornatus* and *Caluras fragilis*) have been recognized as occurring at other levels.

In this paper, which may be considered preliminary, I only wish to call attention to what appears to be a most interesting Morrison fauna. In a later communication, however, I hope to be able to present a more detailed account of this fauna.

EXPLANATION OF PLATE 11.

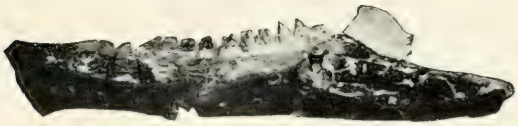
Fig. 1. Left dentary of *Opisthias rarus*. Cat. No. 2860 U.S.N.M. ×2. External view. From a photograph.

2. Left dentary of *Sphenodon punctatum*. Cat. No. 29429 U.S.N.M.. Nat. size. Viewed from the outer side.

3. Anterior portion of right upper mandible of undetermined animal from Quarry 9, Como, Wyo. Cat. No. 6133 U.S.N.M. × 2. Oblique external view.

4. Portion of left dentary of undetermined reptile?. Cat. No. 6134 U.S.N.M. × 2. External view.

1



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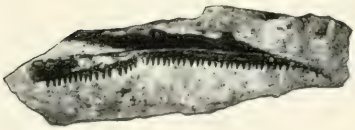

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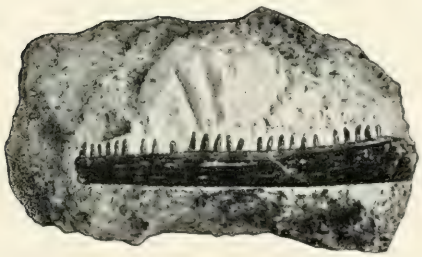

JAWS OF RHYNOCHOCEPHALIAN AND UNDETERMINED FORMS.

FOR EXPLANATION OF PLATE SEE PAGE 42.

ON THE NATURE OF EDESTUS AND RELATED GENERA, WITH DESCRIPTIONS OF ONE NEW GENUS AND THREE NEW SPECIES.

By Oliver P. Hay,
Of Washington, District of Columbia.

1. DESCRIPTIONS OF THREE NEW SPECIES OF EDESTUS

EDESTUS CRENULATUS, new species.

The type and only known specimen of this species belongs to the U. S. National Museum (Cat. No. 6050), and was found in a collection of fossils purchased from Mr. G. Hambach, of St. Louis, Missouri. No record regarding the origin of the fossil accompanied it, but there can be no doubt that the specimen had been obtained from the Coal Measures not far from St. Louis, probably from some of the coal mines of western Illinois. No species of the genus is mentioned in Mr. Hambach's Preliminary Catalogue of the Fossils Occurring in Missouri.[a]

The specimen (pl. 12, fig. 1) is almost as complete as it was on the death of the animal, only the apices of some of the teeth and some of the denticles being broken off and missing. The species resembles most that known as *Edestus heinrichii*,[b] but numerous differences may be observed.

The total length of the fossil is 207 mm.; the greatest height is 58 mm.; but to the latter measurement should be added about 2 mm. for the missing apex of the second tooth, counting from the right. The height of the shaft alone is 46 mm., the greatest thickness, beneath the first tooth, 28 mm. As will be seen from fig. 1, pl. 12, the

[a] Geological Survey Missouri, Bull. No. 1, 1890, pp. 60–85.

[b] Doctor Eastman (Bull. Mus. Comp. Zool., vol. 39, 1902, p. 65) points out that Newberry's specific name *heinrichsii* was improperly formed. Inasmuch as Newberry expressly says that the species was named for Mr. Heinrich, we may assume that the form *heinrichsii* was a *lapsus calami*, and on that ground adopt the form *heinrichii*. Newberry himself used this form in 1879 (Geological Survey Indiana, p. 347), although later he used the original spelling.

tooth-bearing border is arched, while the opposite border is slightly concave in each direction from near the middle of the length. A transverse section (text fig. 1) taken between the first and second teeth, counting from the right, shows that the lower border is here broadly rounded, while a section (text fig. 2) across the hinder half of the fossil shows that there the lower border is acute. Beginning just in front of the first tooth a sharp and narrow groove runs along the midline of the specimen, widening at the front end, then contracting and running backward on the lower side (text fig. 1, 7) to near the middle of the length.

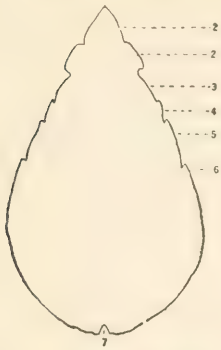

FIG. 1.—EDESTUS CRENULATUS, ×1. TYPE. VERTICAL SECTION BETWEEN THE FIRST AND SECOND TEETH. 2, SECOND SHEATH; 2^1, ENAMELED PROCESS OF SECOND TOOTH; 3, SHEATH OF THIRD TOOTH; 4, SHEATH OF FOURTH TOOTH; 5, SHEATH OF FIFTH TOOTH; 6, UPPER BORDER OF SHEATH OF SIXTH TOOTH; 7, GROOVE ALONG LOWER BORDER OF ANTERIOR HALF OF SHAFT.

Along the upper border of the fossil are six compressed teeth, the anterior and posterior borders of which are furnished with denticles. Of these denticles there are 8 or 9 on the anterior edge and perhaps 1 or 2 fewer on the hinder edge. Each of these denticles is minutely crenulated. Each tooth is covered by a layer of enamel, and at the base of the tooth a process of this enamel runs forward beneath the hinder third of the next tooth in advance. The following figures give the dimensions of the teeth. The length is taken from the point where the tooth joins the one in front to its contact with the next behind. The height is from the apex to the lower border of the enamel, along the axis. Tooth, 1; length of base, 26 mm.; height, 19± mm.: tooth, 2; length of base, 27 mm.; height, 19± mm.: tooth, 3; length of base, 27.5 mm.; height, 19 mm.: tooth, 4; length of base, 28 mm.; height, 19± mm.: tooth, 5; length of base, 30 mm.; height, 19± mm.: tooth, 6; length of base, 30.5 mm.; height, 18± mm.

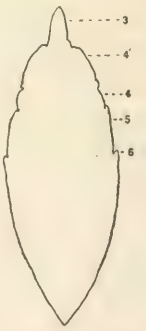

FIG. 2.—EDESTUS CRENULATUS, ×1. TYPE. VERTICAL SECTION BETWEEN THIRD AND FOURTH TEETH. 3, HINDER END OF THIRD TOOTH; 4, SHEATH OF FOURTH TOOTH; 4^1 ENAMELED PROCESS OF FOURTH TOOTH; 5, SHEATH OF FIFTH TOOTH; 6, UPPER BORDER OF SHEATH OF SIXTH TOOTH.

The thickness of most of the teeth at the lower end of the axis is 8 mm. The first one is slightly less; the last one is only 6 mm. thick. The angle between the anterior and posterior borders of any tooth is very close to 90°. It will be observed that the hinder tooth descends to the lower border of the shaft. The surfaces of all the teeth are smooth. A number of cracks in the enamel pass from the base of each tooth to the apex, and these seem to follow slight ridges.

The body of the fossil is made up of a shaft of vasodentine, dense and rough on the surface and without enamel. As has been shown by other observers, in the case of other species of the genus, this shaft consists of trough-shaped processes, one of which runs forward from each tooth, and which supports and partly incloses the process of the preceding tooth and is supported and partly inclosed by the succeeding one. The photograph (pl. 12, fig. 1) shows the grooves limiting each of these processes above and below. It will be seen that measuring each process, or sheath, from the hinder end of the tooth which it supports to its anterior end, the first one is 84 mm. long, the second 105 mm., the third 125 mm., the fourth 138 mm., the fifth 149 mm., the sixth 158 mm. This means that the anterior end of each sheath receded from the end of the shaft by considerably less than the length of the tooth to which it belonged.

This species appears to differ from *E. heinrichii* in various particulars, some of which will be mentioned.

1. The form of the shaft is different in the two species. In *E. crenulatus* the greatest height is in front of the middle of the length and under the second tooth; in *E. heinrichii* it is behind the middle and under the fourth tooth. It is possible that in the original of the figures of the last of these[a] the last-formed tooth is missing, but allowance for this would put the greatest height at the middle of the shaft. The shaft of *E. crenulatus* is relatively pointed in front; that of *E. heinrichii* is deep and truncated. If in the figured specimen of *E. heinrichii* the last-formed tooth is missing, a portion of its enamel ought to show under the last one present. If no tooth is missing, the shaft terminated in quite a different manner from that of *E. crenulatus*. Furthermore, in case the last-formed tooth of that specimen of *E. heinrichii* is missing there would have been present 9 teeth; in the type of *E. crenulatus* there are only 6. The type of *E. heinrichii* is a considerably larger specimen (280 mm. long) than that of *E. crenulatus*. It is difficult to see how the latter could become modified so as to resemble the former.

2. It will be noted the last sheath of *E. crenulatus* extends much farther forward than does that of *E. heinrichii;* also, it covers relatively less of the depth of the shaft.

3. In *E. crenulatus* a tongue-like process of the unenameled surface of the shaft runs backward between each tooth and the pointed process of enamel of the next tooth behind until it touches this hinder tooth; in *E. heinrichii* the tongue-like process is cut off from the hinder tooth by a prolongation of the anterior one.

4. The teeth of the two species are of different forms. In *E. crenulatus* the angle between the two lines carried from the apex of the

[a] Geol. Surv. Ill., vol. 4, pl. 1, fig. 1; Ann. N. Y. Acad. Sci., vol. 4, pl. 5, fig. 2.

tooth to the ends of the anterior and posterior cutting edges respectively is close to a right angle; in *E. heinrichii* the angle measures about 75°. The height of the teeth of *E. heinrichii* is six-tenths the length of the base, while in *E. crenulatus* it is seven-tenths. Nevertheless, the teeth of *E. heinrichii* appear more acute than those of *E. crenulatus* because of the concavity of the cutting borders, those of the latter species being nearly straight. The last tooth of *E. heinrichii* seems to be less elevated than the others. Judging from the apical angle and the straight cutting edges of the tooth, it is believed that Newberry's figure 2*b* [a] represents a specimen of *E. crenulatus*.

It has been mentioned that there is in the specimen here described a narrow groove that runs forward from the first tooth, becoming broader at the end of the shaft. Immediately in front of this first tooth there is a rough surface just like that found bordering the enamel of each of the teeth. These facts suggest that some of the anterior and earliest formed teeth are now missing, that long before the animal died some teeth had dropped off. Certainly it is not probable that the animal became adult before it developed any teeth. There must have been a series of teeth from very small ones up to the first tooth now present. Nevertheless the writer does not believe that the shaft ever extended any considerable distance, if at all, in front of what is now its anterior end. No doubt the trough-like processes or sheaths of these earliest teeth, like those of the ones present, shortened rapidly toward the front, so that they probably never extended beyond the shaft as we now have it. Dr. Charles R. Eastman [b] has figured a series of three teeth which diminish rapidly in size, and in which the sheath of the smallest does not reach beyond the succeeding one.[c] Doubtless still smaller teeth occupied the space in front of the smallest one present. The significance then of the groove found in front of the first tooth of the type of *E. crenulatus* is found in the existence there, in the early youth of the animal, of a series of small teeth that were shed perhaps early in life.

Newberry [d] appears to have regarded the separate segment represented by his fig. 2*a*, pl. 5, as that of a young animal. Its sheath is, however, too long for this. It must have been one of the later teeth. It seems possible that on sufficient maceration all the teeth, with their

[a] Ann. N. Y. Acad., vol. 4, pl. 5; Pal. Fishes N. A., pl. 39.

[b] Bull. Mus. Comp. Zool., vol. 39, p. 76, fig. 7.

[c] In case the reduction of Eastman's figure is really one-half, it seems possible that his specimen belongs to an undescribed species. Otherwise great variation in size of teeth in *E. heinrichii* is indicated. The length of the anterior teeth of the type is only about 30 mm., whereas the largest tooth figured by Eastman has a length of 37 mm.

[d] Ann. N. Y. Acad., vol. 4, p. 122.

sheaths, even of old individuals, might have separated from one another. The type of *E. karpinskii* lately described by Missuna[a] is evidently a segment produced by an adult individual and freed from all its predecessors.

At a short distance behind its anterior end each sheath of *E. crenulatus* is divided on the midline below into right and left portions, the lower edges of which run forward and upward. This is the origin of the groove which occupies the lower border of the front of the shaft. It is probable that in this groove at the point of separation of the lateral portions of the sheath the nerves and blood vessels entered and extended backward into each sheath and tooth.

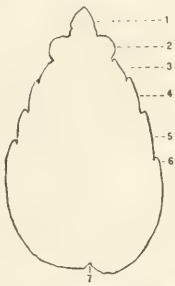

FIG. 3.—EDESTUS SERRATUS, ×1. TYPE. SECTION BETWEEN FIRST AND SECOND TEETH. 1, HINDER END OF FIRST TOOTH; 2, ENAMELED PROCESS OF SECOND TOOTH; 3, SHEATH OF THIRD TOOTH; 4, SHEATH OF FOURTH TOOTH; 5, SHEATH OF FIFTH TOOTH; 6, UPPER BORDER OF SHEATH OF SIXTH TOOTH; 7, GROOVE ALONG LOWER BORDER OF ANTERIOR HALF OF SHAFT.

It is, of course, possible that another tooth would have been produced behind the sixth of the type of *E. crenulatus;* but, in as much as that last tooth is considerably thinner than its predecessors, it is not unlikely that old age and decadence of powers had come on and that no more teeth would have been developed.

EDESTUS SERRATUS, new species.

The history of the type of this species is exactly that of the specimen described as *E. crenulatus*. It is Cat. No. 6049 in the U. S. National Museum. The length of the fossil (pl. 12, fig. 4), as found, is 150 mm. The sixth and last tooth of the series had been broken off before the time of entombment. If an allowance of 27 mm. is made for this missing part the whole length will be 177 mm. The greatest height, from the apex of the second tooth downward, is 51 mm. The greatest height of the shaft, between the second and third teeth, is 35 mm. Its greatest thickness is 21 mm.; that at the rear of the fifth tooth is 9 mm. The form of the shaft and sections of it (text figs. 3, 4) resemble those of *E. crenulatus*, but the hinder section, though not so high as that of *E. crenulatus*, is fully as broad. The last sheath occupies two-thirds of the width of the shaft. The anterior half of the shaft is rough, with close-set patches of enamel, irregular in size and form. The hinder half also is rough for some distance below the teeth, but most of the surface is nearly smooth. It seems possible that the hinder part of the shaft had been embraced by a sheath that had not

FIG. 4.—EDESTUS SERRATUS, ×1. TYPE. SECTION BETWEEN THIRD AND FOURTH TEETH. 3, HINDER END OF THIRD TOOTH; 4, ENAMELED PROCESS OF FOURTH TOOTH; 5, SHEATH OF FIFTH TOOTH; 6, UPPER BORDER OF SHEATH OF SIXTH TOOTH.

[a] Bull. Soc. Imp. Nat. Moscow, vol. 21, 1908, p. 528.

become consolidated, and which was lost when the specimen became interred. The point in the lower border from which the two concavities depart is directly opposite the space between the second and third teeth. In *E. crenulatus* it is opposite the apex of the second tooth.

The following are the dimensions of the teeth of this specimen: Tooth, 1; length of base, 22 mm.; thickness, 8 mm.: tooth, 2; length of base, 24 mm.; height, 19 mm.; thickness, 8 mm.: tooth, 3; length of base, 25 mm.; height, 19 mm.; thickness, 8 mm.: tooth, 4; length of base, 26 mm.; height, 19 mm.; thickness, 8 mm.: tooth, 5; length of base, 27 mm.; height, 19 mm.; thickness, 8 mm.

The apical angle of the teeth is 80°. That of *E. minor* is 35° or 40°; that of *E. crenulatus*, as already mentioned, is 90°. The anterior edge of the teeth is concave; the posterior is nearly straight. The teeth are furnished with denticles, but the edges of these are perfectly smooth. The surfaces of the teeth are enameled. From the base of each tooth a number of sharply defined and frequently anastomosing ridges rise to the apex. The forwardly directed process of each tooth is brought up close to the base of the next tooth in front.

In front of the first tooth there is, as in *E. crenulatus*, a groove that was originally occupied by a series of earlier-formed teeth. The higher and more pointed teeth, with concave anterior cutting edge and smooth denticles, distinguish this species from *E. crenulatus*, which it most resembles.

EDESTUS MINUSCULUS, new species.

Edestus cf. *minor* KARPINSKY, Verhandl. russ.-kais. min. Gesellsch. St. Petersb., 2d ser., vol. 26, 1898, p. 379, pl. 4, figs. 12, 13.

As cited above, Karpinsky identified provisionally as *E. minor* and described with illustrations a single tooth of an *Edestus* which had been found in the lowermost Permian, the Artinskian stage, near Moscow, Russia. A comparison of Karpinsky's description and figures with the numerous good figures that have been published of *E. minor* Newberry has convinced the writer that the tooth in question belonged to a species quite distinct from *E. minor*.

The tooth in Karpinsky's possession was a small one, the height from the base of the enamel to the apex, measured along the axis of the tooth, being only 14 mm., plus 1 mm. or 1.5 mm. that had been broken from the apex. It was therefore only about half as large as the specimen figured by Newberry[a] and by Eastman.[b] We must

[a] Geol. Surv. Ill., vol. 4, pl. 1, fig. 2. "*E. vorax*."

[b] Mark Anniversary Volume, pl. 21, figs. 2, 3.

conclude, therefore, either that it belonged to a much smaller species, than *E. minor* or that it belonged among the teeth of a half-grown animal.

If now, from Eastman's beautiful figures, apparently the best yet published, one compares the basal length of each tooth with its height, it is found that the ratio of the base to the height is 0.83, 0.82, and 0.81 in the first, second, and fourth teeth, respectively, 0.91 in the third and sixth, 0.93 in the fifth, and 0.97 in the seventh. While there are some irregularities here, no encouragement is given to concluding that the ratio would rise in the earlier-formed teeth. Now, the ratio of the base to the height in the tooth described by Karpinsky is 1.18. This means that in *E. minor* the base is considerably shorter than the height, while in the Russian tooth the base is considerably greater than the height.

An examination of the figures of *E. minor* shows that the hinder border of each tooth meets the anterior border of the next at an acute angle. Karpinsky's figure shows that the hinder free border of the tooth was turned at a right angle with the hinder cutting edge, an arrangement that would have made the angle between successive teeth quite different from that in *E. minor*. A somewhat similar process is seen at the hinder end of the last tooth of *E. crenulatus* and even of *E. minor*, but to assume that the Russian tooth was the last of the series is to abandon the supposition that it was the tooth of a young animal. Attention may also be called to the fact that in Karpinsky's specimen the apex of the concavity of the anterior border is placed between the middle and lower thirds of the border, while in *E. minor* it is placed considerably lower down; also that the hinder cutting edge of *E. minusculus* is far more strongly convex than that of *E. minor*.

In the specimen studied by Karpinsky the height of the sheath, taken at the front end of the tooth, is 0.3 the basal length of the tooth. If the last tooth of *E. minor* had the same length as the one immediately in front of it, the height of the sheath, obtained at the hinder border of the last tooth present, would be 0.75 of the length of its tooth.

The section of the sheath of his specimen that Karpinsky has published requires notice.[a] This section shows that the lower border, close to the tooth, was rounded, not sharp, as it is in *E. crenulatus*, *E. serratus*, and *E. heinrichii*. No section of *E. minor* has hitherto, so far as the writer knows, been published. Prof. F. S. Loomis, of Amherst, Massachusetts, has kindly sent me an accurate drawing of the broken hinder end of the type of the species, now deposited in the

[a] Verhandl. russ.-kais. min. Gesellsch. St. Petersb., 2d ser., vol. 26, 1898, p. 380, fig. 16.

collection of Amherst College. This drawing, here reproduced (text fig. 6), represents a section across the sheath immediately in front of the eighth tooth, now missing. For comparison with it is shown Karpinsky's section of his specimen (text fig. 5). The difference will be readily observed. It may be noted here that Mr. E. T. Newton published[a] a description of a species of *Edestus*, *E. triserratus*, found in the coal measures of Britain. The shaft appears to have been much curved. Beneath the tooth the lower border is thin and angular. In front of the tooth the border is broadly rounded.

FIG. 5.—EDESTUS MINUSCULUS. ×3. TYPE. SECTION OF SHEATH JUST IN FRONT OF TOOTH.

2. ON THE HISTOLOGY OF EDESTUS.

The organ called *Edestus*, whatever its position and its function, is composed of dentine which is penetrated by numerous terminal arteries and veins and capillary canals. On the surface of what are called teeth is a thin layer of what is probably true enamel. The dentine must be classed with that called by Tomes vasodentine, although, like osteodentine, there existed no distinct pulp. Some sections have been made, in order to show the minute structure of the organ in question. These have been prepared from two specimens of what are regarded as *Edestus heinrichii*, which have been most kindly sent me by Dr. Bashford Dean, of the American Museum of Natural History, New York. The specimens came originally from western Indiana. There is represented in fig. 1, pl. 13, a section across one of the segments, so taken as to include the front of the tooth. That part which belongs to the tooth broke away from the part below it during mounting. An examination of this figure shows that in this genus the central core of dentine, which contains the larger vessels, was not sharply marked off from the more superficial portions, as it is marked off in *Helicoprion*, as shown by Karpinsky. Below the center of the section there is a large vessel that probably corresponds to Karpinsky's "Längscanal." The section appears to have fallen where the canal was sending off a large branch. In the specimen figured all the larger vessels and many of the smaller ones apparently have the lumen open. They are really filled with a transparent mineral, probably calcite. Each, however, has a narrow black border which represents a deposit of pyrite or marcasite. Many of the capillary channels appear to be filled with pyrite, but this appearance seems often to be due to the position of the vessel in the section, for when the near and the distal walls

FIG. 6.—EDESTUS MINOR, ×1. TYPE. SECTION OF SHEATH JUST IN FRONT OF TOOTH.

[a] Quart. Jour. Geol., vol. 60, 1904, pp. 1–8, pl. 1.

have been cut away the lumen appears. As the surfaces of the organ are approached, the filling of the channels with pyrite becomes more complete. In fig. 1 of pl. 13 and also in fig. 2, in order to bring out the structure, the lumina of the vessels are represented as black. The light spaces between the network of black lines represent the dentine substance.

Examination of the section shows that the longitudinal canals, large and small, are abundantly connected by anastomosis, so that the vascular apparatus formed a dense network. In the lower portion of the section, that corresponding to the root of the tooth, many of the larger capillary canals approach the surface, and probably some of them passed out into the surrounding tissues. Fig. 2 on pl. 13 represents a median sagittal section of another small segment of *Edestus*. This is taken in front of the tooth and includes no part of it. Most of the vascular canals run longitudinally. The main longitudinal canal is seen near the bottom of the section. As seen in favorable situations, fine branching lines run away from the borders of the capillary canals. These lines are regarded as marking the dentinal tubes. Often, especially near the capillaries (pl. 13, fig. 3, taken from near the anterior border of a tooth), they have the lumen filled with pyrite, and then they resemble the canaliculæ of bone. Where not indicated by pyrite filling, the tubes may nevertheless often be traced out under the microscope, and they constitute a network of fine lines in the dentine. Nowhere does there appear to be any layer of dentine made up of tubes running parallel with one another.

The layer of enamel is so deeply stained with pyrite that few observations can be made on it. In one spot it is sufficiently thin and translucent to allow it to be seen that the enamel is penetrated by nearly parallel black lines, which stand at right angles with the outer surface of the tooth, but do not quite reach this surface. This is to be taken as that variety of enamel described by Tomes as being penetrated by dentinal tubes.[a]

Karpinsky[b] has noted the resemblances between the teeth of *Helicoprion* and those of various sharks, living and extinct. The present writer has wished to compare *Edestus* with the spines of fossil sharks, and has accordingly made sections of a fragment of the spine of *Ctenacanthus varians* (pl. 13, figs. 4, 5). Although differences between this genus and *Edestus* may be observed, the writer regards the structure of the two as being essentially the same. In the specimen of *Ctenacanthus* nearly all the capillary vessels are probably filled with limonite, while few of the dentinal tubes are thus filled.

[a] Manual Dental Anat., 6th ed., p. 30.

[b] Verhandl. russ.-kais. min. Gesellsch. St. Petersb., 2d ser., vol. 26, 1898, p. 420.

The larger blood vessels do not appear to be so richly connected by capillaries as in *Edestus*. Under high power a dense network of bright lines, which are regarded as representing the dentinal tubes, is to be seen, running irregular courses and branching dichotomously. The shadowed areas seen around most of the capillaries are produced by the network of dentinal tubes, slightly stained with iron.

3. DESCRIPTION OF NEW SPECIMENS OF LISSOPRION FERRIERI.

In 1907[a] the writer described a fossil which he regarded as related to *Edestus*, but still more closely to *Helicoprion*. The type specimen, now the property of the U. S. National Museum, Cat. No. 6091, had been found in Upper Pennsylvanian deposits, near Montpelier, Bear Lake County, Idaho, by Mr. W. F. Ferrier. At the time of publishing the description it was impossible to determine whether the complete structure would prove to be straight or slightly bent, as the species of *Edestus*, or strongly bent, as the fossil described by Dean as *Edestus leconteï*, or spirally coiled, as *Helicoprion bessonowi* Karpinsky. Immediately after the appearance of that description the writer received from Mr. Ferrier two shipments of specimens from the same horizon at Thomas Fork, Wyoming, not far from the type locality. These showed that the series of teeth and their shaft formed a spiral resembling closely that of *Helicoprion*. From the best of these specimens have been prepared figs. 1 and 2, on pl. 14. At a later time, about October 1, 1907, Mr. Ferrier made a fourth shipment, consisting of a block of limestone, in which there was a complete example of this curious fossil (pl. 15). Unfortunately the limestone is excessively hard and tough, while the fossil teeth and their shaft are friable. As a result the plane of cleavage has passed through the shaft and most of the teeth instead of over their surfaces. Nevertheless the specimen displays well the coils of the spiral and the outlines of most of the teeth. Taking all the specimens together, the most important facts regarding the structure are made known. Credit is due Mr. Ferrier for his interest in collecting so much material belonging to this species. He has, moreover, presented to the U. S. National Museum the type of the species and important parts of the other specimens. Mr. Ferrier is a geologist and paleontologist of much experience, having been for some years assistant to Sir William Dawson, of the Geological Survey of Canada, and being now engaged as mining engineer in charge of phosphate mining for a commercial company.

Besides the specimens of *Lissoprion* Mr. Ferrier has collected many invertebrate fossils from the deposits that furnished *Lissoprion*, and

[a] Science, vol. 26, p. 22.

these fossils are being described by Dr. George H. Girty, of the U. S. Geological Survey. Doctor Girty has very kindly furnished me some information regarding these fossils and their relationships. He writes me that the specimens of *Lissoprion* were obtained from phosphate beds of from 60 to 100 feet in thickness and placed near the middle of the Preuss formation. The fauna has a facies strongly unlike anything known from the Pennsylvanian of eastern North America, and many features tend to ally it with the upper Carboniferous faunas of eastern Europe and Asia. In fact Doctor Girty feels little doubt that it is equivalent to a part of the Gschel stage of the Russian section. Some of the characteristic fossils of the phosphate fauna are *Chonetes ostiolatus*, *Pugnax weeksi*, *Ambocoelia arcuata*, *Nucula montpelierensis*, *Yoldia mechesneyana*, *Leda obesa*, *Plagioglypta canna*, *Omphalotrochus ferrieri*, *O. conoideus*, and *Gastrioceras simulator*. The genus *Productus* is poorly represented in the phosphate fauna, but contains four species closely related and perhaps identical with forms occurring in the Gschelian of Europe. These species, with the species of *Omphalotrochus* and others occurring in the overlying strata of the same formation, are the forms in which the affinities with the Russian fauna are especially manifested.

In the case of the specimen which furnished fig. 1, pl. 14, the rock split in such a way as to expose the right-hand side of the first five large teeth, those at the termination of the shaft, and the left side of the fifth of these (counting from the end), two others succeeding this, and several small teeth of an interior whorl, as well as a part of the shaft. The figure has been prepared by combining two photographs, that of the left side having been reversed. The designation of the sides as right and left is made on the assumption that the base of the spiral, the larger end, was directed backward in the animal, a view that may require modification. The 5 or 6 teeth seen in the lower part of fig. 1, pl. 13, formed probably the beginning of the second whorl, no remains existing in the specimen of the first or innermost whorl. Some traces are found in the matrix of the remainder of the second whorl. The large teeth would then belong to the third whorl.

It will be observed that the shaft of the specimen extends backward (toward the left) some distance beyond the last tooth produced, and the same will be found to be true of the species called by Dean *Edestus leconteï*. The last tooth present can hardly have been the last one that would have been developed had the animal lived longer, for this tooth lacks much of having the size of the teeth of the type specimen. In this the largest tooth has a height of 36 mm. and a width of 17 mm., while the last tooth of fig. 1, pl. 14, has an axial height of 30 mm. and a width of 11 mm.

The small teeth of fig. 1, pl. 14, present only a part of their upper portion, or blade.

The specimen represented by fig. 2, pl. 14, presents wholes or parts of 13 teeth and the corresponding part of the shaft. Plate 15 is taken from the specimen that displays the whole of the spiral. Unfortunately the matrix is of such a dark color that the fossil does not show as distinctly as is desirable. However, from this it is learned that the structure, dentition or spine, whichever it may be, consisted of a shaft of a little more than two and a half coils and a series of enameled teeth occupying the outer border of the shaft. The inner coil with its minute teeth was, of course, first produced. It is not probable that the smallest teeth seen are the first that the animal possessed. Some smaller teeth and their shaft may be hidden in the obdurate matrix, but it is more probable that they had been lost by the animal long before its death.

The greatest diameter of the specimen, measuring from the apex of the last tooth to the apex of the one on the opposite side of the coil is 160 mm. The inner coils were not in contact with the outer coil nor with each other. The apices of the teeth at the beginning of the second coil are removed by about 10 mm. from the inner border of the shaft; the innermost teeth approach within 3 mm. of the shaft. It is impossible to determine exactly the whole number of teeth. An estimate made as accurately as possible indicates that there were 32 teeth in the outer coil, the same number in the preceding coil, and 22 teeth in the portion remaining of the innermost coil, in all 86 teeth, as against 130 in *Helicoprion bessonowi;* but the latter species possessed about one more coil than did the species here described. In Karpinsky's species there were 36 teeth in the innermost coil, 43 in the next, and 51 in the outer.

Karpinsky showed that the teeth of his species might be regarded as consisting of three portions. The first includes the cutting blade, extending from the apex to the points where the edges of the blade come into contact with the blades of the succeeding and the preceding teeth, respectively; the third portion includes that part that is narrowed and turned toward the older teeth of the series; the second portion is found between these two. In the larger teeth of *Helicoprion* the intermediate portion occupies half or more of the height of the tooth; in the case of the smaller teeth it becomes reduced in importance and may become merged into the third portion. In *Lissoprion* this middle part may be said to be present in all the teeth, but to be relatively unimportant. In *Helicoprion* the blade is relatively longest in the oldest, or smallest, teeth, forming sometimes more than half the height of the tooth, while in the largest teeth it forms only about a fourth of the height. In all cases

the blade forms, in *Lissoprion*, about one-half the total height of the tooth.

The apical angle of the teeth before us is obtained by drawing lines from the apex to the opposite ends of the cutting edges. This angle varies with the size of the teeth. In the teeth originally described, the largest yet found, the apical angle is 48°. In the largest teeth of pl. 14, fig. 1, the angle is 35°, while in the teeth of the specimen represented by pl. 14, fig. 2, it is 32°. The smallest teeth appear to have the same angle as just given. It is seen, therefore, that the angle increases rapidly in the largest teeth. Karpinsky has stated[a] that in *Helicoprion bessonowi* the apical angle is 30°. The present writer makes it 45°.

The cutting edges of the teeth of *Lissoprion* were originally described as being smooth; but some of the newer specimens show that these edges were sometimes feebly crenulated.

The middle portion of each tooth is short, convex posteriorly, concave anteriorly. It passes insensibly into the third portion. The latter is narrowed to a point below and turned toward the older parts of the coil. In the smaller and medium-sized teeth its extremity reaches forward to a point opposite the hinder border of the second tooth in advance. In the larger teeth it extends forward only to the middle of the tooth immediately in front. Each tooth touches its predecessor and its successor only at the base of the blade. The median and third portions of the successive teeth are separated by a space very narrow and varying little in relative width throughout the series. In *Helicoprion bessonowi* the interdental spaces vary considerably, being much wider relatively between the smaller teeth.[b] All the teeth of *Lissoprion* were covered with enamel, but this has, in the specimens at hand, been altered or removed. It seems to have been traversed by narrow ridges, which radiated from the apex of the tooth.

Fig. 2, of pl. 14, furnishes a good illustration of the shaft and its relation to the teeth. It will be observed that a wide band of the shaft is exposed below the enameled processes of the teeth, the width in the case of the specimen figured being 6 mm., one-fifth the height of the teeth and the shaft taken together. In *Helicoprion* there is far less of the shaft visible below the teeth; according to Karpinsky's figures, about one-fifteenth of the height of the teeth and the shaft. Text fig. 7 shows a section through the axis of the second tooth from the right. It is seen that the sides of the shaft are convex and that in the lower border there is a rounded notch. This represents a gutter that runs along the inner border of the shaft. A similar gutter occu-

[a] Verhandl. russ.-kais. min. Gesellsch. St. Petersb., 2d ser., vol. 26, 1898, pp. 383, 402, fig. 23.

[b] Idem, p. 394, figs. 24–29.

pies this border in *Helicoprion;* and Karpinsky thinks that it might have conducted some kind of vessel. According to his view, the gutter was completed below by a layer of shagreen, but I find no evidences of any such a covering. The sides of the shaft are unbroken and the edges bounding the gutter are smooth.

FIG. 7.—LISSOPRION FERRIERI, ×1. SECTION OF SHAFT AND TOOTH. 1, ENAMEL OF THIRD TOOTH; 2, GROOVE BETWEEN NARROWED PROCESSES OF THIRD AND SECOND TEETH; 3, ENAMELED PROCESS OF SECOND TOOTH; 4, EXPOSED PORTION OF SHAFT; 5, GROOVE ALONG LOWER BORDER OF SHAFT.

The lateral surfaces of the shaft are covered by a layer which looks as if it might be enamel. For some distance below the teeth this is pitted so as to resemble in miniature the pittings of the carapace of a trionychid turtle; but low down the enamel is raised into delicate ridges that run parallel with the shaft. Doctor Eastman has, in defining *Helicoprion*, stated that the sides of the shaft are traversed by a double lateral groove. This is, however, an error, which has doubtless arisen from a slight misconception of the sections published by Karpinsky.[a] In those figures the two notches on each side represent, not sections of as many longitudinal grooves, but of grooves between the downward prolongations of the crowns of the teeth. There are no longitudinal grooves in *Lissoprion* and no room for them on the sides of the shaft of *Helicoprion*.

4. DESCRIPTION OF A NEW GENUS.

TOXOPRION, new genus.

The type of this genus is Dean's *Edestus leconteï*. Doctor Eastman has recognized that this species did not belong to *Edestus*, inasmuch as he included it in his genus *Campyloprion;* and afterwards, on removing the type of the genus, *C. annectens* to *Heliocoprion*, he essayed to make *leconteï* the type. The writer called attention to this matter in 1907.[b] Even were this procedure admissible it would not be advisable, for the species *annectens* may yet prove to belong to a genus distinct from *Helicoprion* and would then require the name *Campyloprion*.

The teeth of *Toxoprion* resembled most those of *Lissoprion*, but the shaft, though strongly bent, formed only a part of one coil. In this genus the present writer includes H. Woodward's *Edestus davisii*, found in Australia. In this species it will be observed that the width is considerably reduced in passing from the newer to the older ends of the specimen, so that it is not likely that a complete coil was

[a] Verhandl. russ.-kais. min. Gesellsch. St. Petersb., 2d ser., vol. 26, 1898, p. 397, figs. 30, 31.

[b] Science, vol. 26, p. 22.

formed. It will be seen, too, that the teeth change considerably as they are followed from one end of the shaft to the other. In the newer ones the downward prolongations are pointed and carried forward even to the extended axis of the fourth tooth in advance, while in the smaller and older teeth the prolongations are truncated and reach only the extended axis of the second tooth in advance. The part of the shaft exposed is very narrow.

5. DEFINITIONS OF THE GENERA.

It is evident that *Lissoprion* is closely related to *Helicoprion*, but it is believed to be sufficiently distinct. It is possible that future discoveries may abolish the differences noted.

Edestus.—Shaft straight or slightly bent, roots of the teeth betraying distinct traces of their original distinctness, and forming the greater portion of the fossil. Blades of the teeth strongly denticulated. Type, *E. vorax* Leidy.

Toxoprion.—Shaft bent, but forming less than a complete coil, mostly concealed under the bases of the teeth. Roots of teeth showing no traces of their original distinctness in the shaft. Blades of teeth high, pointed, feebly denticulated. Type, *T. lecontei* (Dean).

Lissoprion.—Teeth and their shaft forming a spiral, the coils not in contact. Roots of teeth indistinguishably consolidated. Shaft widely exposed below the teeth. Inner border of shaft with a longitudinal groove. Teeth high, the middle portion short, the cutting edges smooth or feebly denticulated. Type, *L. ferrieri* Hay.

Helicoprion.—Teeth and shaft forming a spiral, the coils not in contact. No traces of the separate roots of the teeth. Blades of teeth distinctly denticulated. Little of the shaft exposed below the bases of the teeth. A longitudinal groove along inner border, as in *Lissoprion*. Middle portion of teeth variable; in the larger teeth greatly developed. Type, *H. bessonowi* Karpinsky.

6. THE NATURE OF THE OBJECTS CALLED EDESTUS, TOXOPRION, LISSOPRION, AND HELICOPRION.

In discussing this subject it is not necessary to enter into the history of opinions regarding the position occupied and the function performed by the structures that have been described above. The literature of the subject may be found cited in Doctor Eastman's papers.[a] In the first of these papers this author, who has devoted so much attention to the fossil fishes and with such profit to science, discusses the homology of the objects before us. He there frames a strong argument in favor of regarding them as the consolidated symphysial teeth of the lower jaws of sharks. Karpinsky had pre-

[a] Bull. Mus. Comp. Zool., vol. 39, pp. 55–99, and in the Mark Anniversary Volume, pp. 281–289.

viously expressed the opinion that the spiral of *Helicoprion* was composed of the symphysial teeth of the upper jaw, the spiral having been pushed outside of the mouth and carried above the snout.

Eastman based his conclusions on the fossil called *Campodus*, which he shows was composed of the symphysial teeth of probably the lower jaw. This row of teeth would correspond to the median row of lower teeth in *Heterodontus philippi*, the Port Jackson shark. If in this shark the outer and older teeth should, instead of dropping off, cohere with the younger teeth, there would be formed at least two-thirds of a coil, a structure that would resemble that of *Campodus*. If, then, the teeth should become strongly compressed the mass would resemble considerably that object that we call here *Toxoprion*. Further coiling would result in a series like *Lissoprion*.

However, when we come to homologizing *Edestus*, *Lissoprion*, and *Helicoprion* with the teeth of *Campodus* and *Heterodontus* difficulties are encountered. In the case of the two latter genera, the difficulty is to determine what disposition to make of such large spirals. If in *Heterodontus* the symphysial teeth should cohere with one another, a spiral of several coils might eventually be formed; but unless there were some especial arrangement developed, the spiral could be completed only by a pushing of the older end of it through the skin and into the flesh and cartilage of the jaw. This would not contribute to the comfort of the animal or the strength of the jaw, however much it might aid our efforts at homologizing. It would be necessary, too, to conjecture a shark with a lower jaw of tremendous proportions to accommodate a spiral like that of *Helicoprion*, the diameter of which is sometimes as much as 260 mm. If it be said that the spiral projected far enough beyond the jaw to escape burial in the tissues, it may be objected that it would have been in a position to be troublesome to the animal and exposed to injuries. The slender and bent dental mass of *Toxoprion*, too, would have hung down in a position dangerous to its existence.

A strong objection to placing any of these fossils in the mouth of a shark is to be found in the fact that none of them show any indications of wear. The species of *Edestus*, described above, present no attrition of the enamel or of the most delicate denticles or crenations. Dr. A. S. Woodward, in speaking of *Helicoprion*[a] has sought to escape this objection by supposing that the rows of teeth were so far apart that they did not rub against one another. Nevertheless, constant contact with the food taken into the mouth must have produced some wear.

It seems certain that the general conclusions of Karpinsky regarding *Edestus* and *Helicoprion* must be accepted, namely: (1) These

[a] Geol. Magazine, dec. 4, 1900, vol. 7, p. 33.

animals belonged among the Elasmobranchii; (2) the organs that represent to us these sharks were more or less imbedded in the soft parts; (3) they must have been organs in the median plane of the body; (4) a considerable part of each of these organs must have been exposed externally—that is, they were not wholly buried in the flesh. If these supposed dental masses were in the mouth they were consolidated teeth. The blades and the processes of enamel descending from them correspond to the crown of the teeth, while the shaft was formed through more or less complete fusion of the roots of the teeth. Now, while the crowns of the teeth in *Edestus* resemble closely those of some kinds of sharks, it must not be supposed that the cutting edges and the denticles correspond to those of sharks. Through strong compression of the teeth the original cutting edges would have been brought to occupy what is now the middle of the lateral faces of the teeth, while the anterior and posterior midlines would have become the cutting edges. The denticles of these edges were developed later and could not have been derived from the original denticles. It will be seen, therefore, that the whole tooth, if a tooth, suffered great transformation.

If the organs under consideration were not teeth they must have been placed either in front of some of the median fins, like many of the other ichthyodorulites, or possibly behind a dorsal fin, like the stings of the Masticura, or on the back of the head, as the spine of *Xenacanthus*. As regards *Edestus*, it does not seem to be important whether the new segment of the compound spine, if spine it was, came up before or behind the older ones, since probably the whole shaft was buried in the flesh. If it came up behind the older ones the spine might have been directed horizontally from the fin; if the new tooth arose in front of the older ones the spine may have been directed upward and backward in the fleshy front of the fin. If in the case of *Helicoprion* and *Lissoprion* the new tooth had arisen behind the older ones the spiral would have been directed forward, and on being subjected to oblique blows would have been liable to be twisted from its socket. It seems almost certain, therefore, that the new teeth came up in front of the older ones, in case, of course, the organ belonged outside of the mouth. If this is true, the end that has in this paper been called the front end is the hinder end and the end called the hinder is the front end.

The stings of the Masticura appear to be shed and replaced by new ones. In *Aëtobatis* there may be as many as five or six of these spines present at once. The statements regarding the origin of the new spines do not agree. Günther[a] says that in the Trigonidæ the stings are shed from time to time and replaced by others growing

[a] Study of Fishes, p. 342.

behind the one in function. Newberry[a] states that the worn spine is succeeded by another from behind. Jækel[b] writes that usually one finds in front of the base of an old spine the germ of a new one. In a specimen of *Rhinoptera bonasus* in the U. S. National Museum there is found a very small spine, loosely attached, in front of the one in function. In the German edition of Günther's Study of Fishes, translated by Hayek (p. 236), is a figure of the tail of a *Myliobatis* bearing two spines, the smaller of which is in front of the larger one. Storer,[c] speaking of *Myliobatis acuta*, states that the smaller spine is in front of the larger. It appears, therefore, that in the Myliobatidæ the new spine comes up in front of the older ones. On the other hand, Mr. B. A. Bean, of the U. S. National Museum, has shown me a specimen of *Urolophus jamaicensis* and one of an undetermined species of *Taeniura* in which a considerably smaller spine is behind the functional one; from which fact it may probably be inferred that in the Dasyatidæ the new spine arises behind the one in function.

It appears to the writer, therefore, that the objects called *Edestus*, *Lissoprion*, *Helicoprion*, etc., may for the present be most easily disposed of by supposing that some ancient elasmobranchs developed in front of a median dorsal fin, or in place of it, not a single spine, but a succession of them. The new compressed spine, serrated in front and behind, arose in front of the older ones. Nevertheless, the root of the new spine became directed backward beneath and on each side of the preceding one, so as partly to embrace it. At first probably the older spines were shed, but in time they began to cohere and thus form a compound spine. In *Edestus* this was straight or slightly bent. All of it, or nearly all, except the serrated teeth, was buried in the flesh. As more and more elements were added, the organ became more curved and finally in some species formed a spiral, which was directed backward and the last turn of the shaft of which was elevated enough to keep the teeth from cutting into the skin. Such a weapon could be brought into action if only its possessor had dived under its victim and brought the spine across its abdomen, thus disemboweling it, a suggestion already made by Trautschold. It is in this way, as Doctor Gill informs me, that *Gasterosteus* attacks its enemies.

If possibly these organs belonged in front of a dorsal fin, that of *Edestus* might have had its shaft buried in the fleshy part of the front of the fin and directed upward and backward. The spiral of *Helicoprion* may be supposed to have been coiled on one side of the fin to which it belonged. The fin would have formed a partial sheath for the spiral.

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[a] Paleoz. Fishes N. A., p. 224.

[b] Sitz.-Ber. Naturfor. Freunde, Berlin, 1890, p. 124.

[c] Fishes of Massachusetts, p. 270.

EXPLANATION OF PLATES.

PLATE 12.

Figs. 1–3. *Edestus crenulatus*, $\times\frac{4}{5}$.

Fig. 1. View of right side.

2. View of section at the fracture through the second tooth from the right.

3. View of section at the fracture through the fourth tooth from right.

4. *Edestus serratus*, $\times\frac{4}{5}$. View of right side.

In Figs. 2, 3, the narrow white lines are at the boundaries between the contiguous sheaths.

PLATE 13.

Figs. 1, 2. *Edestus heinrichii*, $\times 6$.

Fig. 1. Cross-section through shaft and front of tooth.

2. Vertical sagittal section of shaft and part of tooth.

In both of the figures the vascular channels are represented in black.

3. *Edestus heinrichii*, $\times 45$.

Part of sagittal section through tooth to show vascular canals and the dentinal canals diverging from them.

4, 5. *Ctenacanthus varians*, $\times 6$. Cat. No. 6048, U.S.N.M.

4. Transverse section. The vascular canals are black.

5. Longitudinal section.

PLATE 14.

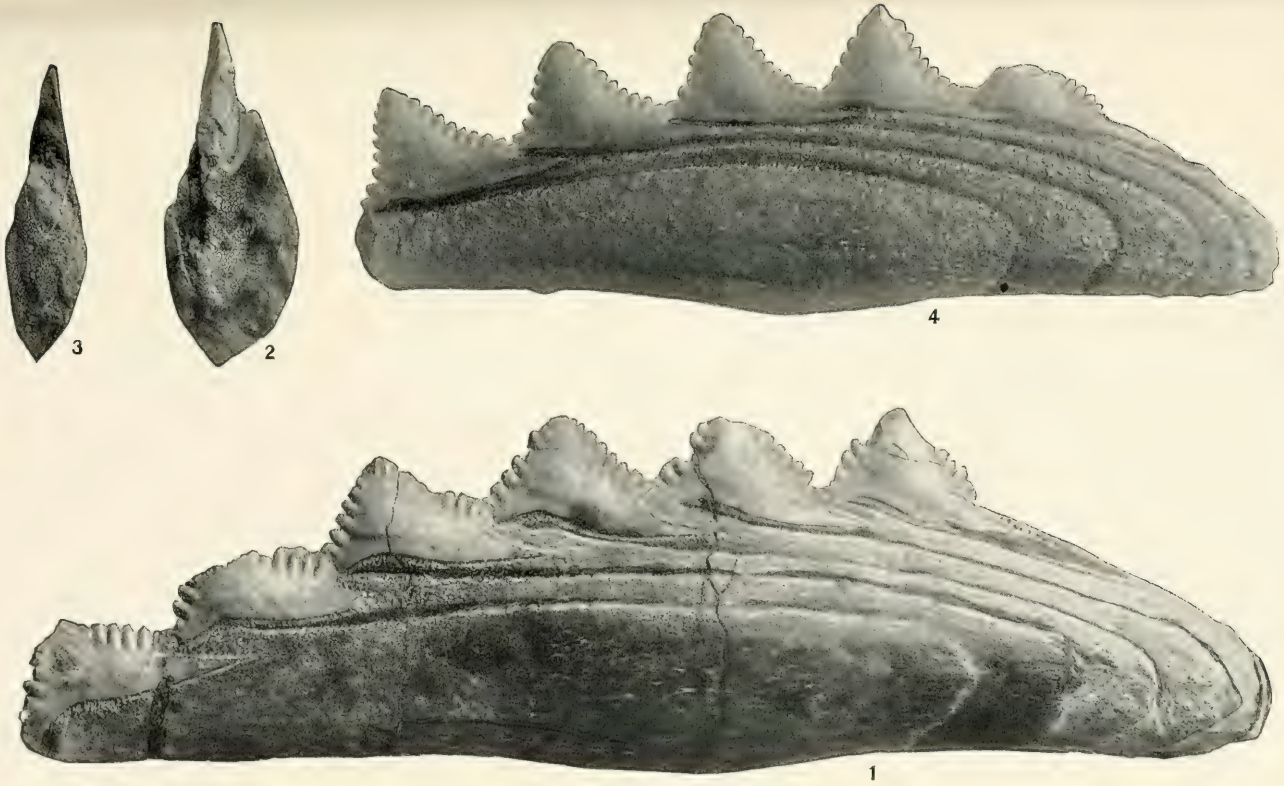
Lissoprion ferrieri, $\times\frac{9}{10}$.

Fig. 1. Part of the outer whorl, with 7 large teeth, and some small teeth of an inner whorl.

2. The axis and about 12 teeth of another specimen.

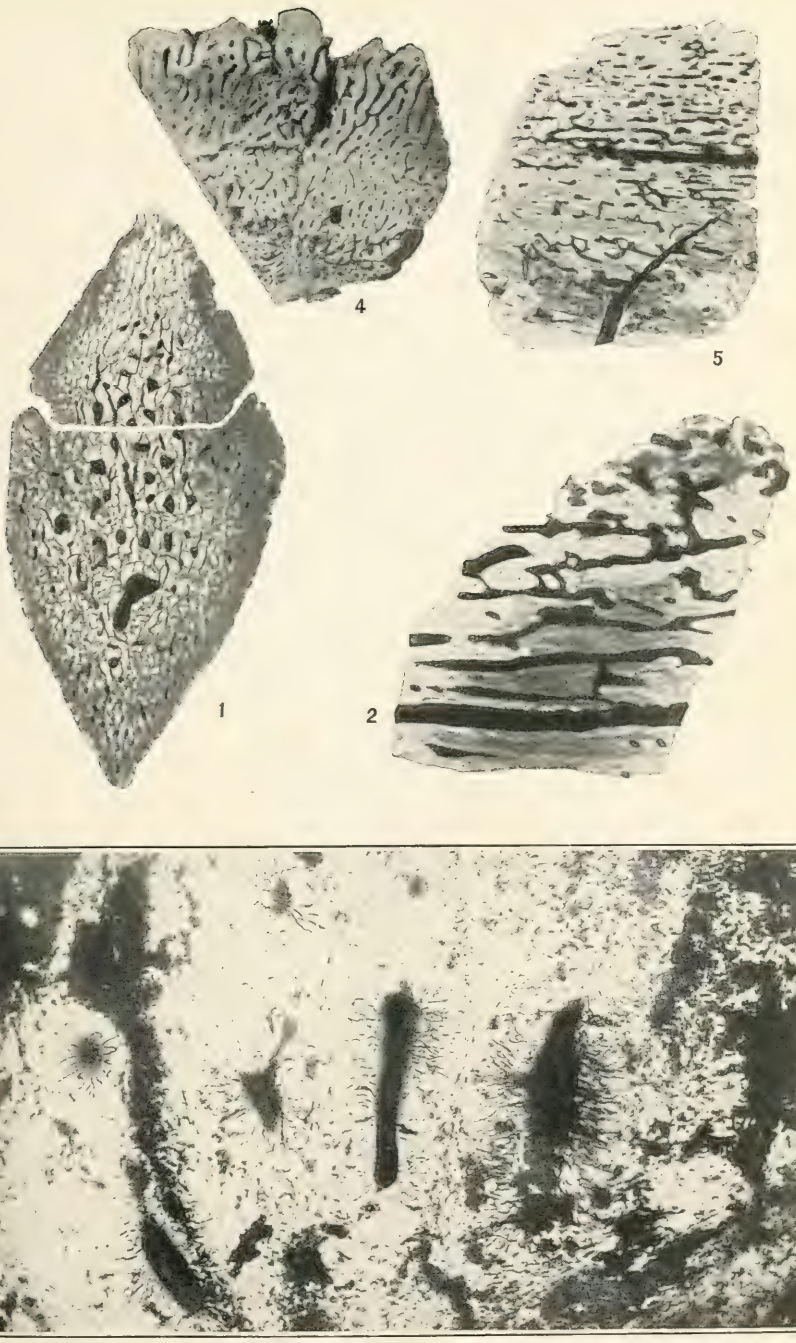
PLATE 15.

Lissoprion ferrieri, $\times\frac{9}{10}$. View of spiral showing the whorls and some of the teeth.



EDESTUS CRENULATUS AND EDESTUS SERRATUS.

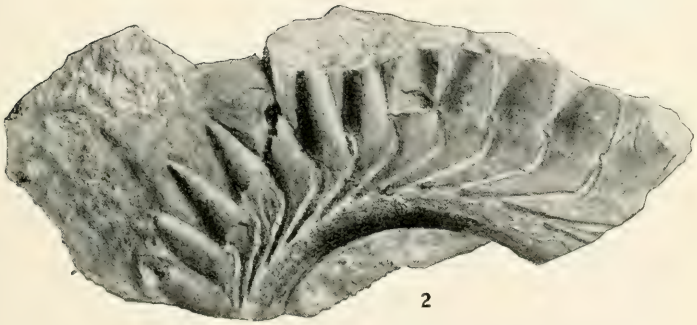
FOR EXPLANATION OF PLATE SEE PAGE 61.



EDESTUS HEINRICHII AND CTENACANTHUS VARIANS.

FOR EXPLANATION OF PLATE SEE PAGE 61.

1



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LISSOPRION FERRIERI.

FOR EXPLANATION OF PLATE SEE PAGE 61.

LISSOPRION FERRIERI.

FOR EXPLANATION OF PLATE SEE PAGE 61.

REPORT ON BARNACLES OF PERU, COLLECTED BY DR. R. E. COKER AND OTHERS.

By Henry A. Pilsbry,
Of the Academy of Natural Sciences, Philadelphia.

Our knowledge of Peruvian Cirripedia is chiefly due to Charles Darwin's "Monograph on the Subclass Cirripedia," 1852, 1854, and to a few records made by W. Weltner of specimens in the Museum für Naturkunde in Berlin. The specimens collected by Dr. R. E. Coker and Dr. W. H. Jones, U. S. Navy, have been studied in the preparation of this report, which has been prepared at the request of the Ministerio de Fomento of the Peruvian Government as a contribution to the knowledge of the aquatic resources of Peru.

No parasitic cirripedes, or forms commensal on crabs, have been found, although specially looked for on the crustacea collected by Dr. Coker. The apparent absence of such species on the west coast of North and South America is remarkable. Further collecting will doubtless add largely to the list of littoral barnacles, as well as to the deep-water fauna, of which nothing is now known.

The figures and descriptions are all from Peruvian examples. The occasion has been taken to offer sufficiently enlarged figures to show the details of the plates of *Balanidæ*. It is hoped they will make the identification of specimens of this difficult genus much easier.

KEY TO FAMILIES AND GENERA OF BARNACLES KNOWN TO OCCUR IN PERU.

a^1. Sessile barnacles.

b^1. Walls symmetrical, conic, or subcylindrical; movable or opercular plates paired.....Family Balanidæ.

c^1. Wall composed of four compartments (the sutures sometimes obliterated externally).....Genus *Tetraclita*.

c^2. Wall composed of six compartments.

d^1. Rostral compartment having overlapping radial areas at the sides, Genus *Balanus*.

d^2. Rostral compartment having side wings or alæ overlapped by the adjacent lateral compartments.....Genus *Chthamalus*.

b^2. Walls asymmetrical; only two dissimilar movable plates, Family Verrucidæ.
Genus *Verruca*.

a^2. Stalked or pedunculate barnacles.
b^1. Peduncle scaly; capitulum composed of many stout plates, Family SCALPELLIDÆ.
Genus *Mitella*.
b^2. Peduncle nude ..... Family LEPADIDÆ.
c^1. Capitulum covered by five large thin plates ..... Genus *Lepas*.
c^2. Plates of the capitulum very small or wanting ..... Genus *Conchoderma*.

Family BALANIDÆ.

Genus TETRACLITA Schumacher.

Acorn barnacles composed of four compartments, externally calcified together, obliterating the sutures in some species; permeated by pores in several rows; base flat, calcareous or membranous.

The single Peruvian species is readily distinguished from Balanus by the absence of external sutures and the thick spongy walls.

TETRACLITA POROSA (Gmelin).

Plate 16, fig. 2.

1791. *Lepas porosa* GMELIN, Syst. Nat., 13th ed., p. 3212.
1854. *Tetraclita porosa* Gmelin, DARWIN, Monograph on the Cirripedia, Balanidæ, p. 329.

Locality.—Payta (Dr. W. H. Jones, U. S. Navy).

The barnacle is rounded-oval in contour, conic, with a rather small orifice. The sutures are obliterated externally, though visible inside, and the outer layer of the wall is removed in adult shells, leaving the surface peculiarly tessellated by exposure of the ends of the filled-up pores. The wall, viewed from the base, is seen to be reduced to a spongy texture by the crowded pores. The usual size is about 30 mm. long, 12 to 15 high. The opercular plates are triangular, as in *Balanus*.

Genus BALANUS Da Costa.

Acorn barnacles with walls composed of six compartments, the side areas or radii of the rostrum overlapping the alæ of the adjacent lateral compartments; lateral compartments with alæ on the rostral radii on the carinal sides; walls permeated by usually only one row of pores or none; rostrum with alæ only. Opercular plates triangular, the scutum and tergum interlocking.

Besides the following species, several others will probably, from their known distribution, be found on the Peruvian coast.[a]

[a] *Balanus amphitrite niveus* Darwin has been reported from "Peru on *Venus flex.*" by Weltner; but *Venus flexuosa* is a species unknown on the west coast of America, and no other locality on that coast has been recorded for the barnacle in question.

BALANUS TINTINNABULUM (Linnæus).

Plate 16, fig. 3; plate 18, figs. 5–8.

1758. *Lepas tintinnabulum* LINNÆUS, Syst. Nat., 10th Ed., p. 668.
1854. *Balanus tintinnabulum* var. *communis* DARWIN, Monograph on the Cirripedia, Balanidæ, p. 195, pl. 1, figs. *a*, *b*.

Localities.—Bay of Sechura, about midway between Bayovar and Matacaballa, 5 to 6 fathoms, R. E. Coker, April 10, 1907. Pacasmayo, from a chain on the pier, Dr. W. H. Jones, October 9, 1884.

The barnacle varies from cylindric, with the orifice as large as the base, to conic, volcano shaped. The height is about equal to the carino-rostral length, or sometimes is greater, in which case the basis forms part of the side walls. The largest Peruvian example seen measures 5 cm. high and long. Color varying from crimson to dull purple. Orifice longer than wide, more or less distinctly hexagonal. The parietes are not ribbed. The wide, conspicuous, transversely striate radii are level at the orifice. The sheath is glossy and nearly smooth, and the plates are smooth or weakly ribbed below it (pl. 16, fig. 3).

The tergum is irregularly trapezoidal, the basal and basi-tergal sides about equal. It has a conspicuous sculpture of concentric lamellar ridges, joining by pairs at the occludent margin, and in the intervals fine striæ radiate from the apex. The plate is bent along a longitudinal line of flexure, the tergal third standing at an angle of about 45° with the rest of the surface. The articular furrow is very deep and narrow, the articular ridge high, usually overhanging at its lower end. Adductor ridge high, overhanging toward the tergal side (figs. 6, 8).

The tergum is triangular, its spur long and separated from the scutal angle by fully double its width. The longitudinal furrow is usually reduced to an impressed line by the infolding of its edges. The external sculpture is otherwise like that of the scutum. Inside there is a wide and open articular groove, a strong articular ridge, and a stout rib running to the spur. Crests for the insertion of the depressor muscle are weak or wanting (figs. 5, 7).

This is a common barnacle in all warm seas, probably derived from an oriental center. It is one of the most abundant forms carried on ship bottoms. Whether it reached the west coast of South America by natural means, or was carried there by commerce has not been ascertained. If it proves to be wanting in pleistocene or pliocene deposits of the west coast, the theory of recent introduction may safely be held.

The Peruvian examples seen all belong to the typical form of *B. tintinnabulum*, which was called var. *communis* by Darwin.

BALANUS PSITTACUS (Molina).

Plate 16, figs. 1, 4; plate 18, figs. 1–4.

1782. *Lepas psittacus* MOLINA, Saggio sulla storia naturale del Chili.[a]

1831. *Balanus picos* LESSON, Voyage autour du Monde de la Coquille, Zoologie, vol. 2, pt. 1, p. 445 (Concepcion, Talcahuano, S. Vincent, Chili).

1854. *Balanus psittacus* DARWIN, Monograph on the Cirripedia, Balanidæ, p. 206, pl. 2, figs. 3 *a–d* (Arica to Chiloe I., Chili).

1905. *Balanus psittacus* VAYSSIERE, Annales de la Faculté des Sciences de Marseille, vol. 15, Fasc. V, p. 161, pl. 1, figs. 1–4 ("Talcahuana," Chili).

Localities.—Pacasmayo (W. H. Jones); Chincha Islands and Pescadores Islands (R. E. Coker); Callao (Weltner).

When typically developed, this barnacle reaches a length of 16 to over 20 cm. It is more or less cylindric, pink or flesh colored, smoothish in old or large examples when not worn, but often showing ribs near the ends of the parietes, showing that the young barnacles are ribbed. The orifice is large and hexagonal or quadrangular. The radii are very broad and transversely striated, and in old shells occupy only the upper portion of the cylinder, the rest being formed of the greatly lengthened base. The sheath is short, and the parietes are smooth inside. The pores which permeate the base and wall (parietes and radii) are often exposed by wear (pl. 16, fig. 1, Pacasmayo).

This large form is what all but the first of the authors cited have described. It is apparently most fully developed on the Chilean coast, where it is fished in about 6 fathoms of water, and is esteemed a delicious food. Only one example from Peru of this large form has come under my notice, the one figured on pl. 16, fig. 1 (Cat. No. 15474, U.S.N.M.). It is less ponderous than Chilean examples. Darwin recorded it from a single Peruvian locality, Arica; but this place is

[a] The date of original publication of *B. psittacus* has been in doubt. Darwin's reference is "Molina, Hist. Nat. Chili (1788), vol. 1, p. 223." I have not seen the original edition of Molina's work. Five later editions are in the library of the Academy of Natural Sciences of Philadelphia. The earliest of these is entitled "Versuch | einer | Naturgeschichte | von | Chili. | von | Abbé J. Ignatz Molina. | Aus dem Italiänischen übersetzt, | von | J. D. Brandis, | Doctor der Arzneywissenschaft. | mit einer Landcharte. | mit Churfürstl. Sächsischer Freyheit. | Leipzig, | bey Friedrich Gotthold Jacobäer 1786." In the translator's preface it is stated that the manuscript had been ready for publication since 1784—four years earlier than Darwin's date. *Lepas psittacus* is described on page 179.

A French translation by M. Gruvel D. M. bears date of 1789. *Lepas psittacus* is described on pages 179 and 328. An American edition translated "by an American gentleman" appeared at Middletown, Conn., in 1808, and an English edition, apparently taken from the American, in 1809. The natural history matter seems to be practically identical in all of these editions. The second Italian edition, Bologna, 1810, evidently contains extensive interpolations, and the systematic list of animals is omitted; but in the preface the date of the original edition is given as 1782.

now on Chilean territory. Besides the large form there is also on the Peruvian coast a littoral form of *B. psittacus*, which agrees better with Molina's description than the large form hitherto considered typical.

Examples from Chincha Islands, "abundant on the shore rocks" and Pescadores Islands, collected by R. E. Coker, are small, though clearly adult. They measure 3.5 to 4.5 cm. high, 2.5 to 3.5 in basal diameter. The shape is conic or vertical sided; parietes irregularly ribbed, radii rather wide. The orifice is ovate, or angular at the sides and truncate at the rostral end. The color is dull whitish gray, sometimes partly dull pink. The parietes are ribbed lengthwise inside below the sheath. The base is as flat as circumstances permit, and either forms no part of the side walls, or is but slightly excavated.

A group from the Chincha Islands, No. 38692 U.S.N.M., is figured, of the natural size (pl. 16, fig. 4).

The scutum is trapezoidal, the basi-tergal side parallel to the occludent and about as long as the basal margin. The tergal third is bent at an angle of about 45° with the rest of the surface. The apical third or fourth of the surface is smooth, the rest sculptured with concentric lamellæ and radial striæ which crenulate the edges of the lamellæ. Inside there is a deep and narrow articular groove and a high acute articular ridge, which is confluent below with the adductor ridge. The latter continues nearly to the base, arching over *a cavity which penetrates nearly to the apex*. The adductor muscle scar is well marked (figs. 3, 4).

The tergum is long and narrow, terminating in a long beak, from one-third to one-fourth the length of the plate. The spur is long and narrow, near the scutal margin. The longitudinal groove has its sides closely folded together. The surface is sculptured otherwise like the scutum. Inside, the articular ridge overrides the rib running to the spur. Between this ridge and the carinal edge there is a short narrow longitudinal ridge. The ridges and the space between them are purple. There are no crests for the depressor muscles (pl. 18, figs. 1, 2, Chincha Islands).

While it is related to *B. tintinnabulum* by the porous walls and base, *B. psittacus* is very distinct by the narrow, long-beaked tergum and the arched-over cavity of the scutum. The opercular plates, in place, have the shape of a parrot's beak.

BALANUS CONCAVUS Bronn.

1838. *Balanus concavus* BRONN, Lethæa Geognostica, Vol. 2, p. 1155, pl. 36, fig. 12.

1854. *Balanus concavus* Bronn, DARWIN, Monograph on the Cirripedia, Balanidæ, p. 235 (Peru, etc.).

Locality.—Peru (Darwin, Balanidæ, p. 236); Island of S. Lorenzo in a recent elevated beach, 85 feet above the sea (Darwin).

The barnacle is conical, orifice rather small, radii narrow. Surface generally smooth; color dull reddish-purple with whitish or darker rays, pale rose-pink with white rays, or wholly white. Diameter of the largest Peruvian (fossil) specimens about 4 cm. Recent examples are smaller, often about 15–20 mm. in diameter.

The scuta are striated longitudinally, beading or denticulating the transverse costulæ. Articular ridge rather small; adductor ridge usually very prominent.

Terga very slightly beaked. There is a longitudinal furrow, usually deep, with the edges folded in and touching, extending down to the spur.

This species may be distinguished from *B. amphitrite* by the longitudinal striation of the scuta.

BALANUS LÆVIS NITIDUS Darwin.

Plate 17; plate 19, figs. 5–9.

1854. *Balanus lævis* Bruguière var. *nitidus* Darwin, Monograph on the Cirripedia, Balanidæ, p. 227, pl. 4, fig. 2 (Chili, Peru, California).

Locality.—Arica, on the gastropod *Concholepas peruviana* Lamarck; San Lorenzo Island, on pebbles at low tide (Dr. W. H. Jones, U. S. Navy); Peru, on *Concholepas* (coll. Acad. Nat. Sci. Phila.).

The barnacle is nude, not covered with a cuticle, conic, white or pale purple, or marked with purple lines near the summit; smoothish, with very narrow radii. Orifice small, ovate or trapezoidal, with an even, not toothed, margin. The parietes and calcareous base are porous; the purple lines often visible near the summit being caused by a purple calcareous filling of the parietal pores. The size varies from a carino-rostral diameter of 8 to 16 mm., the height being about the same, or in large crowded groups they may become higher.

The scutum is triangular, the basal and tergal margins of about equal length. Surface covered with a yellow cuticle, to which remains of old cuticle generally adhere; sculptured with fine transverse riblets and having one or two deep longitudinal furrows. Inside, the articular groove is narrow and deep, the articular ridge high and strong, projecting in a point below. The adductor ridge is massive and strong. The pit for the insertion of the lateral depressor muscle is very deep, passing almost or quite through the calcareous layer of the plate (figs. 6, 8, 9).

The tergum has a broad spur, truncated at the end and nearly half as wide as the whole plate. The longitudinal furrow is wide, with the edges narrowly folded in. Surface elsewhere finely costulate parallel to the basal margin. Inside there is a moderate articular furrow and strong articular ridge. The crests for the depressor muscles are strongly developed (figs. 5, 7).

This barnacle grows on the shell of the gastropod *Concholepas peruviana* Lamarck, wholly covering the outer surface, as shown in pl. 17, showing dorsal and ventral aspects of two shells so overgrown. The barnacle profits no doubt by riding a gastropod, but whether the *Concholepas* benefits by the protection afforded is somewhat in doubt. It is distinguished from *B. laevis* Bruguière, of more southern waters, chiefly by the diminished size and absence of cuticle over the outer walls. *B. l. nitidus* is usually quite nude, but occasionally retains some of the cuticle around the base of the walls. The furrows of the scutum are characteristic and present in very many individuals I have examined, but Darwin mentions finding individuals without the grooves.

BALANUS PERUVIANUS, new species.

Plate 19, figs. 1–4.

Locality.—Salt creeks at La Palasada, near Tumbez, growing on mangroves.

Cotypes.—Cat. Nos. 38691 and 38692, U.S.N.M.

A species of Darwin's Section D. The parietes are permeated by pores near the base; the radii and base are not porous.

General form conic, with flat or concave base and rather small aperture; dirty purplish white or dull purple; very solid and strong. The parietes are smoothish, without ribs, and only minutely roughened; radii narrow, their summits sloping steeply; summits of the alæ also steeply sloping. The aperture is pentagonal, with a strongly notched margin. The sheath is horizontally regularly ribbed, each rib bearing a row of short bristles pointing upward. Below the sheath the surface is strongly ribbed vertically.

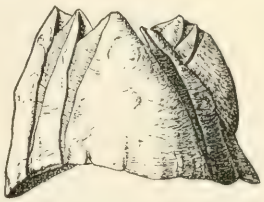


FIG. 1.—BALANUS PERUVIANUS, LATERAL VIEW.

The scutum is triangular, nearly half as wide as long. It is white inside, dirty whitish outside, suffused with dull purple near the apex, and with a narrow streak of the same near the tergal margin. The basal margin is slightly curved, and the basotergal angle is rounded off. The surface is sculptured with flat, slightly overhanging concentric ribs parted by narrower intervals. There are no radial striæ. Inside there is a strong and very high articular ridge, a much lower adductor ridge joining it, and rapidly diminishing downward. Articular furrow deep. The cavity of the adductor muscle is very deep (figs. 3, 4).

The tergum is bicolored, the scutal half white, carinal half dull purple. The spur is short, wide, and obliquely truncate at the end. Its width is contained about two and a half times in the length of

the basal margin. The outer face of the plate is flat, except that the scutal border is turned up a little; there is no longitudinal furrow, but two impressed lines run from apex to the sides of the spur. The surface is marked with concentric striæ and low, flattened riblets, much less conspicuous than on the scutum. There are also numerous unequal radial striæ, chiefly on the carinal half of the plate, and mostly rather weak. Inside there is a broad and rather deep articular furrow and a massive though not high articular ridge. The crests for the depressor muscle are high, acute, and project beyond the basal margin of the plate. The carinal half of the interior is finely rugose throughout.

Carino-rostral length of the base 31 mm.; width, 28.5 mm.; height, 23 mm. Length of the scutum, 10.5 mm.; width, 5 mm. Length of the tergum, 8 mm.; width, 5 mm.

This species is related to *B. glandula* Darwin of California. It differs from that species chiefly by the shape of the scutum, which is narrower than in *B. glandula*, and differs in the shape and proportions of the ridges of the interior. (Compare Darwin, *Balanidæ*, pl. 7, fig. 1*a*). *B. glandula*, moreover, has the "walls rugged, longitudinally folded." *B. trigonus* Darwin differs by having rows of pits on the scutum and longitudinal ribs on the parietes. It is almost identical with *peruvianus* in the shapes of the opercular plates.

The pores of the parietes are filled up except close to the base, and might readily be overlooked. The base is solid. In these features *B. peruvianus* resembles *B. glandula* and *B. trigonus*. Unlike *B. patellaris* (Spengler), the base curves to fit the shape of the support.

BALANUS TRIGONUS Darwin.

1854. *Balanus trigonus* DARWIN, Monograph on the Cirripedia, Balanidæ, p. 223, pl. 3, figs. 7*a*–7*f*.

Locality.—Peru, without special locality (Darwin). Also reported from California, Australia, and New Zealand (Darwin). The original description by Darwin is as follows:

Shell conical, generally depressed; parietes ribbed, mottled purplish red; orifice broad, trigonal, hardly toothed. Scutum thick, with from one to six longitudinal rows of little pits. Tergum without a longitudinal furrow; spur truncated, fully one-third of the width of valve.

The scutum and tergum resemble those of *B. peruvianus* in outline, but differ in sculpture. No definite locality in Peru has been recorded.

Genus CHTHAMALUS Ranzani.

Barnacles like *Balanus* in general appearance, but the rostrum has alæ, or underlying side areas, while in *Balanus* these areas lie over the adjacent edges of the lateral compartments. They are small

and almost always very deeply eroded, dull and gray, with little of the original surface remaining on the exterior of either wall or movable plates. The specific characters are most clearly exhibited in the shape of the scuta, or larger opercular plates.

CHTHAMALUS CIRRATUS Darwin.

1854. *Chthamalus cirratus* DARWIN, Monograph on the Cirripedia, Balanidæ, p. 461, pl. 18, figs. 4*a*, 4*b*.

Localities.—Northeast side of San Lorenzo Island, shore, on rocks; Pescadores Islands, on *Balanus psittacus* Molina (R. E. Coker).

The barnacle is small, diameter of base 10 to 13 mm., and usually low, irregular in contour, the individuals often crowded, forming a crust on the rocks. When free the peripheral portion is costate and strongly crenated or toothed at the edge. The upper part of the wall

FIG. 2.—CHTHAMALUS CIRRATUS. INSIDE VIEWS OF TERGUM AND SCUTUM ENLARGED, AND GROUP OF THREE ENTIRE ANIMALS, NAT. SIZE.

and the opercular plates are deeply eroded, dull gray. The sutures are obliterated. The orifice is rather large. The interior is dull purplish.

The sutures of the opercular plates form a figure the shape of the Greek letter Ψ. The scutum is triangular, the articular groove making a deep notch at the tergal side. Articular ridge well developed. The adductor muscle impression is very deep. The tergum has a ridge inside along the upper and scutal margins. The baso-carinal angle projects. There are two very short crests for the insertion of the depressor muscles.

This species is most readily recognized by the shapes of the terga and scuta, both differing conspicuously from those of *C. scabrosus*. According to Darwin, large specimens from Coquimbo and Valparaiso have a height of 1 inch with a basal diameter of half as much. All of those I have seen from Peru are depressed.

CHTHAMALUS SCABROSUS Darwin.

1854. *Chthamalus scabrosus* DARWIN, Monograph on the Cirripedia, Balanidæ; p. 468, pl. 19, fig. 2.

Locality.—Peru to Falkland Islands (Darwin).

The barnacle is dull purplish brown when well preserved, dirty gray when eroded; surface generally rugged.

According to Darwin the opercular plates generally have their summits much worn down. The scuta are elongated in the line of the longer axis of the orifice; the articular ridge is very prominent, and is placed in the middle of the tergal margin. The terga are very narrow; they are remarkable in two respects, namely, in the depressor muscle being attached to a plate formed apparently by the union of the usual crests, parallel to the outer lamina of the valve itself, a deep narrow cavity being thus formed; and secondly, in the far more extraordinary circumstance of the existence of a small pit at the extreme basi-scutal corner of the valve, in which about half of the scutal lateral depressor muscle is attached.

No definite locality in Peru has been recorded.

Family VERRUCIDÆ Darwin.

Genus VERRUCA Schumacher.

Sessile, box-like cirripedes, with a shell composed of six plates. Scuta and terga without depressor muscles, movable only on one side, on the other immovably united with the rostrum and carina into an asymmetrical shell.

VERRUCA LÆVIGATA (Sowerby).

?1826. *Clitia lævigata* SOWERBY, Genera of Recent and Fossil Shells, figs. 1, 3.
1854. *Verruca lævigata* Sowerby, DARWIN, Monograph on the Cirripedia, Balanidæ, p. 520, pl. 21, fig. 3.

Locality.—Tierra del Fuego to Peru, attached to shells and to Balanus (Darwin). Tumbez (Weltner).

Family SCALPELLIDÆ.

Genus MITELLA Oken.

Valves of the capitulum from 18 to over 100 in number, all with the umbones apical above; latera of the lower whorl numerous. A subrostrum always present. Peduncle closely scaly. These barnacles live attached to fixed, or rarely, floating objects.

MITELLA ELEGANS (Lesson).

1831. *Pollicipes elegans* LESSON, Voy. autour du Monde de "la Coquille" Zoologie, pl. 2, p. 441; Illustrations Zoologiques, pl. 39.
1851. *P. elegans* Lesson, DARWIN, Monograph on the Cirripedia, Lepadidæ, p. 304.

Locality.—Payta, on piles (Lesson); Lobos Island (Cuming).

The capitulum has two or more rows of valves under the rostrum. Valves and scales of the peduncle are reddish orange, the latter symmetrically arranged in close whorls.

Family LEPADIDÆ Darwin.

Genus LEPAS Linnæus.

Valves 5, approximate, thin; carina extending up between the terga, terminating below in an embedded fork or external disk; scuta subtriangular, umbones at the rostral angle; caudal appendages uniarticulate; peduncle long and nude.

Common barnacles in all seas, on floating objects such as buoys, driftwood, or ships' bottoms. Most of the species are almost world-wide in distribution. The following key includes those likely to be found on the Peruvian coast, though up to this time only two species have actually been recorded.

KEY TO SPECIES.

a^1. Carina terminating below in a flat oblong external disk, umbo angularly projecting; valves thin, papery ..... *L. fascicularis.*

a^2. Carina terminating below in a fork, umbo basal; valves well calcified.

b^1. Valves radially furrowed or strongly striate.

c^1. Occludent margin of the scutum arched, protuberant ..... *L. anserifera.*

cc^2. Occludent margin close to the ridge from the umbo to the apex, *L. pectinata.*

b^2. Valves smooth or very minutely striate radially.

c^1. Valves smooth or delicately striate; an internal umbonal tooth on the right-hand scutum ..... *L. anatifera.*

c^2. Valves not striate radially; no internal umbonal teeth on the scuta,

LEPAS ANATIFERA Linnæus.

1907. *Lepas anatifera* Linnæus, PILSBRY, Cirripedia of the U. S. National Museum, Bull. U. S. Nat. Mus. No. 60, p. 79, pl. 9, figs. 3–5.

Locality.—Chincha Islands, abundant on bottoms of "lanchas" (lighters) used in embarking guano (R. E. Coker).

LEPAS PECTINATA Spengler.

1907. *Lepas pectinata* Spengler, PILSBRY, Cirripedia of the U. S. National Museum, Bull. U. S. Nat. Mus. No. 60, p. 81, pl. 8, figs. 4–8.

Locality.—Peru, without special locality (Weltner).

Genus CONCHODERMA Olfers.

Nude cirripedes, with the peduncle long, capitulum generally striped or maculate, with two to five small vestigeal widely separated plates; scutum at base of the orifice, two or three lobed, with the umbo near the middle on the occludent border; carina narrow

arched, with the two ends nearly alike, umbo near the middle; sometimes it is wanting; terga small or, in adults, sometimes wanting. Lateral filaments numerous; mandibles with five finely pectinated teeth; maxillæ with distinct steps. Caudal appendages none. Cirri with the spines arranged comb-like.

These pelagic forms live on whales' "bonnets," turtles, the bottoms of ships, buoys, etc. The two species are nearly or quite world-wide in distribution. *C. virgatum* is a handsomely striped form, with the plates rather well developed, though small, and without fleshy ear-like processes. It has been reported from Iquique, Chile, and from California. While not yet known from Peru, it doubtless occurs on that coast. *C. auritum* is readily known by the two large "ears" rising behind the positions of the terga. The terga and carina are very small, sometimes absent in adults.

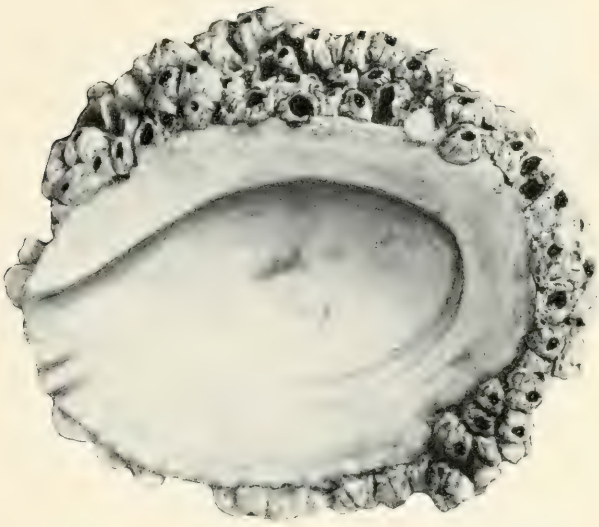
CONCHODERMA AURITUM (Linnæus).

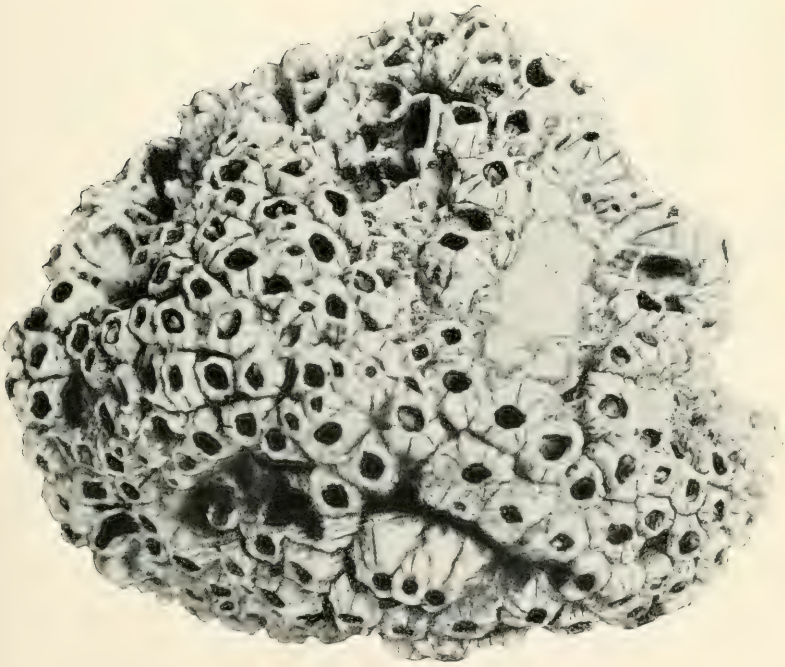
1907. *C. auritum* Linnæus, PILSBRY, Cirripedia of the U. S. National Museum, Bull. U. S. Nat. Mus., No. 60, p. 99, pl. 9, fig. 2.

Locality.—Tumbez, on *Coronula diadema* growing on a whale (Weltner).

1, 4, Balanus psittacus; 2, Tetraclita porosa; 3, Balanus tintinnabulum.

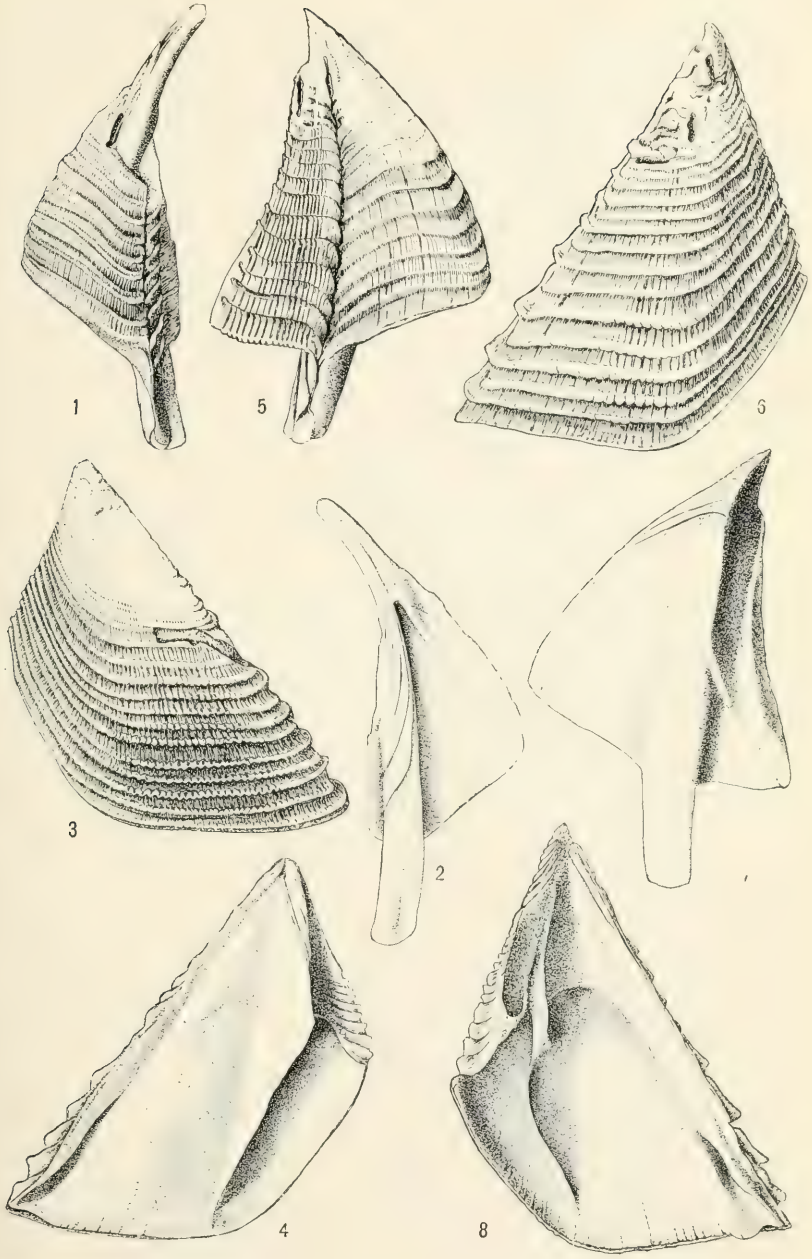
For explanation of figures see pages 64, 65, 66.





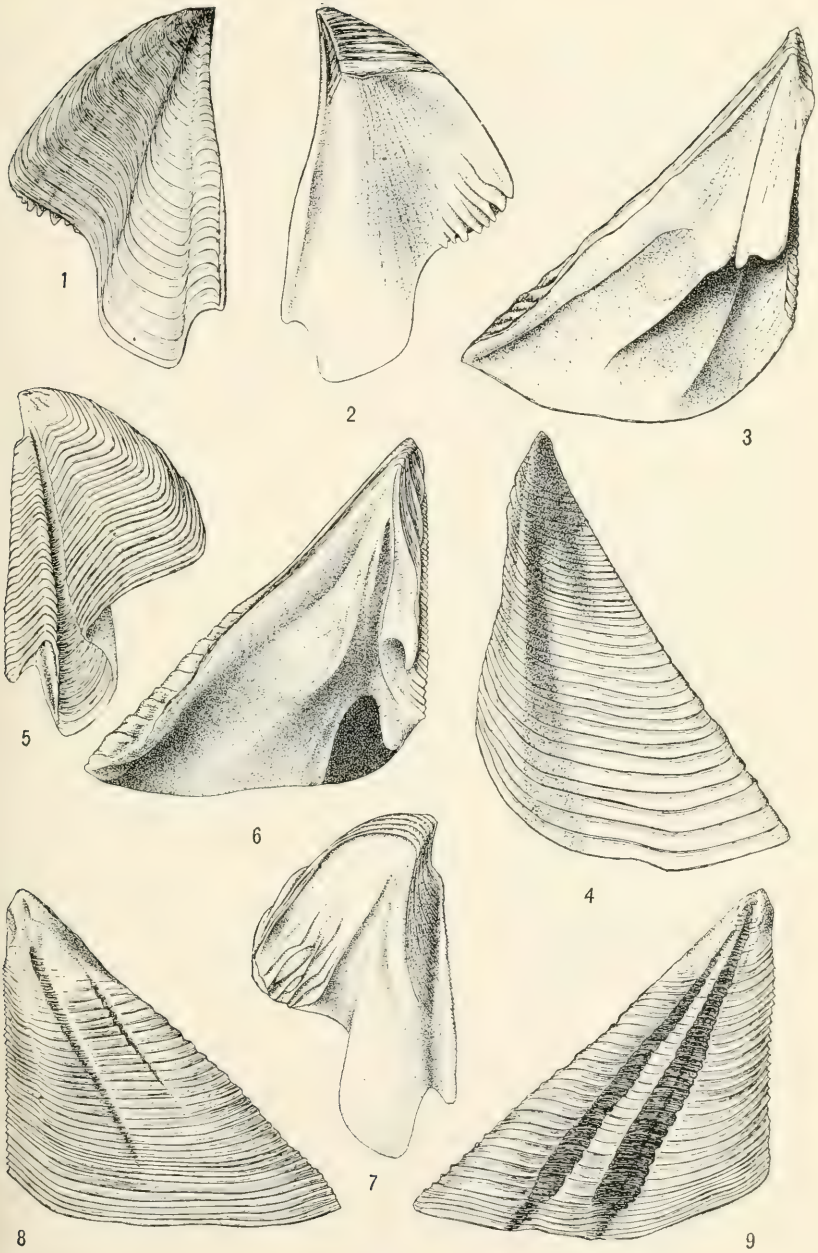
BALANUS LÆVIS NITIDUS ON THE SHELL OF CONCHOLEPAS.

FOR EXPLANATION OF FIGURES SEE PAGE 68.



1–4, BALANUS PSITTACUS; 5–8, BALANUS TINTINNABULUM.

FOR EXPLANATION OF FIGURES SEE PAGES 65, 66.



1–4, BALANUS PERUVIANUS; 5–9, BALANUS LÆVIS NITIDUS.

FOR EXPLANATION OF FIGURES SEE PAGES 68, 69.

ISOPODS COLLECTED IN THE NORTHWEST PACIFIC BY THE U. S. BUREAU OF FISHERIES STEAMER "ALBATROSS" IN 1906.

By Harriet Richardson,

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The following report is of the Isopoda collected by the U. S. Bureau of Fisheries steamer *Albatross* during its cruise in 1906, from San Francisco to Alaska, the Aleutian Islands, Bering Sea, Kamchatka, Japan, etc. A large number of specimens were obtained, including known species and twenty-nine new ones. The new forms are herein described and a list of the known species given with their stations. References to the literature are to be found at the end of the paper.

CYMOTHOIDEA or FLABELLIFERA.

Family GNATHIIDÆ.

Genus GNATHIA Leach.

GNATHIA TUBERCULATA, new species.

Body oblong, ovate.

Head large, squarish, with the anterior margin produced in a rounded lobe and the antero-lateral angles acute. The eyes are small, round, composite, and situated at the base of the antero-lateral angles of the head. The surface of the head is granulate and covered with numerous small spines.

The first pair of antennæ have the first two articles short and subequal; the third is twice as long as the second; the flagellum is composed of five articles. The second pair of antennæ have the basal article short, the last two articles elongate; the flagellum is composed of seven articles. The mandibles are large and conspicuous, and project straight in front, with their inner edges contiguous along the middle and the tips crossing. There is a small dentation about the middle of the outer margin.

On the ventral side of the head the anterior margin is provided with four spines on either side close to the antennæ and within them.

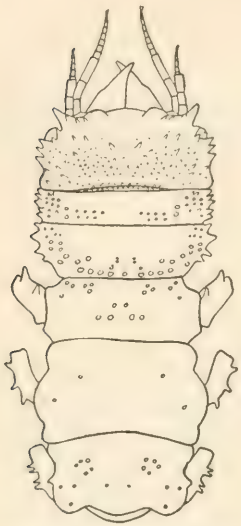

FIG. 1.—GNATHIA TUBERCULATA. HEAD AND THORAX. × 14½.

The first segment of the thorax is short and narrow and almost inconspicuous. The second segment is about half as long as the third, but is equally wide. The second is covered with small spines and tubercles, the third at the sides and on the posterior half. The fourth segment is a little longer than the third and a little narrower; it is also furnished with tubercles. The fifth segment is one and a half times longer than the fourth and has only a very few tubercles on the dorsal surface. The sixth segment is a little shorter and a little narrower than the fifth segment and is furnished with but few tubercles, more, however, than on the fifth segment. The seventh segment is short and almost inconspicuous.

The abdomen is abruptly about half as wide as the sixth thoracic segment. The five anterior segments are subequal. The terminal segment is produced to a long, narrow extremity. The inner angle of the peduncle of the uropoda is produced and extends about half the length of the inner branch. The branches are similar in shape and size, the inner one being a little longer than the outer and also a little longer than the tip of the terminal segment of the abdomen. Both are fringed with long hairs.

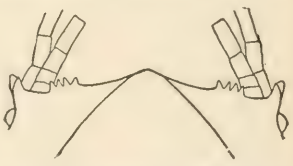

FIG. 2.—GNATHIA TUBERCULATA. ANTERIOR MARGIN OF HEAD (VENTRAL). × 27⅓.

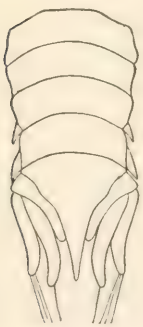

FIG. 3.—GNATHIA TUBERCULATA. ABDOMEN. × 27⅓.

The fourth pair of legs have the basis furnished with two long spines, one being at the distal extremity and the other about the middle; the ischium is furnished with one spine and the merus with one. The fifth pair have the basis furnished with three spines on the exterior margin; the ischium is furnished with one spine and the merus with one. The sixth pair have the basis furnished with four spines. (The rest of the leg is lost in the only specimen.) The first pair of legs are modified into an operculum covering the mouth parts; each appendage is composed of three articles, the last one being minute.

Only one specimen, a male and imperfect, comes from station 4831, on the way from Nanao, Hondo, Japan, to Isuruga, Hondo, Japan,

at Sudzu Misaki Light, N. 68° W., 24 miles (lat. 37° 22′ 30″ N.; long. 137° 47′ E.) at a depth of 619 fathoms in green mud.

Type-specimen.—Cat. No. 39496, U.S.N.M.

Family ANTHURIDÆ.

Genus PARANTHURA Bate and Westwood.

PARANTHURA JAPONICA, new species.

Body narrow, elongate. Color, in alcohol, yellow, with irregular markings of black.

Head about as long as wide, 1 mm.: 1 mm. Anterior margin excavate and with a small median point. Eyes rather large, round, composite and placed in the antero-lateral angles. The first pair of antennæ have the first article of the peduncle elongate; the second and third are subequal in length, and both together are not longer than the first article; the flagellum consists of four articles, the last of which is minute. The second pair of antennæ have the second article elongate; the third and fourth short and subequal, and both together not longer than the second; the fifth is about one and a half times longer than the fourth; the flagellum consists of a single, tapering article, furnished with hairs.

FIG. 4.—PARANTHURA JAPONICA. HEAD AND FIRST THREE SEGMENTS OF THORAX. × 9⅔.

The first five segments of the thorax are subequal in length, each being 1½ mm. long. The sixth segment is shorter, being only 1 mm. long. The seventh is half as long as the sixth, being ½ mm. in length.

The first five segments of the abdomen taken together are equal in length to the sixth thoracic segment. These segments are all fused in the middle of the dorsal region but are distinct at the sides. The sixth segment is almost as long as half the length of the other five segments taken together. The telson is liguiform, with the posterior extremity rounded. The peduncle of the uropoda extends about three-fourths the length of the terminal abdominal segment. The inner branch is short, rounded posteriorly, and does not extend beyond the extremity of the terminal abdominal segment. The outer branch arches over the telson and is as long as the peduncle of the uropoda.

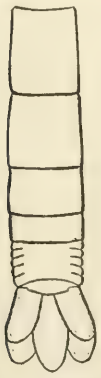

FIG. 5.—PARANTHURA JAPONICA. LAST FOUR SEGMENTS OF THORAX AND ABDOMEN. × 9⅔.

The first three pairs of legs are prehensile, the first pair being stouter and larger than the others. The last four pairs are ambulatory.

Only one specimen, a female, was collected at Mororan, Japan, on the shore.

Type-specimen.—Cat. No. 39497, U.S.N.M.

Family CIROLANIDÆ.

Genus BATHYNOMUS A. Milne Edwards.

BATHYNOMUS DODERLEINI Ortmann.

Bathynomus döderleini Ortmann, Proc. Acad. Nat. Sci. Phila., 1894, pp. 191–193.—Bouvier, C. R. Acad. Sci., vol. 132, pp. 643–645.—A. Milne Edwards and Bouvier, Mem. Mus. Comp. Zool. Harvard College, vol. 22, No. 2, 1902, pp. 159–165, pls. 7, 8.

Locality.—Two fine specimens were collected at station 5067, in Suruga Gulf, Japan, at Ose Saki, 50° E., 6.5 miles (lat. 35° 05′ 50″ N.; long. 138° 41′ 15″ E.).

Depth.—Two hundred and ninety-three fathoms in broken sand and shells.

The type-specimens of this species were collected in Sagami Bay, near Enoshima, Japan. The flagelli of the second pair of antennæ were broken in both specimens, the longest fragment being composed of 25 articles and reaching to the end of the first segment of the thorax. In the two perfect specimens obtained by the Bureau of Fisheries steamer *Albatross*, the flagelli are entire and extend to the posterior margin of the fourth thoracic segment in one specimen and almost to the posterior margin of the fifth thoracic segment in the other specimen. The articles in the flagellum number about 73.

Family CORALLANIDÆ.

Genus ALCIRONA Hansen.

ALCIRONA NIPONIA, new species.

Body narrow, elongate, nearly three times as long as wide (4 mm.: 11 mm.). Surface smooth. Color, in alcohol, pale yellow.

Head twice as wide as long (1 mm.: 2 mm.). Anterior margin widely rounded. Eyes small, round, composite, and situated in the post-lateral angles. The first pair of antennæ have the first two articles of the peduncle short and subequal; the third is about one and a half times longer than the first two combined; the flagellum is composed of about 11 articles and does not quite reach the posterior margin of the first thoracic segment. The second antennæ, with a flagellum of 19 articles, extend to the posterior margin of the third thoracic segment.

The segments of the thorax are about equal in length with the exception of the first, which is a little longer. Epimera are present on all the segments, except the first; those of the second and third

segments do not extend beyond the posterior margin of the segment and are quadrangular; those of the last four segments have the outer post-lateral angle produced so that they extend beyond the posterior margin of the segment, each being increasingly longer. Each epimeron is furnished on the outer post-lateral angle with a bunch of long hairs, a most conspicuous feature.

The first two segments of the abdomen are entirely concealed. The three following are short and subequal. The terminal segment is triangular, with apex rounded. The inner branch of the uropoda is about twice as wide as the outer branch and is a little longer. It is widely rounded posteriorly and extends a little beyond the tip of the abdomen. Both branches, as well as the terminal segment of the abdomen, are furnished with hairs and a few spines.

FIG. 6.—ALCIRONA NIPONIA. LEG OF FIRST PAIR. × 27⅓.

The first three pairs of legs are prehensile, the other four pairs ambulatory. In the first pair of prehensile legs the merus is armed with four blunt spines, the carpus with one, the propodus with seven rounded teeth, and the dactylus with four low rounded serrations.

Only one specimen, a male, was collected at station 4879, in the eastern channel of Korea Strait, vicinity of Oki Shima, S. 70° W., 7.5 miles (lat. 34° 17′ N.; long. 130° 15′ E.), at a depth of 59 fathoms in fine gray sand and broken shells.

This species is very close to *Alcirona insularis* Hansen [a] from Samoa, but differs in the character of the prehensile legs, in having a bunch of hairs on each epimeron at the outer post-lateral angle, and in having the first two segments of the abdomen entirely concealed.

Type-specimen.—Cat. No. 39498, U.S.N.M.

Family ÆGIDÆ.

Genus ÆGA Leach.

ÆGA SYMMETRICA Richardson.

Æga symmetrica RICHARDSON, Bull. U. S. Bureau of Fisheries, vol. 24, 1905, pp. 211–212; Bull. U. S. Nat. Mus., No. 54, 1905, pp. 185–187.

Localities.—Station 4771, on "Bowers Bank," Bering Sea, at lat. 54° 30′ N.; long. 179° 17′ E., and station 4772, at lat. 54° 30′ 30″ N.;

[a] Vidensk. Selsk. Skr. 6te Række, naturvidenskabelig og mathematisk Afd., vol. 5, pt. 3, 1890, pp. 393–395, pl. 8, figs. 2–2n.

long. 179° 14′ E.; station 4781, on the way from "Petrel Bank," Bering Sea, to McDonald Bay, Agattu Island, Aleutians, by the passage east of Semisopochnoi and Amchitka Islands, at lat. 52° 14′ 30″ N.; long. 174° 13′ E.

Depth.—Three hundred and forty-four to four hundred and eighty-two fathoms in fine gray sand and pebbles, in green and brown sand, and in broken shells.

ÆGA MAGNOCULIS, new species.

Body ovate, about twice as long as wide (11 mm. :21 mm.). Surface smooth. Color, in alcohol, yellow.

Head wider than long, 2½ mm. long by 5½ mm. wide. Front produced in a small median point, separating the basal articles of the first antennæ. Eyes large, oval, occupying almost the entire surface of the head, and separated from each other by a distance equal to half a millimeter. The first pair of antennæ have the two basal articles not dilated, and subequal; the third is narrow, elongate, and equal in length to the first two articles taken together; the flagellum is composed of eighteen articles. The first antennæ extend to the posterior margin of the first thoracic segment. The second antennæ, with a flagellum of twenty-one articles, extend to the posterior margin of the third thoracic segment. The frontal lamina is conical, with the distal end flat and ovate, the proximal end produced to a point.

FIG. 7.—ÆGA MAGNOCULIS. HEAD AND FIRST TWO SEGMENTS OF THORAX. × 3½.

The segments of the thorax are subequal, the last one being slightly shorter than the others. The epimera are large, subquadrate, with the outer post-lateral angle acute and produced posteriorly in the last three segments beyond the posterior margin of the segments.

The first segment of the abdomen is almost entirely covered by the seventh thoracic segment, especially in the middle dorsal region; the following three segments are subequal; the fifth segment is slightly longer in the middle dorsal region; the sixth or terminal segment is rounded, with the apex produced in a small point, on either side of which the posterior margin is serrulate. The uropoda extend a little beyond the terminal abdominal segment; the inner branch is slightly longer than the outer branch, is also wider and has the posterior margin obliquely truncate, with the outer angle produced acutely; the outer branch is ovate with the posterior extremity acute. Both branches have the margins serrulate.

The first three pairs of legs are prehensile. There is one small spine at the distal extremity of the propodus, and one larger spine on the carpus. A few small spines are also on the merus. The last

four pairs of legs are ambulatory and are furnished with a few spines and hairs.

Nine specimens of this species come from the following localities: Station 4772, on "Bowers Bank," Bering Sea, at lat. 54° 30′ 30″ N.; long. 179° 14′ E., and station 4771, at lat. 50° 30′ N.; long. 179° 17′ E.; station 4781, on the way from "Petrel Bank," Bering Sea, to McDonald Bay, Agattu Island, Aleutians, by the passage east of Semisopochnoi and Amchitka Islands, at lat. 52° 14′ 30″ N.; long. 174° 13′ E., at a depth of 344–482 fathoms in broken shells, brownish-green sand, and fine gray sand and pebbles.

This species is very close to *Æga symmetrica* Richardson, but differs in the much larger and oval eyes, which are also closer together, in the greater number of articles in the flagellum of both pairs of antennæ, and the longer second antennæ, and in the lesser number of spines on the prehensile legs.

Type-specimen.—Cat. No. 39499, U.S.N.M.

FIG. 8.—ÆGA SYNOPTHALMA. HEAD AND FIRST TWO SEGMENTS OF THORAX. × 3½.

One specimen from station 4906, 10–20 miles southwest of Koshika Islands, Eastern Sea, at Tsurikake Saki Light, S. 85° E., 17.2 miles (lat. 31° 39′ N.; long. 129° 20′ 30″ E.), taken at a depth of 369 fathoms, I have doubtfully referred to this species. It differs from the other specimens in the less oval eyes, in the shorter second antennæ, which extend to the posterior margin of the second thoracic segment, and in the narrower and longer body, being 8½ mm. :20 mm. In color it is reddish brown.

ÆGA SYNOPTHALMA, new species.

This species is very similar to the preceding, but differs in having the eyes confluent and not separated from each other; in having the first antennæ, with a flagellum of only 12 articles, extending to the middle of the first thoracic segment; in having the second antennæ, with a flagellum of 16 articles, extending to the middle of the third thoracic segment; in having the outer post-lateral angles of the first three epimera rounded and not acute; and in having the distal end of the frontal lamina rounded and not flat, and more circular in outline instead of oval.

Only one specimen comes from station 5091, in Uraga Strait (entrance Gulf of Tokyo), at Joga Shima Light; N. 15° W., 4.2 miles (lat. 35° 04′ 10″ N.; long. 139° 38′ 12″ E.), at a depth of 197 fathoms in green mud and coarse, black sand and pebbles.

Type-specimen.—Cat. No. 39500, U.S.N.M.

Genus ROCINELA Leach.

ROCINELA CORNUTA Richardson.

Rocinela cornuta Richardson, Proc. Amer. Philos. Soc., vol. 37, 1898, p. 12, figs. 1–2; Proc. U. S. Nat. Mus., vol. 21, 1899, p. 827; Ann. Mag. Nat. Hist. (7), vol. 4, 1899, p. 169; American Naturalist, vol. 34, 1900, p. 219; Bull. U. S. Nat. Mus., No. 54, 1905, pp. 192–193.

Locality.—Station 4772, on "Bowers Bank," Bering Sea, lat. 54° 30′ 30″ N.; long. 179° 14′ E.

Depth.—Three hundred and forty-four fathoms in green and brown sand. Only one specimen found. This is the only one, besides the type-specimen, which has been taken.

ROCINELA BELLICEPS (Stimpson).

Æga belliceps Stimpson, Proc. Acad. Nat. Sci., Phila., vol. 16, 1864, p. 155.
Æga alascensis Lockington, Proc. Cal. Acad. Sci., vol. 7, 1877, pt. 1, p. 46.
Rocinela alascensis Richardson, Proc. Amer. Philos. Soc., vol. 37, 1898, p. 11.
Rocinela belliceps Richardson, Proc. U. S. Nat. Mus., vol. 21, 1899, p. 827; Ann. Mag. Nat. Hist. (7), vol. 4, 1899, p. 169; American Naturalist, vol. 34, 1900, p. 219; Harriman Alaska Expedition, Crust., vol. 10, 1904, p. 214; Proc. U. S. Nat. Mus., vol. 27, 1904, p. 659; Bull. U. S. Bureau of Fisheries, vol. 24, 1905, p. 213; Bull. U. S. Nat. Mus., No. 54, 1905, pp. 199–201.

Localities.—Unalaska: Nazan Bay, Atka; station 4782, on the way from Agattu Island to Chichagof Harbor, Attu Island, by the Semichi Islands, Aleutians, at East Cape, Attu Island, S. 22° W., 4 miles (lat. 52° 55′ N.; long. 173° 27′ E.); station 4784, on the way from Chichagof Harbor, Attu Island, around eastern end and south of Attu Island to Preobrajeniya Bay, Medni Island, Komandorski Islands, at East Cape, Attu Island, S. 18° W., 4 miles (lat. 52° 55′ 40″ N.; long. 173° 26′ E.); station 4803, on the way from Milne Bay, Simushir Island, Kuril Islands, to Hakodate, Hokkaido, Japan, by the Boussole Strait, at Cape Rollin, Simushir Island, N. 59° W., 9 miles (lat. 46° 42′ N.; long. 151° 45′ E.) and station 4804, N. 58° W., 9.7 miles (lat. 46° 42′ N.; long. 151° 47′ E.); station 4812, on the way from Hakodate, Japan, to Ebisu, Sado Island, Sea of Japan (by the Tsugaru Strait), at north point Sado Island, S. 31° W., 15 miles (lat. 38° 33′ N.; long. 138° 40′ E.); station 4860, on the way from Matsu Shima, Sea of Japan, to Nagasaki, Japan, at C. Clonard, S. 23° W., 13 miles (lat. 36° 18′ N.; long. 129° 44′ E.); station 4779, on "Petrel Bank," Bering Sea, at Semisopochnoi Island, r. t. S. 59½° W., l. t. S. 37° W. (lat. 52° 11′ N.; long. 179° 57′ W.).

Depth.—Shore; 54–229 fathoms in green mud, fine brown mud, black sand, coarse pebbles, rocks, gravel, broken shells.

Remarks.—There are four spines on the propodus of the prehensile legs in these specimens.

ROCINELA ANGUSTATA Richardson.

Rocinela laticauda RICHARDSON (not HANSEN), Proc. Amer. Philos. Soc., vol. 37, 1898, pp. 14–15, figs. 5–6; Proc. U. S. Nat. Mus., vol. 21, 1899, p. 828 (part).
Rocinela angustata RICHARDSON, Proc. U. S. Nat. Mus., vol. 27, 1904, p. 33; Bull. U. S. Bureau of Fisheries, vol. 24, 1905, p. 214; Bull. U. S. Nat. Mus., No. 54, 1905, pp. 206–207.

Locality.—Station 5036, south coast of Hokkaido at Urakawa light, N. 44½° E., 16.8 miles (lat. 41° 58′ N.; long. 142° 30′ 30″ E.); station 5045, at lat. 42° 11′ 10″ N.; long. 142° 12′ E.

Depth.—359–464 fathoms in brown mud, fine black sand and in coral and sand.

ROCINELA MACULATA Schiœdte and Meinert.

Rocinela maculata SCHIŒDTE and MEINERT, Naturhistorisk Tidsskrift (3), vol. 12, 1879–80, p. 393, pl. 12, figs. 10–12; vol. 14, 1883–84, p. 413, pl. 18, fig. 13.—BOVALLIUS, Bihang till Kgl. Sv. Vet. Akad. Handling., vol. 10, No. 11, 1885, p. 10, pl. 2, figs. 18–23.—HANSEN, Vidensk. Meddel. naturh. Foren. i. Kjøbh., 1887, p. 187.—RICHARDSON, Bull. U. S. Nat. Mus., No. 54, 1905, pp. 198–199.

Locality.—Station 4807, on the way from Hakodate, Japan, to Ebisu, Sado Island, Sea of Japan (by the Tsugaru Strait) at Cape Tsiuka, S. 58° W., 10.3 miles (lat. 41° 36′ 12″ N.; long. 140° 36′ E.).

Depth.—Forty-four fathoms, in shells and coarse gravel. This species has been recorded from West Greenland, Vladivostok, Kamtchatka, and east Asia.

FIG. 9.—ROCINELA NIPONIA. HEAD AND FIRST TWO SEGMENTS OF THORAX. × 3½.

The specimen taken by the Bureau of Fisheries steamer *Albatross* has a black spot on the fourth and fifth segments of the abdomen on either side as well as on the last segment at the base. The spines on the propodus are not as long as mentioned in the description of the type by Schiœdte and Meinert.

ROCINELA NIPONIA, new species.

Body ovate, a little more than twice as long as wide (8½ mm.: 18 mm.).

Head triangular in shape, 2 mm. long and 3 mm. wide, with the front produced in a broad median triangular process. Eyes large, composite, and separated in front by a distance equal to the length of one eye. The first pair of antennæ extend to the posterior margin of the head and almost to the end of the peduncle of the second antennæ; the flagellum is composed of six articles, the first one of which is twice as long as the second and the two terminal ones minute. The

second antennæ extend to the posterior margin of the second thoracic segment; the flagellum is composed of sixteen articles.

The first, second, and seventh segments of the thorax are about equal in length; the third, fourth, fifth, and sixth are slightly longer. The epimera of the second and third segments are posteriorly rounded; those of the four following segments are posteriorly acute, and in the last three segments are produced beyond the posterior margins of the segments.

The first segment of the abdomen is covered in the middle by the last thoracic segment, but is visible at the sides; the three following segments are subequal; the fifth segment is narrower than any of the preceding segments, but is longer in the middle portion of the dorsal surface. The sixth or terminal segment is posteriorly triangulate, with the margin furnished with short spines and hairs.

FIG. 10.—ROCINELA NIPONIA. THIRD LEG. × 14½.

The uropoda do not extend beyond the extremity of the abdomen; the outer branch is slightly shorter and slightly narrower than the inner branch; they are both armed with spines and furnished with hairs. The posterior extremity of the inner branch is more rounded than the outer branch.

The propodus of the first pair of prehensile legs is produced in a palmar process furnished with a marginal row of ten curved spines; the two following pairs of legs have eight spines on the propodus; the carpus is furnished with one long spine; the merus is furnished with five long spines, the most anterior one being very long, almost twice as long as the others. The last four pairs of legs are also furnished with numerous spines.

Only one specimen, a female, was collected at station 4815, on the way from Hakodate, Japan, to Ebisu, Sado Island, Sea of Japan, at Niigata Light, S. 25° E., 21.5 miles (lat. 38° 16′ N.; long. 138° 52′ E.), at a depth of 70 fathoms, in dark green sand.

This species is very close to *Rocinela propodialis* Richardson, but differs in having 10 spines on the palmar process of the propodus of the first pair of legs and 8 on the next two instead of 6 teeth; in having five long, sharp spines on the merus instead of five low, blunt ones; in having the posterior margin of the abdomen triangulate instead of rounded; and in having the last three epimera produced beyond the posterior margins of the segments instead of only the last.

Type-specimen.—Cat. No. 39501, U.S.N.M.

Genus SYSCENUS Harger.

SYSCENUS INFELIX Harger.

Syscenus infelix HARGER, Report U. S. Commissioner of Fish and Fisheries for 1878, pt. 6, 1880, pp. 387–390; Bull. Mus. Comp. Zool. Harvard College, vol. 11, 1883, No. 4, pp. 100–102, pl. 3, figs. 5–5a; pl. 4, figs. 3–3h.—RICHARDSON, Proc. Amer. Philos. Soc., vol. 37, 1898, p. 8 (footnote); Amer. Naturalist, vol. 34, 1900, p. 219; Proc. U. S. Nat. Mus., vol. 23, 1901, p. 524.—NORMAN, Ann. Mag. Nat. Hist. (7), vol. 14, 1904, p. 437.—RICHARDSON, Bull. U. S. Nat. Mus., No. 54, 1905, pp. 212–214.

Harponyx pranzoides SARS, Forhandlungen i Videnskab Selsk. Christiania, No. 18, 1883, p. 60 (young).

Rocinela lilljeborgii BOVALLIUS, Bihang. till Vetensk. Akad. Handl., vol. 10, No. 10, 1885, pp. 3–10, pls. 1–11.

Syscenus lilljeborgii BOVALLIUS, Bihang. till K. Sv. Vet. Akad. Handl., vol. 11. No. 17, 1886–87, pp. 17–18.

Locality.—Station 5066, at Ose Saki, S. 52° E., 7.3 miles (lat. 35° 06′ 05″ N.; long. 138° 40′ 20″ E.).

Depth.—Two hundred and eleven to two hundred and ninety-three fathoms, in fine black sand.

Remarks.—Only one imperfect specimen was collected.

SYSCENUS LATUS, new species.

Body 41 mm. long and 20 mm. wide at its greatest width. Thorax broad, ovate; abdomen abruptly narrower than thorax, only 8 mm. wide at the base, and becoming gradually a little narrower from the anterior to the posterior extremity. Surface of body smooth. Color, in alcohol, yellow.

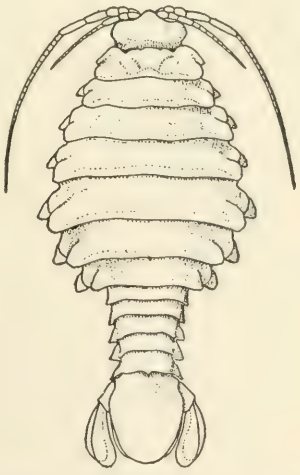

FIG. 11.—SYSCENUS LATUS. × 1.3. (Drawn by Miss V. Dandridge.)

Head nearly twice as wide as long, 4 mm. : 7 mm. Front of head triangularly produced in the middle. Eyes entirely wanting, but ocular swellings are present, showing the position of the eyes. Ocular swellings large and occupying the entire lateral margin. The first pair of antennæ have the first two articles about equal in length; the third is twice as long as the second; the flagellum is composed of thirteen articles and extends three articles beyond the peduncle of the second antennæ. The second pair of antennæ have the first two articles short and subequal; the third is a little longer than either the first or second; the fourth and fifth are long and subequal, each being about as

long as the first three taken together; the flagellum is composed of twenty-eight or twenty-nine articles. The second antennæ, when retracted, extend to the middle of the sixth thoracic segment. The frontal lamina is large, triangular in front, wedge-shaped, with the post-lateral angles produced and widely separating the basal articles of the second pair of antennæ. First, fifth, and sixth segments longest, and subequal, each being 4 mm. in length. Second, third, and seventh segments 3 mm. each in length; fourth segment 3½ mm. long. The segments increase gradually in width to the fifth, which is the widest; the sixth and seventh decrease in width gradually, the seventh being 12½ mm. wide. Epimera are distinctly separated on all the segments with the exception of the first; they are broad plates, with the posterior extremities rounded.

The abdomen is abruptly narrower than the thorax, the basal segment being only 8 mm. wide. All six segments are distinct; the first is 1½ mm. long; the four following segments are 2 mm. in length. The post-lateral angles are acute and in the fifth segment are somewhat produced. The fifth segment also has the posterior margin produced backward in a sharp, median point, about 1 mm. long. The sixth or terminal segment is 7½ mm. wide and 10 mm. long; it is widely rounded posteriorly. The uropoda are about as long as the terminal segment; the inner branch is a little longer and a little wider than the outer branch; they are similar in shape and widely rounded posteriorly.

The first three pairs of legs are prehensile, the last four pairs ambulatory. The last four pairs gradually increase in length, the two last pairs being extremely long. The legs are all free from spines.

One large specimen, a female, comes from station 4907, 10–20 miles southwest of Koshika Islands, Eastern Sea, at Tsurikake Saki Light, S. 83° E., 14.7 miles (lat. 31° 39′ 30″ N.; long. 129° 24′ E.). Another small specimen, a young female, comes from station 4906, Tsurikake Saki Light, S. 85° E., 17.2 miles (lat. 31° 39′ N.; long. 129° 20′ 30″ E.). They were taken at a depth of 406 fathoms in gray globigerina ooze.

This species differs from *Syscenus infelix* Harger in the much broader and more ovate thorax, in the narrower abdomen, the longer antennæ and antennulæ, in the differently shaped head, terminal segment, and uropods, the broader frontal lamina, and the longer legs. The fifth abdominal segment also has a median point on the posterior margin produced backward, not found in *S. infelix*.

Type-specimen.—Cat. No. 39502, U.S.N.M.

Family CYMOTHOIDÆ.

Genus MEINERTIA Stebbing.

MEINERTIA TRIGONOCEPHALA (Leach).

Cymothoa trigonocephala Leach, Dict. Sci. Nat., vol. 12, 1818, p. 353.—Milne Edwards, Hist. Nat. Crust., vol. 3, p. 272.—De Haan, Faun. Japon., vol. 50, 1850, p. 227, fig. 7a–b.

Ceratothoa trigonocephala Schiœdte and Meinert, Naturhist. Tidsskrift, (3), vol. 13, 1883, pp. 358–364, pl. 16, figs. 1–7.

Meinertia trigonocephala Stebbing, Hist. Crust., 1893, p. 354.—Richardson, Proc. U. S. Nat. Mus., vol. 27, 1904, p. 46.

Locality.—Tanegashima, Japan.

Genus LIVONECA Leach.

LIVONECA PROPINQUA Richardson.

Livoneca propinqua Richardson, Proc. U. S. Nat. Mus., vol. 27, 1904, pp. 37–38.

Localities.—Station 5060, at Ose Saki, S. 53° E., 7.3 miles (lat. 35° 06′ N.; long. 138° 40′ 10″ E.); station 4967, going from Kobe, Japan, to Yokohama, Japan, at Shio Misaki Light, N. 83° E., 6.5 miles (lat. 33° 25′ 10″ N.; long. 135° 37′ 20″ E.).

Depth.—One hundred and ninety-seven fathoms in coarse black sand; 244 fathoms in brown mud, sand, and foraminifera.

Host.—Mouth cavity of chalinura.

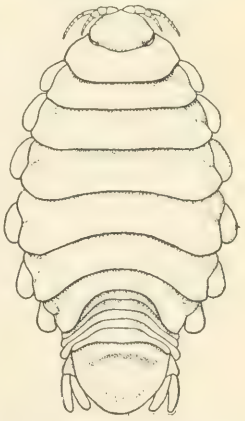

Fig. 12.—Livoneca sacciger. × 1.5. (Drawn by Miss V. Dandridge.)

LIVONECA SACCIGER, new species.

Body of adult female, ovate, 20 mm. wide and 34 mm. long. Surface smooth. Color, in alcohol, pale yellow.

Head almost as long as wide, 4 mm.: 5½ mm. Anterior margin rounded and produced in a small median point. Posterior margin rounded. Eyes almost entirely absent, with only a slight trace of them. First pair of antennæ, composed of eight articles, extend to the antero-lateral angle of the first thoracic segment. Second pair of antennæ, composed of twelve articles, extend to the middle of the first thoracic segment.

The first thoracic segment is 3 mm. long, the second 2¾ mm., the third 3½ mm., the fourth and fifth each 3¾ mm., the sixth 3½ mm., the seventh 2 mm.

The first segment has the antero-lateral angles acutely produced. Epimera are present on all the segments, with the exception of the first, in the form of elongated plates, extending the entire length of

the segment, gradually becoming wider from the first to the last, and all with the posterior extremity rounded, sac-like.

The abdomen is immersed in the seventh thoracic segment. The first four segments are about equal in length, each being about 1 mm. long; the fifth segment is a little longer, being 1½ mm. in length. The sixth or terminal segment is a little wider than long, 7 mm. : 8½ mm. It is posteriorly rounded. The uropods are equal in length, the inner one being a little wider and both rounded posteriorly. They do not reach the extremity of the terminal segment. The outer branch is 1 mm. wide and a little over 3 mm. long.

All the legs are prehensile; the basis of the last four pairs is furnished with a very low carina.

Only one adult female comes from station 4957, having been collected on the way from Kagoshima, Kagoshima Gulf, Japan, to Kobe, Japan, by way of Bungo Channel and Inland Sea at Mizimoko Shima Light N. 22° W., 29 miles (lat. 32° 36′ N.; long. 132° 23′ E.), at a depth of 437 fathoms, in greenish-brown mud, fine gray sand, and foraminifera.

Three young females and two males were collected at station 5044, on the south coast of Hokkaido, at lat. 42° 10′ 40″ N., long. 142° 14′ E. (approximate position), at a depth of 309 fathoms. They are from the mouth cavity of *Synaphobranchus*.

The males differ from the females in the presence of eyes, the longer antennæ of the first and second pairs, the first extending to the middle of the first thoracic segment, the second to the posterior margin of the first thoracic segment, and in the narrower and smaller body. The second antennæ in the young female are also a little longer than in the adult.

Type-specimen.—Cat. No. 39503, U.S.N.M.

LIVONECA EPIMERIAS, new species.

Body of adult female, elongate-ovate, almost twice as long as wide (15 mm.: 29 mm.). Surface smooth. Color, in alcohol, dark yellow.

Head almost as long as wide (3 mm. : 4 mm.). Anterior margin widely rounded. Eyes small, distinct, and placed in the lateral angles. Posterior margin of head also rounded. First pair of antennæ, composed of eight articles, extend to the antero-lateral angles of the first thoracic segment. Second pair of antennæ, composed of seven articles on one side and eight on the other, extend one-third of the lateral margin of the first thoracic segment.

The first segment of the thorax is 3½ mm. long, the second 2½ mm. long, the third 2¾ mm., the fourth 3 mm., the fifth and sixth each 2¾ mm., the seventh 2 mm. All the segments are furnished with distinct epimera with the exception of the first. They are in the form of narrow plates, except the last, which are very broad. All, except

those of the fourth and fifth segments, extend to the posterior margin of the segment. The posterior extremities are rounded.

The abdomen is deeply immersed in the seventh thoracic segment. The first four segments are about equal in length, each being 1 mm. long. The fifth segment is 1½ mm. long. The sixth, or terminal, segment is wider than long, being 10 mm.: 6½ mm. It is posteriorly rounded. The outer branch of the uropoda is a little wider and a little longer than the inner branch. The outer is oval in shape, the inner more tapering. They are shorter than the abdomen, and do not reach its extremity. The outer branch is 1 mm. wide and 2½ mm. long.

All the legs are prehensile; the last four are furnished with a rather high carina.

Two specimens, both females, were collected at Hakodate, Japan. The second specimen has twelve articles to the second pair of antennæ, but is otherwise similar to the first.

The species is very close to *Livoneca propinqua* Richardson,[a] but differs in its larger size, in the shape of the head, the larger seventh epimera, the longer abdomen, and the differently shaped carina on the last four pairs of legs.

It is also similar to *Livoneca raynaudii* Milne Edwards,[b] but differs in the shape of the head and the epimera.

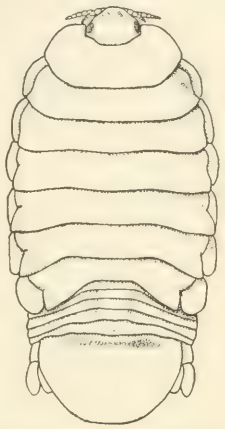

FIG. 13.—LIVONECA EPIMERIAS. × 1.86. (Drawn by Miss V. Dandridge.)

This species differs from *Livoneca caudata* Schiœdte and Mienert[c] in the more rounded head, in the larger and more conspicuous epimera of the seventh segment, in the narrower abdomen as compared with the width of the thorax, in having the outer branch of the uropoda slightly longer instead of shorter than the inner branch, and in having a rather high carina on the basis of the last four pairs of legs.

Type-specimen.—Cat. No. 39504, U.S.N.M.

Family SPHÆROMIDÆ.

Genus TECTICEPS Richardson.

TECTICEPS RENOCULIS, new species.

Body oblong-ovate, very broad, 20½ mm. in length and 13 mm. in width. Surface minutely granulate. Color pink, with the lateral margins becoming white.

[a] Proc. U. S. Nat. Museum, vol. 27, 1904, pp. 37–38.

[b] Hist. Nat. Crust., vol. 3, p. 262.—Schiœdte and Meinert, (3), vol. 14, 1883–84, pp. 367–372, pl. 15, figs. 9–10.

[c] Naturhistorisk Tidsskrift, (3), vol. 14, 1883–84, pp. 360–362, pl. 15, figs. 1–2.

Head wider than long, 7 mm.: 4 mm., wider anteriorly than posteriorly, with the eyes, which are large, composite and kidney shaped, situated in the posterior half, at the post-lateral angles. Front of head roundly produced. In a dorsal view both pairs of antennæ are entirely concealed. The first pair have the basal article large and dilated; the second article is about half as large as the first; the third is slender and elongate; the flagellum is composed of about 11 articles and extends to the posterior margin of the first thoracic segment. The second antennæ, with a flagellum of 11 articles, extend to the posterior margin of the third thoracic segment.

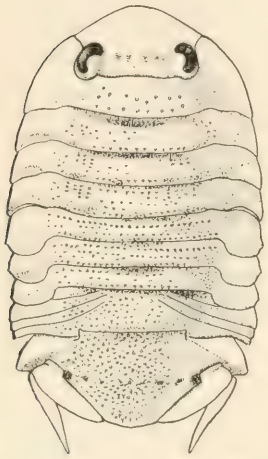

FIG. 14.—TECTICEPS RENOCULIS. × 2.6. (Drawn by Miss V. Dandridge.)

The first segment of the thorax has the antero-lateral angles produced so as to surround the posterior half of the head. All the segments are about equal in length. The epimera are not distinctly separated from the segments; they are produced posteriorly in a quadrilateral process, with rounded angles.

The abdomen consists of two segments, the first of which has three suture lines, indicating partly coalesced segments. The second, or terminal, segment is about twice as broad as long, 5½ mm.: 11 mm. The posterior extremity is roundly truncate. A carina crosses the basal portion of the segment on either side. The inner branch of the uropoda is fixed, immovable, and does not extend beyond the posterior margin of the terminal abdominal segment. The outer, movable branch is much narrower than the inner branch, is a little longer, and is produced to a pointed extremity. In the female the outer branch is equal in length to the inner branch.

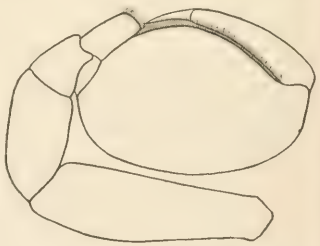

FIG. 15.—TECTICEPS RENOCULIS. FIRST LEG OF MALE. × 14½.

The first two pairs of legs in the male are subchelate. In the first pair the propodus is large and oval in shape, and is armed on the inferior margin with stiff bristles and hairs. In the second pair of legs the propodus is long and narrow, and has a rudimentary pollex at the base. The following five pairs of legs are ambulatory and increase gradually in length. In the female only the first pair of legs are subchelate and are similar to those of the male.

Twenty-three specimens, both males and females, were collected by the U. S. Bureau of Fisheries steamer *Albatross* at stations 5023 and 5024, off eastern coast, Saghalin Island, vicinity of Cape Patience, in Okhotsk Sea, at Flat Hill, N. 53° W., Cape Patience, S. 77° W. (lat. 48° 43′ 30″ N.; long. 145° 3′ E.), and N. 48° W.; Cape Patience, S. 74° W. (lat. 48° 43′ 10″ N.; long. 144° 53′ 30″ E.).

This species differs from *T. alascensis* Richardson [a] in the shape of the terminal segment of the abdomen, which is truncate and not acutely triangular, in the shorter outer branch of the uropoda, in the broader body, and in the tuberculate character of the surface of the body. It differs from *T. convexus* Richardson [b] in the position of the eyes, which are placed in the posterior half of the head, and not in the middle as in *T. convexus*, in the shorter antennæ, in the differently shaped abdomen, the broader body and the tuberculate character of the surface of the body. It differs from both species in the shape of the eyes, which are semi-lunate or kidney-shaped.

Type-specimen.—Cat. No. 39505, U.S.N.M.

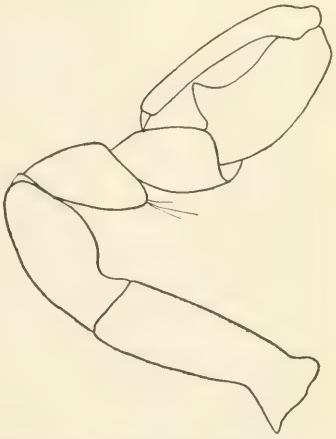

FIG. 16.—TECTICEPS RENOCULIS. SECOND LEG OF MALE. × 14½.

Genus SPHÆROMA Latreille.

SPHÆROMA SIEBOLDI Dollfus.

Sphæroma sieboldi DOLLFUS, Notes from the Leyden Museum, vol. 11, pp. 93–94, pl. 5, fig. 3a-3b.

Locality.—Hakodate, Japan.

Depth.—Surface.

The type species came from Japan. The specimen, collected by the Bureau of Fisheries steamer *Albatross*, differs from the type as described by Dollfus in the longer first pair of antennæ, which have a flagellum of eleven articles instead of eight, and the longer second pair of antennæ, which have a flagellum of fifteen articles instead of ten. The tubercles on the abdomen form two longitudinal parallel rows, one on either side of the median line, not divergent rows. The other tubercles on the abdomen do not appear to be arranged in rows. The tubercles on the anterior part of the body are very small, hardly perceptible, and not numerous.

Hansen [c] does not mention this species in his list of those belonging to the genus *Sphæroma*, but it belongs without question to this genus.

[a] Bull. U. S. Nat. Museum, No. 54, 1905, pp. 276–278.

[b] Idem, pp. 278–280.

[c] Quart. Journ. Microscopical Science, vol. 49, 1906, pp. 115–117.

Genus EXOSPHÆROMA Stebbing.

EXOSPHÆROMA OREGONENSIS (Dana).

Exosphæroma oregonensis DANA, Proc. Acad. Nat. Sci. Phila., vol. 7, 1854–55, p. 177; U. S. Expl. Exp. Crust., vol. 14, 1853, p. 778, pl. 52, fig. 4.—STIMPSON, Bost. Journ. Nat. Hist., vol. 6, 1857, p. 509.—RICHARDSON, Bull. U. S. Nat. Museum No. 54, 1905, pp. 296–298.

Sphæroma olivacea LOCKINGTON, Proc. Cal. Acad. Sci., vol. 7, 1877, pt. 1, p. 45.

Sphæroma oregonensis RICHARDSON, Proc. U. S. Nat. Mus., vol. 21, 1899, p. 836; Ann. Mag. Nat. Hist. (7), vol. 4, 1899, p. 180; American Naturalist, vol. 34, 1900, p. 223; Harriman Alaska Exp. Crust., vol. 10, 1904, p. 214; Proc. U. S. Nat. Mus., vol. 27, 1904, p. 659.

Localities.—Nazan Bay, Atka; Unalaska; Attu.

Depth.—Shore.

Genus CYMODOCE Leach.

CYMODOCE JAPONICA Richardson.

Cymodoce japonica RICHARDSON, Proc. U. S. Nat. Mus., vol. 31, 1906, pp. 7–8 (male).

Cymodoce affinis RICHARDSON, Proc. U. S. Nat. Mus., vol. 31, 1906, pp. 11–12 (female).

Localities.—Hakodate Bay, Japan; Otaru, Hokkaido; Nanao; Mororan, Japan; station 4879, at Oki Shimi, S. 70° W., 7.5 miles (lat. 34° 17′ N.; long. 130° 15′ E.) and station 4877, S. 37° W., 6.3 miles (lat. 34° 20′ 30″ N.; long. 130° 11′ E.); station 4849, on the way from Saigo, Dogo Island, Oki Group, to Matsu Shima, Sea of Japan (off coast of Korea) at lat. 36° 46′ N.; long. 132° 15′ E.

Depth.—Collected around surface light; shore; 59 fathoms in fine gray sand, broken shells; 846 fathoms, in green mud and globigerina.

Remarks.—*Cymodoce affinis* is probably the female of *Cymodoce japonica*, and I therefore unite these two species. A large number of specimens of both sexes were collected in the same locality, which has convinced me that the two species heretofore recognized are the same.

Cymodoce acuta Richardson[a] is the female of an unknown male, which is probably quite similar to *Cymodoce japonica*. The female of *Cymodoce acuta* is very much like the female of *Cymodoce japonica*.

One specimen, a male, which I have doubtfully referred to this species, was collected at station 4876 in eastern channel of Korea Strait, vicinity of Oki Shima, at S. 29° W., 5.3 miles (lat. 34° 20′ N.; long. 130° 10′ E.), at a depth of 59 fathoms, in fine gray sand and broken shells. It differs from the type in having longer uropoda and in having the body covered with thick hairs. It is a small specimen and probably younger than the others in the collection.

[a] Proc. U. S. Nat. Mus., vol. 27, 1904, pp. 38–39.

HOLOTELSON, new genus.

Head of normal size. Basal article of first pair of antennæ with the distal posterior angle not produced in an acute process.

Seventh thoracic segment in male produced backward in two small processes, one on either side of the median line. These processes are much smaller in the female, but are indicated.

First segment of abdomen produced in the median line on the posterior margin in a small tubercle, represented in both sexes.

Terminal segment of abdomen, with the posterior margin produced backward in one long median process, at the base of which on either side is a small rounded process. The median process is shorter in the female, and the lateral processes are also reduced.

The branches of the uropoda are similar in size in the male, the exopod of the female being somewhat smaller than the endopod.

The second pleopod of the male is furnished with a stylet.

The exopod of the third pleopod is jointed near the extremity.

Both branches of the fourth and fifth pairs of pleopods are fleshy, with transverse folds, and are without marginal setæ. The exopod of the fifth pleopod is jointed.

This genus belongs in the section *eubranchiatæ* of Hansen, but differs from the other genera in that section in not having the terminal segment of the abdomen emarginate.

The type of the genus is *Holotelson tuberculatus*, the description of which follows:

HOLOTELSON TUBERCULATUS, new species.

FIG. 17.—HOLOTELSON TUBERCULATUS. FIRST ANTENNA OF FEMALE. × 15⅓.

Body oblong-ovate, about twice as long as wide, 5½ mm.: 11 mm.

Head wider than long, rounded in front, and with a small median point. Eyes round, composite, and placed at the post-lateral angles. The first pair of antennæ have the basal article large and dilated, about twice as long as wide; the second article is short, about as wide as long, and nearly as wide as the basal article; the third article is narrow and elongate, being only half as wide as the second article and twice as long; the flagellum is composed of fourteen articles and extends to the middle of the first thoracic segment. The second antennæ have a flagellum of fifteen articles and extend to the middle of the second thoracic segment.

The first segment of the thorax is about one and a half times longer than any of the following five segments which are of nearly equal length. The lateral parts of these segments are short and broad and produced at the post-lateral angles in rounded triangular processes.

The seventh segment is a little longer in the middle portion than any of the five preceding segments and is produced backward in two short rounded processes, one on either side of the median line, which extend over the first abdominal segment, covering its anterior portion.

FIG. 18.—HOLOTELSON TUBERCULATUS. ABDOMEN OF MALE. × 3½.

The first segment of the abdomen is longer in the middle portion than at the sides, and is produced in the median line in a triangular process which ends in a small tubercle. There are two suture lines on either side, indicating partly coalesced segments. The terminal segment has a transverse row of three tubercles about the middle of the segment, one in the median line and one on either side. Posteriorly it is produced in a long median process, about twice as long as wide and rounded at the extremity. At the base of this process on either side is a small, rounded tooth. The branches of the uropoda are about equal in size and similar in shape; they are oar-like and do not extend beyond the lateral teeth at the base of the median process.

FIG. 19.—HOLOTELSON TUBERCULATUS. ABDOMEN OF FEMALE. × 3½.

The female differs from the male in the shorter terminal abdominal process, in the less pronounced teeth at the base of this process, in the shorter processes on the posterior margin of the seventh abdominal segment, which are only slightly indicated, and in not having the first abdominal segment triangularly produced in the middle and terminating in a tubercle.

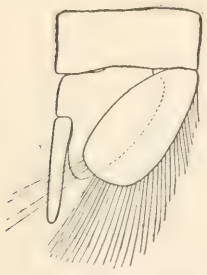

FIG. 20. HOLOTELSON TUBERCULATUS. SECOND PLEOPOD OF MALE. × 15⅓.

Five specimens, two females and three males, were collected by the U. S. Bureau of Fisheries steamer *Albatross* at Mororan, Japan, on the shore.

The female of this species is similar to *Sphæroma aspera* Haswell[a] from Port Jackson, Australia, but differs in having three tubercles in a transverse line about the middle of the terminal segment, in lacking the "prominent tubercle on the posterior margin on either side of the middle line" of the first segment of the abdomen, and in not having the last abdominal segment "ornamented with two slightly convergent irregular rows of minute tubercles."

Type-specimen.—Cat. No. 39506, U.S.N.M.

[a] Proc. Linn. Soc. New South Wales, vol. 5, 1881, p. 472, pl. 16, fig. 3. The species described by Haswell is probably a *Cymodoce*, the specimen obtained being the female.

Family LIMNORIIDÆ.

Genus LIMNORIA Leach.

LIMNORIA JAPONICA, new species.

Body oblong-ovate, 2 mm. : 5 mm. Color of body, in alcohol, yellow, with the fifth, sixth and seventh segments of the thorax reddish brown.

Head three times wider than long ($\frac{1}{2}$ mm. : $1\frac{1}{2}$ mm.). Front with a rounded excavation. Eyes large, round, composite, and situated close to the lateral margin. The head is very bulbous, and from the anterior margin projects upward to form a large rounded prominence. The first pair of antennæ are composed of four articles; the first two are subequal; the third is a little longer than either of the preceding; the fourth is minute and terminates in a bunch of long hairs. The second antennæ have a peduncle of five articles, the first two of which are short, the last three longer and subequal; the flagellum is composed of about five articles, and is furnished with a few hairs.

The first segment of the thorax is twice as long as the head or any of the six following segments, which are subequal. Epimera are distinctly separated on all the segments with the exception of the first and are in the form of wide plates, gradually becoming wider from the first to the last.

FIG. 21.—LIMNORIA JAPONICA. ABDOMEN. × 15½.

The first four segments of the abdomen are subequal in length, and each is a little shorter than any of the preceding six thoracic segments. The fifth segment is twice as long as any of the four preceding segments and has two low median tubercles in longitudinal series. The sixth or terminal segment is large, almost circular in outline, and concave on the dorsal surface. It has a large prominent tubercle in the median line near the base, and two prominent tubercles, close together, one on either side of the median line, about one-third the distance between the anterior and the posterior margin. These tubercles are continued in two low parallel ridges. The uropoda are about as long as the abdomen; the inner branch is shorter than the peduncle; the outer is minute.

Thirty-one specimens of this species were collected at station 4828, on the way from Nanao, Hondo, Japan, to Isuruga, Hondo, Japan, at Sudzu Misaki Light, N. 57° W., 16 miles (lat. 37° 23′ N.; long. 137° 36′ E.) at a depth of 163 fathoms. They were taken "from crevices in water-logged fragment of bamboo." (H. Heath.)

This species differs from *Limnoria lignorum* Rathke in having the fifth abdominal segment armed with two low tubercles: in having the terminal abdominal segment armed with three tubercles and two

parallel ridges, and in the lack of markings on the body, with the last three thoracic segments reddish brown in contrast to the yellow color of the rest of the body.

Type-specimen.—Cat. No. 39507, U.S.N.M.

IDOTHEOIDEA or VALVIFERA.

Family ARCTURIDÆ.

Genus ASTACILLA Cordiner.

ASTACILLA DILATATA, new species.

Body narrow, elongate, 2½ mm. wide and 9½ mm. long. Surface of body thickly tuberculate.

Head with the front deeply excavate, the antero-lateral angles produced and bifid; the lateral margin is also produced in an acute triangular process. The eyes are large, round, composite, and situated close to the lateral margin. About the middle of the head on the dorsal surface are two prominent tubercles, one on either side of the median line. The first pair of antennæ have the basal article large and dilated; the second and third are short and slender and subequal, each being only half the length of the basal article; the fourth article is about twice as long as the third. The first antennæ extend a little beyond the second article of the second pair of antennæ. The first two articles of the second antennæ are short, the first being shorter than the second; the third article is nearly twice as long as the first two taken together; the fourth and fifth are about equal in length and each is twice as long as the third; the flagellum consists of three articles, the first of which is nearly three times as long as the second, and the last is minute, less than half as long as the second. The second antennæ are as long as the body.

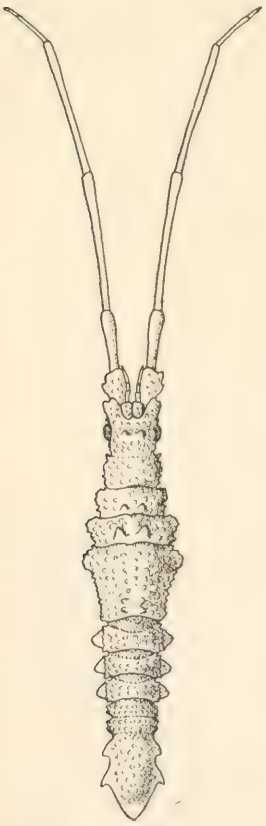

FIG. 22.—ASTACILLA DILATATA. 5½. (Drawn by Miss V. Dandridge.)

The head is coalesced with the first thoracic segment. The antero-lateral angles of the first segment are acutely produced. The first, second, and third segments are about equal in length; close to the posterior margin of the second and third segments are two tubercles, one on either side of the median line, those of the third segment being long and conspicuous. The fourth segment is twice as long as the third and is much broader anteriorly than posteriorly. The antero-lateral

margins of the second, third, and fourth segments are produced on each side in a small lobe, beneath which the epimera are conspicuous each in the form of two small triangular processes. On the dorsal surface of the fourth segment, close to the posterior margin, are four small tubercles, two on either side of the median line, in longitudinal series. The last three segments gradually decrease a little in length, with the tubercles arranged, two on either side of the median line, in longitudinal series on each segment. The epimera project at the sides in the form of large triangular processes, one on each side of the segment.

The abdomen is composed of two short segments anterior to the large terminal segment, all of which appear to be coalesced. The first two segments have each two transverse rows of small tubercles on the dorsal surface. In both segments the lateral margins are produced on either side in a small triangular process. The terminal segment is produced to an acute triangular point and has two triangular processes on either side of the lateral margin, a pair at the base, and a pair about the middle of the segment. The first four pairs of legs are furnished with long hairs; the last three pairs are ambulatory.

The marsupium consists of two pairs of plates, as is also true of *A. cæca* and *A. granulata*, the anterior pair having been overlooked in previous examinations of these two species.

Only one specimen comes from station 4815, on the way from Hakodate, Japan, to Ebisu, Sado Island, Sea of Japan, at Niigata Light, S. 25° E., 21.5 miles (lat. 38° 16′ N.; long. 138° 52′ E.) at a depth of 70 fathoms in dark green sand.

Type-specimen.—Cat. No. 39508, U.S.N.M.

Genus ARCTURUS Latreille.

ARCTURUS HIRSUTUS Richardson.

Arcturus hirsutus Richardson, Proc. U. S. Nat. Museum, vol. 27, 1904, pp. 41–43.

Localities.—Station 4769, on "Bowers Bank," Bering Sea, at lat. 54° 30′ 40″ N.; 179° 14′ E.; station 4770, at lat. 54° 31′ N.; long. 179° 15′ E.; station 4771, at lat. 54° 30′ N.; long. 179° 17′ E.; and station 4772, at lat. 54° 30′ 30″ N.; long 179° 14′ E.; station 4780, on the way from "Petrel Bank," Bering Sea, to McDonald Bay, Agattu Island, Aleutians, by the passage east of Semisopochnoi and Amchitka Islands, at lat. 52° 01′ N.; long. 174° 39′ E.; station 4781, at lat. 52° 14′ 30″ N.; long. 174° 13′ E.; station 4784, on the way from Chichagof Harbor, Attu Island, around eastern end and south of Attu Island, to Preobrajeniya Bay, Medni Island, Komandorski Islands at East Cape, Attu Island, S. 18° W., 4 miles (lat. 52° 55′ 40″ N.; long. 173° 26′ E.); station 4786, on the way from Preobrajeniya Bay, Medni Island, to Nikolski Bay, Bering Island, by the passage

between islands, at North Point Copper Island, N. 84° E., 8.2 miles (lat. 54° 51′ 30″ N.; long. 167° 14′ E.). A large specimen, mutilated, comes from station 5084, off Omai Saki Light (20 to 40 miles distant), N. 29½° E., 41 miles (lat. 34° N.; long. 137° 49′ 40″ E.), at a depth of 918 fathoms, which I have doubtfully referred to this species.

Depth.—344 fathoms; 244 fathoms; 482 fathoms; 135 fathoms; 247 fathoms; 426 fathoms; 1,046 fathoms; in gray sand and green mud; in broken shells; in green and brown sand; in gray mud, sand, and pebbles; in fine gray sand; in coarse pebbles.

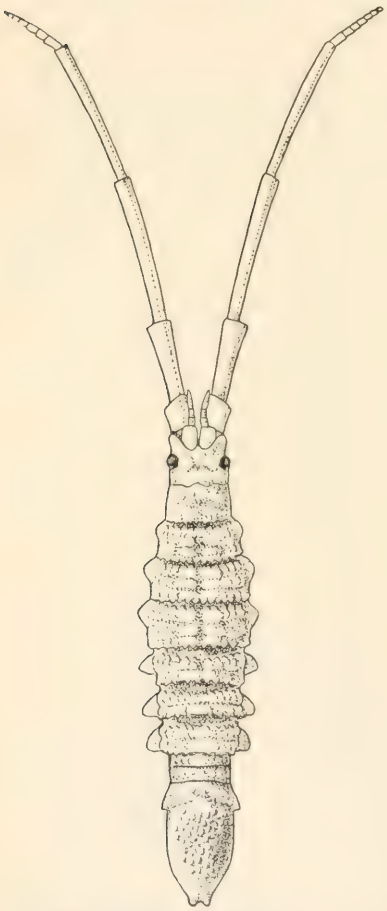

FIG. 23.—ARCTURUS GRANULATUS. × 4⅛. (Drawn by Miss V. Dandridge.)

ARCTURUS GRANULATUS, new species.

Body narrow, elongate, about four times as long as broad, 4 mm.: 15½ mm. Surface of body rugose, with the anterior and posterior margins of all the segments furnished with a row of tubercles. Abdomen covered with low tubercles.

Head a little wider than long, 1½ mm.: 2 mm. Front deeply excavate, with the antero-lateral angles produced. There is a small median point. The eyes are large, round, composite, and paced close to the lateral margin, about halfway between the anterior and the posterior margins. The rugosities on the posterior half of the head form two low elevations, one on either side of the median line. The first pair of antennæ have the basal article large and dilated; the next two articles are slender and subequal; the fourth article is about twice as long as the preceding article and extends to the end of the second article of the second pair of antennæ. The second pair of antennæ have the first article very short; the second is longer and is about 1½ mm. long; the third is 2½ mm. in length; the fourth is twice as long as the third, being 5 mm. long; the fifth is almost as long as the fourth, being 4½ mm.; the flagellum is 2 mm. long and is composed of seven articles.

The first three segments of the thorax are subequal in length, being each about 1½ mm. long; the fourth segment is but little longer than these, being only 1¾ mm. in length; the last three segments are subequal and each is 1 mm. long. The anterior part of the lateral margin of the second, third, and fourth segments is produced on either side in a small lobe; lateral to this lobe is the epimeron, which is in the form of a narrow plate, gradually increasing in size. On the last three segments the epimera are in the form of large, angular processes extending laterally on either side of the segment and occupying one-half the lateral margin in the fifth segment, two-thirds of the lateral margin in the sixth segment, and nearly all of the lateral margin in the seventh segment.

The abdomen is composed of three segments, two short ones anterior to the terminal segment. At the base of the terminal segment are two lateral projections, one on either side, which, together with the depression which extends across the segment, mark the place of coalescence of another segment. The terminal segment is produced to a bifid extremity; it is 2½ mm. wide and 4 mm. long.

There are four pairs of incubatory plates.[a]

The first four pairs of legs are directed forward and are furnished with long hairs; the last three pairs are ambulatory.

Five specimens, males and females (the female is described and figured) were collected at station 4803, on the way from Milne Bay, Simushir Island, Kuril Islands, to Hakodate, Hokkaido, Japan, by the Boussole Strait at Cape Rollin, Simushir Island, N. 59° W., 9 miles (lat. 46° 42′ N.; long. 151° 45′ E.), and at station 4804, at N. 58° W., 9.7 miles (lat. 46° 42′ N.; long. 151° 47′ E.), at a depth of 229 fathoms in coarse pebbles and black sand.

This species is close to *Arcturus beringanus* Benedict,[b] but differs in the rugose and tuberculate character of the body, in the shorter fourth thoracic segment and in the shorter abdomen, the apex of the terminal segment not being produced as in *A. beringanus*.

Type-specimen.—Cat. no. 39509, U.S.N.M.

ARCTURUS HASTIGER, new species.

Body narrow, elongate, 8½ mm.: 52 mm. Surface minutely granulate. Head deeply excavate in the middle, with a small median point. Antero-lateral angles acutely produced. Eyes very large, composite, about twice as wide as long, transversely oval. Two tubercles, one on either side of the median line, are situated about the middle of the head between the eyes. The first pair of antennæ

[a] In the genus *Arcturus* there are four pairs of incubatory plates and not three, as I have heretofore stated. The first pair are small and somewhat obscured by the overlapping second pair.

[b] Proc. Biol. Soc., Washington, vol. 12, 1898, pp. 46–47.

have the basal article large and dilated; the second and third articles are narrow, elongate, about equal in length, and shorter than the basal article; the fourth article is one and a half times longer than the third, and is about as long as the basal article. Second antennæ with the first article short, not reaching beyond the first article of the first pair of antennæ; second article reaching to the end of the flagellum of the first pair of antennæ, being 4 mm. long; third article elongate, about three times longer than the second article, being 13 mm. long; fourth article more than one and a fourth times longer than the third, being 23 mm. long; fifth article about equal to the fourth in length, being 24 mm. long; the flagellum is composed of 10 articles, the first one of which is almost as long as all the others taken together.

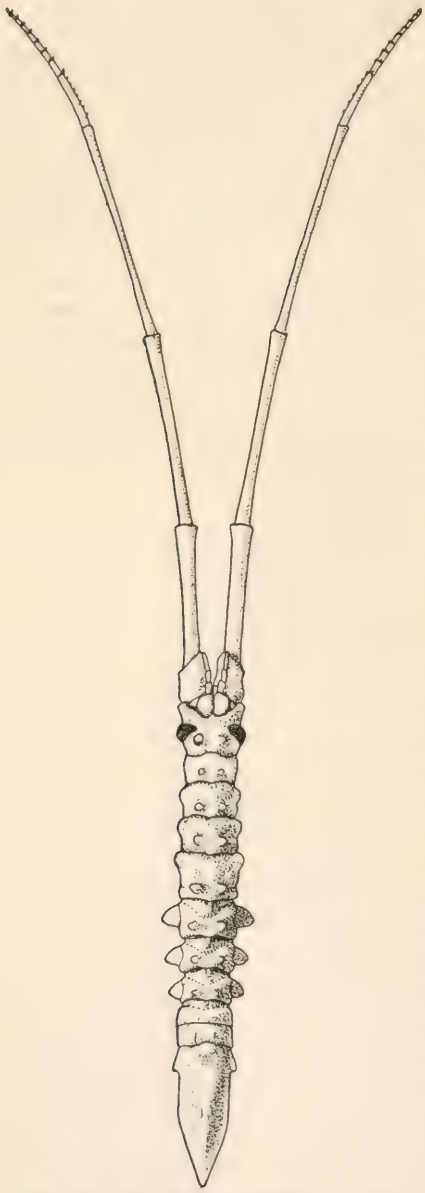

FIG. 24.—ARCTURUS HASTIGER. × 1½. (Drawn by Miss V. Dandridge.)

All seven thoracic segments are furnished with two tubercles each, close to the posterior margin, one on either side of the median line. The fourth segment is about one and a fourth times longer than the third. The epimera are distinct on all the segments with the exception of the first; on the second, third, and fourth segments they are small and anteriorly placed; on the three last segments they are large and conspicuous and situated about the middle of the lateral margin.

The abdomen is composed of three segments, two short ones and the terminal segment, which ends in a pointed extremity, and has two

small tubercles on the middle of the dorsal surface, one on either side of the median line. At the base of the segment there is a prominent lateral tooth or projection on either side.

The first four pairs of legs are furnished with long hairs and are anteriorly directed; the last three pairs are ambulatory. There are four pairs of marsupial plates. (The female is described and figured.)

A large number of specimens come from station 4982, on the way from Hakodate, Hokkaido, Japan, to Otaru, Hokkaido, Japan, by the Tsugaru Strait, at Benkei Mizaki Light, S. 3° E., 10.5 miles (lat. 43° N.; long. 140° 10′ 30″ E.), and station 4983 (lat. 43° 01′ 35″ N.; long. 140° 10′ 40″ E.).

Depth.—Three hundred and ninety to four hundred and twenty-eight fathoms in green mud.

Young specimens differ from the adults in having the tubercles on the head replaced by spines, which are, however, not very long.

This species is very close to *Arcturus baffini* var. *tuberosus* Sars, but differs in the much larger eyes, in having two large and well developed tubercles on the head, and in having two distinct, though small, tubercles on each one of the segments of the thorax, and no tubercles on the first two segments of the abdomen. This species is also distinct from *Arcturus baffini* var. *intermedia* Norman.[a]

Type-specimen.—Cat. No. 39510, U.S.N.M.

ARCTURUS GLABER Benedict.

Arcturus glabrus Benedict, Proc. Biol. Soc. Wash., vol. 12, 1898, p. 46.
Arcturus glaber Richardson, Proc. U. S. Nat. Mus., vol. 21, 1899, p. 855; Ann. Mag. Nat. Hist. (7), vol. 14, 1899, p. 277; American Naturalist, vol. 34, 1900, p. 230; Bull. U. S. Nat. Mus., No. 54, 1905, pp. 330–331.

Localities.—Station 4782 on the way from Agattu Island to Chichagof Harbor, Attu Island, by the Semichi Islands, Aleutians, at East Cape, Attu Island, S. 22° W., 4 miles (lat. 52° 55′ N.; long. 173° 27′ E.); station 3253, between Bristol Bay and Pribilof Islands, Alaska.

Depth.—Thirty-six to fifty-seven fathoms.

ARCTURUS TRITÆNIATUS, new species.

Body narrow, elongate, a little more than four times as long as wide (4½ mm. : 19 mm.). Surface perfectly smooth. Color, in alcohol, yellow, with numerous brown spots close together, covering the entire surface of the body, with the exception of three longitudinal bands of yellow, one median, and a lateral band on either side, which extend the entire length of the body to about the middle of the terminal segment. The median longitudinal band stops at the base of the terminal segment.

[a] Ann. Mag. Nat. Hist. (7), vol. 14, 1904, p. 445.

Head wider than long (2 mm. : 3 mm.) and with the anterior margin deeply excavate between the produced antero-lateral angles; there is also a small median point separating the basal articles of the first pair of antennæ. The eyes are large, composite, wider than long, and placed close to the lateral margin half way between the anterior and the posterior margins. The first pair of antennæ have the basal article large and dilated; it extends to the end of the first article of the second antennæ; the second and third articles are narrow and subequal in length; the fourth article is equal in length to the second and third articles taken together and extends to the end of the second article of the peduncle of the second pair of antennæ. The second antennæ have the first article very short; the second is 2 mm. long; the third is twice as long as the second, being 4 mm. in length; the fourth is 7 mm. and the fifth is 5 mm.; the flagellum is 3 mm. long and is composed of five articles, the first of which is twice as long as the second.

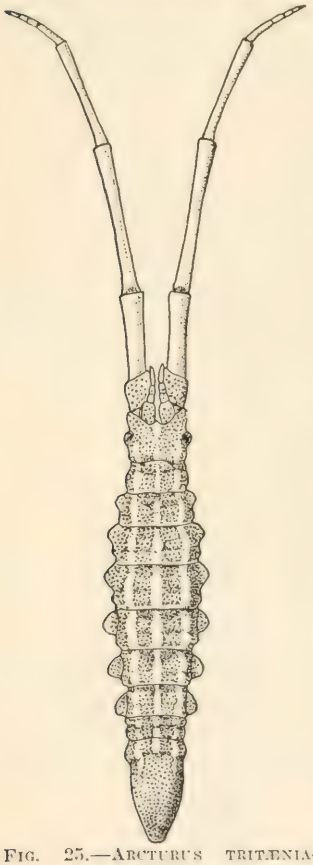

FIG. 25.—ARCTURUS TRITÆNIATUS. × 3. (Drawn by Miss V. Dandridge.)

The segments of the thorax are about equal in length, with the exception of the fourth, which is one and a half times longer than any of the others. The anterior part of the lateral margin in the second, third, and fourth segments is produced in a lobe on either side; lateral to these lobes the epimera are placed and are in the form of narrow plates, gradually becoming wider; on the last three segments the epimera are large and conspicuous, projecting laterally and occupying half the margin of the fifth segment, two-thirds of the margin of the sixth segment, and nearly all of the margin of the seventh segment.

The abdomen is composed of three segments, two short ones anterior to the terminal segment, which is produced posteriorly to a narrow rounded extremity. At the base on either side the terminal segment is produced in a rounded lobe; the incision between the lobe and the rest of the segment marks a depression extending across the segment, which is the indication of another coalesced segment.

There are four pairs of marsupial plates.

The first four pairs of legs extend forward and are furnished with long hairs; the last three pairs are ambulatory.

Two specimens, a male and a female (the female is described and figured) were collected at station 4778, on the way from "Bowers Bank" to "Petrel Bank," Bering Sea, at Semisopochnoi Island, r. t. S. 45° W., l. t. S. 12° W., about 12 miles (lat. 52° 12′ N.; long. 179° 52′ E.), at a depth of 43 fathoms in fine black gravel.

This species is very close to *Arcturus glaber* Benedict[a] from Bering Sea, but differs in the shorter and more thickset body; in the shorter second antennæ; in the shorter abdomen, with the apex less pointed; in the shorter fourth segment of the thorax; and in having the three longitudinal bands of yellow on the body.

This species is also similar to *Arcturus myops* Beddard[b] from New Zealand.

Type-specimen.—Cat. No. 39511, U.S.N.M.

ARCTURUS MAGNISPINIS, new species.

This species is very close to *Arcturus longispinus* Benedict,[c] so that a complete description does not seem necessary. It differs from that form in having the tubercles of the first thoracic segment replaced by small spines; in having the third, fourth, and fifth articles of the peduncle of

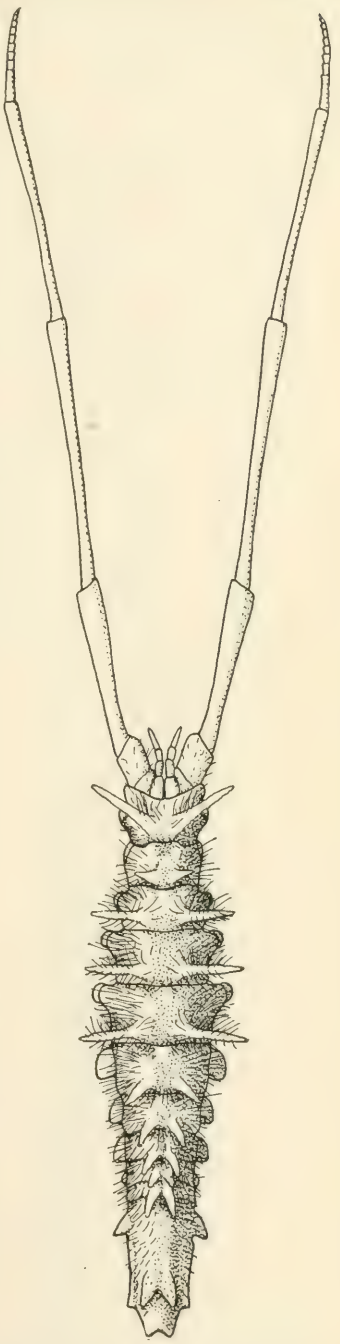

Fig. 26.—Arcturus magnispinis. × 2.4. Female. (Drawn by Miss V. Dandridge.)

[a] Proc. Biol. Soc. Washington, vol. 12, 1898, p. 46.

[b] Challenger Report, vol. 17, 1886, p. 100, pl. 22, figs. 5–8.

[c] Proc. Biol. Soc. Washington, vol. 12, 1898, pp. 44–45; Richardson, Bull. U. S. Nat. Mus., No. 54, 1905, pp. 329–330.

the second antennae shorter (the second article is 3 mm. long, the third is 9 mm., the fourth is 14 mm., the fifth is 13 mm.); in having the spines of the head and of the second, third, and fourth segments of the thorax stouter and longer; in having the body shorter and more thickset (8 mm.:30 mm.), and densely covered with hairs; and in having the abdomen below the median dorsal spines shorter. The first antennæ do not extend beyond the second article of the second antennæ.

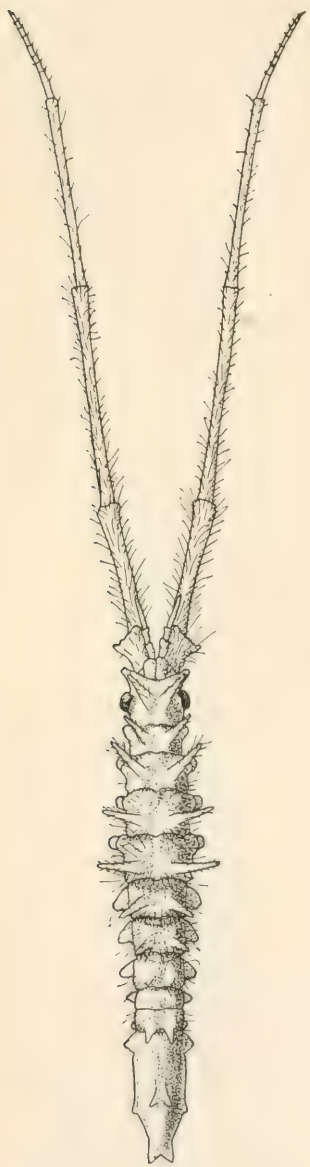

FIG. 27.—ARCTURUS DIVERSISPINIS. × 1.2. FEMALE. (Drawn by Miss V. Dandridge.)

The young are similar to the adults.

A number of specimens (about twelve) were collected at station 4777, on "Petrel Bank," Bering Sea, at Semisopochnoi Island, r. t. S. 44° W., l. t. S. 4° W., about 12 miles (lat. 52° 11′ N.; long. 179° 49′ E.), and station 4778, r. t. S. 45° W., l. t. S. 12° W., about 12 miles (lat. 52° 12′ N.; long. 179° 52′ E.), at a depth of 43–52 fathoms.

One small specimen from station 4779 agrees in every respect with the other specimens, except that the terminal segment, instead of terminating in two points, is rounded posteriorly. This is probably an abnormal condition.

Type-specimen.—Cat. No. 39327, U.S.N.M.

ARCTURUS DIVERSISPINIS, new species.

This species is also close to *Arcturus longispinus* Benedict, but differs in having the tubercles of the first thoracic segment replaced by well-developed spines, which are almost as long as those of the three following segments, and in having the spines of the seventh thoracic segment rudimentary. The first antennæ extend the length of the last article beyond the second article of the second antennæ; the last article of the first antennæ is about twice as long as the preceding article. There is a small, blunt spine on the outer distal end of the second article of the second antennæ, and one on either side of the

head at the antero-lateral angles. The surface of the body is smooth and covered with long hairs. More than fifteen specimens of this species were collected at station 4784, on the way from Chicagof Harbor, Attu Island, around eastern end and south of Attu Island to Preobrajeniya Bay, Medni Island, Komandorskii Islands at East Cape, Attu Island, S. 18° W., 4 miles (lat. 52° 55′ 40″ N.; long. 173° 26′ E.), at a depth of 135 fathoms.

Type-specimen.—Cat. No. 39432, U.S.N.M.

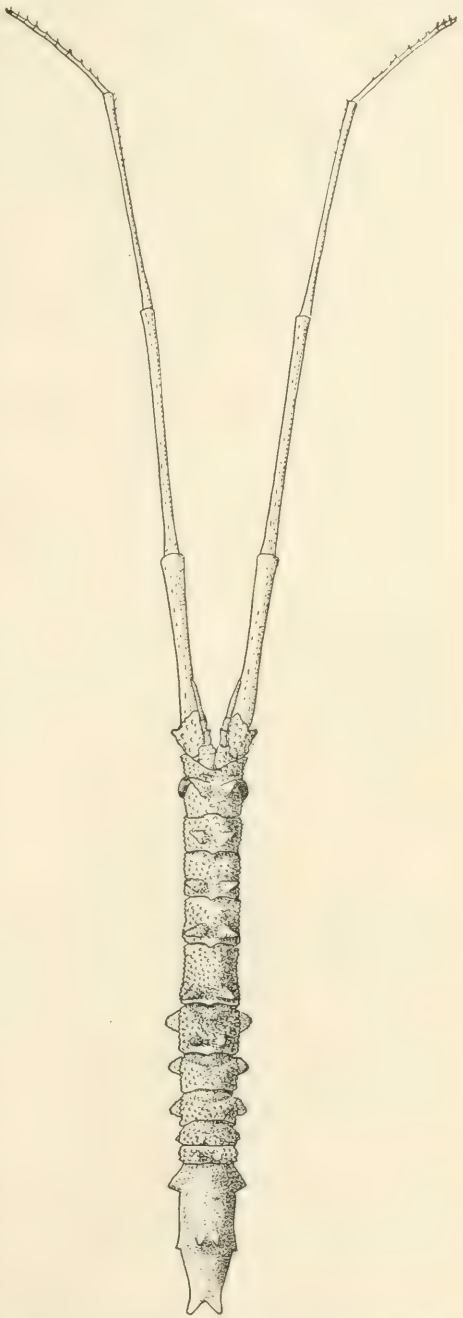

Fig. 28.—Arcturus brevispinis. × 2.2. Male. (Drawn by Miss V. Dandridge.)

ARCTURUS BREVISPINIS, new species.

This species differs from *Arcturus longispinus* Benedict in having all the spines quite short, those of the last three thoracic segments and the first two abdominal segments being almost rudimentary. The terminal abdominal segment in all these specimens is longer than in *A. longispinus*. The body is covered with small, pointed tubercles. The first antennæ extend the length of the last article beyond the second article of the second antennæ. The last article of the first antennæ is about three times longer than the third article.

About nine specimens were collected at station 4784, on the way from Chichagof Harbor, Attu Island, around eastern end and south of Attu Island to Preobrajeniya Bay, Medni Island, Komandorskii

Islands, at East Cape, Attu Island, S. 18° W., 4 miles (lat. 52° 55′ 40″ N.; long. 173° 26′ E.) at a depth of 135 fathoms.

Type-specimen.—Cat. No. 39313, U.S.N.M.

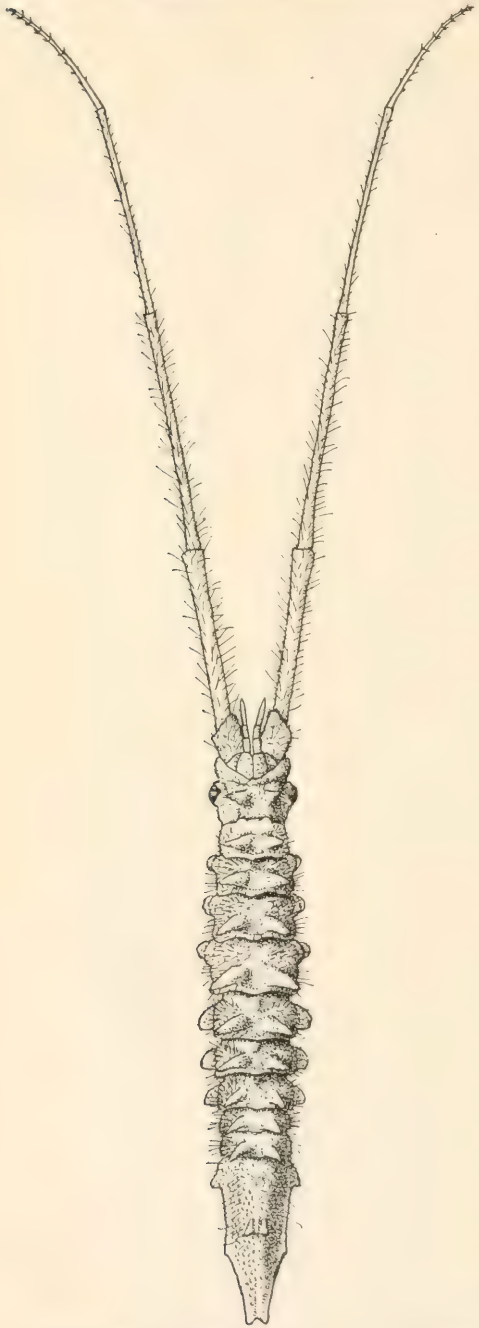

FIG. 29.—ARCTURUS CRASSISPINIS. × 1.5. FEMALE. (Drawn by Miss V. Dandridge.)

ARCTURUS CRASSISPINIS, new species.

This species is likewise close to *Arcturus longispinus* Benedict, but differs in having spines present on all the segments of the thorax and abdomen, only they are all of the same length and short, none being rudimentary. The terminal segment of the abdomen is also longer than in *A. longispinus*. This species is very large, measuring 44 mm. in length and 8½ mm. in width.

The spines on the body are short and stout. The surface of the body is covered with short hairs. The first pair of antennæ do not extend much beyond the second article of the second pair of antennæ. The second antennæ have the second article 4 mm. long; the third 13 mm.; the fourth 20 mm.; and the fifth, 17 mm. in length.

About 45 specimens come from the following localities: Station 5005, in Aniwa Bay, approaching Korsokov, Saghalin Island, at lat. 46° 4′ 40″ N.; long. 142° 27′ 30″ E.; station 5006, at lat. 46° 4′ N.; long. 142° 29′ E.; station 5007, at lat. 46° 3′ N.; long. 142° 31′ E.;

station 5008, at lat. 46° 7′ 50″ N.; long. 142° 37′ 20″ E.; station 5009, at lat. 46° 21′ 10″ N.; long. 142° 40′ E.; station 5010, at Korsokov Light, N. 5° E., 9.5 miles (lat. 46° 30′ 30″ N.; long. 142° 43′ 30″ E.); station 5020, off eastern coast, Saghalin Island, vicinity of Cape Patience, in Okhotsk Sea, at lat. 48° 32′ 45″ N.; long. 145° 7′ 30″ E.; station 5021, at lat. 48° 32′ 30″ N.; long. 145° 08′ 45″ E.; station 5022, at lat. 48° 35′ 30″ N.; long. 145° 20′ E.; station 5024, Flat Hill, N. 48° W.; Cape Patience, S. 74° W. (lat. 48° 43′ 10″ N.; long. 144° 59′ 30″ E.); station 4854, on the way from Matsu Shima, Sea of Japan (off coast of Korea), to Nagasaki, Japan, at Cape Clonard, N. 31° W., 13.3 miles (lat. 35° 54′ N.; long. 129° 46′ E.); and station 4861, S. 27° W., 16.5 miles (lat. 36° 19′ N.; long. 129° 47′ E.).

Depth.—21–73 fathoms.

Type-specimen.—Cat. No. 39309, U.S.N.M.

Family IDOTHEIDÆ.

Genus MESIDOTEA Richardson.

MESIDOTEA ENTOMON (Linnæus).

Oniscus entomon LINNÆUS, Syst. Nat., 12th ed., vol. 1, pt. 2, 1767, p. 1060.

Idotea entomon Bosc, Hist. Nat. des Crust., vol. 2, 1802, p. 178.

Idotæa entomon LOCKINGTON, Proc. Cal. Acad. Sci., vol. 7, 1877, pt. 1, p. 45.

Glyptonotus entomon MIERS, Trans. Linn. Soc. London, vol. 16, 1883, pp. 12–13, pl. 1, figs. 1–2. (See Miers for further synonymy.)

Mesidotea entomon RICHARDSON, Bull. U. S. Nat. Mus., No. 54, 1905, pp. 348–350.

Locality.—Petropaulovsk.

Genus IDOTHEA Fabricius.

IDOTHEA OCHOTENSIS (Brandt).

Idotea ochotensis BRANDT, Middendorff's Sibirische Reise, vol. 2, 1851, Crust., p. 145, pl. 6, fig. 33.—MIERS, Jour. Linn. Soc. London, vol. 16, 1883, p. 32, pl. 1, figs. 8–10.—RICHARDSON, Proc. U. S. Nat. Mus., vol. 21, 1899, p. 846; Ann. Mag. Nat. Hist. (7), vol. 4, 1899, p. 265; American Naturalist, vol. 34, 1900, p. 227; Harriman Alaska Expedition, Crust., vol. 10, 1904, p. 219; Proc. U. S. Nat. Mus., vol. 27, 1904, p. 663; Bull. U. S. Bureau of Fisheries, 1905, p. 216.

Idothea ochotensis RICHARDSON, Bull. U. S. Nat. Mus., No. 54, 1905, pp. 366–367.

Localities.—Milne Bay, Simushir Islands; Nikolski, Bering Island; Petropaulovsk.

Depth.—Shore.

IDOTHEA METALLICA (Bosc).

Idotea metallica Bosc, Hist. Nat. Crust., vol. 2, 1802, p. 179, pl. 15, fig. 6.—MIERS, Jour. Linn. Soc. London, vol. 16, 1883, pp. 35–38 (see Miers for further synonymy).

Idotea robusta KRØYER, Naturh. Tidsskr., (2), 1846–49, p. 108.—STIMPSON, Proc. Acad. Nat. Sci. Phila., vol. 14, 1863, p. 133.—HARGER, Report U. S. Fish Com., pt. 6, 1880, p. 349, pl. 6, figs. 30–32.

Idothea metallica RICHARDSON, Bull. U. S. Nat. Mus., No. 54, 1905, pp. 362–363.

Localities.—Station 4883, on the way from Nagasaki, Japan, to Kagoshima, Kagoshima Gulf, Japan, at Nomo Zaki, N. 83° E., 10.25 miles (lat. 32° 33′ 30″ N.; long. 129° 32′ E.); station 4849, on the way from Saigo, Dogo Island, Oki Group, to Matsu Shima, Sea of Japan (off coast of Korea) at lat. 36° 46′ N.; long. 132° 15′ E.; station 4850, at Liancourt Rocks, NW. (mag.), 13.8 miles (lat. 36° 56′ N.; long. 132° E.); station 3766, Shioya Saki Light, N. 78°, W. 108 miles.

Depth.—Surface; 800–846 fathoms in green mud and globigerina. In dip net with Porpita.

Genus PENTIAS Richardson.

PENTIAS HAYI Richardson.

Pentias hayi RICHARDSON, Proc. U. S. Nat. Mus., vol. 27, 1904, pp. 47–49.

Locality.—Hakodate, Japan.

A single small specimen, a male, of this species was collected, which differs from the type in the narrower body and narrower epimera. The lateral margins of the segments are not incised as deeply for the reception of the epimera as in the type. Owing to the difference in size, the difference in sex and the insufficient material, I have referred the two specimens to the same species. The small specimen has the first segment of the thorax marked with ten parallel longitudinal lines of dark brown, close together. There is a small spot of dark brown on each one of the six following segments in the median line, close to the anterior margin, as well as one at the base of the abdomen. On the seventh thoracic segment is a large spot on either side on the lateral margin, and there is a large brown spot on either side of the abdomen close to the lateral margin about the middle of the segment.

Genus PENTIDOTEA Richardson.

PENTIDOTEA JAPONICA Richardson.

Idotea japonica RICHARDSON, Proc. U. S. Nat. Mus., vol. 22, 1900, pp. 131–134; Idem, vol. 27, 1904, p. 47.

Localities.—Mororan, Japan; Hakodate, Japan; Same, Rikuoku, Japan; Tomakomai, Japan.

Depth.—Shore.

Inasmuch as the palp of the maxillipeds is composed of five articles, this species must be referred to the genus *Pentidotea*.

PENTIDOTEA WOSNESENSKII (Brandt).

Idotea wosnesenskii BRANDT, in Middendorff's Sibirische Reise, vol. 2, 1851, Crust., p. 146.—STIMPSON, Bost. Jour. Nat. Hist., vol. 6, 1857, p. 504.—SPENCE BATE, Lord's Naturalist in British Columbia, vol. 2, 1866, p. 281.—MIERS, Journ. Linn. Soc. London, vol. 16, 1883, p. 40.—RICHARDSON, Proc. U. S. Nat. Mus., vol. 21, 1899, p. 846; Ann. Mag. Nat. Hist. (7), vol. 4, 1899, p. 265; American Naturalist, vol. 34, 1900, p. 227; Harriman Alaska Expedition, Crust., vol. 10, 1904, p. 218; Proc. U. S. Nat. Mus., vol. 27, 1904, p. 663; Bull. U. S. Bureau of Fisheries, 1905, p. 216.

Idotea hirtipes DANA, U. S. Expl. Exp., Crust., vol. 14, 1853, p. 704, pl. 46, fig. 6.

Idotea oregonensis DANA, Proc. Acad. Nat. Sci. Phila., vol. 7, 1854, p. 175.

Idotea media (DANA?) SPENCE BATE, Lord's Naturalist in British Columbia, vol. 2, 1866, p. 282.

Pentidotea wosnesenskii RICHARDSON, Bull. U. S. Nat. Mus., No. 54, 1905, pp. 370–373.

Localities.—Agattu Island; Union Bay, Bayne Sound, British Columbia; Unalaska; Attu Islands; Nazan Bay, Atka.

Depth.—Shore.

PENTIDOTEA WHITEI (Stimpson).

Idotea whitei STIMPSON, Proc. Acad. Nat. Sci. Phila., 1864, p. 155.—MIERS, Journ. Linn. Soc. London, vol. 16, 1883, pp. 42–43.—RICHARDSON, Proc. U. S. Nat. Mus, vol. 21, 1899, pp. 846–847; Ann. Mag. Nat. Hist. (7), vol. 4, 1899, p. 266; American Naturalist, vol. 34, 1900, p. 227.

Pentidotea whitei RICHARDSON, Bull. U. S. Nat. Mus., No. 54, 1905, pp. 373–374.

Locality.—Nazan Bay, Atka.

PENTIDOTEA ROTUNDATA, new species.

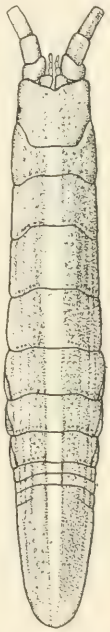

FIG. 30.—PENTIDOTEA ROTUNDATA. × 2. (Drawn by Miss V. Dandridge.)

Body narrow, elongate, about five and a half times longer than wide (6½ mm.: 35½ mm.). Surface smooth, color light green, with markings and dots of a darker green.

Head a little wider than long (4 mm.: 5 mm.). Front excavate, and the antero-lateral angles rounded. Eyes small, round, situated on the lateral margins, close to the posterior margin, and scarcely visible in a dorsal view. The first pair of antennæ have the basal article large and dilated, quadrate; the three following articles are short and subequal. The first antennæ extend to the end of the second article of the peduncle of the second antennæ. The first article of the second antennæ is extremely short and is scarcely visible in a dorsal view; the second and third articles are about equal in length, being each 1½ mm. long; the fourth article is a little longer than the

two preceding, being 2½ mm. long. The second antennæ are broken at the fourth article. The maxilliped has a palp of five articles.

The first segment of the thorax is not wider than the head, and has the antero-lateral angles produced, surrounding the posterior portion of the head. In the median line this segment is only 2 mm. long and is the shortest segment with the exception of the seventh, which is also but 2 mm. in length. The second segment is 3½ mm. long; the third and fourth 4 mm. each; the fifth 3 mm.; and the sixth 2½ mm. long. Epimera are distinct on all the segments with the exception of the first. They are in the form of extremely narrow, elongated plates, which in the second segment extend a little more than half the length of the lateral margin, in the third and fourth segments about two-thirds of the lateral margin, and in the last three segments the entire length of the lateral margin. In a dorsal view the first three epimera are not visible.

FIG. 31.—PENDIDOTEA ROTUNDATA. MAXILLIPED. × 15¾.

The abdomen is composed of three segments, two short ones anterior to the long terminal segment. At the base of the terminal segment is a suture line on either side, indicating another partly coalesced segment. The terminal segment is 9½ mm. long and 5 mm. wide at the base; it tapers gradually to a rounded extremity.

The first four pairs of legs are directed forward, the last three pairs backward. All the legs are very small and short.

Only one specimen, a female, was collected at Same, Rikuoku, Japan.

Type-specimen.—Cat. No. 39516, U.S.N.M.

Genus SYNIDOTEA Harger.

SYNIDOTEA BICUSPIDA (Owen).

Idotea bicuspida OWEN, Crustacea of the Blossom, 1839, p. 92, pl. 27, fig. 6.
Idotea pulchra LOCKINGTON, Proc. Cal. Acad. Sci., vol. 7, 1877, p. 44.
Edotea bicuspida MIERS, Journ. Linn. Soc. London, vol. 16, 1883, p. 66.
Synidotea bicuspida SARS, Crust. Norwegian North Atlantic Exp., 1885, p. 116, pl. 10, figs. 24–26.—BENEDICT, Proc. Acad. Nat. Sci. Phila., 1897, pp. 391–392.—RICHARDSON, Proc. U. S. Nat. Mus., vol. 21, 1899, p. 848; Ann. Mag. Nat. Hist. (7), 1899, p. 268; American Naturalist, vol 34, 1900, p. 228; Bull. U. S. Nat. Mus., No. 54, 1905, pp. 385–386.

Localities.—Station 3253, between Bristol Bay and Pribilof Islands; station 3255, N. and N. W. of Unimak Island.

Depth.—Thirty-six to forty-nine fathoms, in green mud, broken shells, and gray sand and gravel.

SYNIDOTEA ACUTA, new species.

Body oblong-ovate, about twice as long as wide, 5 mm.: 12 mm. Color yellow, with the exception of the third and fourth segments, which are red.

Head with the front produced in a wide border on either side of a median cleft. The frontal excavation is slight. The lateral portions of the frontal border form an angle with the dorsal portion. Just behind the median cleft is a prominent median tubercle. The eyes are small, round, composite, and placed close to the lateral margins. The first pair of antennæ extend to the middle of the fourth article of the peduncle of the second pair of antennæ; the first two articles are about equal in length; the third and fourth are about equal in length and each is a little longer than the second article. The second pair of antennæ have the first two articles about equal in length; the third and fourth are also equal in length and each is twice as long as either of the two preceding articles; the fifth article is about one and a half times longer than the fourth; the flagellum consists of ten articles. When retracted the second antennæ extend to the posterior margin of the first thoracic segment.

FIG. 32.—SYNIDOTEA ACUTA. × 3½.

The lateral margins of the first and second thoracic segments are angulate; those of the following five segments are straight. All the epimera are coalesced with the segments. The first four segments are about equal in length; the last three gradually decrease a little in length.

The abdomen is composed of a single segment, with a suture line on either side at the base, indicating another partly coalesced segment. This segment is triangulate, with the apex very slightly excavate.

Only one specimen was collected by the U. S. Bureau of Fisheries Steamer *Albatross* at station 4778, on "Petrel Bank," Bering Sea, at Semisopochnoi Island, r. t. S. 45° W., l. t. S. 12° W., about 12 miles (lat. 52° 12′ N.; long. 179° 52′ E.) at a depth of 43 fathoms, in fine black gravel.

Type-specimen.—Cat. No. 39517, U.S.N.M.

This species is very close to *Synidotea bicuspida* (Owen), but differs in having the first two segments of the thorax with lateral margins angulate, in having a prominent median tubercle on the head, and in the shape of the frontal border. The abdomen is also different, in being as long as wide, while in *S. bicuspida* it is wider than long, and in having a more shallow excavation at the extremity. The second antennæ are also shorter, with fewer articles in the flagellum.

SYNIDOTEA EPIMERATA, new species.

Body oblong-ovate, a little more than twice as long as wide (6 mm.; 13 mm.).

Head with the front excavate, the antero-lateral angles being very acutely produced. In the middle of the frontal excavation is another small excavation. The eyes are large, composite, and situated close to the lateral margin, about half way between the anterior and the posterior margins. In front of each eye, close to the anterior margin, is a prominent tubercle. Just posterior to the median excavation of the anterior margin is a single prominent median tubercle. A series of small tubercles in a transverse row lies just back of the median tubercle. The transverse ridge at the posterior extremity of the head has a single median tubercle. The first pair of antennæ have the first two articles about equal in length; the two following are also about equal in length and each is a little longer than either of the preceding articles. The first antennæ extend to the middle of the fourth article of the second pair of antennæ.

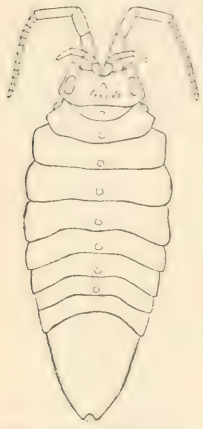

FIG. 33. SYNIDOTEA EPIMERATA. × 3½.

The first two articles of the second antennæ are short and subequal in length; the third and fourth articles are also subequal, and each is twice as long as either of the preceding articles; the fifth article is about one and a half times as long as the fourth; the flagellum consists of twelve articles. The second antennæ, when retracted, extend to the posterior margin of the third thoracic segment.

The first thoracic segment is shorter and narrower than the three following segments and has the lateral margins angulate. There are distinct epimera on the anterior part of this segment which are not present on any of the following segments. The epimera arise from the underside of the lateral margin and project anteriorly beyond the place where they are visible in a dorsal view. The lateral margins of the second segment are also angulate; those of the following segments are straight. The last three segments gradually decrease a little in length. The second, third, and fourth segments are about equal in length. On each one of the segments is a small median tubercle situated close to the posterior margin.

FIG. 34.—SYNIDOTEA EPIMERATA. MAXILLIPED. × 23.

The abdomen is composed of a single segment with a suture line distinct at the sides, but less distinct in the middle, indicating another

partly coalesced segment at the base. The abdomen tapers to the extremity, which has a deep rounded notch or excavation.

Only one specimen comes from station 4987, on the way from Hakodate, Hokkaido, Japan, to Otaru, Hokkaido, Japan, by way of Tsugaru Strait, at Kamoi Mizaki Light, N. 76° E., 3.2 miles (lat. 43° 19′ 20″ N.; long. 140° 17′ E.), at a depth of 59 fathoms in a rocky bottom.

This species differs from all the other species of *Synidotea* in the presence of distinct epimera on the first thoracic segment.

Type-specimen.—Cat. No. 39518, U.S.N.M.

SYNIDOTEA TUBERCULATA, new species.

Body oblong-ovate, about twice as long as wide (8½ mm.; 16½ mm.). Head with the front excavate in the middle, on either side of which the frontal border is wide and forms an angle with the lateral portion. This angle is elevated in the form of an arched tubercle. Just back of the median excavation are two large, prominent tubercles, one on either side of the median line. Posterior to these two tubercles is a transverse row of six low tubercles, three on either side of the median line. Posterior to these six tubercles is a ridge which is elevated to form three low tubercles, one median and one on either side of it. The eyes are large, round, composite, and situated close to the lateral margin on the posterior half of the head; they are somewhat elevated on rounded lobes. The first pair of antennæ have the first two articles subequal; the third and fourth are also about equal in length and each is a little longer than either of the first two. The first antennæ extend to the end of the fourth article of the peduncle of the second antennæ. The first two articles of the second pair of antennæ are short and subequal; the third is as long as the first two taken together; the fourth is a little longer than the third; the fifth is a little longer than the fourth; the flagellum consists of thirteen articles. When retracted, the second antennæ extend to the posterior margin of the second thoracic segment. All the epimera are firmly united with the segments.

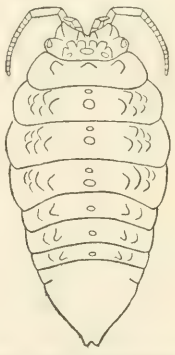

FIG. 35.—SYNIDOTEA TUBERCULATA. × 2½.

The first four segments of the thorax are longer than the last three, which gradually decrease a little in length. The first segment has a prominent median tubercle, and a prominent arched, hornlike tubercle on either side of the median tubercle. The second, third, and fourth segments have each a median tubercle, and on either side of it a group of five or six tubercles, two of the group being larger and more con-

spicuous than the others. The fifth, sixth, and seventh have each a median tubercle, and on either side of it a group of two large tubercles surrounded by low areolations.

The abdomen consists of a single segment, with a suture line on either side at the base, indicating another partly coalesced segment. The abdomen tapers to a narrow extremity, which posteriorly is notched.

The first pair of legs are shorter than the following six pairs, and are prehensile. All the others are similar, and have the basis produced on the upper side in a ridge which is bilobate.

Eight specimens of this species come from the following localities: Station 5020, station 5021, station 5023, and station 5024, off the eastern coast of Saghalin Island, vicinity of Cape Patience, in Okhotsk Sea, at lat. 48° 32′ 45″ N.; long. 145° 07′ 30″ E.; lat. 48° 32′ 30″ N.; long. 145° 08′ 45″ E.; Flat Hill, N. 53° W.; Cape Patience, S. 77° W. (lat. 48° 43′ 30″ N.; long. 145° 03′ E.); Flat Hill, N. 48° W.; Cape Patience, S. 74° W. (lat. 48° 43′ 10″ N.; long. 144° 59′ 30″ E.), at a depth of 67–75 fathoms, in sand, pebbles, and green mud.

This species is perhaps closer to *Synidotea consolidata* (Stimpson), from Pacific Grove, than to any other species.

Type-specimen.—Cat. No. 39519, U.S.N.M.

Genus CLEANTIS Dana.

CLEANTIS ISOPUS Miers.

Cleantis isopus Miers, Journ. Linn. Soc. London, vol. 16, 1883, pp. 80–81, pl. 3, figs. 9–11.—Grube (MS. in Brit. Mus.).

Locality.—Two specimens from Hakodate Bay, Japan; four specimens from Mororan, Japan. Miers's specimens were from Ojica, Goto Island, lat. 33° 12′ 30″ N.; long. 129° 5′ E. Grube's specimens were from Chefoo.

Depth.—Taken on the shore.

The palp of the maxilliped is composed of five articles as in *Cleantis planicauda* Benedict.

ASELLOIDEA or ASELLOTA.

Family JANIRIDÆ.

Genus JANIRA Leach.

JANIRA JAPONICA, new species.

Body oblong-ovate. Color, in alcohol, yellow. Surface smooth and free from spines.

Head wider than long, with the front between the antero-lateral angles, triangularly produced. Antero-lateral angles narrow and but little produced; their extremities are rounded. Eyes large, oval, composite, and placed halfway between the anterior and the posterior margins, and a distance from the lateral margin equal to the width of one eye. The first pair of antennæ have a peduncle of

three articles and a flagellum of about ten articles. The second pair of antennæ are broken at the end of the third article; there is a scale articulated to the third article.

The first three segments of the thorax are about equal in length; the fourth and fifth are shorter; the last two are subequal and are the longest. The lateral margin of the first segment has the posterior half produced in a slight rounded lobe; the epimeron is situated on the anterior half of the lateral margin and is in the form of an angular lobe, projecting as far as the posterior lobe of the lateral margin. The lateral margin of the second segment is straight, with the anterior and posterior angles slightly produced in a lobe; the epimeron is small, bilobed, and placed between the anterior and the posterior lobes. The third segment has the lateral margin nearly straight, with the anterior and posterior angles also slightly produced in a lobe; the epimeron consists of two rounded lobes placed between the anterior and the posterior lobes. The fourth segment has the antero-lateral margin produced in a rounded lobe; the epimeron consists of a double lobe placed below this. The fifth segment has the anterior angle of the lateral margin, slightly produced in a lobe; the epimeron consists of a double lobe just posterior to the posterior lobe of the segment. The sixth and seventh segments have the anterior part of the lateral margins produced in a large lobe, with the epimeron double and placed on the posterior half of the lateral margin.

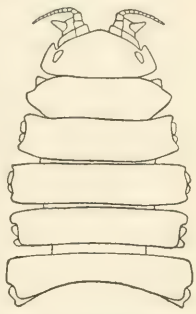

FIG. 36.—JANIRA JAPONICA. HEAD AND FIRST FIVE SEGMENTS OF THORAX. × 9⅜.

FIG. 37.—JANIRA JAPONICA. LAST TWO SEGMENTS OF THORAX AND ABDOMEN. × 9⅜.

The abdomen has the posterior margin broadly triangular, the median angle and the lateral angles rounded. The uropoda are about as long as the abdomen. The branches are almost equal in length, the outer one being but slightly shorter than the inner. They are about one and a half times longer than the peduncle. The first pair of legs are prehensile; the following six pairs are ambulatory and furnished with biunguiculate dactyli.

Only one specimen, a female, was collected at station 4915, 10 to 20 miles southwest of Koshika Islands, Eastern Sea, at Tsurikake Saki Light, N. 62° E., 14.8 miles (lat. 31° 31′ N.; long. 129° 25′ 30″ E.), at a depth of 427 fathoms in gray globigerina ooze and broken shells.

Type-specimen.—Cat. No. 39520, U.S.N.M.

MICROPROTUS, new genus.

Head with short truncated rostrum and without eyes. First pair of antennæ with the first article of the first pair of antennæ produced at the outer anterior angle; flagellum multi-articulate. Second antennæ with the flagellum multi-articulate.

Molar expansion of mandibles well developed. Palp three jointed. First four segments of thorax provided each with three long dorsal spines, one in the median line, and one on either side, at the antero-lateral angle; the last three segments provided with three long spines, one median and one on either side, all close together, and the antero-lateral angles produced in a long spine on either side.

The epimera of the second, third, and fourth segments of the thorax produced in two spines, the anterior one being longer. The epimera of the last three segments, in the form of small rounded lobes, situated on the posterior half of the segment.

Abdomen with the lateral margins produced in two spines on either side, and the posterior margin produced in two spines.

Uropoda consisting of a peduncle and two branches.

The first pleopoda of the male have the distal extremity of the peduncle produced.

First pair of legs small, short, and feeble; the following six pairs robust and similar in character. The second, third, and fourth pairs gradually increase in length. Dactylus bi-unguiculate.

This genus has affinities with the *Munnopsidæ*. The short, truncated rostrum, the absence of eyes, the small and short first pair of legs as compared with the three following pairs and the form of the first article of the first pair of antennæ are characters similar to those found in that family. The absence of natatory legs, the general form of the body and the style of uropods, however, are characters referable to the *Janiridæ*.

The type of the genus is *Microprotus cæcus*, the description of which follows:

MICROPROTUS CÆCUS, new species.

Head, with the anterior margin almost straight, and produced in the middle in a small, truncated rostrum. Eyes wanting. First pair of antennæ, with the first article large and produced at the outer anterior angle; second article about half as long as the first and only half as wide; third article more slender than the second and a little longer. Second antennæ with the second article of the peduncle provided with a long spine; the third article is provided with a long spine on the underside; the fourth article is provided with two long spines, one above and one on the underside; the fifth and sixth articles are long and slender and are not armed. The flagellum is elongate and multiarticulate.

The first segment of the thorax is provided with three spines, one in the middle on the anterior margin and one at the antero-lateral angle on either side. The median spine is about twice as long as the lateral spines. The second, third, and fourth segments are each provided with three spines, one median spine on the anterior margin and a spine on either side on the anterior margin close to the lateral margin; these spines are all of nearly equal length; the epimera of these segments are drawn out in two spines, an anterior spine and a posterior spine, the anterior one being twice as long as the posterior one. The three following segments are each furnished with three spines in a transverse row near the posterior margin, a median small spine and one on either side, some distance from the lateral margin; the lateral spines are longer than the median spines and decrease gradually in length from the fifth to the seventh segments; the antero-lateral angles of these last three segments are produced in an extremely

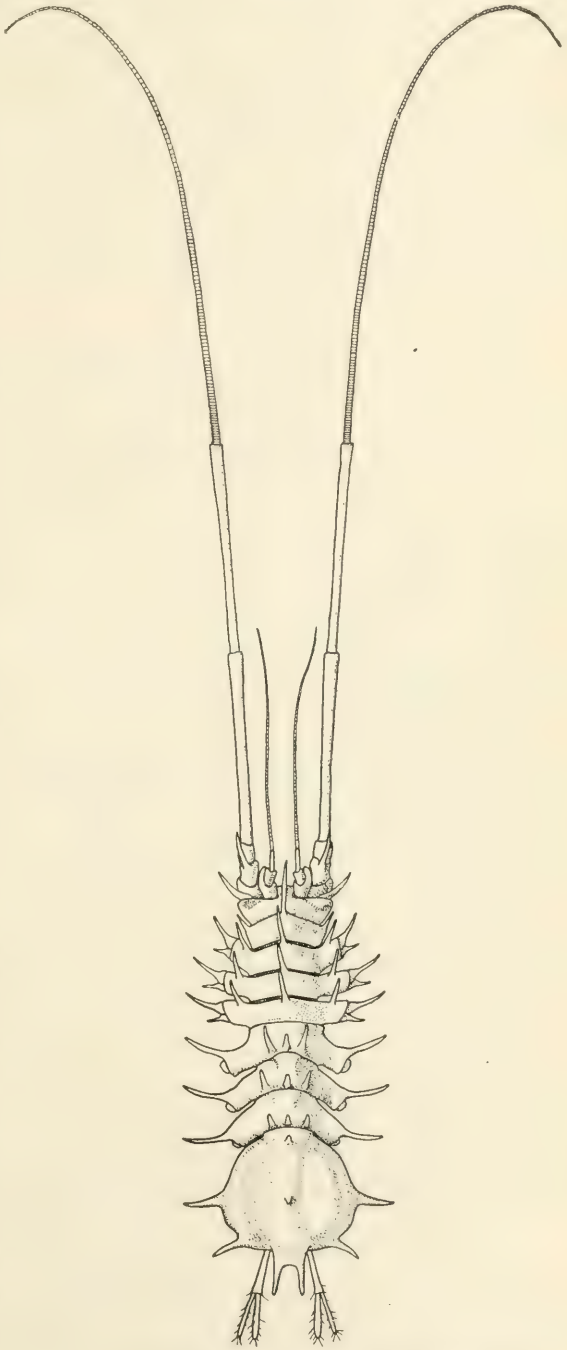

FIG. 38.—MICROPROTUS CÆCUS. × 3.8. (Drawn by Miss V. Dandridge.)

long spine, one on other side; the epimera are in the form of small rounded lobes at the post-lateral angles and are unarmed.

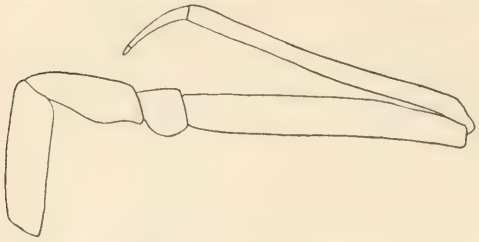

FIG. 39.—MICROPROTUS CÆCUS. SECOND THORACIC LEG. × 14½.

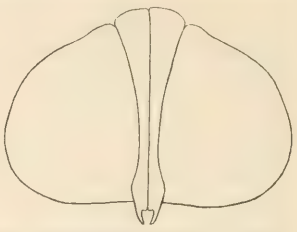

FIG. 40.—MICROPROTUS CÆCUS. FIRST AND SECOND PLEOPODS OF MALE. × 9⅝.

The abdomen consists of a single large segment, which is produced on either side about the middle in a single long spine, directed outward, and at the post-lateral angle in another long spine, also directed outward. The abdomen is posteriorly produced in a process terminating in two long spines, one on either side of the median line. At the base of the abdomen in the median line is a single small tubercle. There is also a single small tubercle in the middle of the segment on the dorsal surface. The peduncle of the uropoda is long and slender, and reaches almost to the extremity of the terminal spines of the abdomen. The branches are about equal in length and also about as long as the peduncle.

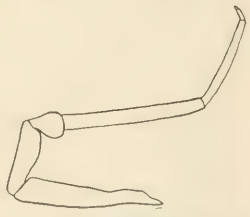

FIG. 41.—MICROPROTUS CÆCUS. FIRST THORACIC LEG. × 14½.

The first pair of legs are very small, short, and feeble. The following six pairs are robust and similar in character. The second, third, and fourth pairs gradually increase in length. All the articles are long and slender, especially the merus and propodus. The legs terminate in bi-unguiculate dactyli.

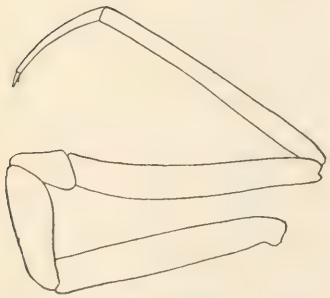

FIG. 42.—MICROPROTUS CÆCUS. SIXTH LEG. × 14½.

Only a single specimen, a male, was collected at station 4781, on the way from "Petrel Bank," Bering Sea, to McDonald Bay, Agattu Island, Aleutians, by the passage east of Semisopochnoi and Amchitka Islands at lat. 52° 14′ 30″ N.; long. 174° 13′ E. at a depth of 300 fathoms in fine gray sand and pebbles. An imperfect specimen, a male, also comes from the same locality.

Type-specimen.—Cat. No. 39521, U.S.N.M.

Family MUNNOPSIDÆ.

Genus MUNNOPSIS M. Sars.

MUNNOPSIS LATIFRONS Beddard.

Munnopsis latifrons Beddard, Proc. Zool. Soc. London, 1885, pt. 4, p. 917; Challenger Report, vol. 17, 1886, p. 56, pl. 10, figs. 1–4.

Localities.—Station 5082, off Omai Saki Light (20 to 40 miles distant), N. 22° E., 33 miles (lat. 34° 5′ N.; long. 137° 59′ E.); station 4919, about 90 miles WSW. of Kagoshima Gulf, Eastern Sea, at Kusakaki Jima, N. 18° E., 17.6 miles (lat. 30° 34′ N.; long. 129° 19′ 30″ E.).

Beddard's specimen was from off Ino Sima Island, Japan.

Depth.—Six hundred and sixty-two fathoms in green mud, fine sand, and globigerina; 440 fathoms in globigerina ooze.

Beddard's specimen came from a depth of 345 fathoms in green mud.

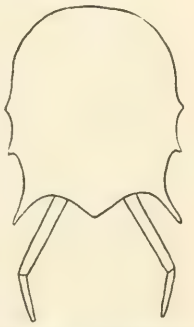

Fig. 43.—Munnopsis latifrons. Abdomen. × 4⅔.

Four specimens of this species were collected by the United States Bureau of Fisheries steamer *Albatross*. In his description of the form Beddard says: "The abdominal shield was, unfortunately, considerably damaged, so that its shape can not be described with great accuracy; it appears to be more or less oval in form and truncated at its free extremity; laterally and just in front of the articulation of the long styliform uropoda is a spiny process directed backward nearly in the same straight line with the longitudinal axis of the abdominal shield."

Fig. 44.—Munnopsis latifrons. Seventh leg. × 4⅔.

In the specimens found by the *Albatross* the abdomen is posteriorly triangular between the two post-lateral spines, and not truncate, as described by Beddard. There are also two small spines on the lateral margin on either side. Because Beddard's specimen was imperfect, I have made a drawing of the abdomen as it appears in the *Albatross* specimen. I have also made a drawing of one of the natatory legs.

MUNNOPSIS, new species.

About twelve specimens of a new species of *Munnopsis* were collected from stations 4765, 4766, 4793, and 4800. All the specimens were mutilated, so that a complete description is not possible.

Genus EURYCOPE G. O. Sars.

EURYCOPE LÆVIS, new species.

Body oblong-ovate, about two and a half times longer than wide, 4 mm.: 10 mm.

Surface perfectly smooth; color, in alcohol, yellow.

Head much wider than long, with the anterior margin produced in the middle in a wide truncated process. Eyes absent. First pair of antennæ with the first article large and dilated; the second and third are very short and about equal in length. The flagellum is composed of numerous articles. The second antennæ are broken at the end of the third article.

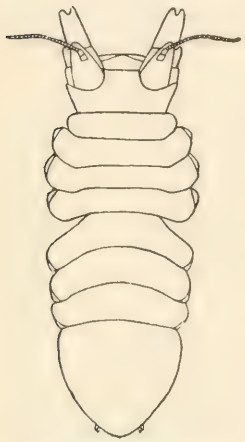

FIG. 45.—EURYCOPE LÆVIS. × 5¼.

The first four segments of the thorax are about equal in length and they are also about as long as the head. The first segment is as wide as the head; the three following are equal in width and a little wider than the first. Epimera are present on the second, third, and fourth segments in the form of narrow plates occupying the entire lateral margin. The last three segments of the thorax gradually increase in length; the fifth is about one and a half times longer than the fourth, but is of equal width; the sixth is twice as long as the fourth; the seventh is about two and a half times longer than the fourth. Epimera are present on the last three segments in the form of narrow plates occupying the posterior two-thirds of the lateral margin.

The abdomen consists of a single, large segment, tapering posteriorly to a rounded extremity. The uropoda are double-branched, both branches being very small and short, the inner slightly longer than the outer.

The first pair of legs are shorter than the three following pairs, which are greatly elongated and gradually increase in length. The last three pairs are natatory.

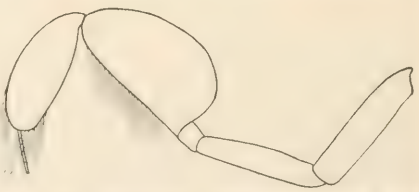

FIG. 46.—EURYCOPE LÆVIS. ONE OF THE NATATORY LEGS. × 14½.

Only three specimens, all mutilated, come from station 4907, 10–20 miles southwest of Koshika Islands, Eastern Sea, at Tsurikake Saki Light, S. 83° E., 14.7 miles (lat. 31° 39′ 30″ N.; long. 129° 24′ E.) at a depth of 406 fathoms in gray globigerina ooze; from station 4774,

on "Bowers Bank," Bering Sea, at lat. 54° 33′ N.; long. 178° 45′ E., at a depth of 557 fathoms; and station 5037, off Otchishi Saki, eastern end of Hokkaido, Pacific Ocean, at Urakawa Light, N. 52½° E., 11.9 miles (lat. 42° 02′ 40″ N.; long. 142° 33′ 20″ E., at a depth of 349 fathoms.

The only species of *Eurycope* recorded from Japan is *E. fragilis* Beddard[a] from off Yokohama, which is entirely different from the species described here.

Type-specimen.—Cat. No. 39522, U.S.N.M.

BOPYROIDEA or EPICARIDEA.

Family BOPYRIDÆ.

Genus PHRYXUS Rathke.

PHRYXUS ABDOMINALIS Krøyer.

Bopyrus abdominalis Kroyer, Nat. Tidsskr., vol. 3, 1840–1841, pp. 102–112, 289–299, pls. 1, 2.

Phryxus abdominalis Lilljeborg, Œfvers, Kongl. Vet. Akad. Forh., vol. 9, 1852, p. 11.—Harger, Report U. S. Fish Comm., 1880, pt. 6, p. 312. (See Harger for further synonymy.).—Richardson, Bull. U. S. Nat. Mus. No. 54, 1905, pp. 500–503.

Localities.—Station 4814, on the way from Hakodate, Japan, to Ebisu, Sado Island, Sea of Japan, at north point Sado Island, S. 42° W., 15.7 miles (lat. 38° 32′ N.; long. 138° 43′ E.) on *Spirontocaris*, species (?) at a depth of 429 fathoms; station 4782, on the way from Agattu Island to Chichagof Harbor, Attu Island, by the Semichi Islands, Aleutians, at East Cape, Attu Island, S. 22° W., 4 miles (lat. 52° 55′ N.; long. 173° 27′ E.) at a depth of 57 fathoms; station 4992, on the way from Otaru, Hokkaido, Japan, to Korsakov, Aniwa Bay, Saghalin Island (by the Gulf of Tartary and La Perouse Strait) at Bomasiri Shima (off N. end of Rebun To), N. 52° E., 8 miles (lat. 45° 24′ N.; long. 140° 49′ 10″ E.), on *Spirontocaris*, species (?) at a depth of 325 fathoms; station 4853, on the way from Matsu Shima, Sea of Japan (off coast of Korea), to Nagasaki, Japan, at C. Clonard, S. 80° W., 9.8 miles (lat. 36° 08′ N.; long. 129° 49′ E.) on *Spirontocaris* species (?) at a depth of 335 fathoms; station 5020, off eastern coast Saghalin Island, vicinity of Cape Patience, in Okhotsh Sea, at lat. 48° 32′ 45″ N.; long. 145° 07′ 30″ E. on *Spirontocaris* species (?) at a depth of 73 fathoms, and station 5021, at lat. 48° 32′ 30″ N.; long. 145° 08′ 45″ E. on *Spirontocaris* species (?); station 5045, south coast of Hokkaido, at lat. 42° 11′ 10″ N.; long. 142° 12′ E. on *Spirontocaris* species (?) at a depth of 359 fathoms.

Character of bottom.—Found in rocks and gravel and in brown mud.

[a] Challenger Report, vol. 17, 1886, pp. 63–66, pl. 9, figs. 8–12.

Genus PARAPENÆON Richardson.

PARAPENÆON CONSOLIDATA Richardson.

Parapenæon consolidata RICHARDSON, Proc. U. S. Nat. Mus., vol. 27, 1904, pp. 43–44.

Localities.—At Tsuruga on a Penæid; station 4942, in Kagoshima Gulf at Chirin Jima △, S. 12½° E., 6.6 miles (lat. 31° 23′ 10″ N.; long. 130° 39′ 10″ E.), from branchial cavity of a Penæid.

Depth.—One specimen was collected on the shore; the other comes from a depth of 118 fathoms.

The type-specimen is from Mogi, Japan.

Genus ARGEIA Dana.

ARGEIA PUGETTENSIS Dana.

Argeia pugettensis DANA, U. S. Expl. Exp., Crust., vol. 14, 1853, p. 804, pl. 53, fig. 7.—STIMPSON, Bost. Journ. Nat. Hist., vol. 6, 1857, p. 511.—RICHARDSON, Proc. U. S. Nat. Mus., vol. 21, 1899, p. 868; Ann. Mag. Nat. Hist. (7), vol 4, 1899, p. 337; American Naturalist, vol. 34, 1900, p. 308.—BONNIER, Travaux de la Station Zool. de Wimereux, vol. 8, 1900, pp. 327–328.—RICHARDSON, Proc. U. S. Nat. Mus., vol. 27, 1904, pp. 60–64; Bull. U. S. Bureau of Fisheries, vol. 24, 1905, p. 220; Bull. U. S. Nat. Mus., No. 54, 1905, pp. 544–550.

Argeia, species (?) CALMAN, Ann. N. Y. Acad. Sci., vol. 11, 1898, p. 281.

Argeia calmani BONNIER, Travaux de la Station Zool. de Wimereux, vol. 8, 1900, p. 329.

Localities.—Hakodate, Japan; station 5000, in the Gulf of Tartary, off southwestern coast of Saghalin, at lat. 47° 35′ N.; long. 141° 43′ E., and station 5003, lat. 47° 32′ 30″ N.; long. 141° 45′ E.; station 4870, on the way from Matsu Shima, Sea of Japan (off coast of Korea) to Nagasaki, Japan, at lat. 36° 30′ 30″ N.; long. 129° 43′ E.

Depth.—Surface light; 31–94 fathoms in green mud and gray sand.

Parasitic on *Nectocrangon*, species (?)

Genus BOPYROIDES Stimpson.

BOPYROIDES HIPPOLYTES (Krøyer).

Bopyrus hippolytes KRØYER, Kongelige Danske Videnskabenes Selskabs naturvidenskabelige og mathematiske Afhandlinger, vol. 7, 1838, p. 306 (78), pl. 4, fig. 22.

Bopyroides acutimarginatus STIMPSON, Proc. Acad. Nat. Sci. Phila., vol. 16, 1864, p. 156.

Gyge hippolytes HARGER, Report U. S. Fish Comm., 1880, pt. 6, p. 311.

Bopyroides hippolytes RICHARDSON, Bull. U. S. Nat. Mus., No. 54, 1905, pp. 567–572. (See Richardson for further synonymy.)

Localities.—Unalaska on *Spirontocaris*, species (?); station 4778, on "Petrel Bank," Bering Sea, at Semisopochnoi Island, r. t. S. 45° W., l. t. S. 12° W. about 12 miles (lat. 52° 12′ N.; long. 179° 52′ E.) on

Spirontocaris, species (?); station 4788, on the way from Preobrajeniya Bay, Mendi Island, to Nikolski Bay, Bering Island, by the passage between islands at North point Copper Island, N. 76° E., 8.8 miles (lat. 54° 50′ 24″ N.; long. 167° 13′ E.); station 4819, on the way from Ebisu, Sado Island, to Nanao, Noto Peninsula, Hondo, Japan, at Hime Saki Light, S. 16° E., 3.8 miles (lat. 38° 09′ N.; long. 138° 32′ 12″ E.).

Depth.—Forty-three to two hundred and forty-five fathoms in green sand and fine brown mud.

Remarks.—The specimen from station 4778 has five pairs of small, rounded tubercles on the fleshy ridges or modified appendages of the abdomen (the pleopoda).

Family DAJIDÆ.

Genus HOLOPHRYXUS Richardson.

HOLOPHRYXUS GIARDI Richardson.

Holophryxus giardi Richardson, Proc. U. S. Nat. Mus., vol. 33, 1908, pp. 690–692.

Locality.—Station 4793, on the way from Nikolski Bay, Bering Island, Komandorski Islands, to Petropaulovsk, Avatcha Bay, Kamchatka, at Toporkov Island, harbor of Nikolski, Bering Island, N. 58° E., 44 miles (lat. 54° 48′ N.; long. 164° 54′ E.).

Depth.—Two thousand seven hundred fathoms.

Parasitic on *Gennadas borealis* Rathbun.

HOLOPHRYXUS CALIFORNIENSIS Richardson.

Holophryxus californiensis Richardson, Proc. U. S. Nat. Mus., vol. 33, 1908, pp. 692–694.

Locality.—On the way from Yes Bay to Seattle, at Bushby Point.

Depth.—One hundred and fifty to two hundred and eighty fathoms.

Parasitic on *Pasiphæa pacifica* Rathbun.

Genus ARTHROPHRYXUS Richardson.

ARTHROPHRYXUS BERINGANUS Richardson.

Arthrophryxus beringanus Richardson, Proc. U. S. Nat. Mus., vol. 33, 1908, pp. 695–696.

Locality.—One female, with Schizopoda but not attached, from station 4760, on the way from Union Bay, British Columbia, to Dutch Harbor, Alaska, by the Goletas Channel and Unalga Pass, at lat. 53° 53′ N.; long. 144° 53′ W.

Depth.—Two thousand two hundred fathoms.

The type-specimen came from station 4793, on the way from Nikolski Bay, Bering Island, Komandorski Islands, to Petropaulovsk,

Avatcha Bay, Kamchatka, at Toporkov Island, harbor of Nikolski, Bering Island, at a depth of 2,700 fathoms; it was parasitic on *Eucopia australis*.

PROPHRYXUS, new genus.

Body of adult female irregular in outline. Head and first three segments of thorax defined. Last four thoracic segments indicated only in the dorsal region. Lateral parts of thorax swollen and extending backward in a small rounded lobe on either side.

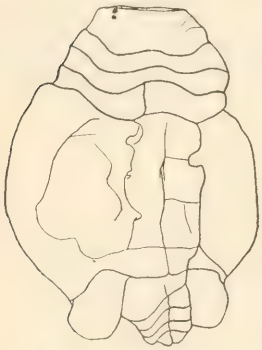

FIG. 47. PROPHRYXUS ALASCENSIS. DORSAL VIEW OF ADULT FEMALE. × 19¾.

Five abdominal segments defined. Pleopods rudimentary.

Five pairs of legs surround the oral area.

Male unknown.

Type of genus.—Prophryxus alascensis.

PROPHRYXUS ALASCENSIS, new species

Body of adult female oval in outline, with the front somewhat quadrangular, more or less depressed. Lateral parts of body swollen, but not projecting anteriorly. Head extending straight in front, with the anterior margin straight. Two little black spots on one side may represent one eye. Head indistinctly defined from thorax.

The first three segments of the thorax are indistinctly indicated; they extend from one side of the body to the other. The following four segments are only indicated in the middle of the dorsal region. The lateral parts of the thorax are expanded and unsegmented, and extend backward in a small posterior lobe on either side of the abdomen, reaching almost to its extremity.

FIG. 48.—PROPHRYXUS ALASCENSIS. VENTRAL VIEW. × 19¾.

The abdomen consists of five indistinctly defined segments, indicated more on one side of the body than on the other. The fifth or terminal segment is bilobate.

In a ventral view of the body there are five pairs of legs surrounding the oral area. There seem to be rudimentary pleopods.

Only one specimen was obtained at station 4759, on the way from Union Bay, British Columbia, to Dutch Harbor, Alaska, by the Goletas Channel and Unalga Pass, at lat. 53° 05′ N.; long. 138° 31′ W. It was taken at a depth of 2,000 fathoms with a schizopod, but unattached.

Type-specimen.—Cat. No. 39523, U.S.N.M.

Attached to one of the legs of *Æga symmetrica* Richardson was a parasite, the outline of which was more or less irregularly transversely oval, with no traces of segmentation on the dorsal surface. The body seems to be converted into a sac for carrying the eggs,

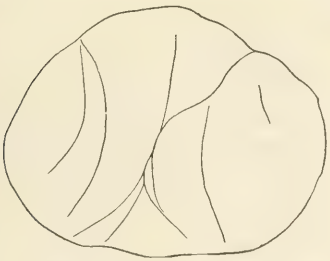

FIG. 49.—ISOPOD PARASITE. DORSAL VIEW. × 14½.

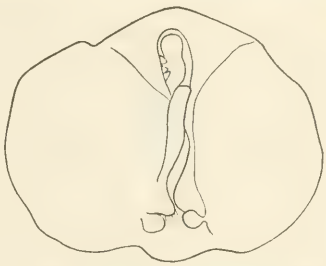

FIG. 50.—ISOPOD PARASITE. VENTRAL VIEW. × 14½.

which fill the lateral portions and can be seen through the thin, almost transparent integument. On the ventral side at the anterior end is the oral opening, below which are the lamellæ which bound the opening into the marsupial cavity. Below these lamellæ are two small oval lamellæ, one on either side.

The specimen shown in figs. 49 and 50 is Cat. No. 39524, U.S.N.M.

ONISCOIDEA.

Family LIGYDIDÆ.

Genus LIGYDA Rafinesque.

LIGYDA PALLASII (Brandt).

Ligia pallasii BRANDT, Bull. Soc. Impér. des Natur. de Moscou, vol. 6, 1833, p. 172.

Ligia dilatata STIMPSON, Bost. Jour. Nat. Hist., vol. 6, 1857, p. 507, pl. 22, fig. 8.—SMITH, Report Progress Geol. Survey of Canada, 1880, p. 218.—UNDERWOOD, Bull. Ill. State Lab. Nat. Hist., vol. 2, 1886, p. 361.

Ligia septentrionalis LOCKINGTON, Proc. Cal. Acad. Sci., vol. 7, 1877, pt. 1, p. 46.

Ligia stimpsoni MIERS, Proc. Zool. Soc. London, 1877, p. 671 (footnote).

Ligia pallasii BUDDE-LUND, Crust. Isop. Terrestria, 1885, pp. 261–262.—RICHARDSON, Proc. U. S. Nat. Mus., vol. 21, 1899, p. 866; Ann Mag. Nat. Hist. (7), vol. 4, 1899, p. 334; American Naturalist, vol. 34, 1900, p. 306; Harriman Alaska Expedition, Crust., vol. 10, 1904, p. 226; Proc. U. S. Nat. Mus., vol. 27, 1904, p. 670.

Ligyda pallasii RICHARDSON, Bull. U. S. Nat. Mus., No. 54, 1905, pp. 682–684.

Localities.—Attu Island; Nazan Bay, Atka.

Depth.—Shore.

LIGYDA EXOTICA (Roux).

Ligia exotica ROUX, Crust. Medit., 1828, p. 3, pl. 13, fig. 9.—BUDDE-LUND, Crust. Isop. Terrestria, 1885, pp. 266–268.—RICHARDSON, Proc. U. S. Nat. Mus., vol. 21, 1899, p. 866; Ann. Mag. Nat. Hist. (7), vol. 4, 1899, p. 335; American Naturalist, vol. 34, 1900, p. 306; Proc. U. S. Nat. Mus., vol. 23, 1901, p. 575.

Ligia gaudichaudii DANA, U. S. Expl. Exp., Crust., vol. 14, 1853, p. 741, pl. 49, figs. 6a–h.

Ligyda exotica RICHARDSON, Bull. U. S. Nat. Mus., No. 54, 1905, pp. 676–677.

Localities.—Matsushima; Same, Rikuoku, Japan.
Depth.—Shore.

LIGYDA CINERASCENS (Budde-Lund).

Ligia cinerascens BUDDE-LUND, Crust. Isop. Terrestria, 1885, p. 265.

Locality.—Hakodate, Japan. Budde-Lund says of the type that it is uncertain whether it comes from Manila or Chile, or was taken in Japan, but he thinks it very likely to have come from Japan.

About six specimens, which I hesitatingly refer to this species, were taken at Hakodate, Japan. They differ from *Ligyda exotica* in having shorter antennæ which do not reach beyond the last thoracic segment and in the much shorter uropoda, which do not quite equal half the length of the body. The body is also more thickly granulated than that of *L. exotica*, and the color is uniformly dark gray.

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FRESH-WATER SPONGES COLLECTED IN THE PHILIPPINES BY THE ALBATROSS EXPEDITION.

By Nelson Annandale,
Superintendent of the Indian Museum, Calcutta.

During the recent expedition of the Bureau of Fisheries steamer *Albatross* to the Philippine Islands a number of fresh-water sponges were collected, which have been referred to me by Dr. Hugh M. Smith, of the United States Bureau of Fisheries and are here reported on.

Genus SPONGILLA.

Subgenus EUSPONGILLA.

SPONGILLA MICROSCLERIFERA, new species.

Sponge light, fragile, tomentose, of a dirty white color in dry specimens, apparently without branches and of no great thickness.

Skeleton practically devoid of spongin, but forming a close and almost regular reticulation in which the radiating and transverse fibers are of approximately equal diameter. The free microscleres extraordinarily abundant in the interstices of the skeleton.

Spicules: Skeleton spicules short, slender, smooth, sharply pointed at either end, feebly curved. Gemmule spicules slender, cylindrical, nearly straight, bluntly pointed at the ends, irregularly covered with short, sharp spines, which are more numerous at the extremities, at which they are usually directed backward, than in the middle. Free microscleres straight or curved, varying greatly in length, of extreme tenuity, densely covered with minute spines.

Gemmules few, free, small, spherical, without a foraminal tubule, with a thick granular coat, in which the spicules are arranged tangentially and horizontally in an irregular manner.

	Mm.
Length of skeleton spicule	.254 – .365
Breadth of skeleton spicule	.0083
Length of gemmule spicule	.0954 – .112
Breadth of gemmule spicule	.0062
Length of free microsclere	.0539 – .1245
Breadth of free microsclere	.00103 – .00207
Diameter of gemmule	.35 – .49

Habitat.—Taal Lake, east side of Taal Island, Luzon, Philippines. H. M. Smith coll., December 26, 1907. "Abundant round shores of lake, and washed up in large quantities after storms." The specimens appear to have coated both surfaces of leaves, which have perished and almost disappeared.

The most noteworthy characters of this sponge are the number and hair-like appearance of the free microscleres, which are sometimes of unusual length in spite of their tenuity. Otherwise there is very little, except perhaps color, to distinguish it from some forms of *Spongilla lacustris*. The specimens I have examined are dry and appear to be somewhat worn on the external surface, but there is no trace of their having borne branches; the oscula seem to have been fairly large. The skeleton, in spite of the closeness of its reticulation, contains much less spongin than is usually the case in *S. lacustris*, but this is a character liable to a certain amount of variation, although perhaps less inconstant than is usually thought.

The type-specimen will be transferred to the U. S. National Museum.

SPONGILLA PHILIPPINENSIS Annandale.

Spongilla philippinensis ANNANDALE, Proc. U. S. Nat. Mus., vol. 36, 1909, p. 629, text figs. 2 and 3.

Several specimens from the original locality, Lake Lanao, Mindanao, collected by Dr. Paul Bartsch, were sent to me. They have a gray color in alcohol. I have not been able to find gemmules in these specimens, which were taken in May, 1908, at Vicars Landing, in shallow water at the edge of the lake, and were attached to submerged drift; but they are full of embryos. The embryos lie in the interstices of the skeleton and have no protecting membrane as is the case in some oriental species.[a] They are so numerous that in preparations made by boiling pieces of the sponge in nitric acid their minute immature skeleton spicules are present in sufficient numbers to appear to be a feature of the species and might easily be mistaken for free microscleres. True flesh spicules are, however, absent.

Only four species of Spongillinæ appear to have been recorded as yet from the Philippines, namely, *Spongilla philippinensis* and *S. clementis* from Mindanao, and *S. microsclerifera* and *Ephydatia fortis* from Luzon. It may be expected that more will be discovered.

[a] Annandale, Records of the Indian Museum, vol. 1, 1907, p. 269.

THE POLYCHÆTOUS ANNELIDS DREDGED IN 1908 BY MR. OWEN BRYANT OFF THE COASTS OF LABRADOR, NEWFOUNDLAND, AND NOVA SCOTIA.

By J. Percy Moore,

Of the Zoological Department of the University of Pennsylvania, Philadelphia.

Our knowledge of the Polychæta of Labrador is very meager, being based almost entirely upon two imperfect lists published by Prof. A. S. Packard in 1863 and 1867, respectively. The second and more complete list embraces 28 species of Polychæta, the determination of several of which is doubtful, though some of the identifications have been verified by Professor Verrill. It was, of course, not to be expected that the Labrador coast would furnish many novelties in this group, but that the fauna would be similar to that of the better-known waters adjacent.

Beginning with Fabricius, in 1780, the Polychæta fauna of Greenland has had many able students down to our own time, and this group of animals is better known in few regions than in this. The ranges of many species, first made known from the waters of Greenland and northern Europe, have been found to extend to the American coast at the region about the Bay of Fundy and the waters surrounding Nova Scotia. Stimpson, Verrill, and Webster and Benedict have described the rich fauna of the former, and McIntosh, in a series of papers, has recorded especially the results of the dredgings of Whiteaves in the Gulf of St. Lawrence. Both regions, while yielding a considerable number of forms peculiar to the American coast, have exhibited a facies essentially Arctic.

It was to be presumed, therefore, that the Labrador Polychæta would belong chiefly to Arctic species, with some additions from the more southern fauna. Packard's lists had already furnished a basis for this expectation, to which the present collection affords welcome confirmation. Fortunately, the bulk of the collection comes from Labrador, where additions to our knowledge were most to be desired. Of the 51 species recorded, 38 are from the coast of Labrador, and only 7 of these appear in Packard's lists, leaving 31 as probably new to that region. The remaining 13 species were dredged mostly off

Cape Sable, Nova Scotia; 6 species have not previously been reported from American waters. In the following list it will be understood that where the name of the Province is omitted the locality is in Labrador.

Family SILLIDÆ.

AUTOLYTUS LONGISETOSUS (Œrsted) Malmgren.

A single male epitoke taken in the tow net off Egg Harbor, August 10, agrees closely with the descriptions and figures of this northern species given by Œrsted, Malmgren, and Verrill. The number of segments (30) in the caudal region is, however, greater, but their total length bears about the same proportion to the other regions. There are 6 setigerous segments in the anterior and 30 in the middle or swimming region. Notocirri of the anterior region bear a large dorsal basal gland, probably represented in Œrsted's figure as a thickening of this region. Some confusion exists in the American records of this species. Verrill reports it from Massachusetts Bay.

Family PHYLLODOCIDÆ.

PHYLLODOCE MUCOSA Œrsted.

Port Manvers, August 21, 30 fathoms, sticky mud; halfway between Cape Mugford and Hebron, August 23, 60 fathoms, mud and sand. This species resembles very closely *P. pulchella* Malmgren and *P. catenula* Verrill. From the latter, so common on the New England coast, it differs in the form of the notocirri and especially in the greater number and smaller size of the papillæ of the basal division of the proboscis. The nuchal papilla, so generally overlooked in members of this genus, is present. The only published American Atlantic record is that of Webster and Benedict for Eastport.

PHYLLODOCE, species.

Off Beachy Island, between Flint Island and Cape Mugford, August 22, 80 fathoms, soft mud. A young specimen 18 mm. long; resembles *P. pulchella* rather more closely than *P. mucosa*, except in the relative length of the seta appendages.

Family POLYNOIDÆ.

HARMOTHOE IMBRICATA (Linnæus) Malmgren.

Egg Harbor, August 10, 7 fathoms, mud; Shoal Tickle, southeast of Nain, August 15; 20 miles northeast of Nain, August 20; Komatoroic Bay, north of Nakoak, August 28, 5 fathoms, rocky; off St. Lawrence Harbor, Placentia Bay, Newfoundland, September 29; St.

Pierre Harbor, October 1, 5 fathoms, rock and gravel; Browns Bank, off Cape Sable, Nova Scotia, October 8, 45 fathoms; 43 miles west by south from Cape Sable, October 8, 110 fathoms, gravel.

This widely distributed species appears to be common throughout the region represented. The usual marked variations in color, marginal ciliation, and papillation of the elytra occur. Packard reports this species as common along the coast of Labrador. It is probable that he did not fully differentiate this from other species of Polynoidæ.

LÆNILLA GLABRA Malmgren.

Egg Harbor, August 10, 7 fathoms, mud. A single example among several of the last, from which it is distinguishable only upon careful examination. Apparently not previously recorded from the American coast.

EUNOE ŒRSTEDI Malmgren.

Browns Bank, off Cape Sable, Nova Scotia, October 8, 40–45 fathoms, rocky and sandy; 20 miles east of Cape Sable, October 7, 70 fathoms, fine sand; about 40 miles west by south from Cape Sable, October 8, 76 fathoms, black gravel. The elytral papillæ are large and usually rough, generally conical, but in some cases bifid or even trifid. On our coast this species occurs as far south as Crab Ledge, off Chatham, Massachusetts, and is common in Casco Bay, Maine.

ANTINOE SARSI Kinberg.

Halfway from Cape Mugford to Hebron, August 23, 60 fathoms, mud and sand. Five typical examples like those occurring on the coasts of northern Europe and Greenland. Known as far south as Casco Bay.

GATTYANA CIRROSA (Pallas) McIntosh.

Egg Harbor, August 10, 7 fathoms, mud; Shoal Tickle, southeast of Nain, August 15; off Beachy Island, between Flint Island and Cape Mugford, August 22, 80 fathoms, soft mud; halfway between Cape Mugford and Hebron, August 23, 60 fathoms, mud and sand; outside of Hebron, August 25, 60 fathoms, gravel; Browns Bank, off Cape Sable, Nova Scotia, October 8, 40 fathoms, rocky and sandy.

Except under date of August 23, when four specimens were taken, single examples only of this species occur in the collections from each locality. From *G. amondseni* in this collection they are readily distinguished by the broader, more depressed form and by the elytra, which have larger and rougher papillæ and much longer marginal cilia; considerable numbers of cilia, not exhibited in Malmgren's figures, are scattered over the dorsal surface also.

GATTYANA AMONDSENI (Malmgren) McIntosh.

Halfway from Cape Mugford to Hebron, August 23, 60 fathoms, mud and sand; off Fish Island, August 25, 75 fathoms, mud; 1 mile north of Battle Harbor, September 14, 50 fathoms, fine sand. These specimens are of a nearly uniform pale gray or brownish gray color and in structural characters agree closely with Malmgren's figures. This and the preceding species are found southward to Provincetown, Massachusetts, and Andrews has reported a specimen of *G. cirrosa* even at Beaufort, North Carolina.

EUPOLYNOE ANTICOSTIENSIS McIntosh.

Egg Harbor, Huntington Island, August 8, 7 fathoms, mud; off Fish Island, outside of Hebron, August 25, 75 fathoms, mud; 1 mile north of Battle Harbor, September 14, 50 fathoms, fine sand.

As its name indicates, this very clearly characterized species was originally described by McIntosh from the Gulf of St. Lawrence and up to the present has not been recorded elsewhere. A single example was taken at each station, and the label accompanying that first recorded bears the interesting memorandum "Worm with row of phosphorescent spots on each side," thus adding this species to the list of known luciferous Polynoidæ.

The dark spot on the elytra mentioned by McIntosh lies at the anterior side of the isthmus of an ∞-shaped, unpigmented spot bounded by the curved brown bands, which, however, may not fully inclose it, but leave it continuous antero-laterally with the colorless covered portion of the elytra. Each segment is marked on the dorsum by a narrow, transverse, greenish stripe and often by a pair of small brown spots.

The proboscis protruded on one specimen measures 5.5 mm. long, 3 mm. wide, and 3.5 mm. deep, with 9 dorsal and 9 ventral orificial papillæ and 4 short, stout, pale-brown jaws of the usual form, but shorter than in most related species.

LEPIDONOTUS SQUAMATUS (Linnæus) Kinberg.

Browns Bank, off Cape Sable, Nova Scotia, October 8, 140 fathoms, rocky and sandy.

Curiously enough, this species, usually so plentiful and ubiquitous on all northern coasts, is represented by a single example only, a specimen about 25 mm. long with bright brick-red elytral papillæ. Packard reports this species as common all along the Labrador coast from the littoral zone to 20 fathoms. It ranges at least to Virginia, and probably beyond.

Family APHRODITIDÆ.

LÆTMONICE FILICORNIS Kinberg.

Off Sable Island, Nova Scotia, 75 miles W.N.W., October 5, 75 fathoms, fine sand. A single fine specimen, which, however, was not sufficiently closely studied to determine if it is really distinct from *L. armata* Verrill, of the New England coast and Gulf Stream slope, which many European students of the Polychaeta consider to be identical. Ehlers considers *L. armata* to be a synonym of *L. kinbergi* Baird, and records the species from the West Indian region. McIntosh reports *L. filicornis* from the Gulf of St. Lawrence and Verrill *L. armata* from the Gulf of Maine, Georges Banks, etc.

Family NEPHTHYDIDÆ.

NEPHTHYS CÆCA (Fabricius) Œrsted.

Egg Harbor, August 10, 7 fathoms, mud; Shoal Tickle, near Nain, August 15; Port Manvers, August 21, 30 fathoms, sticky mud; off Beachy Island, between Flint Island and Cape Mugford, August 22, 80 fathoms, soft mud; half way between Cape Mugford and Hebron, August 23, 60 fathoms, mud and sand; 1 mile north of Battle Harbor, September 14, 50 fathoms, fine sand.

Typical examples of this circumboreal species occur in considerable numbers on both muddy and sandy bottoms. Those from the first-mentioned habitat are chiefly of small size and are more or less deeply pigmented. Those taken on sandy bottoms are colorless, like the representatives of the species in southern New England, which likewise occur on sandy or stony bottoms exclusively. Packard records this species from Labrador, and it is common at Eastport, as reported by both Ehlers and Webster and Benedict.

NEPHTHYS INCISA Malmgren.

East of Cape Sable 55 miles, October 6, 85 fathoms, mud. Several specimens of this species, so abundant on the soft, muddy bottoms of Buzzards Bay, Massachusetts, where it was formerly erroneously identified with *N. ingens* Stimpson. It is common in northern Europe also. From *N. cæca* it is readily distinguished by its much shorter, prismatic body and deeply incised parapodia, as well as differences in papillation of the proboscis and characters of the setigerous rami and setae.

Family NEREIDÆ.

NEREIS PELAGICA Linnæus.

Cock Capelin, Gready Harbor, August 8, 20 miles E.S.E. of Cape Sable, Nova Scotia, October 7, 70 fathoms, fine sand; 14 miles south

of Cape Sable, October 7, 45 fathoms, rocky; Browns Bank, off Cape Sable, October 8, 40–45 fathoms, rocky and sandy.

A single specimen from the Labrador station; common off Cape Sable. Reported by Packard. Circumboreal and south to Beaufort, North Carolina.

Family LUMBRINERIDÆ.

LUMBRINERIS FRAGILIS (Müller).

Port Manvers, August 21, 30 fathoms, sticky mud. Two fragments of anterior ends of a large *Lumbrineris* are referred, with some doubt, to this species. They are 4–5 mm. in diameter, with a faint, narrow brown band on the dorsum of each segment. The form of the head, parapodia, etc., agree with this species. The jaws closely resemble McIntosh's figure, have five obscure teeth on the large right maxilla (II) and four, more distinct ones, on the left. Two hooded crochets appear in the parapodia at XX and two acute limbate setæ remain in the middle of the bundle at LXXV, but have disappeared at XCV. Intermediate forms of setæ occur. Common and generally distributed north of Cape Cod, as well as in European waters, but rare south of Cape Cod.

LUMBRINERIS HEBES Verrill.

Shoal Tickle, southeast of Nain, August 15; off Beachy Island, between Flint Island and Cape Mugford, August 22, 80 fathoms, soft mud.

Two incomplete examples, which agree with Verrill's description in every respect, except that a single acute limbate seta persists in the bundles as far as XL or L, while in examples of this species from southeastern Massachusetts limbate setæ seldom occur beyond somite XX to XXIV.

This species, common throughout the length of the New England coast, has not before been reported north of Eastport, where it was taken by Webster and Benedict.

Family ONUPHIDÆ.

NOTHRIA CONCHYLEGA (Sars) Malmgren.

Egg Harbor, August 10, 7 fathoms, mud; outside of Hebron, August 25, 60 fathoms, gravel; same, August 26, 80 fathoms; off St. Lawrence Harbor, Placentia Bay, Newfoundland, September 29; Browns Bank, off Cape Sable, Nova Scotia, October 8, 45 fathoms; same, 110 fathoms, gravel. From one to four, mostly richly colored examples, at each station. On muddy bottoms the tubes are covered with fragments of shells; on gravelly bottoms with flat bits of rock. This species is well known throughout the northern North Atlantic and occurs as far south as Chatham, Massachusetts.

Family ARICIIDÆ.

SCOLOPLOS ARMIGER (Müller) Blainville.

Off Beachy Island, between Flint Island and Cape Mugford, August 22, 80 fathoms, soft mud; 1 mile north of Battle Harbor, September 14, 50 fathoms, fine sand.

Small incomplete specimens, representing the anterior end only, from these stations agree very closely with the published descriptions and figures of this species. They are much contracted and the anterior branchiæ are very minute, but appear to begin on somite XIII in all cases. Several of the anterior segments are lightly banded on the dorsum with brown; *S. acutum* Verrill is very closely related, if not, indeed, identical, with this northern European species and occurs in southern New England. Webster and Benedict regard it as the same as *S. armiger* which they report from Eastport.

Family CIRRATULIDÆ.

CIRRATULUS CIRRATUS (Müller) Malmgren.

Shoal Tickle, southeast of Nain, August 15. A single much contracted specimen about 30 mm. long and filled with eggs. There are seven or eight conspicuous eye-spots on each side of the prostomium, arranged in a pair of slightly curved oblique lines, converging, but not meeting, in front. This is another of the species reported by Packard.

CHÆTOZONE SETOSA Malmgren.

Off Beachy Island, between Flint Island and Cape Mugford, August 22, 80 fathoms, soft mud.

Four small imperfect specimens 8–15 mm. long agree with Malmgren's description and figures except that they possess a pair of long, stout tentacular cirri (sometimes called palpi) and a larger number of branchial filaments (notocirri). The posterior spines are also more slender and elongated than in the adults. In these respects they agree exactly with examples found at Eastport by Webster and Benedict. The tentacular cirri of many Cirratulidæ are known to be extremely caducous, and this, together with the fact that many become epitokous (recently discovered by Caullery), has caused much confusion and unnecessary multiplication of genera.

Family AMPHARETIDÆ.

SABELLIDES BOREALIS Sars.

Halfway between Cape Mugford and Hebron, August 23, 60 fathoms, mud and sand.

A fine specimen, 60 mm. long and more than 3 mm. in maximum width; segments 29, 14 setigerous. Notocirri begin on XIX and ex-

tend to XXIX, inclusive. Caudal cirri 1.5 mm. long. Branchiæ shorter than in Malmgren's figure and his figures of uncini imperfect in that they fail to show the double series of marginal teeth; those examined have 4 teeth in each series. Tentacles ciliated. The tube is moderately firm with collapsable ends, formed of fine silt, and measures 170 mm. long by 5 mm. in diameter. Not previously reported from the American coast.

SAMYTHA SEXCIRRATA Sars.

Port Manvers, August 21, 30 fathoms, sticky mud.

Two specimens (the largest 22 mm. long, found in a soft mucoid tube) appear to belong to this species, but exhibit several peculiarities. There are only 16 setigerous segments instead of the typical 17; this count is reliable for one specimen, but the other is macerated about the middle, and it is possible that a seventeenth may bear setæ. There are 12 post-setigerous segments, and the pygidium is 4-lobed, with a pair of ventral cirri. One has three pairs of branchiæ arranged typically in a transverse rank on a ridge. On the other the rank is crowded and irregular and on the right side an additional gill —making 7 in all—quite similar to the others arises behind them. The uncini have the marginal teeth in two alternating series of five or six each. Verrill reports this species from several localities on the northern New England coast.

Family AMPHICTENIDÆ.

PECTINARIA (CISTENIDES) HYPERBOREA (Malmgren).

Egg Harbor, August 10, 7 fathoms, mud; off Beachy Island, between Flint Island and Cape Mugford, August 22, 80 fathoms, soft mud; halfway between Cape Mugford and Hebron, August 23, 60 fathoms, mud and sand. The tubes measure from 9 to 72 mm. long, the largest being 9 mm. in diameter at the mouth. The worms have 12 or rarely 13 pairs of paleæ, and the uncini sometimes have 4 instead of 3 large hooks. Though common in Greenland waters, this species is new to the American coast, though it seems probable that some of the records of the closely similar *P. granulata* may refer to this species. *P. granulata* is reported by Packard as common in Labrador, and is recorded from all parts of the New England coast, especially northward.

Family TEREBELLIDÆ.

AMPHITRITE INTERMEDIA Malmgren.

About 40 miles west by south from Cape Sable, Nova Scotia, October 8, 76 fathoms, black gravel. A single specimen 65 mm. long. Verrill has recorded this species from the northern New England coast.

LEÆNA ABRANCHIATA Malmgren.

Egg Harbor, August 10, 7 fathoms, mud. An incomplete specimen in a portion of tube constructed of small shell fragments. There are 11 fascicles of setæ on one side, 10 on the other. The only record of this species on our coasts is the doubtful one in Verrill's check list.

AXIONICE FLEXUOSA (Grube) Malmgren.

Nain, August 18, 7 fathoms, mud; off Beachy Island, between Flint Island and Cape Mugford, 80 fathoms, soft mud; southeast from Burin, Placentia Bay, Newfoundland, September 28, 110 fathoms, rocks and pebbles.

A single specimen of the worm was taken at the station last recorded. At the other stations the characteristic, hard, sandy, regularly flexuous tubes were noted. Another addition to the American fauna.

NICOLEA ZOSTERICOLA (Œrsted) Malmgren.

Egg Harbor, August 10, 7 fathoms, mud. A female, barely 18 mm. long, and having 40 segments, 15 of which are setigerous; contains numerous large eggs. A still smaller male has the sexual cirri already developed. The female has two pairs, the male one pair and an unpaired one, of small little-branched gills. It is possible that these may be small specimens of *N. arctica*, from which species they differ only in their smaller size and slightly developed gills. Webster and Benedict give the only previous record for the American coast, their specimens having been taken at Eastport.

THELEPUS CINCINNATUS (Fabricius) Leuckart.

Near Egg Harbor, August 10, 20 fathoms, rocks; Shoal Tickle, near Nain, August 15; outside Hebron, August 26, 80 fathoms, gravelly; 14 miles south of Cape Sable, Nova Scotia, October 7, 45 fathoms, rocky; Browns Bank, off Cape Sable, October 8, 40 45 fathoms, rocky and sandy; about 40 miles west by south from Cape Sable, October 8, 76 fathoms, black gravel; about 43 miles west by south from Cape Sable, October 8, 110 fathoms, gravel.

This well-known and widely distributed species, originally described from Greenland waters, and known on our coasts southward as far as the banks off Marthas Vineyard and Block Island, occurs generally in the region covered by these explorations. The characteristic tubes are frequently dredged, especially on the gravelly bottoms off Cape Sable. The muddy bottoms off much of the Labrador coast are unfavorable to its presence.

TEREBELLIDES STRŒMI Sars.

Egg Harbor, August 10, 7 fathoms, mud; halfway between Cape Mugford and Hebron, August 23, 60 fathoms, mud and sand; 55 miles east of Cape Sable, Nova Scotia, October 6, 85 fathoms, mud.

A species of wide distribution and frequent occurrence, known on our coast as far south as Vineyard Sound, where it was discovered by Verrill.

Family MALDANIDÆ.

LUMBRICLYMENE, species?

Off Cape Sable, Nova Scotia, 14 miles south, October 4, 45 fathoms, rocky. The anterior ten segments with a color pattern like Arwidssons figure of *L. cylindricauda* but with differently shaped crochets.

PRAXILLELLA GRACILIS (Sars) Verrill.

Egg Harbor, August 8, 7 fathoms, mud. The head and anterior ten setigerous segments of a large individual 70 mm. long and 5 mm. in diameter. Except that the number of uncini in anterior setigerous segments (II–IV) is greater, it agrees fully with descriptions of specimens from northern Europe.

PRAXILLELLA PRÆTERMISSA (Malmgren) Verrill.

Egg Harbor, August 10, 7 fathoms, mud. Represented by a caudal end 1.3 mm. in diameter. The caudal funnel bears 15 very regular, bluntly pointed papillæ as long as one-third of the diameter of the funnel and an unpaired neural filament nearly twice as long. Both this and the preceding species have been reported by Verrill and others from the northern New England coast.

PRAXILLELLA, species?

One mile north of Battle Harbor, September 14, 50 fathoms, fine sand. A much contracted caudal end consisting of four short achætous segments and an anal funnel exactly like Arwidssons *P. affinis* (Taf. fig. 147), but with 36 short, blunt, regular marginal papillæ, which become somewhat shorter and more crowded dorsally; the unpaired ventral one in the neural line about twice as long as the others. Crochets unknown.

MALDANE SARSI Malmgren.

Shoal Tickle, near Nain, August 15; Port Manvers, August 21, 30 fathoms, sticky mud. From the first recorded station comes one and from the second twenty or more fragments of anterior ends, including the head, and from one to ten setigerous segments. The

diameter is from 0.8 to 3.2 mm. The only obvious feature in which these specimens differ from typical examples of the species is the elevation into a ridge of the transverse glandular bow on the dorsum behind the fifth fascicles of setæ. An abundant circumboreal species well known from the coast of northern New England.

Family CHLORHÆMIDÆ.

BRADA GRANULATA Malmgren.

Halfway between Cape Mugford and Hebron, August 23, 60 fathoms, mud and gravel; off Fish Island, outside of Hebron, August 25, 75 fathoms, mud; outside of Hebron, August 26, 80 fathoms, gravel.

These are stout grub-shaped worms measuring 40–45 mm. long and 9–13 mm. in diameter, with 21–23 setigerous segments. There is little doubt that they belong to Malmgrens species, but it seems probable that this is identical with *B. sublevis* Stimpson described from the Bay of Fundy in 1853, as has been suggested already by Webster and Benedict.

TROPHONIA ASPERA Stimpson.

Egg Harbor, August 10, 7 fathoms, mud; Nain, August 18, 7 fathoms, mud; Port Manvers, August 21, 30 fathoms, sticky mud; off Beachy Island, between Flint Island and Cape Mugford, August 22, 80 fathoms, soft mud; outside of Hebron Harbor, August 25, 60 fathoms, gravel. One specimen from each station; a complete one has 32 segments and a length of 45 mm. A tuft of seven rather thick tentacles, having a length equal to one-half the body diameter, is exposed on one side. The setæ of the first three segments are very long, and the first five tufts of notopodials are directed forward. This is one of the species reported by Packard.

FLABELLIGERA AFFINUS Sars.

Egg Harbor, August 10, 7 fathoms, mud; outside Hebron, August 26, 80 fathoms, gravelly; 55 miles east of Cape Sable, Nova Scotia, October 6, 85 fathoms, mud. One specimen from each station, 22 to 60 mm. long. This species and the next are European forms well known on our coast as far south as Casco Bay.

Family SCALIBREGMIDÆ.

SCALIBREGMA INFLATUM Rathke.

Off Cape Sable, Nova Scotia, 55 miles east, October 6, 85 fathoms, mud. One much macerated specimen.

Family STERNASPIDÆ.

STERNASPIS FOSSOR Stimpson.

Off Cape Sable, Nova Scotia, 55 fathoms east, September 6, 85 fathoms, mud.

These specimens are identical with some collected near the type locality by Dr. Harold S. Colton. They differ greatly from the southern New England species which has long gone under Stimpson's name, but which I am unable to distinguish from Mediterranean examples of *S. scutata* (Ranzani). *S. fossor* has seven segments between the genital pores and the anterior margin of the caudal shields, which have obscure ridges and a bright ferruginous color. The cuticle is more or less densely pilose, especially behind the genital pores, where most of the cutaneous papillæ become aggregated in a regular row of low tufts on many of the segments; above the region of the caudal shield they become longer and almost filamentous. Southern specimens, in striking contrast, have eight segments between the genital pores and the caudal shield and the cuticle is nearly smooth. The ranges of these two species on our coasts can not now be stated.

Family ERIOGRAPHIDÆ.

MYXICOLA STEENSTRUPI Kroyer.

Browns Bank, off Cape Sable, Nova Scotia, October 8, 40 fathoms. A young specimen having a total length of 22 mm. and a maximum width of nearly 2 mm. Perfectly colorless except for segmental pairs of conspicuous lateral, small, nearly black eye-spots, arranged in a somewhat irregular series on each side. Common at Eastport and reported by Verrill from Casco Bay, Maine.

Family SABELLIDÆ.

SABELLA CRASSICORNIS Sars.

Off Sable Island, Nova Scotia, 75 miles W. N. W., October 5, 75 fathoms, fine sand. A single specimen 24 mm. long with 14 pairs of branchiæ 8 mm. long marked with five or six regular pale brown bands, at each of which, except the first, a pair of large dark-brown eye-spots is borne on the back of each rachis. The rather stiff tube is strengthened with fine sand grains. Not previously reported from our coasts, though the related *S. pavonica* is well known in New England waters.

CHONE INFUNDIBULIFORMIS Kroyer.

Same station as last. Two specimens.

CHONE, species?.

Near Egg Harbor, August 10, 20 fathoms, rocks. Portion of caudal end of a specimen 3 mm. in diameter. The abdominal uncini have much longer beaks than those of the specimens of *C. infundibuliformis*, longer, indeed, than figured for any of the North Atlantic species. They resemble those of *C. duneri* Malmgren rather more closely.

EUCHONE TUBERCULOSA (Kroyer) Malmgren.

Off Beachy Island, between Flint Island and Cape Mugford, August 22, 80 fathoms, soft mud. Two fine specimens. One is 31 mm. long, the gills being 8.5 mm., the other slightly longer. Both are colorless and both have the left ventral plate of the first abdominal segment more than twice as large as the right and extending in front of it. Tubes of fine silt, terete, 103 mm. long and 2 mm. in diameter.

EUCHONE RUBROCINCTA (Sars) Malmgren.

Egg Harbor, August 10, 7 fathoms, mud. A small specimen 12 mm. long. This is an addition to the North American fauna, but the two preceding species have been taken by Verrill in northern New England.

POTAMILLA NEGLECTA (Sars) Malmgren.

Off Cape Sable, Nova Scotia, 14 miles south, 45 fathoms, rocky; 75 miles WNW. from Sable Island, 75 fathoms, fine sand; Browns Bank, off Cape Sable, October 8, 40 fathoms, rocky and sandy.

The four specimens are larger than is usual for the species in northern European waters, having a thoracic width of 2.6–4 mm. The gills, of which there are 15 or 16 pairs, are either colorless or more or less diffusely colored with pale chestnut or orange brown. Reported by Webster and Benedict from Eastport and by Verrill from Georges Banks.

Family SERPULIDÆ.

FILOGRANA FILOGRANA Berkeley.

Browns Bank, off Cape Sable, Nova Scotia, October 8, a small group of tubes of this species, which occurs southward to Marthas Vineyard.

SPIRORBIS SPIRILLUM Linnaeus.

Egg Harbor, August 10, 7 fathoms, fine mud; Shoal Tickle, 20 miles southeast of Nain, 25 fathoms, gravel; outside of Hebron, August 25, 60 fathoms, gravel; Browns Bank, off Cape Sable, Nova Scotia, October 8, 40 fathoms, rocky and sandy. Most of the specimens are of the ascending (*lucidus*) form attached to bryozoans and

hydroids, but a few of the typical discoid form occur on *Laminaria*, etc. Reported by Packard (not as *spirillum*, but as *S. porrecta*, teste Verrill).

SPIRORBIS CANCELLATUS (Fabricius) Morch.

Egg Harbor, August 10, 7 fathoms, mud. One thick-walled, dextral tube showing carinæ, three teeth at the aperture, and series of basal pits exactly like Levinsen's figure 18. Also in Packard's list.

SPIRORBIS VALIDUS Verrill.

Egg Harbor, August 10, 7 fathoms, mud; Shoal Tickle, August 15, 25 fathoms, gravel; Komactoroic Bay, north of Nakoak, 5 fathoms, rocky. Several tubes attached to pebbles, a broken shell of *Sipho islandica*, and to bryozoans. Both discoid and ascending forms occur, and a few small ones may possibly be *S. tubæformis*. Previously known from Greenland, Grand Banks, etc.

REPORT ON A COLLECTION OF SHELLS FROM PERU, WITH A SUMMARY OF THE LITTORAL MARINE MOLLUSCA OF THE PERUVIAN ZOOLOGICAL PROVINCE.

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INTRODUCTION.

Under the auspices of the Ministerio de Fomento of Peru, Mr. R. E. Coker was engaged in making studies and collections of animals of the Peruvian coast with the intention of contributing to the knowledge of the aquatic resources of the country. In the course of this work numerous economic notes were made in relation to the animals obtained.

On the portion of the collection consisting of Mollusca, the authorities of Peru, through the intervention of Mr. Coker, have requested the writer to prepare a report.

It was found on looking into the matter that no systematic list of the shore mollusks of the Peruvian province had been published for more than half a century. It was thought that the value of this report to the naturalists of Peru and elsewhere would be considerably enhanced, after discussing the collection in question, if to it was added a list of the species reported as occurring on the shores of the Peruvian zoological province. The present report therefore contains both, together with illustrations of the chief economic mollusks of the Peruvian coast and islands contained in the collection.

It should be said that specimens of this collection have been returned with identifications, to the Peruvian authorities, and another series retained in the U. S. National Museum for reference. The notes in small type were prepared by Mr. Coker, who also collected the local names by which the more conspicuous species are known to the fishermen and local salesmen. It will be observed that these "common" names are no more precise or descriptive than those of our own fishermen, the same name being often applied to extremely distinct animals.

ANNOTATED LIST OF THE MOLLUSCA COLLECTED.

ANOMIA PERUVIANA Orbigny.

Plate 28, fig. 4.

Anomia peruviana ORBIGNY, Voy. Amer. Mér., vol. 5, 1846, p. 673.—PHILIPPI, Abb. und Beschr. Neue Conch., vol. 3, 1850, p. 211, pl. 1, fig. 2.

Anomia lampe GRAY, Proc. Zool. Soc. of London for 1849, p. 117.—REEVE, Conch. Icon., vol. 11, *Anomia*, 1859, pl. 4, fig. 16.

Concha perla. Not "Concha de la Perla Viuda," which is applied to *Pteria*, the pearl oyster. Common, sessile on oysters, etc., near Capon and Matapalo.

Distribution.—From San Pedro, California, to Paita, Peru.

Shell very thin, pearly; white or coppery brown on the upper valve, bluish green internally and on the central part of the lower valve; sessile on other shells or smooth objects adhering by a prominent byssus which passes through a large hole in the lower valve. The scars of the muscles in an area on the inside of the upper valve form a nearly even straight row radiating from the direction of the hinge. The species can be distinguished from the other local species, *Anomia adamas* Gray, by the fact that the latter has the two distal scars on the area side by side and about equidistant from the hinge.

These shells have no economic relation unless it is that, when present in large numbers, they are injurious to the oysters upon which they perch, by consuming food the latter might otherwise get, or by overloading the oysters with their weight.

The *A. adamas* Gray, has been collected in Sechura Bay, at Matacaballa, but seems to be less common than *A. peruviana*.

OSTREA MEGODON Hanley.

Ostrea megodon HANLEY, Proc. Zool. Soc. of London for 1845, p. 106.—SOWERBY, in the Conchologia Iconica, vol. 18, *Ostrea*, 1871, pl. 12, fig. 24.

Taken in dredge, Bay of Sechura, about halfway between Bayovar and Matacaballa.

Distribution.—From Scammon Lagoon, Lower California, and the Gulf of California, south to Peru. Fossil in the Antilles.

This species is very thin, narrow, and ribbon like; the margin fluted by four or five broad rounded waves, the color pale brownish when fresh, bleaching to white when beach worn. It has no economic value.

OSTREA CHILENSIS Philippi.

Plate 26, fig. 1.

Ostrea chilensis PHILIPPI, Martini-Chemnitz Conch. Cab., 2d ed., *Ostrea*, 1845, p. 74, pl. 13, figs. 7–8.

Ostra of the fishermen. From the roots of mangroves, near the mouth of the Tumbes River.

Distribution.—From the island of Chiloë northward to the coast of Ecuador.

Shell ovate trigonal, irregular, moderately heavy; externally grayish white, internally white, sometimes faintly tinged with green;

the muscular scars white; the lower valve deep, rugose-scaly, the upper valve nearly flat.

This species is reported by Hupé to have as good a flavor as the edible oyster of Europe, yet the natives of South America will eat it only when cooked. It seems from an economic standpoint to be the most important species of the genus in the region where it occurs. It is easily distinguished from the following species in any of its mutations by the white or pale green margin of the valves.

OSTREA COLUMBIENSIS Hanley.

Plate 26, fig. 2.

Ostrea columbiensis HANLEY, Proc. Zool. Soc. of London, for 1845, p. 107.—SOWERBY, in the Conchologia Iconica, *Ostrea*, 1871, pl. 7, fig. 10a–b.

From the roots of the mangroves near the mouth of the Rio Tumbes; on the beach near the Estero Bendito; and bought in Callao, where they had been brought from the Tumbes region. *Ostra* of the fishermen.

Distribution.—From the Gulf of California south to Coquimbo, Chile.

Shell smaller than that of the preceding species, streaked with purple externally, the margins of the valves and the muscular scars purple or tinged with purple; ligamentary area broad, the beak of the lower valve strongly laterally recurved; form irregularly rounded trigonal, externally more or less lamellose and somewhat obscurely radiately ridged.

This species, distinguished by its purple scars and margins, is gathered for sale in the markets, but never attains the size of *O. chilensis*.

PECTEN PURPURATUS Lamarck.

Plate 26, figs. 5, 6.

Pecten purpuratus LAMARCK, Anim. s. Vert., vol. 6, pt. 1, 1819, p. 166.—SOWERBY, Thesaurus Conch., vol. 1, 1843, p. 53, pl. 15, fig. 113; pl. 16, figs. 123–125.

Concha abanico or conchitas. Taken near San Lorenzo Island, in Callao Bay, in about 15 feet of water, and in Sechura Bay, half-way between Bayovar and Matacaballa.

Distribution.—From Coquimbo, Chile, northward to Ecuador.

Shell orbicular, moderately convex, subequivalve, rather thin, with about 26 flat-topped ribs, laterally fringed, and separated by channeled interspaces; colors white, rose color, and different shades of purple distributed in an irregular manner; the interior zoned with blackish purple.

The large adductor muscle of this species is a delicious morsel when delicately cooked. The Chilean name for the species is *Ostion*.

PTERIA PERUVIANA Reeve.

Plate 28, fig. 1.

Avicula peruviana REEVE, Conchologia Iconica, vol. 10, *Avicula*, 1857, pl. 14, fig. 53.

Concha perla viuda, purchased in Paita.

Distribution.—Gulf of California to Peru.

Shell large, inequivalve, very inequilateral, thin, purple or reddish with radiating yellowish rays externally, internally pearly with a dull margin, hinge line produced into auricles or "wings," the posterior usually longer and more broad, the anterior smaller and separated from the body of the valve by a conspicuous sinus in the flat valve, surface smooth or slightly laminated, the body of the shell plump, the extremities compressed. Byssiferous and potentially migratory.

This is the species originally abundant on this coast which supplied the pearl fisheries of Paita and Sechura bays, and at present the pearl industry of the Gulf of California. For the most part these fisheries have been destroyed by overfishing, and the mollusks no longer occur in sufficient profusion to afford a commerce of real importance.

THE PEARL FISHERY IN PERU IN MODERN TIMES.

It seems that on the finding of pearls two companies were formed, one of which held a concession from the Government to take pearls from Tallara on the north to the Rio Piura on the south, while the latter fished from this river south to the Punta Aguja. The southern company employed divers in Panama, and made a promising start. Something like 200 pearls were taken at the outset, yielding about $2,000 and repaying expenses. After this practically nothing was obtained. They then began exploring with dredges, the two companies finally working in conjunction in this investigation. They worked in water of from 2 to 12 fathoms and up to a distance of 7 miles from the shore, but failed to locate any bank of pearl oysters. It is believed, however, that there is somewhere in the bay a considerable bank of these shellfish, since when the wind blows stiffly from the north the beach is often strewn with the concha perlas. The conchas so found contain few pearls, and these of little value. The rastras which were used for exploring the bay were much like those used in Callao for concha abanicos, but with sharper teeth. No attempts have been made since 1901. The most valuable pearl was black and small, and worth $400. For most of the above information I am indebted to Sr. Manuel Perez, who was the representative of the company which held the southern concession.

Getting such directions as were practicable regarding the location where the conchas were formerly encountered, I made several efforts with rastras to find them, but without success in this direction. Other forms of especial interest were taken, however. Later, at Paita, having obtained a dredge formerly used for the concha perlas, and a guide who had worked with one of the companies, we made other attempts a little south of Paita, but again with no success beyond the finding of a few dead shells. It is evident from this and from the repeated failures of the pearl companies that the locating of these banks would be accomplished only by long and thorough survey.

MYTILUS CHORUS Molina.

Plate 25, fig. 1.

Mytilus chorus MOLINA, Hist. de Chile, 1782, p. 202, ed. 1787, p. 177; Conchologia Iconica, *Mytilus*, pl. 2, fig. 4.

Choro. From Windy Bay, in the southeast part of Independencia Bay.

Distribution.—From Coquimbo, Chile, northward to Peru. Known in Chile as Almeja, or Choro de Concepcion, after Conception Bay, where it abounds.

Shell large, ovate oblong, bluish with a thick black periostracum, smooth or concentrically subrugose; anterior end pointed, recurved; distal end rounded, produced; a single denticle at the hinge; the interior white with a bluish margin; byssus strong.

This is the largest of the mussels on the coast, and is regarded as the best of the edible shellfish. It is collected for the market where plentiful and transported to the principal towns as a standard article of sea food.

MYTILUS MAGELLANICUS Lamarck.

Plate 25, fig. 4.

Mytilus magellanicus LAMARCK, Anim. s. Vert., vol. 6, pt. 1, 1819, p. 119; Encyclop. Méth., pl. 217, fig. 2.

Choro. Ancon and Callao Bays.

Distribution.—From Magellan Straits northward to Chile and Peru; the northern specimens smaller and less rugose than the more southern variety.

Shell of moderate size, straight, ovate-elongate, ventricose, anteriorly attenuated, subpyriform, blackish brown, varying to chestnut, with a thick periostracum; inside with a bluish nacre somewhat distributed in zones; the exterior feebly concentrically sculptured, the anterior half of the shell with more or less distinct radiating grooves and ridges.

Distinguishable from the young of *M. chorus* by the anterior radial sculpture.

MYTILUS ATER Molina.

Mytilus ater MOLINA, Hist. de Chile, 1782, p. 203.

Mytilus orbignyanus HUPÉ, in Gay, Hist. de Chile, vol. 8, 1854, p. 211, pl. 5, fig. 5.

Choro. From rocks along the shore on the northeast side of San Lorenzo Island, Callao Bay. Also taken from the bottom of a small vessel after a voyage from Callao to the island Lobos de Afuera.

Distribution.—From Talcahuano, Chile, northward to Ecuador and the Galapagos Islands.

This species differs from the preceding in being quite smooth, without radiating sculpture, and when full grown does not exceed 3 inches in length. It takes the place of *Mytilus edulis* in the northern

hemisphere, and is chiefly found near tide limits on rocky shores. The specimens collected by Mr. Coker were very young, but seem to be referable to this species.

MYTILUS GRANULATUS Hanley.

Mytilus granulatus HANLEY, Proc. Zool. Soc. of London, for 1844, p. 17.—GAY, Hist. de Chile, vol. 8, 1854, p. 312, pl. 5, fig. 7.

Abundant on the rocky shores of the island Lobos de Afuera.

Distribution.—From Chiloë Island north to the Peruvian coast and islands.

Shell small, trigonal, inflated, thick, yellowish-brown, radiately conspicuously and closely costate, the costæ divaricating and bifurcating; anterior end high, obtuse; posterior end dilated, obliquely truncated; interior whitish, with a crenulate margin; the costæ are more or less distinctly granulate, and the form of the shell variable.

This species has no economic importance.

MODIOLUS GUYANENSIS Lamarck.

Plate 27, fig. 2.

Modiola guyanensis LAMARCK, An. s. Vert., vol. 6, 1819, p. 112.—REEVE, Conch. Iconica, vol. 10, *Modiola*, 1857, pl. 4, fig. 17.

Mejillones. From the flats at Capon and at the mouth of the Tumbes River, embedded in soft mud. They are usually quite buried or covered with mud, but their presence can be recognized by slits in the mud, such as would be made by thrusting in a broad knife blade. They occur in the mud floor of mangrove swamps and are commonly used for food.

Distribution.—Peru to the Gulf of California on the west, Guiana on the north, and south to Rio on the east coast of South America.

This is one of the few species which occur on both the eastern, northern, and western shores of South America. It was described by Lamarck from Guiana; there is a specimen from Rio Janeiro, obtained by Anthony, in the National Collection, and we now have it from Guayaquil and Peru.

Shell oblong, wedge shaped, externally green behind and above; the green area concentrically minutely wrinkled and separated from the rufous brown anterior part by a narrow lighter ray; ventral edge nearly straight, the interior pearly white, purple behind; the anterior end attenuated and the beaks adjacent.

This is one of the most attractive species of the genus when in good condition.

MODIOLUS ARCIFORMIS, new species.

Plate 28, fig. 2.

Huaquilla on the Ecuador border; apparently from a shellheap.

Two fragments of a slender arcuate *Modiolus* were gathered with the other dead shells from the shore at this locality and appear to belong to an undescribed species.

Shell slender, arcuate, of a pale brownish-white color (more or less bleached?) with some purple undertones dorsally; moderately tumid, with nearly terminal, very inconspicuous adjacent beaks; dorsal margin arcuate, very slightly subangulate at the end of the hinge line; posterior end rounded; anterior attenuated and rounded; base flattish and excavated or subconcave; bounded above by an obscure ridge; interior very pearly, of a lurid brown color, especially near the hinder edge, paler in the anterior region; shell margins simple; anterior adductor scar triangular, small, and deep; posterior scar larger, less impressed and near the posterior end of the shell. The type (Cat. No. 207756, U.S.N.M.) measured: Length of shell, 65; height at middle, 21; diameter at middle, 18 mm.

The nearest species to this is Carpenter's *Modiolus mutabilis*, which, however, is not arcuate to any conspicuous extent and has a different basal profile. It is also in all probability when adult a much larger shell.

MODIOLUS PURPURATUS Lamarck.

Modiola purpurata LAMARCK, Anim. s. Vert., vol. 6, pt. 1, 1819, p. 113.
Modiola ovalis CLESSIN, Martini Chemnitz, Conch. Cab., 2d ed., 1889, *Mytilacea*, p. 125, pl. 33, figs. 4, 5.

Choro. Callao Bay, island of San Lorenzo, on rocks; also at Estero Zarumilla on the Ecuador border, near Capon.

Distribution.—From Punta Arenas, Chile, north to Ecuador, on the rocky shores of the whole Peruvian province.

Shell small, oval, coarsely radiately grooved, black or blackish purple with a thick periostracum, solid, angular anteriorly; interior purple, the margin crenate, not denticulate near the hinge; the concentric incremental lines sometimes crenulate the radial ridges.

This small shell has no economic value, but is abundant on the rocky beaches. The beaks are often badly eroded.

LITHOPHAGA (MYOFORCEPS) ARISTATA Dillwyn.

Mytilus aristatus DILLWYN, Descr. Cat. Rec. Shells, vol. 1, 1817, p. 303.—WOOD, Ind. Test., 1828, pl. 12, fig. 8.

Taken in dredge about halfway between Bayovar and Matacaballa, Sechura Bay.

Distribution.—Red Sea, West Africa, West Indies, the west coast of America from the Gulf of California south to Chile, boring in coral, lime rock, and nullipores.

Shell small, slender, thin, nearly cylindrical, rounded and blunt in front, pointed behind; the surface is covered with a thin brown periostracum beneath which the shell is white; it deposits the calcareous matter from its boring on the exterior of the posterior end of the shell, forming a smooth coating which is extended on each valve beyond the end of the valve into a point; these points pass by each other like the blades of a pair of scissors.

This shell is of no economic importance, but is interesting on account of its boring habit and the singular form of the incrustation from which its subgeneric name was derived. The allied *L. attenuata* Deshayes, which also occurs on this coast, is distinguished by having the prolongations of its incrustation proximally flat and opposite like a duck's bill, instead of alternate.

ARCA (ANADARA) GRANDIS Broderip and Sowerby.

Plate 25, figs. 9, 10.

Arca grandis BRODERIP and SOWERBY, Zool. Journ., vol. 4, 1829, p. 365.—REEVE, Conch. Iconica, *Arca*, 1844, pl. 1, fig. 4.

Pata de Burro. From the oyster banks of Matapalo, near Capon, and at Huaquilla, on the northern border of Peru. A large coarse form eaten by fishermen.

Distribution.—From Magdalena Bay, Lower California, south to Peru. Common in the mud about mangrove roots.

Shell large, heavy, white, covered with a strong smooth dark olivaceous periostracum; obliquely subquadrangular, with strong radiating rounded ribs crenulated only near the anterior end of the shell.

The name applied by the Tumbes fishermen to this heavy coarse bivalve is the same which in the south they give to the univalve *Concholepas*.

ARCA (SCAPHARCA) TUBERCULOSA Sowerby.

Plate 27, fig. 4.

Arca tuberculosa SOWERBY, Proc. Zool. Soc. of London for 1833, p. 19.—REEVE, Conch. Iconica, *Arca*, 1844, pl. 3, fig. 18.

Concha prieta. Mouth of the river Tumbes, and near Capon, from the muddy floor of mangrove swamps. Among the first phenomena to catch one's attention on entering the mangrove swamps is a sound, heard repeatedly on every side, as of nuts falling into the water or the soft mud. Tracing the sound with some care, it is found to come from the watery hollows in the mud occupied by the concha prieta, and is presumably made by the sudden closing of its valves under water by the mollusk. This species, though inferior to some other shellfish of the region, is the one most commonly eaten.

Distribution.—From Cedros Island, west coast of Lower California, in mangrove swamps and muddy places, south to Peru.

Shell oval, turgid, oblique, the hinge line subauriculate, with numerous radiating ribs, armed, especially in front, with scattered tubercles; surface covered with a dense, pilose periostracum in life, the shell beneath white and porcellanous; ligamental area narrow, umbones adjacent.

This very common shell somewhat resembles *A. secticostata* Reeve, of the Florida coast.

ARCA (SCAPHARCA) LABIATA Sowerby.

Arca labiata SOWERBY, Proc. Zool. Soc. of London for 1833, p. 21.—REEVE, Conch. Iconica, *Arca*, 1844, pl. 1, fig. 7.

From the flats at Capon.

Distribution.—From San Diego, California, south to Peru.

Shell very small, but having the aspect of *Arca grandis* in miniature. Without close inspection it would be taken for the young of that species. It has no economic importance.

GLYCYMERIS INÆQUALIS Sowerby.

Pectunculus inæqualis SOWERBY, Proc. Zool. Soc. of London for 1832, p. 196 (not of Zool. of Beechey's Voy., 1839, pl. 32, fig. 3).—REEVE, Conch. Icon., *Pectunculus*, pl. 4, fig. 16.

Dredged in 5 fathoms, Sechura Bay, west of Matacaballa.

Distribution.—Gulf of California to Sechura Bay, Peru.

Shell subcordate, solid, heavy, with obtuse radial ridges; lilac gray or white with four or five broad rusty or blackish transverse bands, irregularly disposed; interspaces of the ribs striated; ligament short and a very small part of it behind the umbones.

This species is rare and too small to have any economic value.

GLYCYMERIS OVATA Broderip.

Pectunculus ovatus BRODERIP, Proc. Zool. Soc. of London for 1832, p. 126.—REEVE, Conch. Icon., *Pectunculus*, 1843, pl. 1, fig. 2.

Dredged in Callao Bay, near San Lorenzo Island.

Distribution.—Coquimbo, Chile, northward to the Lobos Islands, Peru, in 17 fathoms.

Shell obovate, convex, smooth, white, with fine transverse lines; the umbones pale chestnut, the interior white with a crenate margin. Periostracum thin, velvety, olive brown.

This species has no economic value and is rather uncommon.

ALIGENA COKERI, new species.

Plate 28, figs. 5, 6.

Attached to worm tubes thrown upon the beach of the lagoon at Capon, Peru. The worms live in the beach. The tubes resembled those of *Chætopterus*.

Shell small, white, thin, very fragile, tumid, more or less medially constricted; beaks full, high, closely adjacent, slightly anteriorly twisted and somewhat in advance of the middle of the shell; valves rounded quadrate, with a wide shallow furrow or constriction extending from the vicinity of the beaks to the middle of the base; ends rounded, base mesially excavated; sculpture consisting of concentric incremental lines and sparser, little-elevated, concentric threads;

the surface seems very liable to injury with resulting irregularities and depressions not normal to the shell; ligament strong, internal, its surface with a slight limy coat not consolidated into a lithodesma; hinge line edentulous, with a small callosity immediately in front of the ligament; pallial line entire, faint; interior of the valves white and smooth.

The type (Cat. No. 207759, U.S.N.M.) measures: Length, 7.5; height, 6.5; diameter, 6.5 mm.

Species of this genus exist on the east coast of the United States, and in the southern Tertiaries from the Eocene up; but this is the first time it has been recognized from the Pacific coast of the Americas. The present species is very similar to the *A. æquata* Conrad, of the Virginia Miocene. It is named for Mr. R. E. Coker.

DIPLODONTA (FELANIELLA) ARTEMIDIS, new species.

Plate 28, fig. 8.

On the "inside" or lagoon beach at Capon, in the sand.

Shell small, rather compressed, suborbicular, slightly inequivalve, the posterior side shorter; white with a polished yellowish periostracum and concentric sculpture, recalling in miniature that of *Dosinia dunkeri;* beaks small, pointed, slightly prosocœlous, adjacent; anterior end evenly rounded; posterior end slightly subtruncate, straighter, a little produced near the base, which is evenly arcuate; ligament strong, somewhat sunken; hingeplate excavated; teeth two in each valve, the anterior in the left and the posterior in the right valve larger and bifid; pallial line entire, margin simple, muscular scars small. Length, 12.0; height, 11.5; diameter, 6.0 mm.

This form has a rather unusual sculpture and polish for a *Diplodonta*, the yellowish periostracum is slightly zoned with pale gray. It has, like other shells of its size, no economic relations.

Type-specimen.—Cat. No. 207758, U.S.N.M.

CHAMA PELLUCIDA Broderip.

Chama pellucida Broderip, Trans. Zool. Soc. of London, vol. 1, 1835, p. 302, pl. 38, fig. 3.

On the shore rocks at the island of Lobos de Afuera, and at Matacaballa, Sechura Bay, Peru.

Distribution.—From California south to Chile and Juan Fernandez Island.

Shell coarse, irregular, variable in form, adherent by the whole of one valve to rocks or other objects; rounded, the valves more or less subspiral; white with occasional reddish streaks on a subtranslucent ground; white within, with a crenulated margin; the exterior rude or rough, often much eroded, sometimes lamellose under favorable conditions of growth, reaching 2 inches in diameter, but having no economic value.

CARDIUM PROCERUM Sowerby.

Cardium procerum SOWERBY, Proc. Zool. Soc. of London for 1833, p. 83; Conch. Ill., vol. 1, 1840, pl. 50, fig. 23.

A fragment was collected at the island Lobos de Afuera.

Distribution.—Cedros Island, Lower California, south to Paita, Peru.

Only a fragment was collected, and it is probably rare on the Peruvian coast.

DOSINIA DUNKERI Philippi.

Cytherea dunkeri PHILIPPI, Abb. und Beschr. neue Conch., vol. 1, 1844, p. 4, pl. 2, fig. 9.—SOWERBY, Thes. Conch., *Artemis*, pl. 140, fig. 5.

From a tidal lagoon at La Boca Grande, Tumbes.

Distribution.—Head of the Gulf of California and southward to Tumbes, Peru, and the Galapagos Islands.

Shell suborbicular, rather tumid, strong, and glossy, of a yellowish-white color, with moderately distant concentric sulci, the interspaces almost lamellar at the extremities of the shell; a few radiating very feeble striæ near the ends of the shell; lunule sunken, cordate; beaks not prominent; the greatest length is on a vertical line from the beaks.

The soft parts are small for the size of the shell and, though eaten by the natives of the Gulf of California, the shell is not sufficiently common to have an economic value.

TIVELA PLANULATA Broderip and Sowerby.

Plate 28, fig. 9.

Cytherea planulata BRODERIP and SOWERBY, Zool. Journ., vol. 5, 1829, p. 48.—SOWERBY, Thes. Conch. *Cytherea*, 1851, pl. 127, fig. 13.

Matacaballa, Sechura Bay.

Distribution.—Gulf of California and southward to Coquimbo, Chile.

MACROCALLISTA (PARADIONE) PANNOSA Sowerby.

Cytherea pannosa SOWERBY, Proc. Zool. Soc. of London for 1835, p. 47; Thes. Conch., 1851, pl. 133, figs. 140–142; pl. 163, figs. 202–203.

Dredged in Sechura Bay, west of Matacaballa, in about 5 fathoms.

Distribution.—Cape St. Lucas, Lower California, southward to Valparaiso, Chile.

Shell small, polished, compressed, obovate, solid, smooth, yellowish, variously painted with brown lines, spots, or streaks; beaks rather prominent; the interior of the shell white, the margins entire.

This little shell in some localities is quite common; in the Gulf of California the dead valves occur in heaps on the beaches, but it is too small to have any economic value, averaging only about an inch in length. It is attractive on account of its pretty and varied colors.

CHIONE ASPERRIMA Sowerby.

Venus asperrima SOWERBY, Proc. Zool. Soc. of London for 1835, p. 42; Thes. Conch. *Venus*, 1853, pl. 155, figs. 57–58.

From the shell heaps at Huaquilla and Matapalo. Common in some localities, especially shelly beaches. "Concha tabaco" of the fishermen, who do not like it, saying it has the flavor of tobacco.

Found associated with the *Anomalocardia*.

Distribution.—Gulf of California southward to the Lobos Islands, Peru.

Shell rounded triangular, moderately tumid, whitish or grayish, with fine, rough, reticulate sculpture; in favorable localities with brown or livid varied painting on a lighter ground; lunule ovate, depressed, whitish.

This shell is recognizable by its rasp-like surface and long anterior cardinal tooth.

CHIONE COMPTA Broderip.

Venus compta BRODERIP, Proc. Zool. Soc. of London, for 1835, p. 43.—SOWERBY, Thes. Conch. *Venus*, 1853, pl. 154, figs. 32–34.

Beach of Sechura Bay, near Matacaballa.

Distribution.—Gulf of California and southward to the Galapagos Islands and Sechura Bay, Peru.

Shell closely resembling *Chione cancellata* of the Atlantic coast, but flatter, more spread at the sides where the radiating threads are divergent, and the concentric sculpture is more laminar and less reflected; the latter is apt to be crowded, ventrally, in senile examples. The shell is white, rounded trigonal, solid, and heavy, with radiating rounded threads and concentric more or less distant lamellæ. The internal margins are crenulate, and the shell rarely exceeds 30 mm. in length. It is too small and not sufficiently abundant to have an economic value.

ANOMALOCARDIA SUBRUGOSA Sowerby.

Plate 26, fig. 3.

Venus subrugosa SOWERBY, Genera of Shells, 1834, fig. 2.

Conchas de los bajos. Near Capon, at the oyster beds of Matapalo, there is along the border of the mangrove swamp a shelly bank about 25 meters wide. From this thousands of these shells may be taken in a short time. They are esteemed as food by the fishermen. They were also taken at Lancha de Fierro, at the mouth of the Tumbes River, and in the tidal lagoon La Boca Grande, at Tumbes; and the dead shells occur in the shell heaps at Huaquilla, on the Ecuador border.

Distribution.—From the Gulf of California to Valparaiso, Chile.

Shell ovate, subcordate, very tumid, thick and solid, the ventral edge much arcuated; color pale, with three or four dark rays; a few large, coarse, smooth, rounded and concentric ribs which become obsolete on the anterior slope and toward the ventral edge; lunule cordate, limited by an impressed line; inner margins crenated; length about 35 mm.

CYRENA ISOCARDIOIDES Deshayes.

Plate 26, fig. 4.

Cyrena isocardioides DESHAYES, Proc. Zool. Soc. of London for 1854, p. 22.—PRIME, Smiths. Misc. Coll. No. 145, 1865, p. 25.

Llurona. Tumbes region, from the Estero Bendito. West Colombia, Deshayes.

These shells were found in some numbers barely covered by the muddy sand and rather high above low-water mark. The animal contains such a quantity of salt water as to be very unpalatable, even if the flesh be repeatedly punctured while roasting.

Shell much inflated, rounded trigonal, cordate, thin; anterior end evenly rounded; posterior side obliquely declining, subtruncate at the extremity; surface smooth except for incremental lines; periostracum thin, velvety, of an olivaceous brown; beaks large, swollen, incurved; shell white with faint violet streaks; hinge plate very narrow, teeth small, nearly equidistant from the cardinals; valves white inside, with sometimes a little violet near the margins, which are entire. Pallial line entire, without the sinus found in other American Cyrenas.

DONAX ASPERA Hanley.

Plate 28, fig. 7.

Donax asper HANLEY, Proc. Zool. Soc. of London for 1845, p. 14.—SOWERBY, Thes. Conch., vol. 3, 1862, p. 307, pl. 1, fig. 24.

Almejas. Found at the sand beach of Santa Lucia, mouth of the Tumbes River. A small but esteemed comestible, abundant on many beaches.

Distribution.—Central America and southward to Tumbes, Peru.

Shell triangular, wedge shaped, small, solid, white or purple; radiately striate in front; on the short posterior side granulated near the angle of the truncation; behind the angle striated; posterior ventral margin denticulate; posterior area convex below, concave above; beaks elevated, the anterior dorsal slope steep.

The color, as in most donaces, is very variable. On the Lower Californian coast shells of this genus, even smaller than *D. aspera*, are washed, thrown, shells and all, into hot water, boiled until the juice is extracted and then strained out, leaving a clear broth of which the flavor is highly praised.

IPHIGENIA ALTIOR Sowerby.

Plate 25, fig. 8.

Capsa altior SOWERBY, Proc. Zool. Soc. of London for 1832, p. 96.—ROEMER, Mon. *Donax*, 1869, p. 114, pl. 21, figs. 1–4.

Playeras. From the flats at Capon, 4 to 6 inches deep in the sand, and from a tidal lagoon at La Boca Grande, Tumbes.

Distribution.—Gulf of California and southward to Tumbes, Peru.

Shell subtriangular, oblong, arcuate, pale green or rosy under an olive periostracum, internally violet; posterior dorsal margin sloping,

rounded at the end; in front subtruncate; ventral edge rounded behind, in front somewhat flexuous; umbones blackish; the internal margins not crenate.

There is no record as to the edibility of this species.

TELLINA (ANGULUS) EBURNEA Hanley.

Plate 28, fig. 3.

Tellina eburnea HANLEY, Proc. Zool. Soc. of London for 1844, p. 61; Mon. *Tellina* in Thes. Conch., 1846, p. 241, pl. 58, fig. 91.

From the flats at Capon.

Distribution.—Gulf of California and southward to Paita, Peru.

Shell small, oblong, compressed, opaque white, glossy, inequilateral, with strong concentric sulci which usually are more feeble in one of the valves; and which become closer and the interspaces sublamellose on passing the flattened area at the upper edge of the more convex valve; posterior end shorter, subcuneiform, anterior edge straight, then rounded down to the base; ligament short and prominent; fold almost obsolete; inside pure white.

An inconspicuous species, not known to have any economic value.

TAGELUS (MESOPLEURA) DOMBEYI Lamarck.

Plate 27, fig. 3.

Solen dombeii LAMARCK, Anim. s. Vert., vol. 5, 1818, p. 454; Encycl. Méth., pl. 224, fig. 1.

Navaja. Taken in sand, under 3 or 4 feet of water, at Chilca Bay, Peru. Used as food, but apparently does not occur abundantly.

Distribution.—From the island of Chiloë northward to Tumbes, Peru.

Shell elongate, parallel-sided, the ends rounded; covered with a dull olivaceous periostracum, white or purplish with an obsolete white ray; beaks subcentral, the ends of the shell gaping slightly; the base with its margin in the middle somewhat concave. Hinge with two inconspicuous cardinal teeth.

SEMELE SOLIDA Gray.

Plate 28, fig. 10.

Amphidesma solidum GRAY, Spicilegia Zoologica, 1828, pl. 6, fig. 6.—HUPÉ, in Gay, Hist. de Chile, vol. 8, 1854, p. 359, pl. 7, fig. 1.

Concha blanca. Bay of Chilca, 30 miles south of Callao.

Distribution.—Chonos Archipelago and northward to Callao, Peru.

Shell thick, solid, suborbicular, compressed, with concentric grooves and delicate radiating striæ; somewhat wrinkled distally; a touch of purple on the hinge margin; ligament internal; lunule minute, lanceolate; cardinal teeth very slender. Not of economic importance.

MESODESMA DONACIUM Lamarck.

Plate 27, fig. 1.

Mactra donacia LAMARCK, Anim. s. Vert., vol. 5, 1818, p. 479.—CHENU, Man. de Conchyl., vol. 2, 1862, p. 79, fig. 341.

Almejas. Ancon. Used for food and bait. Seen not infrequently but irregularly in the market. Also obtained at Mollendo and Sechura Bay.

Distribution.—Whole Peruvian province, from Valparaiso north to Sechura Bay.

Shell white, solid, covered with a straw-colored periostracum; smooth or concentrically obscurely striated; wedge shaped, very inequilateral; shorter end subtruncate, longer end compressed, rounded, much produced.

This is the type of the genus *Mesodesma*.

SAXICAVA SOLIDA Sowerby.

Saxicava solida SOWERBY, Proc. Zool. Soc. of London for 1834, p. 88; Thes. Conch., vol. 4, 1884, p. 133, pl. 471, fig. 12.

Taken from the rocks at north end of the water front at Callao, and from nullipores dredged in 5 fathoms, in Sechura Bay, west of Matacaballa.

Distribution.—From Guayaquil to the Straits of Magellan, boring in soft material.

Shell small, irregular, mostly subcylindrical, distally blunt or subtruncate, chalky, covered with a straw-colored periostracum.

MARTESIA CURTA Sowerby.

Pholas curta SOWERBY, Proc. Zool. Soc. of London for 1834, p. 71; Thes. Conch., vol. 1, 1849, p. 494, pl. 104, figs. 33, 34; pl. 108, fig. 105.

Boring in driftwood on the mud flats of La Pampa, mouth of the Tumbes River, Peru.

Distribution.—Almost world-wide in the tropics; boring in floating timber; West Indies, Panama, Ecuador, and Peru.

Shell oval, pointed behind, rounded in front; valves divided by a transversely grooved band; the anterior area obliquely divided in the adult, the dorsal portion with radiating wrinkles and transverse striæ, the ventral thinner and inflated, only filling the anterior wide gape when the shell is mature; posterior part of the valves concentrically striated; an accessory piece over the beaks on the back of the shell, pointed distally and contracted in the middle; posterior gape covered with a horny cuticle.

These small borers, except as helping to disintegrate sunken driftwood or wrecks, seem to have no economic importance.

XYLOTRYA DRYAS, new species.

Plate 25, figs. 2, 3, 5, 6, 7.

From the stem of a living mangrove at Estero del Palo Santo, Tumbes, Peru.

As a rule, animals belonging to this family excavate their burrows in dead wood, not living trees, though the African mangrove of Senegal is bored in the living state by a true *Teredo*, which received the name of *T. senegalensis* from Blainville. The present species so far as noted is the first to be reported from living trees in America, and the first of the genus *Xylotrya* known to have this habit.

The external surface of the valves, beginning in front, is divided into five areas, of which the first might perhaps be regarded as internal rather than external, though when the muscles are removed it faces outward. It is in reality a myophoric surface, free from periostracum and in life supports very powerful muscles, which hold the two valves together; the surface of this area is rather irregular, the dorsal extremes of the area in the two valves project in blunt points; this area is separated from what is generally called the anterior area of the valves by a deep sulcus, the posterior slope of which terminates in a rounded bounding ridge; the anterior area proper is concentrically sculptured by regular, low, sharp, equally spaced, fine lamellæ with slightly wider interspaces; these are crossed by extremely sharp, fine, close, microscopic, radial striæ; the vertical width of this area is a little more than the width of the premedian area; the sculpture changes abruptly at the junction of the two areas and the angle at the junction of their ventral margins, as of the sculpture, is about 97°. The premedian area is similarly sculptured, but the lamellæ are rather smaller and more close set than in the anterior area, while the radial striæ are coarser and deeper, showing distinctly on the tops of the lamellæ. The postmedian area is feebly concentrically striated, covered with a thin glossy periostracum and more or less brown stained by the mangrove sap; it is separated from the posterior lobe by an angle; the posterior lobe or area is similar in surface and forms somewhat less than a semicircle, low and evenly rounded. The two valves are held together by strong muscles, chiefly attached to three myophoric areas. The first of these, anterior and looking outward and forward, has been described; the second forms an irregular concavely excavated rough surface extending from the anterior sulcus to the angle between the postmedian and posterior lobes of the shell. This surface includes much of the dorsal edges of the original valves, and when the muscles are removed the appearance is as if the valves have been badly eroded, but the condition is the same in the youngest valves I have been able to examine, and if, as seems evident, a considerable portion of the umbonal surface is missing, it has unquestionably been removed by absorption, and not by external erosion. The styloid processes are broad and long, extending nearly to the

nodules on the inside of the ventral points of the valves. They spring from a thick reinforcement of the hinge line, simulating a hinge plate, and they have nothing to do with the muscular system, but, as in the Pholads, are buried within the mass of the body and are probably of use in supporting the internal organs against the violent shocks resulting from its boring operations. From the posterior end of the "hinge plate" to a point on the margin of the valves corresponding to the angle between the postmedian and posterior areas, extends in the adult a broad septum in each valve, continuous on its inner edge with the margin of the valves and on the opposite edge free, with a recess behind it equal in depth to about half the whole width of the septum. The surfaces of these two plates form the third myophoric area above referred to and carry a relatively immense mass of muscular fibers uniting and holding closed the two valves and counteracting the action of the muscles massed on the exterior myophores. In other words, these muscles correspond to adductors of ordinary bivalves as regards their function, while the external muscles operate like a ligament. The nodules on the inside of the distal or ventral ends of the valves are of a rather unusual shape, subcylindrical and blunt at the opposed ends, rapidly cuneate at the proximal ends. The type, an adult shell, (Cat. No. 207695 U.S.N.M.), measures dorsoventrally 20, in length 19, and transverse diameter 19 mm. The soft parts, in alcohol, of this specimen were about 8 inches (20 cm.) in length. The pallets, set rather far back from the siphonal ends, measured about 45 mm. in length, of which 25 mm. is smooth cylindrical stalk, the remainder being vane, of which the mass is set on the stalk inequilaterally, the segments being closely crowded with a serrate profile, and pretty well covered by a thin brownish periostracum which passes over the segments on the back without interruption for the interspaces. The width of the vane is about 5 mm. near the base, gradually narrowing to a point at the tip.

It is somewhat odd that, in comparing the shell of this species with that of other Teredinidæ, the most similar shell found was not that of any *Xylotrya*, but a shell belonging to another genus, the *Teredo norvegica* of Spengler. From this the valves of *X. dryas* differ in having the posterior area axially longer, the postmedian shorter, the premedian wider, and the anterior about the same proportion. The styloid processes are longer; between the root of the process and the anterior end of the thickening I have for convenience called a "hinge plate," there is a small but prominent denticle which I have not found in any other species.

It is not improbable that this species may be confined to the mangroves and not attack dry wood; if so this would account for the form not being reported before.

BULLARIA PUNCTULATA A. Adams.

Bulla punctulata A. ADAMS, Thes. Conch., vol. 2, 1850, p. 604, pl. 123, fig. 77.
Lobos de Afuera Island. One dead specimen.

Distribution.—From Cape St. Lucas, Lower California, and the Gulf of California, southward to Pacasmayo, Peru, and the Galapagos Islands.

Shell oval, involute, solid, with a marbling and punctate painting of reddish brown; surface smooth, length about 25 mm.

SIPHONARIA (LIRIOLA) LESSONI Blainville.

Siphonaria lessoni BLAINVILLE, Dict. Sci. Nat., vol. 32, 1824, p. 267, pl. 44, fig. 2.
From rocks at north of water front, Callao. One specimen.

Distribution.—Straits of Magellan northward to Callao, Peru.

Shell patelliform, erect, the apex rather sharp, recurved; surface feebly radially striate; of a brownish-olive color. Margin entire. Interior brown, polished, the muscular scar interrupted for the passage of the siphon.

This is a very common species, of no economic value, frequently found among true marine limpets on rocks between tide marks. It has been frequently confounded with the *S. tristensis* of Sowerby from Tristan d'Acunha Island in the Atlantic Ocean.

BULIMULUS HENNAHI Gray.

Bulimulus hennahi GRAY, Spicilegia Zool., vol. 1, 1828, p. 5, pl. 5, fig. 5.
Snails from the hills of San Gallan Island, near Pisco, Peru; 1,200 to 1,368 feet above the sea. The lower parts of the island are arid, but the higher parts derive sufficient moisture from the clouds to support a good deal of vegetation and these snails.

Distribution.—Arica, Tacna, and San Gallan Island, Peru.

Shell oval, subacuminate, solid, rather rude, with irregular feeble axial rugosities; color pinkish white, with pink apex, and about seven whorls, the last about equal to the spire, moderately rounded. Aperture ovate, purplish inside, pillar straight; peristome simple, acute; a small umbilical perforation behind the expanded posterior part of the pillar. Length about 27 mm.

These snails have no economic value.

BULIMULUS COKERIANUS, new species.

Plate 23, fig. 3.

Snails from the peaks of Vieja Island, Independencia Bay, at about 1,200 feet elevation.

Shell small, thin, conical, with about eight whorls separated by a distinct but not channeled suture; nucleus smooth, brownish, with

an apical dimple and about a whorl and a half; spire above the last whorl about one-third of the total length or even less; color lilac-gray, with retractive axial streaks, more or less irregular, of purplish brown; aperture ovate, with a sharp simple peristome, a wash of enamel on the body, and a straight, thin, hardly reflected pillar; interior with the coloration shining through the shell and a faint grayish enamel; umbilicus small, deep; sculpture of incremental lines and feeble irregular rugosities. The type (Cat. No. 207700, U.S.N.M.) measures: Height of shell 27; of last whorl 19; of aperture 13.5; maximum diameter of last whorl 15 mm.

This species is most nearly approached by *B. apodematus* Orbigny, but differs constantly in its depressed spire with deep sutures, the very slight masking of the umbilicus by the expansion of the pillar, the aperture slightly more angular at the base, and the deeper and more intense coloration. It is named for the collector of the specimens.

CONUS XIMENES Gray.

Conus ximenes GRAY, Zoöl. Beechey's Voy. p. 119, (pl. 33, fig. 2, 1839, as *C. interruptus* BRODERIP and SOWERBY, Zoöl. Journ., vol. 4, p. 379, 1829; not *C. interruptus* MAWE, Conch., 1828).

Dredged in Sechura Bay, halfway between Bayovar and Matacaballa. One dead specimen.

This is the original *interruptus* of Broderip and Sowerby, as figured in Beechey's voyage. The normal *C. Ximenes*, as described, has additional brown flammules, this variety only the spiral rows of brown dots on a greenish-white ground. The spire has a very shallow channel behind the suture, but is not spirally striated like *C. purpurascens*, or granulated anteriorly as in that species. The shell is covered with a velvety periostracum, while that of *C. purpurascens* is smooth and almost polished.

OLIVA PERUVIANA Lamarck.

Plate 23, fig. 4.

Oliva peruviana LAMARCK, Ann. du Muséum, vol. 16, 1810, p. 317; Encycl. Méth. pl. 364, fig. 3.

Dredged, living, in Sechura Bay, between Bayovar and Matacaballa.

Distribution.—From Valparaiso, Chile, northward to Guayaquil and the Galapagos Islands.

Shell ovate, solid, polished, whitish with irregular brown stripes, sometimes angular, sometimes axially directed. The epipodia behind, from the preserved specimens, seem to form a sort of pocket, which in life should fit over the spire of the shell.

OLIVELLA COLUMELLARIS Sowerby.

Oliva columellaris SOWERBY, Tankerville Cat., App. 1825, p. XXXIV.—REEVE, Conch. Icon. *Oliva*, 1850, fig. 62.
Beach of Sechura Bay, near Matacaballa.

Distribution.—Central American coast, Panama and southward to Paita and Sechura Bay.

Shell small, polished, spire acute, short, last whorl expanded in front, feebly axially striated; pale grayish or lead color, with a heavy whitish body callus, and usually a yellowish spiral band at the middle of the whorl and behind the suture. There is a single strong plait on the anterior edge of the pillar; interior of the aperture purple, showing one paler band. The animal, unlike that of *Oliva*, possesses a small horny operculum. These shells in prehistoric times were used as beads.

OLIVELLA SEMISTRIATA Gray.

Oliva semistriata GRAY, Zool. Beechey's Voy., 1839, p. 130, pl. 36, fig. 10.
Dredged in Sechura Bay, in about 5 fathoms, west of Matacaballa.

Distribution.—Gulf of California and southward to Sechura Bay.

This species is very similar to the last, but has a proportionately longer spire and is less compressed in front. Neither of the species has any present economic value.

MARGINELLA CURTA Sowerby.

Marginella curta SOWERBY, Proc. Zool. Soc. of London for 1832, p. 105; Thes. Conch., vol. 1, p. 397, pl. 76, figs. 88, 89.
Dredged in Sechura Bay, between Bayovar and Matacaballa; found also at the Chincha Islands and Lobos de Afuera Island.

Distribution.—From Panama southward to Iquique, Chile.

Shell small, polished, of a purplish brown, the spire very short, the aperture narrow, nearly as long as the spire, the pillar with four well-marked plaits; the surface without sculpture except faint incremental lines.

This species has no present economic value, but the prehistoric tribes ground off the apex of the spire, strung the shells on a cord, and used them for beads.

MITRA ORIENTALIS Gray.

Mitra orientalis GRAY, in Griffith's Cuvier, 1834, pl. 40, fig. 5.
Taken on rocks of beach at Ancon; one dilapidated specimen.

Distribution.—Valparaiso, north to Ancon.

Shell elongate, turrited, covered with a thick black periostracum which in drying peels off, coarsely feebly spirally striated; the last whorl longer than the spire; aperture about half as long as the shell,

interior livid purple brown or whitish; pillar with three prominent plaits; no operculum. Species of no economic importance.

This species is one of a group of black *Mitras* characteristic of the west coast of the two Americas from California to Valparaiso. These shells have been generally confounded together on account of their general similarity, and the fact that specimens obtained are usually in poor condition, the periostracum at least being almost invariably defective.

SOLENOSTEIRA FUSIFORMIS Blainville.

Plate 22, fig. 3.

Purpura fusiformis BLAINVILLE, Nouv. Ann. du Muséum, Paris, vol. 1, 1832, p. 31, pl. 11, fig. 7.

Dredged in Sechura Bay, west of Matacaballa, in about 5 fathoms. Also found at the Chincha Islands on the shores.

Distribution.—From Panama southward to the Chincha Islands.

Shell ovate, turrited, ventricose, white, covered with a thick lamellose dark olive periostracum; whorls convex, carinated, tuberculous above; the tubercles elevated and compressed; aperture ovate, white; columella smooth; base narrowly umbilicated; canal short, flaring. Operculum elongate with an apical nucleus.

This shell has much similarity to the *Thais kiosquiformis*, with which it has very generally been associated. It can be distinguished by the absence of the lamellose sutural band of the *Thais* and the entirely distinct operculum.

COLUMBELLA PAYTENSIS Lesson.

Columbella paytensis LESSON, Voy. Coquille, vol. 2, 1830, pt. 1, p. 402.—SOWERBY, Thes. Conch., *Columbella*, p. 116, pl. 36, figs. 36–37.

Dredged in Sechura Bay west of Matacaballa, in about 5 fathoms. Also obtained at Lobos de Afuera Island.

Distribution.—Central American coast southward to Sechura Bay, and at the Galapagos Islands.

Shell small, stout, with a short spire and narrow aperture; whorls broadly channeled below the sutures; chestnut brown, more or less dotted with white; outer lip internally denticulated, a few tubercles on the pillar; aperture within whitish or purple; length about 25 mm.

ANACHIS RUGOSA Sowerby.

Columbella rugosa SOWERBY, Proc. Zool. Soc. of London, for 1832, p. 115.—KIENER, Icon., *Columbella*, 1839, p. 46, pl. 16, fig. 4, 1839 (as *C. bicolor* Kiener).

On oysters, at Matapalo, near Capon.

Distribution.—Gulf of California southward to Paita, Peru.

Shell small, ovate, tuberculate, plicate or rudely ribbed axially, the ribs only developed on the upper half of the body whorl; whole

surface with revolving striæ; spire acute, shorter than the body whorl; color white, gray, or olivaceous, with chocolate clouding especially on the back of the body whorl, which is sometimes nearly all chocolate colored; length 18 mm.

These small shells have no economic value in themselves; but they drill the very young oysters when about 10 mm. in diameter, pierce the thin shell, and suck the juices of the animal. If very numerous they might be a serious detriment to the maintenance of growing oysters.

ASTYRIS UNICOLOR Sowerby.

Columbella unicolor SOWERBY, Proc. Zool. Soc. of London for 1832, p. 119.—REEVE, Conch. Icon., *Columbella*, pl. 19, fig. 105.

Dredged in Callao harbor, in 2½ fathoms, near San Lorenzo Island.

Distribution.—From Chiloë Island northward through Chile, Peru, and the Galapagos Islands.

Shell very small, ovate, smooth with revolving striæ near the canal; color chocolate or chestnut brown, with or without a lighter band revolving on the periphery; aperture brownish within; outer lip and pillar with a few obscure denticles in the adult; length about 12 mm.

This small shell, remarkable for its wide geographic range, has no economic relations.

ALECTRION (HIMA) DENTIFERUS Powys.

Nassa dentifera POWYS, Proc. Zool. Soc. of London for 1835, p. 95.—ORBIGNY, Voy. Am. Mér., vol. 5, 1841, p. 432, pl. 61, figs. 22–23.

Dredged in about 9 fathoms, muddy bottom, in Ancon Bay.

Distribution.—Coasts of Chile and Peru, from Valparaiso northward to Panama.

Shell small, turrited, rather thin, obscurely reticulately sculptured, chocolate brown, inside and out, with occasionally a paler peripheral spiral band; outer lip sharp, thin, in the adult having an obscure varix behind it; the sculpture variable in strength; length 20 mm.

This small and unattractive species has no economic importance.

CONCHOLEPAS CONCHOLEPAS Bruguière.

Plate 22, fig. 1.

Buccinum concholepas BRUGUIÈRE, Encycl. Méth., 1789, p. 252.—DILLWYN, Rec. Sh., vol. 2, 1817, p. 611.

Concholepas peruvianus LAMARCK, An. s. Vert., vol. 7, 1822, p. 252.—TRYON, Man. Conch., vol. 2, 1880, p. 199, pl. 162, figs. 314–316.

Pata de burro, of the southern region. Common on some of the rocks some yards from shore and at or below low-water line.

Distribution.—Chincha Islands. Mollendo, and south to the Magellanic region. Also northward, according to E. von Martens, to the west coast of Mexico.

Shell large, rude, with spiral imbricated sculpture, the spire so reduced that the last whorl appears like a large rounded limpet; the color brownish. Inside white, polished, the margin more or less crenulated, and produced toward the anterior edge into two or more projecting denticulations. There is an operculum, but too small to close the aperture, into which the animal can barely withdraw. The shell may reach a length of 80 mm. or even more. It lives seated on rocks like a limpet, though closely related to the genus *Thais*.

Mr. Coker in his notes mentions that this species is sometimes eaten, but not esteemed.

THAIS CHOCOLATA Duclos.

Plate 22, fig. 2.

Purpura chocolata Duclos, Ann. Sci. Nat., vol. 26, 1832, p. 108, pl. 2, fig. 7.
Caracoles. Callao Bay, shore to 2½ fathoms, and on the shore of San Lorenzo Island. This form is commonly sold in the markets, after being removed from the shell.

Distribution.—From Valparaiso, Chile, northward to Paita, Peru.

Shell large, solid, with a short spire and very large body whorl often carinated and more or less tuberculate at the shoulder of the whorl; exterior chocolate color, the aperture within bluish or yellowish, the pillar orange colored; the shell when weathered, as many specimens are, becomes of a grayish color and is frequently more or less eroded. Operculum large with a lateral nucleus; the length of the shell sometimes reaching 3½ inches.

The word "caracoles" seems to be applied by the fishermen to any species of *Thais* or *Solenosteira*, and the general remarks as to edibility, etc., are probably referable to all the Peruvian species of these groups.

THAIS CRASSA Blainville.

Purpura crassa Blainville, Nouv. Ann. du Muséum, vol. 1, March, 1832, p. 241, pl. 12, fig. 4.
Purpura melones Duclos, Ann. Sci. Nat., vol. 26, May, 1832, p. 105, pl. 1, fig. 2.
Purpura melo Reeve, Conch. Icon., *Purpura*, 1846, pl. 4, fig. 17.
Callao, taken in fish-net near San Lorenzo Island.

Distribution.—Panama south to Callao and the Galapagos Islands.

Shell resembling that of the last species, but destitute of tubercles and only half as large; chestnut variegated with white, especially anteriorly; the pillar tinged with pink, the inner edge of the outer lip frequently marginated with black.

THAIS CALLAOËNSIS Gray.

Purpura callaoënsis Gray, Spicilegia Zool., vol. 1, 1828, p. 4, pl. 6, fig. 11.—Reeve, Conch. Icon., *Purpura*, 1846, fig. 79.
Lobos de Afuera Island, among stones at low water.

Distribution.—Panama and southward to Callao, Peru, and the Galapagos Islands.

Shell small, white or pale brownish inside and out, of the same general form as the last species; smooth, or faintly striated; length about 25 mm.

This is not the *P. callaoënsis* of Blainville, 1832. It is too small a shell to have much economic importance and does not seem to be abundant. Tryon referred it wrongly to the genus *Coralliophila*, probably from figures or worn specimens; but it is quite destitute of the peculiar sculpture of *Coralliophila*.

THAIS DELESSERTIANA Orbigny.

Purpura delessertiana ORBIGNY, Voy. Am. Mér., vol. 5, 1841, pp. ix, 439, pl. 77, fig. 7.

Caracolitos. Callao Bay, on the shores of San Lorenzo Island; on the Callao water front; and common on the shore rocks at the Chincha Islands.

Distribution.—Cedros Island, west coast of Lower California, and southward to the Chincha Islands.

Shell of the same general shape as *T. chocolata* Duclos, but smaller, thinner, with a smoother and more polished surface, the shoulder of the whorls more sloping and less prominently tuberculose, or without tubercles; general color brownish, usually with one or two paler, narrow, spiral bands on the last whorl; length about 50 mm.

This is *Purpura callaoënsis* Blainville, 1832, not of Gray, 1828.

THAIS KIOSQUIFORMIS Duclos.

Plate 22, fig. 4.

Purpura kiosquiformis DUCLOS, Ann. d'Hist. Nat., May, 1832, pl. 1, fig. 5.—KIENER, Icon., *Purpura*, p. 59, pl. 15, fig. 40.

Caracoles. Mouth of the Tumbes River. Also from the oysters of Matapalo, growing on the mangrove shoots. Near Capon, from the Estero Zarumilla, opposite Estero Cascajal.

These oyster drills are of importance economically as being a serious enemy to the young oysters. Also as of use in making a purple dye which is considered permanent. It is said that this forms a small industry in Ecuador. The purpuriferous gland is extracted and mixed with lemon juice to prepare the dye. The flesh of the animal is also preserved for food.

It is said to be customary to take thread from the region of Sechura and Piura to Guayaquil, to be dyed and returned, when it is used in fancy alforjas and other hand-woven articles. The dyed thread is called "hilo de caracoles" by the natives.

I saw a neat alforja hand-woven chiefly from hand-spun thread. It was in four colors: Natural white cotton and natural brown cotton, the purple hilo de caracoles, and an imported thread.

These drills were commonly found (Jan. 23) in pairs, breeding. Their destructive work on the young oysters is erroneously attributed by the local fishermen to an isopod, which is found boring into the mangrove roots.

Distribution.—From Magdalena Bay, Lower California, south to Tumbes, Peru.

Shell turrited, whorls more or less tabulate above the shoulder, in front of which there are one or two strong, more or less tuberculose

or angulate keels; the whole shell spirally threaded, with an axially lamellose band appressed at the suture; shell white with an olivaceous periostracum, the threads sometimes brownish, and the interior of the aperture sometimes spirally brown threaded; pillar without plaits, the operculum with a lateral nucleus. Length about 36 mm.

Specimens prepared for market by breaking off the greater part of the last whorl were also sent in by Mr. Coker. This species has been widely confused with *Cymia* (or *Cuma*) and *Solenosteira*. From the first it may be known by the absence of the strong plait or keel in the middle of the pillar, and from the second by its laterally nucleated operculum and the lamellose sutural band.

Several other species of *Thais* have been used since prehistoric times by the natives of Central America as a source of purple dye. The most commonly used species there is *Thais* (*Patellipurpura*) *patula* Linnæus. Many years ago the writer, at San Juan del Sur, Nicaragua, stained a handkerchief with the unmixed purple from one of these shells. Perhaps because lemon juice or other mordant was lacking the color faded considerably during three years that the handkerchief was kept, and the color was not at any time brilliant, resembling the water color known as "neutral tint." Señora Zelia Nuttall, of Mexico City, well known for her profound ethnological researches, has recently read a paper before the American Association for the Advancement of Science on the prehistoric use of these Molluscan purples in Mexico and Central America.

BURSA VENTRICOSA Broderip.

Ranella ventricosa Broderip, Proc. Zool. Soc. of London for 1832, p. 178.—Sowerby, Conch. Ill., *Ranella*, 1839, pl. 92, fig. 116.

Ranella tenuis Potiez and Michaud, Galerie de Douai, Moll., vol. 1, 1837, p. 426, pl. 34, figs. 1, 2.

Dredged in Callao Bay, in about 2½ fathoms, near the northeast side of San Lorenzo Island. Also sold in Callao market, among other gastropods, under the name of Caracoles.

Distribution.—Nicaraguan coast and south to Callao, Peru.

Shell thin, whitish, obscurely rugosely sculptured or smooth, with lateral varices, a large aperture, with thickened and varicose outer lip, with a wide and deep canal near the junction of the lip and the body whorl.

CYMATIUM VESTITUM Hinds.

Triton vestitus Hinds, Zool. Sulphur's Voy., Moll., p. 11, pl. 4, fig. 1, 1844.

Chincha Islands, among the rocks.

Distribution.—West coast of Central America and southward to the Chincha Islands, Peru.

Shell rather large, thin, with a moderately elevated spire and strong spiral ribs; surface covered with a dense lamellose periostracum

more or less produced in thread-like filaments; aperture large, lirate on the body callus and denticulate on the varicose outer lip, the denticles more or less painted with black streaks and associated in separate pairs.

This species is rare and without economic importance.

CYPRÆA ANNETTÆ Dall.

Cypræa annettæ DALL, Nautilus, April, 1909, p. 125.

Cypræa sowerbyi KIENER, Icon., *Cypræa*, 1845, p. 38, pl. 7, fig. 3. Not *C. sowerbyi* of GRAY, 1832; or ANTON, 1839.

Beach of Sechura Bay, near Matacaballa, one badly worn specimen.

Distribution.—Gulf of California and southward to Paita and Sechura Bay, Peru.

This species has no economic relations.

CERITHIUM STERCUSMUSCARUM Valenciennes.

Cerithium stercusmuscarum VALENCIENNES, Humboldt Voy., vol. 2, 1833, p. 278.—SOWERBY, Thes. Conch., 1855 (as *C. ocellatum*), p. 865, pl. 179, figs. 59, 73.

From the shell bank at Matapalo near Capon. Occurs in great abundance on shelly ground, but is of no economic importance.

Distribution.—From Cedros Island, Lower California, and the Gulf of California, southward to Panama, Tumbes, and the Galapagos Islands.

TURRITELLA GONIOSTOMA Valenciennes.

Turritella goniostoma VALENCIENNES, Humboldt Voy., vol. 2, 1833, p. 275.—REEVE, Conch. Icon., *Turritella*, 1849, fig. 10, a–b.

Island of Lobos de Tierra, one young shell.

Distribution.—Gulf of California and southward to Paita, Peru, and the Lobos Islands.

Shell slender, elongated, with many flat-sided, spirally threaded, purple and brownish whorls. Aperture subcircular. Length of a full-grown specimen about 75 mm.

This shell, though common, has no economic importance.

LITTORINA PERUVIANA Lamarck.

Plate 23, fig. 7.

Phasianella peruviana LAMARCK, Anim. s. Vert., vol. 7, 1822, p. 53.—WOOD, Index Test. suppl., 1828, pl. 6, fig. 33 (as *Turbo zebra*).

From rocks on the shores of Callao Bay and San Lorenzo Island. Also on the Chincha Islands in similar places, and along shore at Mollendo. Here some of these snails were taken far above the water line.

Distribution.—From Panama and the Galapagos Islands south to Valparaiso.

Shell small, conical, turbinate, with a corneous operculum of few whorls; the color black with large oblique blotches or streaks of

pure white; aperture simple, semilunate without denticulation, and the base without umbilicus.

These pretty little black and white snails are phytophagous, and too small to be of use for food, yet they form one of the most widely and commonly distributed and characteristic species of the Peruvian province.

LITTORINA VARIA Sowerby.

Littorina varia SOWERBY, Genera of Shells, fascic. 37, 1832, fig. 3.—PHILIPPI, Abb. und Beschr., vol. 2, *Littorina*, pl. 1, figs. 2, 3.

Near Capon, oyster beds of Matapalo; found crawling high on the branches of the mangroves, where they are extremely common in the mangrove swamps.

Distribution.—Gulf of California and southward to Peru.

Shell larger and proportionately thinner than the preceding species, spirally threaded, of a pale purple, grayish, or brownish color more or less articulated, streaked, or dotted with darker shades.

This species is large enough to be eaten like the English "periwinkle," but no data to the effect that it is actually so used have come to hand.

CRUCIBULUM IMBRICATUM Sowerby.

Calyptræa imbricata SOWERBY, Gen. Shells, fascic. 23, 1824, *Calyptræa*, fig. 5.

Dredged in about 5 fathoms, west of Matacaballa, in Sechura Bay, Peru.

Distribution.—Gulf of California, and southward to the Galapagos Islands and Valparaiso, Chile.

Shell conical, irregularly marginate, according to the object upon which it is seated, of a brownish color, with emphatic radial appressed imbrications and deep interstices, the interior purplish brown or yellow, with a thin internal cup-like process attached on one side to the dome of the shell. It sometimes reaches a diameter of 70 mm.

A singular and characteristic limpet, of no economic importance.

CRUCIBULUM SPINOSUM Sowerby.

Calyptræa spinosa SOWERBY, Gen. Shells, fascic. 23, 1824, *Calyptræa*, figs. 4, 7.

From the flats at Capon, and near Matacaballa, Sechura Bay, Peru.

Distribution.—California, and southward to Valparaiso, Chile, and the Galapagos Islands.

Shell resembling the preceding species in a general way, but less heavy, lighter in color, and with the upper surface faintly concentrically striated, and with more or less developed subtubular spines varying in different specimens from mere low tubercles to long elevated spines. It reaches only about 30 mm. in diameter, as a rule, and is of no economic importance.

CREPIDULA DILATATA Lamarck.

Crepidula dilatata LAMARCK, Anim. s. Vert., vol. 6, 1822, pt. 2, p. 25.—BRODERIP, Trans. Zool. Soc. London, vol. 1, 1834, p. 203, pl. 28, fig. 11.

On oysters and other objects in about 5 fathoms, near Matacaballa, Sechura Bay; also on the beaches. Also from rocks at the north end of Callao water front, and on the north shore of San Lorenzo Island; called by the fishermen "piques." Found breeding in February.

Distribution.—From the Straits of Magellan northward to Mazatlan, Mexico, and at the Galapagos Islands.

Shell slipper shaped, rounded, brownish with a white septum internally; upper surface convex, varying from nearly smooth to lamellose, the general form irregular, conforming to the individual situs. Length about 30 mm.

CREPIDULA CREPIDULA Linnæus.

Patella crepidula LINNÆUS, Mus. Lud. Ulricæ, 1764, p. 689.—FAVANNE, Conch., pl. 4, fig. D.

Crepidula unguiformis LAMARCK, Anim. s. Vert., vol. 6, 1822, pt. 2, p. 25.—GUALTERI, Test., pl. 69, fig. H.

In dead shells on the flats at Capon.

Distribution.—The whole Peruvian province, in dead shells, and northward to the Gulf of California.

Shell oval, flattened or dorsally concave, white, corresponding to the curve of the shell in which it is found; of irregular outline, conforming to its situs; length about 35 mm. It has no economic value.

CREPIDULA ONYX Sowerby.

Plate 23, figs. 2, 5.

Crepidula onyx SOWERBY, Gen. Shells, fascic. 23, 1824, *Crepidula*, fig. 2.

In various parts of Sechura Bay, adhering to oyster shells and other objects; and dredged off Matacaballa in about 5 fathoms.

Distribution.—From San Pedro, California, southward to Chile.

Shell slipper shaped, oval, with a smooth convex upper surface, a short, hardly prominent apex, and the internal septum white, with a nearly straight margin, and covering nearly half of the cavity of the shell; the exterior is more or less painted with brown spots, streaks or markings on a lighter ground; the interior usually dark brown, the septum white. It reaches a length of 45 mm.

The flesh of the analogous *C. fornicata* Lamarck, of the Atlantic coast of North America is regarded as a dainty in the raw state by epicures, but there is no information as to the economic use of the present species. The other species of the genus found in Peru are too small to be of much importance.

TROCHITA TROCHIFORMIS Gmelin.

Plate 23, fig. 1.

Patella trochiformis GMELIN, Syst. Nat., vol. 8, 1791, p. 3693.
Calyptræa dilatata SOWERBY, Gen. Shells, fascic. 23, 1824, fig. 9.
Picachos. From the beach at Pisco.

Distribution.—From Panama southward to Chile.

Shell conical, flattened on the slopes, with a spiral suture giving the effect of a spire; the surface radiately ribbed with rounded riblets, the color yellowish; below rounded with a more or less spiral septum of a white color; the dome of the shell brownish or whitish, the margin suborbicular when not disturbed by its situs. The elevation of the shell is very variable, and the diameter will average about 30 mm.

This is a very characteristic species of the Peruvian province, but of no particular economic significance.

SINUM CONCAVUM Lamarck.

Sigaretus concavus LAMARCK, Anim. s. Vert., vol. 6, 1822, pt. 2, p. 208.—SOWERBY, Gen. Shells, fascic. 19, 1823, *Sigaretus*, fig. 1.
From muddy sand on the inside beach at Capon (one young specimen). Caracol tapadera of the fishermen.

Distribution.—Between the equator and lat. 25° 30′ S., and at the Galapagos Islands.

Shell flattened, paucispiral, the last whorl much the largest; spirally closely sulcate, with a wide aperture and gyrate pillar; color livid flesh color to pale brownish.

The shell in the adult is nearly covered by the fleshy parts. The animal plows its way under the sand, drills holes in the shells it encounters and sucks the juices of its prey. It is economically injurious through its destruction, especially in their younger stages, of edible bivalves.

TURBO MAGNIFICUS Jonas.

Turbo magnificus JONAS, Zeitschr. für Malak., vol. 1, 1844, p. 167.—PHILIPPI, Abb. u. Beschr. neue Conch., vol. 2, 1847, p. 25, pl. 6, fig. 1.
Dead shells and an operculum on the beach at Lobos de Afuera Island.

Distribution.—From Manta, Ecuador, south to Callao, Perú, and the Lobos Islands.

Shell turbinate, ovate conic, turgid, imperforate, spotted or marbled with violet and white on an olivaceous or dark-greenish ground; whorls rounded, delicately axially striated; obscurely angulated above, on the spire; suture distinct, not channeled; aperture large, circular, internally pearly with an opaque margin; columella simple, callous above; operculum nearly smooth externally. A rare shell, probably without economic importance.

TURBO (PRISOGASTER) NIGER Wood.

Turbo niger WOOD, Index Test., suppl., 1828, pl. 6, No. 1.—SOWERBY, Gen. Shells, fascic. 37, 1832, *Turbo*, fig. 7.—GRAY, in Beechey's Voy., Zool., 1839, p. 143, pl. 36, fig. 1.

From rocks at west end of Callao water front; from tidal pool on shingle beach at La Punta, Callao; dredged in 2½ fathoms on the northeast side of San Lorenzo Island; and common on the rocks along shore at the Chincha Islands.

Distribution.—From the Straits of Magellan northward to Pacasmayo, Peru.

Shell small, turbinate, smooth or spirally striated (especially in southern specimens), black, with a white aperture and smooth nearly hemispherical white shelly operculum; base imperforate, interior of aperture pearly; diameter about 20 mm.

TEGULA ATRA Lesson.

Plate 24, fig. 4.

Trochus ater LESSON, Voy. Coq., 1830, p. 344, pl. 16, fig. 2.

With the last species.

Distribution.—From the Straits of Magellan northward to Pacasmayo, Peru.

Shell imperforate, conical, more or less depressed; heavy, solid, lusterless black; with about six moderately convex, nearly smooth whorls; suture impressed; last whorl obtusely rounded at the periphery, base flattish, concave in the center, eroded and light purple in front of the aperture; outer lip with a black margin, pearly within; a white callus, bearing a spiral rib and somewhat excavated, in the umbilical region; an obscure tubercle at the end of the pillar. Operculum horny, multispiral; diameter of shell about 40 mm.

This is the largest of the black trochoid species for which the coast is noted.

TEGULA PATAGONICA Orbigny.

Trochus patagonicus ORBIGNY, Voy. Am. Mér., vol. 5, 1840, p. 408, pl. 55, figs. 1–4.—PHILIPPI, Conch. Cabinet, 2d ed., *Trochus*, p. 225, pl. 34, fig. 12.

Taken on the shore rocks at Lobos de Afuera Island.

Distribution.—San Blas, Patagonia, northward to the Lobos Islands, Peru.

Shell orbiculate conic, thick, umbilicate, axially granulose-sulcate, uniform brownish or purplish, spire obtuse; whorls five, subcarinate; sutures excavated, aperture rounded, columella bidentate; diameter about 14 mm.

TEGULA TRIDENTATA Potiez and Michaud.

Trochus tridentatus POTIEZ and MICHAUD, Gal. de Douai, vol. 1, 1838, p. 321, pl. 29, figs. 16–17.—KIENER, Icon., *Trochus*, pl. 57, fig. 2.

Dredged in Sechura Bay, in 5 fathoms, also taken on the rocks in various places about the harbor of Callao.

Distribution.—From Talcahuano, Chile, northward to Sechura Bay, Peru.

Shell conoidal, heavy, solid, elevated, minutely perforate, black or purplish; whorls five or six, slightly convex, smooth; last whorl rounded at the periphery; base flattish, deeply eroded in front of the aperture; outer lip thick, lirate within, aperture small, oblique; umbilicus circular, minute; the pillar small, oblique, distinctly tridentate at the anterior end; diameter about 16 mm.

FISSURELLA CRASSA Lamarck.

Plate 24, figs. 5, 6.

Fissurella crassa LAMARCK, Anim. s. Vert., vol. 6, 1822, pt. 2, p. 11.—SOWERBY, Conch. Ill., 1834, fig. 11 (not fig. 2, nor *F. crassa* SOWERBY, Gen. Shells, 1828).

Lapa. Sometimes called "pata de burro," though this name is more generally applied to another form. Taken on rocky shores of the Pescadores Islands near Ancon; also at the Chincha Islands in similar places abundantly; also at Mollendo. Used for food and bait.

Distribution.—Coast of Chile and Peru, and the Galapagos Islands, and southward to the Straits of Magellan.

Shell oblong, depressed, with a subcentral foramen, sculptured only with faint concentric and radiate undulations, especially in front; color brownish; inside within the muscular scar pinkish, outside of it yellowish white with a narrow brown margin. Length about 85 mm.

FISSURELLA COSTATA Lesson.

Fissurella costata LESSON, Voy. Coq., vol. 2, 1830, p. 410.

Fissurella chilensis SOWERBY, Conch. Ill., 1836, *Fissurella*, fig. 36.

Lapa. Taken at Mollendo, July 23. These are probably utilized like the preceding species.

Distribution.—From the island of Chiloë northward to Mollendo, Peru.

Shell rounded oval, depressed, with the apex a little in front of the center; with radiating riblets. Perforation small, contracted in the middle by two small projections from each side; color grayish, rayed with brownish olive. Length about 40 mm.

FISSURELLA NIGRA Lesson.

Fissurella nigra LESSON, Voy. Coq., vol. 2, 1830, p. 412.—REEVE, Conch. Icon., *Fissurella*, 1850, fig. 11.

Lapa. One young specimen from the rocks at the north end of the Callao water front.

Distribution.—Straits of Magellan and northward to Peru and the Galapagos Islands.

Shell large, oval, conical, the summit in front of the middle; color black or purplish black, not rayed; surface, except for faint radial striation, smooth; foramen oblong, in young specimens tridentate; inside the shell is white with a black margin. Length up to 100 mm.

FISSURELLA PERUVIANA Lamarck.

Fissurella peruviana LAMARCK, Anim. s. Vert., vol. 7, 1822, pt. 2, p. 15 (not of DELESSERT, Rec., pl. 24, fig. 7).—REEVE, Conch. Icon., 1849, *Fissurella*, fig. 26.

Lapa. Dredged in Callao Harbor on the northeast side of San Lorenzo Island, in 2½ fathoms.

Distribution.—The whole Peruvian province.

Shell rounded oval, elevated, conical, the foramen small, a little in advance of the middle; radiately finely striated; inside white, the margin alternately red and gray; outside red toward the summit, becoming more purple and darker toward the base; the margin is smooth, with a dark border inside, the exterior rayed with dark purple. Length about 30 mm.

This is the *F. occidens* of Gould.

MEGATEBENNUS COKERI, new species.

Plate 24, figs. 3, 7.

Lobos de Afuera Island, on beach.

Shell ovate, narrower in front, solid, heavy, steep sided, anterior slope shorter, sharply radially sulcate, the interspaces flattish, feebly rounded, not uniform in width; lines of growth looped toward the apex over the interspaces; color greenish white toward the base, reddish purple toward the apex, with sparse rays of the latter color; foramen large, keyhole shaped, with a greenish margin; length of foramen at the outer margin nearly one-third of the total length of the shell; interior greenish white, with a polished, greenish, radiately striate margin to the foramen; margin of the base smooth, entire, extended for a narrow space over the exterior edge. The type (Cat. No. 207744, U.S.N.M.) measures: Length of shell 27.5; of outer edge of foramen 9.0; of inner edge of same 6.0; of foraminal inside margin 11.0; maximum width of shell at the posterior edge of the above margin 16.5; at the anterior edge of the above margin 14.0; height of the shell 10.0 mm.

This species unquestionably belongs to Pilsbry's section *Amblychilepas*, which was supposed to be wholly old world in its distribution. It much resembles *M. scutellum* (Gmelin) Pilsbry, but is darker toward the summit and lighter toward the base, while in the Cape of Good Hope species the reverse coloration obtains.

Named for Mr. R. E. Coker.

ACMÆA VIRIDULA Lamarck.

Plate 24, figs. 1, 2.

Patella viridula LAMARCK, Anim. s. Vert., vol. 7, 1822, p. 539.—DELESSERT, Rec. Coq., pl. 23, fig. 2.

Acmæa pretrei ORBIGNY, Voy. Am. Mér., vol. 5, 1841, p. 481, pl. 78, figs. 15–16.

Patela. From rocky shore on the northeast side of San Lorenzo Island, Callao Bay; similar stations on Lobos de Afuera Island; the Pescadores Islands; Sechura

Bay, and Mollendo. These shells, like other limpets, are also called "señoritas," or ladies (probably from a fancied resemblance to one of the flounced petticoats favored by Spanish señoras), and are used for food and bait.

Distribution.—Whole Peruvian province from Valparaiso to Paita.

Shell conical, with entire apex, solid, strong; rounded ovate, variable in height, the apex slightly in front of the middle of the shell; sculpture of low, rather wide radial ribs and obscure concentric and radial feeble striation; color whitish, with reticulated green markings, the interspaces of the ribs with larger greenish blotches; old shells may appear wholly gray outside and white inside, with a greenish inner border to the shell; young ones have a brownish or greenish blotch in the center.

These shells sometimes exceed 2 inches in length.

ACMÆA ORBIGNYI Dall, new name.

Acmæa scutum ORBIGNY, Voy. Am. Mér., vol. 5, 1841, p. 479, pl. 64, figs. 8, 9. Not of ESCHSCHOLTZ, Zool. Atlas, vol. 5, 1833, p. 19, pl. 23, figs. 1, 2, 3.

Lottia punctata GRAY, 1835, according to ORBIGNY; not *P. punctata* LAMARCK (*Acmæa*), 1822.

Patela. On rocky shores of the northeast part of San Lorenzo Island, Callao Bay. Confused by the fishermen with the other species.

Distribution.—Whole Peruvian province from Chonos archipelago to Callao, Peru, and the Galapagos Islands. All these limpets seem to be called Patelas or Señoritas by the fishermen.

Shell rounded oval, conical, the apex a little anterior and directed forward; surface finely radiately striate; the striæ sometimes obsolete; color blackish, more or less flecked or dotted with white, with a broad dark margin and dark-brown central tract which, in old shells, may be obscured by a white shelly deposit. Length about 35 mm.

SCURRIA PARASITICA Orbigny.

Patella parasitica ORBIGNY, Voy. Am. Mér., vol. 5, 1841, p. 481, pl. 81, figs. 1, 2, 3. Not of REEVE, 1855.

Among other limpets collected at Mollendo. Of no economic importance.

Distribution.—From Valparaiso, Chile, north to Mollendo, Peru.

Shell rounded, conical, dome shaped, solid, the apex at the anterior third, with the anterior slope straight, the posterior arched; surface finely radially striated; whitish or gray, with radiating blackish rays of varying width; inside white, brown in the central area, border yellowish white, mottled by the external rays. Length about 20 mm.

CHITON CUMINGSII Frembly.

Chiton cumingsii FREMBLY, Zool. Journ., vol. 3, 1827, p. 198, suppl. pl. 16, fig. 3.—SOWERBY, Conch. Ill., 1841, *Chiton*, fig. 32.

Amaurochiton cumingsii THIELE, Gebiss d. Schneck., vol. 2, 1893, p. 362.

Barquillo. From rocks on the north side of the Callao water front and from tidal pool at La Punta, Callao; also from rocks on the shore at the Chincha Islands. Of no economic importance.

Distribution.—From Chiloë Island north to Tumbes, Peru.

Shell ovate oblong, with eight overlapping valves within a narrow border covered with flat pavement-like scales; whitish or olive, very closely and regularly striped with brown or lavender-colored concentric lines, which converge forward on the middle of the valves. Interior pale blue. Length about 50 mm., when full grown.

This is one of the most elegant and characteristic of the numerous chitons for which this province is noted.

CHITON GRANOSUS Frembly.

Chiton granosus FREMBLY, Zool. Journ., vol. 3, 1829, p. 200, suppl. pl. 17, fig. 1.—REEVE, Conch. Icon., 1848, *Chiton*, pl. 5, fig. 27.

Barquillo. Collected at Mollendo.

Distribution.—From Magellan Straits north to Tumbes, Peru.

Shell black, having a white stripe on each side of the central line, between the stripes clouded with whitish; surface sculptured with radiating lines of bead-like pustules; inside whitish, more or less clouded with olive gray. Length about 40 mm.

This species like the other chitons is of no economic importance.

CHÆTOPLEURA HENNAHI Gray.

Chiton hennahi GRAY, Spicilegia Zool., 1828, p. 6, fig. 11.—SOWERBY, Conch. Ill., 1841, *Chiton*, figs. 1, 33.

Barquillo. Callao, 5 to 7 fathoms, and from rocks at the north end of Callao water front.

Distribution.—Callao, Peru.

Shell brownish, smooth, sometimes marked with red or greenish white; girdle or border leathery, with short hairs easily rubbed off; inside white, brown under the beaks of the valves. Length about 40 mm.

ACANTHOPLEURA (COREPHIUM) ECHINATA Barnes.

Plate 23, fig. 6.

Chiton echinatus BARNES, Am. Journ. Sci., vol. 7, 1823, p. 71, pl. 3, figs. 4, 4a.

Chiton spiniferus FREMBLY, Zool. Journ., vol. 3, 1827.—SOWERBY, Conch. Ill., 1833, *Chiton*, fig. 47.

Barquillo. From rocks along shore on the northeast side of San Lorenzo Island, Callao Bay.

Distribution.—From Valparaiso, Chile, northward to Paita, Peru, and the Galapagos Islands.

Shell elongate, solid, carinated along the dorsal ridge, the sides of the central areas engraved with fine flexuous grooves; color dark brown; lateral areas with several radiating lines of pustules; girdle broad, leathery, with strong projecting spines. Length 100 mm. or less, according to age.

This and the following species are particularly characteristic of this zoological province.

The name "barquillo," used for these animals by the fishermen, is probably derived from the resemblance, when the animal is placed on its back, to a little boat.

ENOPLOCHITON NIGER Barnes.

Plate 23, fig. 8.

Chiton niger BARNES, Am. Journ. Sci., vol. 7, 1823, p. 71, pl. 3, fig. 3.
Chiton coquimbensis FREMBLY, Zool. Journ., vol. 3, 1829, p. 197, suppl. pl. 16, fig. 2.

Barquillo. Collected at Mollendo.

Distribution.—Valparaiso, Chile, and northward to Mollendo, Peru.

Shell oblong, with rather elongate, strongly beaked, polished valves of a dark brown inside and out, which are usually badly eroded; girdle broad, fleshy, bearing numerous elongated, more or less widely separated narrow scales, the interspaces having a velvety surface. Length about 75 mm.

This species is said to live on the rocks between tides, exposed to the full force of the surf. The peculiar separated scales on the girdle will always enable it to be identified.

POLYPUS FONTAINEANUS Orbigny.

Plate 20, fig. 1.

Octopus fontaineanus ORBIGNY, Voy. Am. Mér., vol. 5, 1835, p. 28, pl. 2, fig. 5.

Pulpo. Taken on the shore rocks, Lobos de Afuera Island, in March; and taken in a trammel net at the Chincha Islands. Common and used as food.

Distribution.—Coasts of Chile and Peru.

Animal with eight arms, of a rich purple color, but the tint variable, the surface obscurely granulose. Extreme length of specimens examined about 25 centimeters.

The details of its appearance will be very clearly recognized from the figure above referred to. It has no internal shell or endostyle.

LOLIGO GAHI Orbigny.

Plate 21, figs. 1, 2.

Loligo gahi ORBIGNY, Voy. Am. Mér., vol. 5, 1835, Moll., p. 60, pl. 3, figs. 1, 2.

This species was not collected by Mr. Coker, who is, however, familiar with it, and since it forms one of the economic species of Peru, I have copied Orbigny's figure to make the report more complete. Mr. Coker notes in regard to the names for the cuttlefish (*Octopus, Polypus*) that it is called *pulpo*, or *jibia*. A large pulpo is called *chancharro*.

The squid (*Loligo*) is called *calamar*, a word doubtless derived from the Latin *calamarius*, a pen bearer, in allusion to the internal endostyle of the ten-armed cephalopods. To the larger specimens, those 2 feet or more in length, the name *pota* is given. Calamar, pulpo, and jibia are proper Spanish names, pota and chancharro probably of local origin.

Distribution.—In the Patagonian and Peruvian zoological provinces and the West Indian region.

The animal is normally of a pinkish white dotted with dark red, especially on the dorsal region. It has ten arms and an internal "pen" or endostyle, which is plume-shaped with symmetrical vanes, as represented in figure 2. This endostyle is of a cartilaginous material and not shelly, as in some other genera, such as *Sepia*, etc. The details of form are well represented by the figure.

Beside the mollusks enumerated in the above report, Mr. Coker collected the following species belonging to the Brachiopoda.

DISCINISCA LAMELLOSA Broderip.

Orbicula lamellosa Broderip, Proc. Zool. Soc. of London for 1833, p. 124; Trans. Zool. Soc. London, vol. 1, 1834, p. 142, pl. 23, fig. 2.

On *Mytilus* (Choro) at Ancon Bay. Of no economic importance.

Distribution.—From the Island of Chiloë northward to the Gulf of Panama, adhering like limpets to mussels, the timbers of old wrecks, and even to the bottoms of vessels which remain at anchor for some months. They occur from low-water mark to a depth of 9 or 10 fathoms.

The shell is horny, rounded, and nearly flat, with a more or less profusely lamellose surface; the upper valve is slightly convex, the apex a little eccentric, the lower valve is flat, radially striate, very thin, and pierced by a narrow foramen through which a fleshy pedicel extends by which the animal adheres to solid objects. The color is yellowish brown, and the diameter of these shells when normally developed rarely much exceeds 25 mm.

LIST OF THE PRINCIPAL WORKS RELATING TO THE MOLLUSCAN FAUNA OF THE PERUVIAN ZOOLOGICAL PROVINCE.

The following works are those most necessary for a study of this fauna, though many others have been consulted for incidental references. The abbreviations used in the faunal list to designate some of the more frequently cited works follows the title in parentheses.

Bayern, Therese, Princessin von. Im Jahre 1898, auf einer Reise in Süd-amerika gesammelte Mollusken. Nachr. Deutsche Malak. Ges., 1900, pp. 49–58, pl. 1.

Bergh, Rudolph. Die Opisthobranchier der Sammlung Plate. Zool. Jahrb. suppl. This is supplemental Bd. 4, pt. 1, 1898, pp. 481–582, 8°, pl. 6. (Fauna Chilensis).

Bertin, Victor. Revision des Tellinidés du Muséum d'histoire naturelle. Nouvelles Archives du Muséum, ser. 2, vol. 1, 1878, pp. 203–361, pls. 8–9.

——— Revision des Donacidées du Muséum d'histoire naturelle. Nouvelles Archives du Muséum, ser. 2, vol. 4, 1879, pp. 57–121, pls. 3, 4.

——— Revision des Garidées du Muséum d'histoire naturelle. Nouvelles Archives du Muséum, ser. 2, vol. 3, 1880, pp. 57–129, pls. 4, 5.

Boas, J. E. V. Spolia Atlantica, 1886, 248 pp. 4°, 8 pls. (see pp. 160–161).

Broderip, W. J. Descriptions of some new species of Calyptræidæ. Trans. Zool. Soc. London, vol. 1, 1834, pp. 195–206, pls. 27–29.

DALL, WILLIAM HEALEY. Preliminary Report on the Collection of Mollusks and Brachiopoda obtained (by the U. S. S. *Albatross*) in 1887–88. Proc. U. S. Nat. Mus., vol. 12, 1889, No. 773, pp. 219–362.

——— Synopsis of the Family Veneridæ and of the North American recent species. Proc. U. S. Nat. Mus., vol. 26, 1902, No. 1312, pp. 335–412, pls. 13–16.

——— Synopsis of the Carditacea and of the American species. Proc. Acad. Nat. Sci. Phila., for 1902, pp. 696–716, Jan. 1903.

——— The Mollusca and Brachiopoda (of the *Albatross* in the Eastern Pacific during 1891, 1904, and 1905). Bull. Mus. Comp. Zoöl., vol. 43, 1908, pp. 205–531, pls. 1–22.

DAUTZENBERG, PHILIPPE. Liste des Mollusques du Chili. Actes de la Société Scientifique du Chili, vol. 6, 1896, pp. lxiv–lxvii, 1896.

FISCHER, PAUL. Manuel de Conchyliologie, 1880–1887. Paris, F. Savy. 8°, pp. xxiv, 1569; pls. 1–23 (Man. Con.) (see pp. 169–171).

GRAY, JOHN EDWARD, and SOWERBY, GEORGE BRETTINGHAM. Zoölogy of Captain Beechey's Voyage, 1839, pp. xii, 155, 4°, pls. 33–44. (Beech. Voy.)

The Mollusca were treated by Gray, pages 103–142, and continued by Sowerby, pages 143–155.

GOULD, AUGUSTUS ADDISON. United States Exploring Expedition, 1838–1842, by Charles Wilkes, U. S. N., vol. 12, Mollusca and Shells, 4°, pp. xv, 510, 1852; atlas folio, 1856. (Wilkes Exp.)

The figures in the Atlas are numbered continuously without reference to the plates. The collections, field notes, and many of the descriptions were prepared by Joseph Pitty Couthouy, naturalist of the expedition. Many of the preliminary diagnoses were published in the Proceedings of the Boston Society of Natural History, 1846–47, and afterwards collected with other reprints, in 1862, by Doctor Gould, in a small volume entitled "Otia Conchologica," (Boston, 1862, Gould and Lincoln, 8°, 256 pp.)

HIDALGO, JOAQUIN GONZALEZ. Moluscos del Viaje al Pacifico verificado de 1862 a 1865, por una comision de naturalistas enviada por el Gobierno Español., vol. 3, Univalvos marinas, Madrid, 1879. 4°, pp. 1–44 (all issued).

——— Descripcion de los moluscos recogidos por la Comision cientifica enviada por el Gobierno Español a la America Meridional, Madrid, 1893, 4°, pt. 3, pp. 332–432 (1893), 433–608, 1898.

HOYLE, WILLIAM E. A Catalogue of the Recent Cephalopoda. Edinburgh, Proc. Roy. Phys. Soc., vol. 9, 1886, 8°, pp. (1–63) 205–267.

——— A Catalogue of the Recent Cephalopoda, Supplement 1887–1896. Idem., 1897, pp. (1–13) 363–375.

——— Report on the Cephalopoda (of the Expedition to the tropical Pacific, of the U. S. S. *Albatross* 1899–1900). Bull. Mus. Comp. Zoöl., vol. 43, 1904, Cambridge, Mass., 8°, pp. 1–93, pls. 1–12.

HUPÉ, LOUIS HIPPOLYTE. Fauna Chilena. Moluscos. (In) Historia fisica y politica de Chile, por Claudio Gay; Zoologia, vol. 8, Paris, 1854. 8°, pp. 1–500; Atlas II, fol. pls. 1–14, 1854. (Hist. Chile.)

LESSON, RENÉ PRIMEVÉRE. Voyage autour du monde, sur la Corvette la Coquille, pendant les années 1822–1825. Zoölogie, vol. 2, 4°, pt. 1, 1830; pt. 2, 1831–32. (Voy. Coq.)

Usually catalogued under the name of Duperrey, commander of the vessel.

MABILLE, JULES. Étude monographique du genre Concholepas. Annales de Malac., vol. 2, 1886, pp. 261–282, pl. 3–5.

MARTENS, EDUARD VON. Ueber einige Conchylien aus Chile. Malak. Blätt., vol. 16, 1869, pp. 215–222.

MOLINA, GIOVANNI IGNACIO. Saggio sulla storia naturale del Chili. Bologna, 1782, 8°, 7 pls., 1 chart.

ORBIGNY, ALCIDE D'. Vòyage dans l'Amérique Méridionale, vol. 5, Mollusques. Paris, Bertrand, 1835–1846. 4°, pp. 1–48, 1835; 49–184, 1836; 185–376, 1837; 377–408, 1840; 409–488, 1841; 489–758, 1846; and atlas, 4°, pp. 4, pls. 1–84, 1846. (Voy. Am. Mér.)

PFEFFER, GEORG. Die Cephalopoden des Hamburger Naturhist. Museum. Abh. Ver. Hamb., vol. 8, 1885, pp. 1–30, pl. 1–3.

PHILIPPI, RUDOLPHUS AMANDUS. Abbildungen und Beschreibungen neuer oder wenig gekanntes Conchylien. Cassel, 4°, vol. 1, 1842–1845; vol. 2, 1847; vol. 3, 1847–1851. (Abb.)

——— Breves descriptiones Molluscorum quorundam terrestrium et marinorum Chilensium. Abhand d. Naturf. Ges. zu Halle, vol. 4, pts. 2 und 3, 1858; Sitzungb. d. Jahr. 1857, pp. 21–24.

——— Beschreibung einige neuer Conchylien aus Chile. Zeitschr. f. d. ges. naturw. Halle, vol. 12, 1858, pp. 123–125.

——— Reise durch die Wüste Atacama auf befehl der Chilenischen regierung in sommer 1853–54. Halle, Eduard Anton, 1860. 4°, pp. 192+62, pl. 27, 1 karte. (Atac.)

PLATE, LUDWIG H. Die Anatomie und Phylogenie der Chitonen. Zoöl. Jahrb., suppl. Bd. 4, pt. 1, 1898, pp. 1–243; pt. 2, 1899, pp. 15–216.

POIRIER, JULES. Revision des Murex du Muséum. Nouvelles Archives du Muséum d'histoire naturelle. Sér. 2, vol. 5, 1881, pp. 13–128, pl. 4–6. (Rev. Murex.)

REEVE, LOVELL AUGUSTUS. Conchologia Iconica or Illustrations of the shells of Molluscous animals. 20 vols., 4°, 1843–1878.

These monographs contain a large number of figures of West South American species from the collection of Hugh Cuming, now in the British Museum. The work is cited by monographs, each of which is supposed to be complete in itself, the numbers assigned to figures running continuously from the beginning to the end of each monograph without reference to the separate plates. After the death of Mr. Reeve, in 1865, the remaining volumes were edited by Mr. G. B. Sowerby.

SOWERBY, GEORGE BRETTINGHAM. Genera of recent and fossil shells. 8°, 42 parts, 264 colored plates, not numbered or paginated. 1820–1834. (Gen. Sh.)

The figures are cited by genera. For dates of the several fasciculi consult Sherborn in Ann. Mag. Nat. Hist., ser. 6, vol. 13, April, 1894; and Sykes, Proc. Mal. Soc., vol. 7, 1906, pp. 193–194.

——— The Conchological Illustrations. London, 1832–1841. 8°, 2 vols. (C. Ill.)

Contains monographic lists of 19 genera and figures many of the species first collected by Hugh Cuming.

——— Thesaurus Conchyliorum, or figures and descriptions of shells. 5 vols., 4°, 1842–1884. (Thes. Con.)

STEARNS, ROBERT EDWARDS CARTER. List of shells collected on the west coast of South America, principally between latitudes 7° 30′ S. and 8° 49′ N., by Dr. W. H. Jones, surgeon, U. S. Navy. Proc. U. S. Nat. Mus., vol. 14, No. 854, pp. 307–335, Washington, 1891.

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TAPPARONE-CANEFRI, CESARE. Zoologia del viaggio intorno al globo della R. Fregata Magenta, durante gli anni 1865-1868, Malacologia. Mem. della R. Accademia d. Scienze di Torino, ser. 2*a*, vol. 28, 1866, pp. 109–265, 4°, pls. 1–4.

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TRYON, GEORGE WASHINGTON (and PILSBRY, HENRY AUGUSTUS). Manual of Conchology, structural and systematic. 17 vols., 8°, 1879–1898. (Man. Con.)

After the death of Mr. Tryon, in 1888, this work was continued by Doctor Pilsbry. The above title refers to the series containing the Marine Gastropods only. In particular monographs the authors were assisted by W. B. Marshall, Benjamin Sharp, and S. Raymond Roberts.

WISSEL, KURT VON. Beiträge zur Anatomie der Gattung Oncidiella. Zool. Jahrbuch, suppl. Bd. 4, pt. 1, 1898, pp. 583–640.

ZOOLOGICAL SOCIETY OF LONDON. Proceedings, 1832–1854. 8°.

Includes descriptions of species collected on the west coast of South America by Hugh Cuming, and diagnosed by Broderip, Sowerby, Powys, Swainson, and others. These descriptions as a rule have no titles assigned to them. (Proc. Zool. Soc.)

THE PERUVIAN PROVINCE.

The littoral marine molluscan faunas of the west coast of the two Americas, excluding the Arctic and Antarctic faunas properly so called, were recognized more than half a century ago in their main outlines by Woodward.[a]

They comprise, beginning at the north:

1. The *Oregonian Province*, extending from the limit of floating ice in Bering Sea south to Point Conception, California;
2. The *Californian Province*, ranging from Point Conception south to Lower California;
3. The *Panamic Province*, from Lower California, including the Gulf of California, south to the Bay of Guayaquil, Ecuador;
4. The *Peruvian Province*, extending from Guayaquil south to the vicinity of the island of Chiloë in southern Chile; and
5. The *Magellanic Province*, from Chiloë to the Fuegian Archipelago, and for a short but undetermined distance north on the Argentine coast, on the Atlantic side.

These provinces will eventually be recognized as containing minor divisions, with which, on this occasion, we are not concerned.

The distribution recognized in the term "Province" appears to be directly dependent on the temperature of the surface stratum of the sea which, in its turn, is distributed by ocean currents. In the case of the Peruvian Province a branch of the eastward-flowing south Pacific current diverges from the main stream and impinges upon the coast of South America in the vicinity of Chiloë Island. Thence it follows the coast northward, until by the northwesterly trend of the Peruvian shores it is diverted, in the vicinity of Point Aguja and Cape Blanco, to the westward, where it continues in the direction of the Galapagos group of islands. This current, known as the "Peruvian" or "Humboldt" current, throughout its entire extent maintains a temperature varying with the season of from 65° to 70° F. The temperature of the surface off Aguja Point, Peru, in November was 65° F. The temperature of the water in the Magellanic

[a] Manual of the Mollusca, 1856, pp. 373–377.

Province in midsummer varies from 50° F. in the straits themselves to 55° on the Chilean coast in the vicinity of Valdivia.

The surface temperatures of the Peruvian current, as related to those of the Magellanic water, are therefore warmer; and, as compared with the Panamic waters, measurably colder.

Precisely such a relation to the coast of North America is held by the southerly branch of the North Pacific current, which reaches the coast near Sitka with a summer temperature of 65° to 68°. This has diminished in the latitude of San Francisco Bay to 54° F., but the current continues until, in the vicinity of Point Conception, California, it is diverted off shore in a manner entirely analogous to the fate of the Peruvian current at Point Aguja.

The water of the Panamic Province is less disturbed by currents, receives the full heat of the tropical sun, and, as shown by Dr. Alexander Agassiz, emerges from the Gulf of Panama, follows the coast toward Cape San Lorenzo, and is there diverted offshore toward the Galapagos Islands. Trees from the mainland with leaves still adhering to them are occasionally cast upon the shores of the Galapagos, as observed by Dr. Agassiz, showing clearly that the current is not only present, but has no inconsiderable motion. The temperature of this water near the coast of Ecuador and only a few miles from the limit of the Peruvian current, in November, varied from 70° to 83° F., and, in March and April from 78° to 85° F. Among the Galapagos Islands the range in April was 81° to 83° F.

It will be noticed therefore that the currents fully account for the peculiarities of the Galapagos mollusk fauna, which exhibits large contributions from the Panamic and Peruvian faunas with only a very unimportant tincture of the Indo-Pacific in its make up.

A series of surface temperatures measured in November at right angles to the Peruvian current off Point Aguja, by the United States Bureau of Fisheries steamer *Albatross*, began with a temperature of 65° F. close in shore, rose quickly to 69° and later to 70° in the middle of the current, and declined again to 69° F. on its western edge.

The first exploration of the molluscan fauna of the Peruvian Province which was systematically carried on was that of Hugh Cuming. He was resident for some years at Valparaiso, later dredged and collected vigorously at various points of the Bay of Guayaquil. Tradition has handed down the account that a severe earthquake (referred to by Darwin in the Voyage of the *Beagle*) laid bare a long stretch of coast where the shore mollusks, elevated above their natural situs, were accessible to the collector by the thousand. Mr. Cuming collected largely, and on his return to England these collections gave an opportunity to the systematic naturalists to describe many new Peruvian and Chilean shells. This lasted for a good many years. Broderip, Sowerby, Swainson, Gaskoin, Powys, Deshayes, and Reeve worked on

these collections during the first half of the nineteenth century, and, according to Woodward,[a] Mr. Cuming's collection embraced 222 species from the coast of Peru south of Paita, and 172 species from the coast then politically included in Chile. Of these probably half were common to the northern and southern portions of the province. A little later the explorations of Humboldt and Bonpland added a few species; the majority of their collection it would seem were not worked up.

M. Alcide D'Orbigny's South American investigations seem to have been, so far as this province is concerned, largely restricted to the Chilean portion of it. He collected 160 species, one-half of which were common to Chile and Peru, while only one species was common to Callao and Paita. The inference naturally drawn from this last fact by Woodward and others was that the northern border of the province lay between those two ports. But this conclusion was due to imperfect knowledge, and is completely refuted by later information. At present more than 200 species are known to be common to Paita and Callao.

Orbigny's report with its atlas of fine illustrations is a classic source for information, relating, however, to South America as a whole, rather than to the Peruvian Province.[b]

Collections made by Gay and others, worked up in his monographic Historia de Chile, by Hupé, form the third large and well-illustrated contribution to the malacology of the province, chiefly restricted of course to the southern, or Chilean, portion.

The last important contributor to a knowledge of this fauna, in these earlier days, was the German naturalist Philippi, who added numerous species and useful illustrations in the Zeitschrift für Malakozoologie, his Abbildungen, and his Atacama Reise.

Of course many minor contributors to the work, such as Lesson, Jonas, etc., might be mentioned, but I propose in this hasty sketch to touch only on the most important. The list of Tschudi's collection, ostensibly from Peru, as described by Troschel, unfortunately contains numerous exotic Indo-Pacific and Panamic species, so that its authority is seriously impaired.

More recently the researches of Ludwig Plate, the Princess of Bavaria, and others mentioned in the bibliography have added essentially to our knowledge.

In considering the distribution of species along the coast of the province it should not be forgotten that the collections have not been made in an equal manner on different parts of the coast. The

[a] Manual, p. 376.

[b] In my references to this work, for simplicity and convenience, I have omitted the article, since there seems to be no particular reason why we should reserve for D'Orbigny what custom has denied to De la Marck and De la Cépéde.

ports of Guayaquil, Paita, Callao, and Valparaiso have naturally been much more thoroughly explored than others. The careful collecting which would obtain the smaller species is not recorded to have been done anywhere at all.

Dredging also is practicable with difficulty, except in the sheltered harbors, which occur so rarely on this coast, or by the aid of a large steamer, which could be had only under government auspices on account of the great expense involved.

The small lots of material derived from the mud which came up on the anchor of the U. S. Bureau of Fisheries steamer *Albatross* at one or two points, show that proper exploration will certainly reveal the presence of many small species, new or extra limital, which are at present unknown.

In the preparation of this list I have endeavored to give a reference to the original description and to the best available figure or figures. In determining what species should be included I have depended somewhat upon the known characteristics, as regards distribution, of the groups to which the species belong. For instance, if I found a species reported from Guayaquil and belonging to a widely distributed group, such as the *Pholadidæ*, though not actually reported from a Peruvian locality, I have not hesitated to include it, knowing that in all probability it will be found on more thorough search in Peruvian territory. There can be little doubt that a large number of the more mobile of the Panamic species reaching the Bay of Guayaquil will be found to have extended their range more or less within the northern border of the Peruvian Province, just as a certain number of the characteristic Magellanic species have traveled beyond their strict limits and mingle with the southern members of the Peruvian fauna. Species properly belonging to the Panamic Province and not reported as far south as Guayaquil or the Galapagos Islands have been omitted from the list.

It will be observed that the list contains only a few minute species. Doubtless many of these exist, and will be found when carefully sought for, but, as previously indicated, the majority of collectors seem to have confined their attention to the more conspicuous species.

I have included a certain number of pelagic forms, Cephalopods, Pteropods, and Nudibranchs, which are not strictly littoral, but are found occasionally thrown on the beaches or are captured within a short distance of the shore. And since collectors are certain to obtain them in their search for mollusks, I have added at the end of the list of Mollusca a list of the littoral Brachiopoda, some of which are so common on these shores.

In any first census of this kind some species will be included which later investigation will exclude. I have rejected a number of Tschudi's

species as obviously exotic, but a small number remain which are doubtful and which are indicated by the name (Tschudi) as needing confirmation. I have also omitted a few names which seemed to be almost certainly due to misidentification or to a confusion between such localities as Arica and Africa. "Lumping" closely related species, such as some of the Siphonarias, has led certain authors to include purely Atlantic forms with their Pacific analogues under one name. So far as time and the access to specimens permitted, I have tried to disentangle such cases and use only the name belonging to the Pacific form. In making her dredgings the U. S. Bureau of Fisheries steamer *Albatross* seems to have avoided shallow water; and in the case of *Dentalium*, which has a wide range in depth, I have included a few species actually dredged beyond the 100-fathom line, but which will in all probability be found within it when sought for. No other deep-water species, however, have been admitted. An account of them will be found in my *Albatross* report of 1908. In scanning the list those unfamiliar with the repetition of names so prevalent in Spanish geographical nomenclature will need to remember that there is a Tumbes in Chile as well as in Peru, and be on the lookout for analogous cases. Species of Auriculidæ which are exclusively littoral although pulmonate have been included, also the salt-water Cyrenas, my aim being to include all species which are to be found along the shores of the province, on the beaches, and in the adjacent waters of the sea. Whatever deductions from the list may be necessary hereafter, I am convinced that they will be more than made up for by future additions from the ranks of the minute species.

It is probable, though not by any means certain, that when we eliminate the overflow from the Panamic and Magellanic provinces the remaining fauna on this long stretch of coast may be susceptible of division into subfaunas, but it is too early to speculate about this possible feature of the distribution.

I have indicated in the preceding remarks the nature of the reservations which must be made in discussing the statistics of our present census of the Peruvian fauna, and subject to those reservations we may now proceed to consider the figures.

The total number of species appears to be 869, of which 64 are pelagic and may be omitted from consideration in the matter of distribution, leaving 805. Taking the present political limits of the two countries as a starting point, we find 71 species reported from Peru exclusively, and 103 restricted to Chile. But as political and biological boundaries rarely have anything in common, these data are not especially significant. We have 174 species restricted to Peru or Chile, and 141 common to Peru and Chile, making 315 species proper to the province itself. In addition to these we have

253 species common to the Panamic Province and to Peru, and 239 species of the Panamic Province which are known to reach the northern border of the Peruvian Province at or near Cape Blanco, many of which will doubtless be found to have a more extended southerly range. In addition to these there are 25 species whose range extends from Upper California south to Peru or even to Valparaiso.

At the southern extreme of the Peruvian Province it receives 41 recruits from the Magellanic Province, few of which range north of Valparaiso. Of the whole 805 species enumerated, which are not pelagic, only 24 are known from the West Indies or Atlantic Ocean, most of which are Pholads, borers, or limpets, forms peculiarly liable to transportation long distances on ships or floating timber. The only species which can be regarded as also Indo-Pacific are even fewer in number and to be included in the same category.

Eliminating all the pelagic species and all the Panamic species not shown to be now actually domiciled within the limits of the Peruvian Province, we have a population for the province of 566 species of littoral marine mollusks.

In Bulletin 84 of the U. S. Geological Survey, pages 25–28, 1892, I have shown that the average population for a warm-temperate area (where the temperature ranges from 60° to 70° F.) is about 500 species of shell-bearing mollusks. Adding the species of Nudibranchs, naked Tectibranchs, and littoral cephalopods enumerated in our list, it would seem that the average is pretty well maintained in the case of the Peruvian Province.

Dismissing the minuter species from consideration as insufficiently known, the more striking characteristics of the Peruvian fauna may be summed up as follows:

1. There is an unusual proportion of the species which are black or blackish or of a lurid tint. This feature of the fauna has attracted attention from all who have studied it and has been discussed by von Martens. It is particularly marked among the phytophagous groups.

2. The fauna is notable for its Fissurellidæ and Acmæidæ, its Trochids of the genus *Tegula*, its numerous and peculiar chitons, its numerous Cancellarias, the development of Calyptræidæ, of species of Arcidæ, and of the genus *Thais*, *Chione*, *Semele*, *Petricola*, *Mulinia*, all represented by numerous species.

3. The deficiencies in the fauna are as marked as the redundancies. There are notably few Pectens or Lucinas, and the Tellinidæ are poorly represented. *Acteon*, the smaller Tectibranchs, *Conus*, the Turritidæ especially, the Marginellidæ, *Fusinus* and its allies, *Epitonium* (*Scala*) and the Pyramidellidæ are all very poorly represented. *Calliostoma* and *Margarita*, *Haliotis* and *Pleurotomaria* are absent or barely represented.

The notion that the mournful colors of so many of the species might be correlated with the huge beds of kelp characteristic of these shores seems to be negatived by the fact that in California similar kelp beds afford a shelter to some of the most brightly colored Trochidæ, etc., and that, as I am informed by Mr. Coker, red and green seaweeds are abundant on the rocks below low-water mark, on a large part of the coast of Peru, and presumably also of Chile. This and a number of other problems await the investigations of the future.

Lastly, a survey of the characteristic groups of which the fauna is largely made up leads to the conclusion that the fauna is chiefly of southern origin. In spite of the fact that many species are common to the Panamic fauna and a relatively small number to the Magellanic fauna, the more conspicuous types, like the blackish species of *Tegula*, have a Magellanic rather than a tropical character. This particular group has extended its range to Alaska on the north and Japan on the northwest, but its metropolis is in southern Chile. The type represented by the various species of *Thais* and *Acanthina* has traveled the same road, and so has the *Protothaca* group of Veneridæ.

If we may accept as the original metropolis of a special type of mollusks that region where it is developed in the greatest number and variety of species, and perhaps also with the most extreme limits of size and ornamentation, we shall have for example *Buccinum* and *Chrysodomus* focused in the boreal Pacific region, certain types of *Thais* and *Acanthina* in the region of southern Chile.

Cook has called attention to the relation between *Thais lapillus* and the Oregonian *T. lamellosa*, and other species in the Tropics of the Panamic and Antillean region; but, viewed from an Eastern Pacific standpoint, the relatively few Atlantic forms may easily have originated in the Pacific, where their existing representatives show a much more luxuriant development.

There is only one *Thais* of the *Nucella* type in the North Atlantic, but the North Pacific has five or six. It is very remarkable that in the Peruvian Province we have not a single distinctively old world type of mollusk. Those which seem to be such are really cosmopolitan types, more familiar to us from old world localities, perhaps, but not necessarily of old world origin.

APPROXIMATE LATITUDES OF PLACES MENTIONED IN THIS CATALOGUE.

	°	′
San Diego, California	33	12 N.
Cerros (Cedros) Island, Lower California	28	00 N.
Mazatlan, Gulf of California	23	20 N.
Acapulco, Mexico	16	00 N.
Gulf of Nicoya, Central America	9	40 N.
Panama	8	29 N.
Chiriqui, Central America	8	00 N.
Montijo Bay, Central America	7	40 N.
Bahia (Panguapi) Ecuador	3	00 N.
Atacames, Ecuador	0	50 N.
Bahia de Caraques (Caracas)	0	35 S.
Chatham Island, Galapagos Islands	1	00 S.
Manta, Ecuador	1	00 S.
Monte Cristi, Ecuador	1	00 S.
Jipijapa (Xipixapi), Ecuador	1	15 S.
Isla la Plata, Ecuador	1	20 S.
Salango, Ecuador	1	30 S.
Bahia Santa Elena, Ecuador	2	10 S.
Guayaquil, Ecuador	2	11 S.
Puna Island, Bay of Guayaquil, Ecuador	3	00 S.
Capon, Huaquilla, and Matapalo	3	10 S.
Tumbes (Tumbez), Peru	3	30 S.
Paita (Payta), Peru	5	00 S.
Lobos Islands (northern), Peru (Lobos de Tierra)	5	20 S.
Lobos Islands (southern), Peru (Lobos de Afuera)	6	27 S.
Sechura Bay, Peru (and Matacaballa)	5	40 S.
Lambayeque, Peru	6	30 S.
Pacasmayo, Peru	7	25 S.
Salaverri, Peru	8	10 S.
Guañape Islands, Peru	8	30 S.
Isla Blanca, Chimbote Bay, Peru	9	08 S.
Casma, Peru	9	30 S.
Ancon, Peru (and Pescadores Islands)	11	47 S.
Callao, Peru (with La Punta, S. Lorenzo Island, etc.)	12	00 S.
Chilca, Peru	12	30 S.
Asia Islands, Peru	12	50 S.
Pisco (Chincha and Ballestas Islands, San Gallan Island)	13	45 S.
Paracas Bay, Peru	13	50 S.
Bay of Independencia, Peru (and Windy Bay)	14	15 S.
Ica, Peru	14	30 S.
Islay, Peru	17	00 S.
Mollendo, Peru	17	00 S.
Arica, Chile	18	30 S.
Mejillones del Norte, Chile	19	50 S.
Iquique, Chile	20	15 S.
Cobija, Chile	22	30 S.
Antofagasta, Chile	22	40 S.
Mejillones (Mexillones) del Sur, Chile	23	00 S.
Isla Blanca (del Chimba) of Philippi, Chile	23	37 S.
Paposo, Chile	25	07 S.
Caldera, Chile	27	00 S.

	°	′
Copiapo, Chile	27	10 S.
Coquimbo, Chile	30	00 S.
Quintero, Chile	32	45 S.
Valparaiso, Chile	33	00 S.
Juan Fernandez Island, Chile	33	40 S.
Talcahuano, Quiriquina, and Tumbes, Chile	36	40 S.
Lota and Concepcion, Chile	37	10 S.
Valdivia, Chile	39	50 S.
Puerto Montt, Chile	41	30 S.
Island of Chiloë, Chile	42	30 S.
Chonos Archipelago, Chile	45	00 S.
Magellan Straits, western entrance	52	35 S.

LIST OF SPECIES COMPOSING THE FAUNA.

SUBKINGDOM MOLLUSCA.

Class CEPHALOPODA.

Order DIBRANCHIATA.

Suborder OCTOPODA.

Family ARGONAUTIDÆ.

Genus ARGONAUTA Linnæus.

ARGONAUTA CORNUTA Conrad.

1854. Journ. Acad. Nat. Sci. Phila., ser. 2, vol. 2, p. 332, pl. 34, fig. 2. Gulf of Panama to Cape St. Lucas.

ARGONAUTA NOURYI Lorois.

1852. Rev. et Mag. de Zool., ser. 2, vol. 4, p. 9, pl. 1, fig. 5. Marquesas Islands; coast from Peru to Mexico.

ARGONAUTA PACIFICA Dall.

1869. Amer. Nat., vol. 3, p. 237. From the Galapagos Islands north to Monterey, California.

ARGONAUTA NODOSA Solander.

1786. Portland Catalogue, p. 96, No. 2120.—Shaw, Nat. Misc. 1811, vol. 23, pl. 995. Off Chiloë Island.

ARGONAUTA HIANS Solander.

1786. Portland Catalogue p. 44, No. 1055.—Adams and Reeve, Voy. Samarang, Moll., 1850, p. 4, pl. 3, figs. 2 *a–c*. Indo-Pacific Ocean; Chilean coast.

Family PHILONEXIDÆ.

Genus TREMOCTOPUS Della Chiaje.

TREMOCTOPUS MINIMUS Orbigny.

1835. Voy. Am. Mér., vol. 5, p. 23, pl. 1, figs. 4, 5. S. Lat 30°. off Coquimbo.

Family ALLOPOSIDÆ.

Genus BOLITÆNA Steenstrup.

BOLITÆNA MICROTYLA Steenstrup.

1859. Vid. med. Nat. Foren. Kjobenh. for 1858, p. 183.—HOYLE, Bull. Mus. Comp. Zool., vol. 43, p. 9, pl. 3, figs. 6–11; pl. 4, fig. 1. Galapagos Islands; also Atlantic Ocean.

Family POLYPODIDÆ.

Genus POLYPUS Schneider, 1784. (*Octopus* Lamarck, 1799.)

POLYPUS GRANULATUS Lamarck.

1799. Mém. Soc. Hist. Nat. Paris, vol. 1, p. 20.—ORBIGNY, Céph. Acét., 1838, p. 45, pls. 6, 23, fig. 2. Atlantic and Pacific Oceans; coast of Peru.

POLYPUS FONTAINEANUS Orbigny.

1835. Voy. Am. Mér., vol. 5, p. 28, pl. 2, fig. 5. Coast of Chile and Peru.

POLYPUS OCCIDENTALIS Hoyle.

1886. Challenger Ceph., p. 77.—ORBIGNY, Moll. Cuba, p. 14, pl. 1, 1845. Atlantic and Pacific Oceans; Galapagos Islands.

POLYPUS CHIERCHIÆ Jatta.

1889. Boll. soc. nat. Napoli, vol. 3, p. 65. Peru.

POLYPUS OCULIFER Hoyle.

1904. Bull. Mus. Comp. Zool., vol. 43, p. 14, pl. 4, figs. 3–4. Galapagos Islands.

POLYPUS PUSILLUS Gould.

1852. U. S. Expl. Exped. (Wilkes) Moll., p. 478, fig. 591. Cocos Island north to Acapulco, Mexico.

POLYPUS JANUARII Hoyle.

1886. Challenger Ceph., p. 97, pl. 7, figs. 1–4. Cocos Island.

POLYPUS SAPHENIA Gray.

1849. Brit. Mus. Cat. Ceph., p. 11. Peru.

POLYPUS MIMUS Gould.

1852. U. S. Expl. Exped. (Wilkes) Moll., p. 473, fig. 587. Peruvian region.

Genus MOSCHITES Schneider, 1784. (*Eledone* Leach, 1817.)

MOSCHITES ROTUNDA Hoyle.

1886. Challenger Ceph., p. 104, pl. 8, figs. 4–6. Gulf of Panama.

MOSCHITES VERRUCOSA Verrill.

1881. Bull. Mus. Comp. Zool., vol. 8, p. 105, pls. 5, 6. Gulf of Panama.

Genus ELEDONELLA Verrill.

ELEDONELLA DIAPHANA Hoyle.

1885. Ann. Mag. Nat. Hist., ser. 5, vol. 15, p. 232; Challenger Ceph., p. 107, pl. 9, figs. 3–6, 1886. Galapagos Islands.

Genus JAPETELLA Hoyle.

JAPETELLA PRISMATICA Hoyle.

1885. Ann. Mag. Nat. Hist., ser. 5, vol. 15, p. 231; Challenger Ceph., p. 109, pl. 9, figs. 1–2, 1886.

Suborder DECAPODA.

Superfamily MYOPSIDA.

Family LOLIGINIDÆ.

Genus LOLIGO Lamarck.

LOLIGO GAHI Orbigny.

1835. Voy. Am. Mér., vol. 5, Moll., p. 60, pl. 3, figs. 1–2. Valparaiso; Patagonian, Peruvian, and West Indian regions.

Superfamily ŒGOPSIDA.

Family OMMATOSTREPHIDÆ.

Genus OMMASTREPHES Orbigny.

OMMASTREPHES GIGAS Orbigny.

1835. Voy. Am. Mér., vol. 5, Moll., p. 50, pl. 4. Peruvian region; Valparaiso to Arica.

Genus SYMPLECTOTEUTHIS Pfeffer.

SYMPLECTOTEUTHIS OUALANIENSIS Lesson.

1829. Voy. Coquille, Moll., vol. 2, p. 240, pl. 1, fig. 1. Indo-Pacific region; Cocos Island; Gulf of Panama.

Genus STEENSTRUPIOLA Pfeffer.

STEENSTRUPIOLA CHILENSIS Pfeffer.

1884. Ceph. Hamburg Mus., p. 16, fig. 20. Peruvian region.

Genus CUCIOTEUTHIS Steenstrup.

CUCIOTEUTHIS UNGUICULATUS Molina.

1782. Saggio Stor. Nat. Chile, p. 199.—Owen, Trans. Zool. Soc. Lond., vol. 11, pt. 5, p. 150, pls. 30–32. Chile.

Family BATHYTEUTHIDÆ.

Genus BATHYTEUTHIS Hoyle.

BATHYTEUTHIS ABYSSICOLA Hoyle.

1885. Challenger, Sci. Results, p. 272, fig. 108. Chall. Ceph. p. 168. Eastern Pacific.

Family MASTIGOTEUTHIDÆ.

Genus MASTIGOTEUTHIS Verrill.

MASTIGOTEUTHIS DENTATA Hoyle.

1904. Bull. Mus. Comp. Zool., vol. 43, p. 34, pl. 6, figs. 8–11. Galapagos Islands. Gulf of Panama.

Family ONYCHOTEUTHIDÆ.

Genus ONYCHOTEUTHIS Lichtenstein.

ONYCHOTEUTHIS BRACHYPTERA Pfeffer.

1884. Ceph. Hamburg Mus., p. 20, fig. 26. Peruvian region.

Genus TELEOTEUTHIS Verrill. (*Onychia* Lesueur.)

TELEOTEUTHIS PLATYPTERA Orbigny.

1835. Voy. Am. Mér., vol. 5, Moll., p. 41, pl. 3, figs. 8–11. Indo-Pacific region. Chilean coast, off Valdivia.

TELEOTEUTHIS PERATOPTERA Orbigny.

1835. Voy. Am. Mér., vol. 5, Moll., p. 39, pl. 3, figs. 5–7. Indo-Pacific region. Juan Fernandez Island. Chilean coast.

Family ENOPLOTEUTHIDÆ.

Genus ABRALIOPSIS Joubin.

APRALIOPSIS HOYLEI Pfeffer.

1884. Ceph. Hamburg Mus., p. 17, fig. 22. Gulf of Panama to Acapulco, Mexico.

Genus PTERYGIOTEUTHIS H. Fischer.

PTERYGIOTEUTHIS GIARDI Fischer.

1896. Journ. de Conchyl., vol. 48, pp. 205–211, pl. 9. Gulf of Panama. Galapagos Islands north to Guaymas, Mexico. Also North Atlantic.

Family HISTIOTEUTHIDÆ.

Genus CALLITEUTHIS Verrill.

CALLITEUTHIS REVERSA Verrill.

1880. Am. Journ. Sci., vol. 20, p. 393; Trans. Conn. Acad. Sci., vol. 5, p. 295, pl. 46, figs. 1, 1*b*., 1880. North Atlantic. Gulf of Panama.

Family CRANCHIIDÆ.

Genus TAONIUS Steenstrup.

TAONIUS SCHNEEHAGENI Pfeffer.

1884. Ceph. Hamburg Mus., p. 23, fig. 31. Peruvian region.

Class GASTROPODA.

Subclass ANISOPLEURA.

Superorder OPISTHOBRANCHIATA.

Order PTEROPODA.

Suborder GYMNOSOMATA.

Family PNEUMODERMATIDÆ.

Genus PNEUMODERMON Cuvier.

PNEUMODERMON BOASI Pelseneer.

1888. Challenger Pterop., p. 30, pl. 2, fig. 3. Off Caldera, Chile, S. lat. 27°.

Genus DEXIOBRANCHÆA Boas.

DEXIOBRANCHÆA POLYCOTYLA Boas.

1886. Spolia Atlantica, vol. 4, p. 161. Challenger Pterop., p. 17, pl. 1, figs. 4, 5, 1888. Off Chile, S. lat. 27° to 37° 30′.

DEXIOBRANCHÆA SIMPLEX Boas.

1886. Spolia Atlantica, vol. 4, p. 160. Challenger Pterop., p. 16, pl. 1, fig. 3, 1888. Off Caldera, Chile, in S. lat. 27°.

Suborder THECOSOMATA.

Family CAVOLINIIDÆ.

Genus CAVOLINA Abildgaard.

CAVOLINA GIBBOSA Rang.

1836. *Hyalæa gibbosa* RANG, in Orbigny, Voy. Am. Mér., p. 95, pl. 5, figs. 16–25. Southeast Pacific, Atlantic, and Indian seas.

CAVOLINA INFLEXA Lesueur.

1813. *Hyalæa inflexa* LESUEUR, Nouv. Bull. Soc. Philom., vol. 3, p. 285, pl. 5, fig. 3. Eastern Pacific from N. lat. 13° to S. lat. 42°. Also Atlantic.

CAVOLINA LONGIROSTRIS Lesueur.

1822. *Hyalæa longirostris* LESUEUR, Dict. Sci. Nat., vol. 22, p. 81.—ORBIGNY, Voy. Am. Mér., p. 101, pl. 6, figs. 11 to 15, 1836. S. lat. 12° to N. lat. 23°. Also Atlantic.

CAVOLINA TELEMUS Linnæus, var. **OCCIDENTALIS** Dall.

1758. *Monoculus telemus* LINNÆUS, Syst. Nat., 10th ed., p. 1059. *Hyalæa tridentata* (FORSKAL) BOAS, Spolia Atlantica, p. 115, pl. 1, figs. 8, 9; pl. 2, fig. 19; pl. 4, fig. 66; pl. 6, fig. 100, 1886. Off the west coast of South America and the Galapagos Islands. Also North Pacific.

CAVOLINA UNCINATA Rang.

1836. *Hyalæa uncinata* RANG in Orb. Voy. Am. Mér., p. 93, pl. 5, figs. 11–13. Cape St. Lucas, Lower California, south to Ecuador and the Galapagos Islands. Also Atlantic.

Genus CLIO Linnæus.

CLIO ANTARCTICA Dall.

1908. Smithsonian Misc. Coll., vol. 50, p. 501. *Hyalæa australis* ORBIGNY Voy. Am. Mér., p. 117, pl. 8, figs. 9–11, 1836; not of Peron, 1816. Southeastern Pacific, also near Cape of Good Hope.

CLIO PYRAMIDATA Linnæus.

1767. Syst. Nat., 12th ed., p. 1094. *Cleodora lanceolata* SOULEYET, Zool. Bonite, vol. 2, p. 179, pl. 6, figs. 17–25, 1852. Southeastern Pacific, in S. lat. 27° 11′. Also Atlantic.

CLIO SULCATA Pfeffer.

1879. *Cleodora sulcata* PFEFFER, Monatsb. k. Preuss. Akad. Wiss., p. 240, figs. 11, 12. Off Manta, Ecuador, and southward to the Antarctic.

CLIO (HYALOCYLIX) STRIATA Rang.

1828. *Creseis striata* RANG, Ann. Sci. Nat., ser. 1, vol. 13, p. 315, pl. 16, fig. 7. Off coast of Chile. Also Atlantic.

Genus CRESEIS (Rang) Sowerby.

CRESEIS SUBULA Quoy and Gaimard.

1827. Ann. Sci. Nat., ser. 1, vol. 10, p. 233, pl. 8*D*, figs. 1, 2, 3 (as *Cleodora*). Eastern Pacific. Also Atlantic, etc.

Genus STYLIOLA (Lesueur) Gray.

STYLIOLA ACICULA Rang.

1828. *Creseis acicula* RANG, Ann. Sci. Nat., ser. 1, vol. 13, p. 318, pl. 17, fig. 6. Eastern Pacific. Also Atlantic.

STYLIOLA CONICA Eschscholtz.

1829. *Creseis conica* ESCHSCHOLTZ, Zool. Atlas, p. 17, pl. 15, fig. 3. Eastern Pacific. Also Atlantic.

STYLIOLA VIRGULA Rang.

1828. *Creseis virgula* RANG, Ann. Sci. Nat., ser. 1, vol. 13, p. 316, fig. 2. Southeastern Pacific, off Juan Fernandez Island. Also Atlantic.

STYLIOLA (BOASIA) CHIERCHIÆ Boas.

1886. *Cleodora chierchiæ* BOAS, Spolia Atlantica, p. 62, pl. 3, fig. 39*ter*. Tropical eastern Pacific. Also Atlantic.

Genus CUVIERINA Boas.

CUVIERINA COLUMELLA Rang.

1828. *Cuvieria columella* RANG, Ann. Sci. Nat., ser. 1, vol. 13, p. 323, pl. 45, figs. 1–8. Eastern Pacific from N. lat. 23° to S. lat. 42°. Also Atlantic.

Family LIMACINIDÆ.

Genus LIMACINA Lamarck.

LIMACINA BULIMOIDES Orbigny.

1836. *Atlanta bulimoides* ORBIGNY, Voy. Am. Mér., p. 179, pl. 12, figs. 36–38. Temperate and tropical eastern Pacific. Also Atlantic.

LIMACINA LESUEURI Orbigny.

1836. *Atlanta lesueuri* ORBIGNY, Voy. Am. Mér., p. 177, pl. 20, figs. 12–15. Eastern Pacific to S. lat. 42°. Also Atlantic.

LIMACINA TROCHIFORMIS Orbigny.

1836. *Atlanta trochiformis* ORBIGNY, Voy. Am. Mér., p. 177, pl. 12, figs. 29–31. Eastern Pacific to S. lat. 30°. Also Atlantic.

Genus EMBOLUS Jeffreys.

EMBOLUS INFLATUS Orbigny.

1836. *Atlanta inflata* ORBIGNY, Voy. Am. Mér., p. 174, pl. 12, figs. 16–19. Eastern Pacific from N. lat. 42° to S. lat. 40°. Also Atlantic.

Genus PERACLE Forbes.

PERACLE RETICULATA Orbigny.

1836. *Atlanta reticulata* ORBIGNY, Voy. Am. Mér., p. 178, pl. 12, figs. 32–35, 39. Eastern Pacific in S. lat. 20°. Also Atlantic and Mediterranean.

Order TECTIBRANCHIATA.

(*CEPHALASPIDEA.*)

Family ACTEONIDÆ.

Genus ACTEON Montfort.

ACTEON VENUSTUS Orbigny.

1840. *Tornatella venusta* ORBIGNY, Voy. Am. Mér., p. 399, pl. 56, figs. 4, 5, 6. Paita, Peru.

Family BULLARIIDÆ.

Genus BULLARIA Rafinesque.

BULLARIA ASPERSA A. Adams.

1850. *Bulla aspersa* ADAMS, Thes. Con., vol. 2, p. 578, pl. 123, fig. 78. Panama to Paita, Peru.

BULLARIA GOULDIANA Pilsbry.

1898. *Bulla gouldiana* PILSBRY, Man. Con., vol. 15, p. 340, pl. 36, figs. 22–24. San Pedro, Cal., southward to the Gulf of California, Mazatlan, and Guayaquil.

BULLARIA PUNCTULATA A. Adams.

1850. *Bulla punctulata* ADAMS, Thes. Con., p. 604, pl. 123, fig. 77. Gulf of California to the Lobos Islands, Peru.

Family AKERATIDÆ.

Genus HAMINEA Leach.

HAMINEA PERUVIANA Orbigny.

1837. *Bulla peruviana* ORBIGNY, Voy. Am. Mér., p. 211, pl. 19, figs. 4, 5 (*B. hydatis* on plate). Callao, Peru.

(*ANASPIDEA.*)

Family AGLAJIDÆ.

Genus AGLAJA Renier.

AGLAJA MACULATA Orbigny.

1837. *Posterobranchea maculata* ORBIGNY, Voy. Am. Mér., p. 203, pl. 17, figs. 6–9. Valparaiso and Juan Fernandez Island.

Family APLYSIIDÆ.

Genus TETHYS Linnæus.

TETHYS CHIERCHIANA Mazzarelli and Zuccard.

1889. *Aplysia chierchiana* MAZZARELLI and ZUCCARD, Bol. Soc. Nat. Napoli, vol. 3, p. 52. San Lorenzo Island. Callao, Peru.

TETHYS INCA Orbigny.

1837. *Aplysia inca* ORBIGNY, Voy. Am. Mér., p. 207, pl. 14, fig. 13. Callao, Peru.

TETHYS LESSONI Rang.

1828. *Aplysia lessoni* RANG, Mon. Aplysia, p. 60, pl. 14. Paita, Peru.

TETHYS NIGRA Orbigny.

1837. *Aplysia nigra* ORBIGNY, Voy. Am. Mér., p. 209, pl. 18, figs. 1–2. Callao, Peru.

TETHYS RANGIANA Orbigny.

1837. *Aplysia rangiana* ORBIGNY, Voy. Am. Mér., p. 210, pl. 17, figs. 11–13. Paita, Peru.

Genus APLYSIOPSIS Bergh.

APLYSIOPSIS JUANINA Bergh.

1898. BERGH, in Plate, Fauna Chilensis, vol. 1, p. 483, pl. 28, figs. 1–25, pl. 29, fig. 1. Juan Fernandez Island.

Genus DOLABELLA Lamarck.

DOLABELLA GUAYAQUILENSIS Petit.

1868. SOWERBY, Con. Icon., vol. 16, pl. 2, figs. 6 *a–b*. Guayaquil.

(*NOTASPIDEA.*)

Family PLEUROBRANCHIDÆ.

Genus PLEUROBRANCHUS Cuvier.

PLEUROBRANCHUS PLATEI Bergh.

1898. Fauna Chilensis, vol. 1, p. 494. Calbuco, Chile.

PLEUROBRANCHUS PATAGONICUS Orbigny.

1837. Voy. Am. Mér., p. 204, pl. 17, figs. 4, 5. Talcahuano, Chile. Also south of the Rio Negro on the Atlantic coast of Patagonia.

Genus PLEUROBRANCHÆA Leue.

PLEUROBRANCHÆA MACULATA Quoy and Gaimard.

1832. Voy. Astrolabe, Zool., vol. 5, pt. 2, p. 301, pl. 22, figs. 11–14. Plate, Fauna Chilensis, vol. 1, p. 492, pl. 29, figs. 2–9, 1898. Juan Fernandez Island.

Order NUDIBRANCHIATA.

(*CLADOHEPATICA.*)

Family AEOLIDIIDÆ.

Genus AEOLIDIA Cuvier.

AEOLIDIA LOTTINI Lesson.

1830. *Aeolis lottini* Lesson, Voy. Coq., p. 290, pl. 14, figs. 6 *g–n*. Southern Chile.

AEOLIDIA PAPILLOSA (Linnæus) Bergh.

1898. Plate, Fauna Chilensis, vol. 1, p. 540. Chile.

AEOLIDIA SEROTINA (Linnæus) Bergh.

1898. Plate, Fauna Chilensis, vol. 1, p. 541, pl. 31, figs. 26–31. Talcahuano and Tumbes, Chile.

Genus CRATENA Bergh.

CRATENA CAVANCA Bergh.

1898. Plate, Fauna Chilensis, vol. 1, p. 545, pl. 31, figs. 32–34. Cavancha, Chile.

CRATENA PUSILLA Bergh.

1898. Plate, Fauna Chilensis, vol. 1, p. 547, pl. 31, figs. 35–37. Juan Fernandez Island.

Genus PHIDIANA Gray.

PHIDIANA EXIGUA Bergh.

1898. Plate, Fauna Chilensis, vol. 1, p. 559, pl. 32, figs. 16–18. Coquimbo, Chile.

PHIDIANA INCA Orbigny.

1837. *Aeolis inca* Orbigny, Voy. Am. Mér., p. 195, pl. 13, figs. 1–7. Callao to Talcahuano, Chile.

PHIDIANA NATANS Orbigny.

1837. *Aeolis natans* ORBIGNY, Voy. Am. Mér., p. 195, pl. 13, figs. 8–10. Off Peru, S. lat. 13°.

Genus FIONA Hancock and Embleton.

FIONA PINNATA Eschscholtz.

1831. *Aeolidia pinnata* ESCHSCHOLTZ, Zool. Atlas, pt. 4, p. 14, pl. 19, fig. 1. Eastern Pacific; off Sitka, Alaska, and southward. Pelagic.

FIONA MARINA Forskål, var. PACIFICA Bergh.

1898. Plate, Fauna Chilensis, vol. 1, p. 560. Juan Fernandez Island and Talcahuano, Chile.

Genus GLAUCILLA Bergh.

GLAUCILLA DISTICHOICA Orbigny.

1837. *Glaucus distichoicus* ORBIGNY, Voy. Am. Mér., p. 196, pl. 14, figs. 1–3. Off Peru, S. lat. 20°.

Family PHYLLIRHOIDÆ.

Genus PHYLLIRHOË Peron and Lesueur.

PHYLLIRHOË ROSEA Orbigny.

1836. *Phyllirhoë roseum* ORBIGNY, Voy. Am. Mér., p. 183, pl. 20, figs. 16–17. Eastern Pacific S. lat. 36°.

Family PLEUROPHYLLIDIIDÆ.

Genus PLEUROPHYLLIDIA Meckel.

PLEUROPHYLLIDIA CUVIERI Orbigny.

1837. *Diphyllidia cuvieri* ORBIGNY, Voy. Am. Mér., p. 199, pl. 17, figs. 1–3. Paita, Peru, to Valparaiso, Chile, in 7–8 fathoms.

Family TRITONIIDÆ.

Genus TRITONIA Cuvier.

TRITONIA (CANDIELLA) AUSTRALIS Bergh.

1898. Plate, Fauna Chilensis, vol. 1, p. 536, pl. 31, figs. 17–25. Calbuco, Chile. Juan Fernandez Island.

(*HOLOHEPATICA.*)

Family DORIDIDÆ.

(*CRYPTOBRANCHIATA.*)

Genus ARCHIDORIS Bergh.

ARCHIDORIS? FONTAINEI Orbigny.

1837. *Doris fontainei* ORBIGNY, Voy. Am. Mér., p. 189, pl. 15, figs. 1–3. Valparaiso, Tumbes, Chile.

ARCHIDORIS? INCERTA Bergh.

1898. Plate, Fauna Chilensis, vol. 1, p. 504, pl. 29, figs. 21–25. Tumbes, Chile.

Genus ANISODORIS Bergh.

ANISODORIS MARMORATA Bergh.

1898. Plate, Fauna Chilensis, vol. 1, p. 515, pl. 30, figs. 5–7. Coquimbo, Chile.

ANISODORIS PUNCTUOLATA Orbigny.

1837. *Doris punctuolata* Orbigny, Voy. Am. Mér., p. 187, pl. 16, figs. 4–6.—Bergh, Fauna Chilensis, vol. 1, p. 509, pl. 29, figs. 31–34; pl. 30, figs. 1–2, 1898. Callao, Peru, south to Talcahuano, Chile.

ANISODORIS TESSELLATA Bergh.

1898. Plate, Fauna Chilensis, vol. 1, p. 518, pl. 30, figs. 8–11. Molle Bay, Chile, 8 fathoms.

ANISODORIS VARIOLATA Orbigny.

1837. *Doris variolata* Orbigny, Voy. Am. Mér., p. 186, pl. 16, figs. 1–3.—Bergh, Fauna Chilensis, vol. 1, p. 512, pl. 30, figs. 3–4, 1898. Valparaiso and Tumbes, Chile.

Genus TRIPPA Bergh.

TRIPPA ? HISPIDA Orbigny.

1837. *Doris hispida* Orbigny, Vol. Am. Mér., p. 188, pl. 15, figs. 4–6. Calbuco, Valparaiso, and Tumbes, Chile.

Genus TYRINNA Bergh.

TYRINNA NOBILIS Bergh.

1898. Plate, Fauna Chilensis, vol. 1, p. 524, pl. 30, figs. 21–29; pl. 32, figs. 21–24. Calbuco, Chile.

Genus PLATYDORIS Bergh.

PLATYDORIS PUNCTATELLA Bergh.

1898. Plate, Fauna Chilensis, vol. 1, p. 521, pl. 30, figs. 12–20. Isla de Pajargo, Chile.

Genus CHROMODORIS Alden and Hancock.

CHROMODORIS JUVENCA Bergh.

1898. Plate, Fauna Chilensis, vol. 1, p. 531, pl. 31, figs. 4–11. Isla de Pajargo, Chile, and Juan Fernandez Island.

(*POROSTOMATA.*)

Family DORIOPSIDIDÆ.

Genus DORIOPSIS Pease.

DORIOPSIS PERUVIANA Orbigny.

1837. *Doris peruviana* Orbigny, Voy. Am. Mér., p. 188, pl. 15, figs. 7–9. Galapagos Islands and Callao, Peru, and south to Valparaiso, Chile.

(*PHANEROBRANCHIATA.*)

Family POLYCERATIDÆ.

Genus EUPLOCAMUS Philippi.

EUPLOCAMUS MACULATUS Bergh.

1898. Plate, Fauna Chilensis, vol. 1, p. 534, pl. 31, figs. 12–16. Juan Fernandez Island.

Order PULMONATA.

Suborder BASOMMATOPHORA.

Superfamily AKTEOPHILA.

Family AURICULIDÆ.

Genus AURICULA Lamarck.

AURICULA STAGNALIS Orbigny.

1835. Orbigny in Guerin, Mag. de Zoöl., p. 23; Voy. Am. Mér., p. 325, pl. 42, figs. 7–8, 1837. Panama to Guayaquil.

Genus MELAMPUS Montfort.

MELAMPUS ACROMELAS Troschel.

1852. *Conovulus acromelas* Troschel, Arch. f. Nat., vol. 18, pt. 1, p. 197, pl. 6, fig. 2. Peru (Tschudi).

MELAMPUS LUTEUS Quoy and Gaimard.

1832. Voy. Astrolabe, Zool., vol. 2, p. 163, pl. 13, figs. 25–27. Tumaco Island, Guayaquil. Peru (Tschudi).

MELAMPUS PIRIFORMIS Petit.

1842. *Auricula piriformis* Petit, Proc. Zool. Soc., p. 202.—Küster, Conch. Cab., *Auricula*, p. 37, pl. 5, figs. 12–14, 1844. Tumaco Island, Guayaquil.

MELAMPUS (SIONA) FRUMENTUM Petit.

1842. *Conovulus frumentum* Petit, Rev. Zoöl., p. 32. Callao, Peru.

MELAMPUS (SIONA) AVENA Petit.

1842. *Conovulus avena* Petit, Rev. Zoöl., p. 106.—Küster, Conch. Cab., *Auricula*, p. 48, pl. 7, figs. 17–19, 1844. Valparaiso, Chile.

MELAMPUS (DETRACIA) GLOBULUS Ferussac.

1835. Orbigny, Mag. de Zoöl., p. 23, no. 4.—Pfeiffer, Nov. Conch., vol. 1, p. 23, pl. 6, figs. 23–25. Tumaco Island, Guayaquil.

Genus TRALIA Gray.

TRALIA (ALEXIA) REFLEXILABRIS Orbigny.

1840. *Auricula reflexilabris* Orbigny, Voy. Am. Mér., p. 326, pl. 42, figs. 1–3. Callao, salt marshes.

Genus MARINULA King.

MARINULA ACUTA Orbigny.

1835. *Auricula acuta* ORBIGNY, in Guerin, Mag. de Zoöl., 1835, p. 23, no. 2; Voy. Am. Mér., p. 326, pl. 42, figs. 4–6, 1837. Panama to Guayaquil.

MARINULA MARINELLA Küster.

1844. *Auricula marinella* KÜSTER, Conch. Cab., *Auricula*, p. 24, pl. 3, figs. 4, 5. Callao, Peru, south to the island of Chiloë.

MARINULA PEPITA King.

1831. Zoöl. Journ., vol. 5, p. 344.—H. and A. ADAMS, Gen. Rec. Moll., vol. 2, p. 247, pl. 83, fig. 2*a*, 1856. Guayaquil, south to the island of Chiloë.

Superfamily PETROPHILA.

Family SIPHONARIIDÆ.

Genus SIPHONARIA Sowerby.

SIPHONARIA COSTATA Sowerby.

1835. Proc. Zool. Soc., p. 6.—REEVE, Con. Icon., vol. 9, pl. 4, fig. 19, 1856. Guacomayo, Central America, south to Valparaiso, Chile.

SIPHONARIA GIGAS Sowerby.

1825. Tankerville Cat., App., p. VI.—REEVE, Con. Icon., pl. 1, fig. 3, 1856. Acapulco, Mexico, to Peru. Cocos and Galapagos Islands.

SIPHONARIA LÆVIUSCULA Sowerby.

1835. Proc. Zool. Soc., p. 7.—REEVE, Con. Icon., vol. 9, pl. 1, fig. 5, 1856. Valparaiso, southward to the Magellan Straits.

SIPHONARIA LESSONI Blainville.

1824. Dict. Sci. Nat., vol. 32, p. 267, pl. 44, fig. 2. Nicaragua, and south to the Magellan Straits.

SIPHONARIA LINEOLATA Sowerby.

1835. Proc. Zool. Soc., p. 6.—REEVE, Con. Icon., vol. 9, pl. 3, fig. 11, 1856. Guayaquil, south to the Chilean coast.

SIPHONARIA MAURA Sowerby.

1835. Proc. Zool. Soc., p. 7.—REEVE, Con. Icon., vol. 9, pl. 7, fig. 36, 1856. Magdalena Bay, Lower California, south to Guayaquil. Chile (Dautzenberg).

SIPHONARIA TENUIS Philippi.

1860. Atacama Reise, p. 181, Zoöl., pl. 7, figs. 5*a–c*. Paita, Peru, to Valparaiso, Chile.

Genus WILLIAMIA Monterosato.

WILLIAMIA GALAPAGANA Dall.

1909. *Vaella subspiralis* WIMMER, Sitzb. k. Akad. Wiss. Wien., vol. 80, p. 41, 1879, not of CARPENTER, 1866. Galapagos Islands, Panama Bay, etc., on floating seaweed.

Family GADINIIDÆ.

Genus GADINIA Gray.

GADINIA PERUVIANA Sowerby.

1835. *Mouretia peruviana* SOWERBY, Proc. Zool. Soc., p. 6; Zoöl. Beechey's Voy., Moll., p. 147, pl. 39, fig. 6, 1839. Gulf of California, south to Talcahuano, Chile.

Suborder STYLOMMATOPHORA.

Superfamily DITREMATA.

Family ONCHIDIIDÆ.

Genus ONCHIDIUM Buchanan.

ONCHIDIUM CHILENSE Hupé.

1854. Gay, Hist. Chile, p. 120. San Carlos de Chiloë.

ONCHIDIUM JUANFERNANDEZIANA Wissell.

1898. Zoöl. Jahrb., suppl. vol. 4, pp. 583–640, pl. 1–3. Juan Fernandez Island.

ONCHIDIUM LANUGINOSUM Hupé.

1854. Gay, Hist. Chile, p. 121. San Carlos de Chiloë.

Superorder CTENOBRANCHIATA.

(*STREPTONEURA.*)

Order ORTHODONTA.

Superfamily TOXOGLOSSA.

Family TEREBRIDÆ.

Genus TEREBRA Bruguière.

TEREBRA GUAYAQUILENSIS E. A. Smith.

1880. Proc. Zool. Soc., p. 481. Guayaquil.

TEREBRA STRIGATA Sowerby.

1825. Tankerville Cat., App., p. xxv; Thes. Con., p. 151, pl. 41, fig. 10, 1847. Cape St. Lucas and Gulf of California south to Paita, Peru, and the Galapagos Islands.

TEREBRA ASPERA Hinds.

1843. Proc. Zool. Soc., p. 154.—SOWERBY, Thes. Con., p. 174, pl. 43, fig. 44, 1847. Guayaquil and Paita, Peru.

TEREBRA GEMMULATA Kiener.

1839. KIENER, Icon., *Terebra*, p. 15, pl. 5, figs. 11, 11*a*. Chile.

TEREBRA LARVÆFORMIS Hinds.

1843. Proc. Zool. Soc., p. 155.—SOWERBY, Thes. Con., p. 176, pl. 43, figs. 46, 47, 1847. Guayaquil.

TEREBRA PLICATA Gray.

1834. Proc. Zool. Soc., p. 61.—TRYON, Man., vol. 7, p. 24, pl. 7, fig. 20, 1885. Guayaquil.

Family CONIDÆ.

Genus CONUS Linnæus.

CONUS BRUNNEUS Mawe.

1828. WOOD, Ind. Test., suppl. pl. 3, fig. 1.—SOWERBY, Con. Ill., *Conus*, pl. 57, fig. 88; var. fig. 63. Central America and southward to Manta, Ecuador, and the Galapagos Islands.

CONUS FERGUSONI Sowerby.

1875. Proc. Zool. Soc., p. 145, pl. 15, fig. 1. Panama and southward. Galapagos Islands.

CONUS LUCIDUS Mawe.

1828. WOOD, Index Test. suppl. pl. 3, fig. 4. Gulf of Panama; Paita, Peru; and Galapagos Islands.

CONUS MONILIFER Sowerby.

1833. Proc. Zool. Soc., p. 54. Con. Ill., pl. 33, fig. 37, 1833. Magdalena Bay, Lower California, and south to Sechura Bay, Peru.

CONUS PRINCEPS Linnæus.

1758. Syst. Nat., 10th ed., p. 713.—SOWERBY, Con. Ill., figs. 30*a*–30*b*, 1833. Panama, south to Paita, Peru.

CONUS PURPURASCENS Broderip.

1833. Proc. Zool. Soc., p. 54.—SOWERBY, Con. Ill., fig. 13, 1833 Gulf of California and south to Paita, Peru.

CONUS RECURVUS Broderip.

1833. Proc. Zool. Soc., p. 54.—SOWERBY, Con. Ill., fig. 36, 1833. Guaymas, Mexico, to Guayaquil.

CONUS TORNATUS Broderip.

1833. Proc. Zool. Soc., p. 53.—SOWERBY, Con. Ill., fig. 25, 1833. Ecuador coast.

CONUS XIMENES Gray.

1839. Zool. Beech. Voy. p. 119, pl. 33, fig. 2. Gulf of California to Sechura Bay, Peru.

Family TURRITIDÆ.

Genus SURCULA H. and A. Adams.

SURCULA MACULOSA Sowerby.

1833. *Pleurotoma maculosa* SOWERBY, Proc. Zool. Soc., p. 135.—REEVE, Con. Icon., *Pleurotoma*, fig. 45. Gulf of California to Guayaquil.

SURCULA MAURA Sowerby.

1833. *Pleurotoma maura* SOWERBY, Proc. Zool. Soc., p. 134.—REEVE, Con. Icon., *Pleurotoma*, fig. 47 (not *P. maura* Kiener). Guayaquil.

SURCULA OLIVACEA Sowerby.

1833. *Pleurotoma olivacea* SOWERBY, Proc. Zool. Soc., p. 136.—REEVE, Con. Icon., *Pleurotoma*, fig. 27. Guayaquil, Salango, Ecuador.

Genus DRILLIA Gray.

DRILLIA ADUSTA Sowerby.

1833. *Pleurotoma adusta* SOWERBY, Proc. Zool. Soc., p. 137. Monte Cristi, Ecuador.

DRILLIA ATERRIMA Sowerby.

1833. *Pleurotoma aterrima* SOWERBY, Proc. Zool. Soc., p. 137.—REEVE, Con. Icon., *Pleurotoma*, fig. 100. Monte Cristi, Ecuador.

DRILLIA BOTTÆ Valenciennes.

1840. *Pleurotoma bottæ* (VALENCIENNES) KIENER, Icon., p. 33, pl. 15, fig. 12. Gulf of California to Guayaquil.

DRILLIA CLAVATA Sowerby.

1833. *Pleurotoma clavata* SOWERBY, Proc. Zool. Soc., p. 135.—REEVE, Con. Icon., *Pleurotoma*, fig. 132. Ecuador coast.

DRILLIA COLLARIS Sowerby.

1833. *Pleurotoma collaris* SOWERBY, Proc. Zool. Soc., p. 139.—REEVE, Con. Icon., *Pleurotoma*, fig. 120. Ecuador coast.

DRILLIA DISCORS Sowerby.

1833. *Pleurotoma discors* SOWERBY, Proc. Zool. Soc., p. 137.—REEVE, Con. Icon., *Pleurotoma*, fig. 38. Ecuador coast.

DRILLIA LUCTUOSA Hinds.

1843. *Pleurotoma luctuosa* HINDS, Proc. Zool. Soc., p. 40; Zoöl. Sulph. Voy., p. 18, pl. 6, fig. 4 (as *Clavatula*). Magdalena Bay, Lower California, and south to Guayaquil.

DRILLIA NIGERRIMA Sowerby.

1833. *Pleurotoma nigerrima* SOWERBY, Proc. Zool. Soc., p. 137.—REEVE, Con. Icon., *Pleurotoma*, fig. 102. Gulf of California to Ecuador.

DRILLIA ROSEA Sowerby.

1833. *Pleurotoma rosea* SOWERBY, Proc. Zool. Soc., p. 134.—REEVE, Con. Icon., *Pleurotoma*, fig. 43. Nicaragua coast and southward to Ecuador.

DRILLIA RUDIS Sowerby.

1833. *Pleurotoma rudis* SOWERBY, Proc. Zool. Soc., p. 134.—REEVE, Con. Icon., *Pleurotoma*, fig. 53. Mazatlan, Mexico, south to Ecuador and the Galapagos Islands.

DRILLIA RUSTICA Sowerby.

1833. *Pleurotoma rustica* SOWERBY, Proc. Zool. Soc., p. 138.—REEVE, Con. Icon., *Pleurotoma*, fig. 91. Mazatlan, Mexico, and south to Ecuador.

DRILLIA SOWERBYI Reeve.

1833. *Pleurotoma sowerbyi* REEVE, Con. Icon., errata, and fig. 49. Ecuador coast.

DRILLIA ZONULATA Reeve.

1843. *Pleurotoma zonulata* REEVE, Syst. Con., vol. 2, pl. 234, fig. 10; Con. Icon., *Pleurotoma*, fig. 39. Coast of Ecuador.

Genus CLATHURELLA Carpenter.

CLATHURELLA ASPERA Hinds.

1843. *Pleurotoma aspera* HINDS, Proc. Zool. Soc., p. 40; Zoöl. Sulph. Voy., p. 19, pl. 6, figs. 7, 8, 1844. Guayaquil.

Genus MANGILIA (Leach) Risso.

MANGILIA FORMICARIA Sowerby.

1833. *Pleurotoma formicaria* SOWERBY, Proc. Zool. Soc., p. 139.—REEVE, Con. Icon., *Pleurotoma*, fig. 247. Iquique.

MANGILIA ORDINARIA E. A. Smith.

1882. Ann. Mag. Nat. Hist., p. 216.—TRYON, Man. Con., vol. 6, p. 250, pl. 34, fig. 97, 1884. Chile and Peru.

MANGILIA RUFOCINCTA E. A. Smith.

1882. Ann. Mag. Nat. Hist., p. 215. Porto Cavallo.

Family CANCELLARIIDÆ.

Genus CANCELLARIA Lamarck.

CANCELLARIA ALBIDA Hinds.

1843. Proc. Zool. Soc., p. 47.—SOWERBY, Thes. Con., vol. 2, p. 442, pl. 94, fig. 43, 1848. Coast of Nicaragua and south to Guayaquil.

CANCELLARIA BREVIS Sowerby.

1832. Proc. Zool. Soc., p. 52; Thes. Con., pl. 93, fig. 21, 1848. Mazatlan, Mexico, and south to Guayaquil.

CANCELLARIA BUCCINOIDES Sowerby.

1832. Proc. Zool. Soc., p. 54; Con. Ill., vol. 2, fig. 11, 1832. Coast of Nicaragua and southward to Mejillones, Chile.

CANCELLARIA BULLATA Sowerby.

1832. Proc. Zool. Soc., p. 53; Con. Ill., fig. 35, 1832. Gulf of Panama and southward to Iquique.

CANCELLARIA CASSIDIFORMIS Sowerby.

1832. Proc. Zool. Soc., p. 53; Con. Ill., fig. 22, 1832. Gulf of California to Paita, Peru.

CANCELLARIA CHRYSOSTOMA Sowerby.

1832. Proc. Zool. Soc., p. 54; Thes. Con., p. 451, pl. 94, fig. 39. Gulf of Panama to Paita, Peru.

CANCELLARIA CLAVATULA Sowerby.

1832. Proc. Zool. Soc., p. 52; Con. Ill., fig. 12, 1832. Panama to Paita, Peru.

CANCELLARIA CORRUGATA Hinds.

1843. Proc. Zool. Soc., p. 48.—SOWERBY, Thes. Con., vol. 2, p. 448, pl. 96, figs. 92–93, 1848. Guayaquil.

CANCELLARIA EXOPLEURA Dall.

1908. Albatross Rep., p. 294. Panama Bay to Paita, Peru.

CANCELLARIA MITRIFORMIS Sowerby.

1832. Proc. Zool., Soc. p. 51; Con. Ill., fig. 15, 1832. Panama to Pacasmayo, Peru.

CANCELLARIA OBESA Sowerby.

1832. Proc. Zool. Soc., p. 52; Thes. Con., vol. 2, p. 441, pl. 95, fig. 37, 1848. Gulf of California to Guayaquil.

CANCELLARIA PARVA Philippi.

1860. Atacama Reise, p. 187, pl. 7, fig. 18. Paposo, Chile.

CANCELLARIA TESSELATA Sowerby.

1832. Proc. Zool. Soc., p. 51; Thes. Con., vol. 2, pl. 93, fig. 32, 1848. Gulf of California to Guayaquil.

CANCELLARIA TUBERCULOSA Sowerby.

1832. Proc. Zool. Soc., p. 51; Con. Ill., fig. 36, 1833. Callao. Peru, south to Mejillones, Chile.

CANCELLARIA UNIPLICATA Sowerby.

1848. Thes. Con., vol. 2, pl. 93, fig. 35. Panama to Valparaiso.

Superfamily RHACHIGLOSSA.

Family OLIVIDÆ.

Genus OLIVA Martyn.

OLIVA ANGULATA Lamarck.

1810. Ann. du Mus., vol. 16, p. 310; Encycl. Méth., pl. 363, fig. 6. Magdalena Bay, Lower California, southward to Peru.

OLIVA KALEONTINA Duclos.

1836. Mon. *Oliva*, pl. 8, figs. 7, 8.—Sowerby, Thes. Con., p. 10, pl. 333, figs. 92, 93, 1871. Cape St. Lucas and southward to Paita, Peru, and the Galapagos Islands.

OLIVA PERUVIANA Lamarck.

1810. Ann. du Mus., vol. 16, p. 317.—Reeve, Con. Icon., fig. 14. Whole Peruvian province from Paita, Peru, to Lota, Chile, and the Galapagos Islands.

OLIVA TESTACEA Lamarck.

1810. Ann. du Mus., vol. 16, p. 324.—Martens, Arch. Nat., vol. 63, p. 165, pl. 15, figs. 13, 14, 1897; and var. *philippii;* Idem, pl. 16, figs. 7, 12, 1897. Mazatlan, Mexico, and southward to Cobija, Chile.

Genus OLIVELLA Swainson.

OLIVELLA COLUMELLARIS Sowerby.

1825. Tankerville Cat., App., p. xxxiv.—Reeve, Con. Icon., *Oliva*, fig. 62, 1850. Central American coast and southward to Sechura Bay, Peru.

OLIVELLA SEMISTRIATA Gray.

1839. Zoöl. Beech. Voy., p. 130, pl. 36, fig. 10. Gulf of California to Sechura Bay, Peru.

OLIVELLA TERGINA Duclos.

1835. Mon. *Oliva*, pl. 2, figs. 13–16.—REEVE, Con. Icon., *Oliva*, fig. 80, 1850. Acapulco, Mexico, and southward to Paita, Peru.

OLIVELLA VOLUTELLA Lamarck.

1810. *Oliva volutella* LAMARCK, Ann. du Mus., vol. 16, p. 322.—DUCLOS, Mon. *Oliva*, pl. 6, figs. 5, 6, 1835. Gulf of California to Paita, Peru.

OLIVELLA ZONALIS Lamarck.

1810. *Oliva zonalis* LAMARCK, Ann. du Mus., vol. 16, p. 327.—REEVE, Con. Icon., *Oliva*, fig. 56, 1850. Mazatlan, Mexico, to Guayaquil.

Family MARGINELLIDÆ

Genus MARGINELLA Lamarck.

MARGINELLA CURTA Sowerby.

1832. Proc. Zool. Soc., p. 105; Thes. Con., vol. 1, p. 397, pl. 76, figs. 88, 89. Gulf of California and southward to Iquique, Chile.

MARGINELLA FRUMENTUM Sowerby.

1832. Proc. Zool. Soc., p. 57.—REEVE, Con. Icon., *Marginella*, fig. 71, 1865. Cape St. Lucas and south to Guayaquil and the Galapagos Islands.

MARGINELLA SAPOTILLA Hinds.

1844. Proc. Zool. Soc., p. 74.—SOWERBY, Thes. Con., vol. 1, p. 383, pl. 77, figs. 150, 151. Gulf of Panama to Peru.

Family VOLUTIDÆ.

Genus ADELOMELON Dall.

ADELOMELON MAGELLANICUS Lamarck.

1811. *Voluta magellanica* LAMARCK, Ann. du Mus., vol. 17, p. 69; Encycl. Méth., pl. 385, figs. 1*a*, 1*b*, 1816. Chiloë Island and southward to Magellan Straits, and on the Argentine coast and the Falkland Islands.

ADELOMELON ANCILLA Solander.

1786. Portland Museum, p. 137, No. 3061.—LAMARCK, Encycl. Méth., pl. 385, fig. 3, 1816. Magellanic region and northward to Puerto Montt, and Chiloë Island, Chile.

Family TURBINELLIDÆ.

Genus VASUM Bolten.

VASUM CÆSTUS Broderip.

1833. *Turbinella cæstus* BRODERIP, Proc. Zool. Soc., p. 8.—REEVE, Con. Icon., *Turbinella*, pl. 6, fig. 34*a*. San Diego, California, south to Ecuador.

Family MITRIDÆ.

Genus MITRA Martyn.

MITRA EFFUSA Swainson.

1835. Proc. Zool. Soc., p. 194.—REEVE, Con. Icon., *Mitra*, pl. 14, fig. 100, 1844. Gulf of Panama to the Galapagos Islands.

MITRA LENS Mawe.

1828. WOOD, Ind. Test., suppl. pl. 3, fig. 25. Mazatlan, Mexico, south to Paita, Peru, and the Galapagos Islands.

MITRA ORIENTALIS Gray.

1834. Griffith's Cuvier, pl. 40, fig. 5. Ancon, Peru, south to Iquique, Chile.

MITRA SEMIGRANOSA Von Martens.

1897. Arch. Nat., vol. 63, p. 178, pl. 16, figs. 24, 25. Ecuador coast and south to Chile.

MITRA SULCATA Swainson.

1825. Tankerville Cat., App., p. XXVI.—REEVE, Con. Icon., *Mitra*, pl. 22, fig. 176, 1844. West coast Central America and southward to Ecuador.

MITRA TRISTIS Swainson.

1835. *Tiara tristis* SWAINSON, Proc. Zool. Soc., p. 194.—REEVE, Con. Icon., *Mitra*, pl. 15, fig. 114, 1844. Mazatlan, Mexico, to Guayaquil and the Galapagos Islands.

Family FASCIOLARIIDÆ.

Genus FASCIOLARIA Lamarck.

FASCIOLARIA GRANOSA Broderip.

1832. Proc. Zool. Soc., p. 32.—REEVE, Con. Icon., *Fasciolaria*, fig. 6, 1847. West Mexico, Panama; Peru (Tschudi).

FASCIOLARIA PRINCEPS Sowerby.

1825. Tankerville Cat., App., p. XVI.—KIENER, Icon., *Fasciolaria*, p. 6, pls. 12, 13. Gulf of California to Peru and the Galapagos Islands.

Genus LATIRUS Montfort.

LATIRUS CERATUS Gray.

1828. In Wood, Ind. Test., suppl. pl. 5, fig. 15 (as *Murex*). Mazatlan, Mexico, to Manta, Ecuador, and the Galapagos Islands.

LATIRUS CONCENTRICUS Reeve.

1847. Con. Icon., *Turbinella*, figs. 2, 44. Acapulco, to Panama and Guayaquil.

Family BUCCINIDÆ.

Genus AUSTROFUSUS Kobelt.

AUSTROFUSUS FONTAINEI Orbigny.

1841. *Fusus fontainei* Orbigny, Voy. Am. Mér., p. 447, pl. 63, fig. 2. Callao, Peru, south to Valparaiso, Chile.

Genus ATRACTODON Charlesworth.

ATRACTODON PLUMBEUS Philippi.

1844. *Fusus plumbeus* Philippi, Abb., vol. 1, p. 108, pl. 1, fig. 3. Southern Chile and the Magellanic region; Puerto Montt; Chiloë.

Genus GALEODES Bolten.

GALEODES PATULUS Broderip.

1829. *Pyrula patula* Broderip and Sowerby, Zoöl. Journ., vol. 1, p. 377.—Gray, Beech. Voy., Zoöl., p. 115, pl. 34, fig. 10; pl. 35, figs. 1, 3. Central American coast; Gulf of Panama and southward.

Genus SOLENOSTEIRA Dall.

SOLENOSTEIRA FUSIFORMIS Blainville.

1832. *Purpura fusiformis* Blainville, Nouv. Ann. du Mus., vol. 1, pl. 11, fig. 7.—Reeve, Con. Icon., *Buccinum*, pl. 7, fig. 50, 1846. Gulf of Panama and southward to the Chincha Islands, Peru.

Family COLUBRARIIDÆ.

Genus COLUBRARIA Schumacher.

COLUBRARIA SOWERBYI Reeve.

1844. *Triton sowerbyi* Reeve, Con. Icon., *Triton*, fig. 65. Galapagos Islands.

Genus CANTHARUS Bolten.

CANTHARUS BOLIVIANUS Eydoux and Souleyet.

1852. *Buccinum bolivianum* Eydoux and Souleyet, Voy. Bonite, Zoöl., vol. 2, p. 610, pl. 41, figs. 22, 24. Cobija, Chile.

CANTHARUS DISTORTUS Gray.

1828. *Buccinum distortum* Gray, in Wood, Ind. Test., suppl. pl. 4, fig. 7. Panama to Guayaquil.

CANTHARUS ELEGANS Gray.

1833. *Triton* (*Pusio*) *elegans* Gray, in Griffith's Cuvier, vol. 12, p. 600, pl. 25, fig. 2; not of Orbigny, 1852. Mazatlan, Mexico, to Paita, Peru.

CANTHARUS GEMMATUS Reeve.

1846. *Buccinum gemmatum* REEVE, Con. Icon., fig. 49. Mazatlan, Mexico, to Guayaquil.

CANTHARUS INCA Orbigny.

1841. *Murex inca* ORBIGNY, Voy. Am. Mér., p. 455, pl. 78, fig. 3. Peruvian coast, Pacasmayo to Callao.

CANTHARUS JANELLI Kiener.

1835. *Purpura janelli* KIENER, Icon., *Purpura*, p. 122, pl. 38, fig. 89; not of VALENCIENNES, 1846. Paita, Peru, and the Chincha Islands.

CANTHARUS RINGENS Reeve.

1846. *Buccinum ringens* REEVE, Con. Icon., fig. 45. Panama to Guayaquil.

CANTHARUS SANGUINOLENTUS Duclos.

1833. *Purpura sanguinolenta* DUCLOS, Guérin, Mag. de Zoöl., vol. 5, p. 22, fig. 1. Mazatlan, and south to Guayaquil.

CANTHARUS VIBEX Broderip.

1832. Proc. Zool. Soc., p. 175 (unfigured). Gulf of Panama to Guayaquil.

Genus ENGINA Gray.

ENGINA CONTRACTA Reeve.

1846. *Ricinula contracta* REEVE, Con. Icon., *Ricinula*, fig. 32. Gulf of Panama to Guayaquil.

ENGINA CARBONARIA Reeve.

1846. *Ricinula carbonaria* REEVE, Con. Icon., fig. 22. Gulf of Panama to Manta, Ecuador, and the Galapagos Islands.

Family ALECTRIONIDÆ.

Genus ARCULARIA Link.

ARCULARIA LUTEOSTOMA Broderip and Sowerby.

1829. *Nassa luteostoma* BRODERIP and SOWERBY, Zoöl. Journ., vol. 4, p. 376.—GRAY, Beech. Voy., p. 127, pl. 36, fig. 3, 1839. Mazatlan to Panama. Peru (Tschudi).

ARCULARIA PAPOSANA Philippi.

1860. *Buccinum paposanum* Philippi, Atac. Reise, p. 188. Paposo, Chile.

Genus ALECTRION Montfort.

ALECTRION (HIMA) COMPLANATUS Powys.

1835. *Nassa complanata* POWYS, Proc. Zool. Soc., p. 36.—REEVE, Con. Icon., *Nassa*, figs. 105, 107, 111*b*. Gulf of Panama south to S. lat. 25°.

ALECTRION (HIMA) DENTIFERUS Powys.

1835. *Nassa dentifera* POWYS, Proc. Zool. Soc., p. 95.—ORBIGNY, Voy. Am. Mér., p. 432, pl. 61, figs. 22, 23, 1841. Gulf of Panama south to Valparaiso, Chile.

ALECTRION (HIMA) ESCALÆ Philippi.

1860. *Buccinum escalæ* PHILIPPI, Atac. Reise, p. 188, pl. 7, fig. 19. Mejillones, Chile, S. lat. 23°.

ALECTRION (HIMA) EXILIS Powys.

1835. *Nassa exilis* POWYS, Proc. Zool. Soc., p. 95.—REEVE, Con. Icon., *Nassa*, fig. 101*a*. Panama to Paita, Peru.

ALECTRION (HIMA) FESTIVUS Powys.

1835. *Nassa festiva* POWYS, Proc. Zool. Soc., p. 95.—REEVE, Con. Icon., *Nassa*, fig. 117. Panama to Guayaquil.

ALECTRION (HIMA) GAYII Kiener.

1835. *Buccinum gayii* KIENER, Icon., *Buccinum*, p. 71, pl. 21, fig. 79. Callao, Peru, southward to Magellan Straits.

ALECTRION INSCULPTUS Carpenter, var.?

Sechura Bay, Peru.

ALECTRION (HIMA) PANAMENSIS Philippi.

1851. *Buccinum panamense* PHILIPPI, Zeitschr. f. Mal., p. 61; not of ADAMS. Panama to Paita, Peru.

ALECTRION (HIMA) PLANICOSTATUS A. Adams.

1851. *Nassa planicostata* ADAMS, Proc. Zool. Soc., p. 108.—REEVE, Con. Icon., *Nassa*, fig. 96*b*. Paita.

ALECTRION (HIMA) SPARTA Marrat.

1897. *Nassa sparta* MARRAT, New forms of *Nassa*, p. 11, pl. 1, fig. 22. "West coast of South America."

ALECTRION (HIMA) VERSICOLOR C. B. Adams.

1852. *Nassa versicolor* ADAMS, Panama Shells, p. 66.—REEVE, Con. Icon., *Nassa*, fig. 110. Mazatlan, Mexico, to Paita, Peru.

ALECTRION (TRITIA) TÆNIOLATUS Philippi.

1845. *Buccinum tæniolatum* PHILIPPI, Arch. f. Naturg., vol. 11, p. 69.—HUPÉ, Hist. Chile, vol. 8, p. 207, pl. 4, fig. 7, 1854. Magellan Straits and northward to Coquimbo, Chile.

ALECTRION (TRITIA) TSCHUDII Troschel.

1852. *Nassa tschudii* TROSCHEL, Arch. f. Naturg., p. 173, pl. 5, fig. 4. Peru.

Genus NORTHIA Gray.

NORTHIA NORTHIÆ Gray.

1833. *Nassa northiæ* GRAY, in Griffith's Cuvier, pl. 30, fig. 2.—KIENER, Icon., *Buccinum*, p. 23, pl. 9, fig. 28, 1834. Gulf of Panama and south to Guayaquil.

Genus BUCCINANOPS Orbigny.

BUCCINANOPS PAYTENSIS Valenciennes.

1834. *Buccinum paytensis* VALENCIENNES, Kiener, Icon., p. 17, pl. 6, fig. 16. Paita, Peru.

Family COLUMBELLIDÆ.

Genus COLUMBELLA Lamarck.

COLUMBELLA FUSCATA Sowerby.

1832. Proc. Zool. Soc., p. 117; Thes. Con., *Columbella*, p. 114, pl. 36, figs. 21, 25, 1844. Gulf of California and southward to Paita, Peru, and the Galapagos Islands.

COLUMBELLA HÆMASTOMA Sowerby.

1832. Proc. Zool. Soc., p. 116; Thes. Con., *Columbella*, p. 111, pl. 36, fig. 5, 1844. Gulf of California and southward to Ecuador and the Galapagos Islands.

COLUMBELLA LABIOSA Sowerby.

1822. Gen. Sh., *Columbella*, fig. 2. Santa Elena, Guayaquil.

COLUMBELLA MAJOR Sowerby.

1832. Proc. Zool. Soc., p. 119; Thes. Con., *Columbella*, p. 110, pl. 36, figs. 3, 4, 1844. Gulf of California, south to Paita, Peru.

COLUMBELLA PAYTENSIS Lesson.

1830. Voy. Coq., vol. 2, pt. 1, p. 402.—SOWERBY, Thes. Con., *Columbella*, p. 116, pl. 36, figs. 36, 37, 1844. Pacific coast of Nicaragua and southward to Sechura Bay, Peru, and the Galapagos Islands.

COLUMBELLA STROMBIFORMIS Lamarck.

1822. An. s. Vert., vol. 7, p. 293.—SOWERBY, Thes. Con., *Columbella*, p. 110, pl. 36, figs. 1, 2, 1844. Gulf of California to Paita, Peru, and the Galapagos Islands.

COLUMBELLA UNCINATA Sowerby.

1832. Proc. Zool. Soc., p. 114.—SOWERBY, Thes. Con., *Columbella*, p. 112, pl. 36, figs. 13, 14, 1844. Guayaquil.

Genus ANACHIS H. and A. Adams.

ANACHIS FLUCTUATA Sowerby.

1832. Proc. Zool. Soc., p. 115.—KIENER, Icon., *Columbella*, p. 45, pl. 9, fig. 2. Gulf of Panama to Paita, Peru.

ANACHIS GUATEMALENSIS Reeve.

1859. *Columbella guatemalensis* REEVE, Con. Icon., vol. 11, pl. 31, fig. 198. Gulf of California to Zorritos, Peru.

ANACHIS PYGMÆA Sowerby.

1832. *Columbella pygmæa* SOWERBY, Proc. Zool. Soc., p. 119; Thes. Con., *Columbella*, p. 141, pl. 40, fig. 163, 1847. Gulf of California to Guayaquil.

ANACHIS RUGOSA Sowerby.

1832. *Columbella rugosa* SOWERBY, Proc. Zool. Soc., p. 115; *C. bicolor* KIENER, Icon., *Columbella*, p. 46, pl. 16, fig. 4. Gulf of California to Paita, Peru.

ANACHIS RUGULOSA Sowerby.

1844. *Columbella rugulosa* SOWERBY, Proc. Zool. Soc., p. 51; Thes. Con., *Columbella*, p. 133, pl. 39, fig. 131, 1844. Gulf of Panama to Paita, Peru, and the Galapagos Islands.

ANACHIS VARICOSA Gaskoin.

1851. *Columbella costellata* SOWERBY, Proc. Zool. Soc., 1832, p. 118; not of SOWERBY 1829. *C. varicosa* GASKOIN, Proc. Zool. Soc., 1851, p. 5.—SOWERBY, Thes. Con., *Columbella*, fig. 147, 1844. Mazatlan, Mexico, south to Paita, Peru, and Arica, Chile.

Genus ASTYRIS H. and A. Adams.

ASTYRIS ELECTROIDES Reeve.

1858. *Columbella electroides* REEVE, Con. Icon., fig. 72. Guayaquil.

ASTYRIS UNICOLOR Sowerby.

1832. *Columbella unicolor* SOWERBY, Proc. Zool. Soc., p. 119.—REEVE, Con. Icon., *Columbella*, fig. 105. From Chimbote Bay, Peru, south to the island of Chiloë, Chile; also at the Galapagos Islands.

ASTYRIS UNIFASCIATA Sowerby.

1832. *Columbella unifasciata* SOWERBY, Proc. Zool. Soc., p. 114; Thes. Con., *Columbella*, p. 133, pl. 39, fig. 130, 1844. Valparaiso, Chile, north to Arica. Magellan? (*C. ebenum* Gould.).

Genus NITIDELLA Swainson.

NITIDELLA BUCCINOIDES Sowerby.

1832. *Columbella buccinoides* SOWERBY, Proc. Zool. Soc., p. 114 (not of LESSON, 1842).—SOWERBY, Thes. Con., fig. 128, 1844. Paita, Peru, south to Coquimbo, Chile.

NITIDELLA OCELLATA Gmelin.

1791. *Voluta ocellata* GMELIN, S. Nat., vol. 8, p. 3455.—REEVE, Con. Icon., *Columbella*, fig. 62. Tropical Atlantic. West Indies. Pacific, from Cape St. Lucas south to the Galapagos Islands and Guayaquil.

NITIDELLA OBLITA Reeve.

1859. *Columbella oblita* REEVE, Con. Icon., vol. 11, pl. 31, fig. 22. Peru.

Genus STROMBINA Morch.

STROMBINA DORSATA Sowerby.

1832. Proc. Zool. Soc., p. 120.—REEVE, Con. Icon., *Columbella* fig. 15*a*. 1858. Guayaquil.

STROMBINA GIBBERULA Sowerby.

1832. *Columbella gibberula* SOWERBY, Proc. Zool. Soc., p. 115.—REEVE, Con. Icon., *Columbella*, fig. 61*b*. 1858. West coast of Central America and southward to Paita, Peru.

STROMBINA LANCEOLATA Sowerby.

1832. *Columbella lanceolata* SOWERBY, Proc. Zool. Soc., p. 116; (not of LOCARD, 1886); Thes. Con., *Columbella*, p. 139, pl. 40, fig. 153–155, 1847. Paita, Peru, and the Galapagos Islands.

STROMBINA RECURVA Sowerby.

1832. *Columbella recurva* SOWERBY, Proc. Zool. Soc., p. 115.—REEVE, Con. Icon., fig. 18*a*, 1858. Central America and south to Guayaquil.

STROMBINA TURRITA Sowerby.

1832. *Columbella turrita* SOWERBY, Proc. Zool. Soc., p. 115; Thes. Con., p. 135, pl. 39, figs. 137, 138, 1847. Nicaragua, to coast of Ecuador.

Family MURICIDÆ.

Genus TROPHON Montfort.

Subgenus XANTHOCHORUS Fischer.

TROPHON CASSIDIFORMIS Blainville.

1832. *Purpura cassidiformis* BLAINVILLE, Nouv. Ann. du Mus., vol. 1, p. 214.—REEVE, Con. Icon., *Purpura*, fig. 24. Paita, Peru, south to Chiloë Island, Chile, and at the Galapagos Islands.

TROPHON HORRIDUS Broderip.

1832. *Murex horridus* BRODERIP, Proc. Zool. Soc., p. 176.—SOWERBY, Con. Ill., *Murex*, fig. 29, 1834. Panama and south to Antofagasta, Chile.

Subgenus TROPHON s. s.

TROPHON LACINIATUS Martyn.

1784. *Buccinum laciniatum* MARTYN, Univ. Conch., vol. 2, pl. 42. Magellan Straits and northward to Puerto Montt, Chile.

Genus MUREX Linnæus.

MUREX ELENENSIS Dall, new name.

1909. *Murex plicatus* SOWERBY, Proc. Zool. Soc., 1840, p. 139; Con. Ill., *Murex*, fig. 6, 1834. Not *M. plicatus* GMELIN, 1791. Gulf of California and south to Santa Elena, Bay of Guayaquil.

MUREX NIGRESCENS Sowerby.

1840. Proc. Zool. Soc., p. 138; Con. Ill., vol. 2, pl. 198, fig. 113, 1841. Jipijapa, Ecuador.

Genus PHYLLONOTUS Swainson.

PHYLLONOTUS BICOLOR Valenciennes.

1833. *Murex bicolor* VALENCIENNES, Zool. Humboldt Voy., vol. 2, p. 301.—REEVE, Con. Icon., *Murex*, pl. 11, fig. 44, 1845. Guaymas, Mexico, to Paita, Peru.

PHYLLONOTUS BRASSICA Lamarck.

1822. *Murex brassica* LAMARCK, An. s. Vert., vol. 7, p. 167.—SOWERBY, Con. Ill., fig. 56, 1834. Mazatlan, Mexico, and south to Peru.

PHYLLONOTUS EXIGUUS Broderip.

1832. *Murex exiguus* BRODERIP, Proc. Zool. Soc., p. 175.—SOWERBY, Con. Ill., fig. 17, 1834. Salango, Ecuador.

PHYLLONOTUS HUMILIS Broderip.

1832. *Murex humilis* BRODERIP, Proc. Zool. Soc., p. 176.—SOWERBY, Con. Ill., figs. 46, 47, 1834. Gulf of Panama to Guayaquil.

PHYLLONOTUS INCISUS Broderip.

1832. *Murex incisus* BRODERIP, Proc. Zool. Soc., p. 176 (not of CARPENTER).—SOWERBY, Con. Ill., fig. 13, 1834. Bay of Guayaquil.

PHYLLONOTUS LAPPA Broderip.

1832. *Murex lappa* BRODERIP, Proc. Zool. Soc., p. 177.—SOWERBY, Con. Ill., fig. 15, 1834. Mazatlan, Mexico, south to Guayaquil.

PHYLLONOTUS RADIX Lamarck.

1822. *Murex radix* LAMARCK., An. s. Vert., vol. 7, p. 168 (after GMELIN, 1791).—KIENER, Icon., *Murex*, p. 60, pl. 37, fig. 1; pl. 38, fig. 1. Acapulco, Mexico, southward to Panama and Paita, Peru.

PHYLLONOTUS REGIUS Wood.

1828. *Murex regius* WOOD, Ind. Test., suppl. pl. 5, fig. 13. Acapulco, Mexico, to Peru and the Galapagos Islands.

PHYLLONOTUS SQUAMOSUS Broderip.

1832. *Murex squamosus* BRODERIP, Proc. Zool. Soc., p. 176.—SOWERBY, Con. Ill. fig. 27, 1834. Paita, Peru.

PHYLLONOTUS TORTUOSUS Sowerby.

1841. *Murex tortuosus* SOWERBY, Con. Ill., *Murex*, fig. 8; new name for *M. crispus* (BRODERIP not of LAMARCK). Pacasmayo, Peru.

PHYLLONOTUS VARICOSUS Sowerby.

1834. Con. Ill., *Murex*, fig. 49.—*Murex varicosus* SOWERBY, Proc. Zool. Soc., p. 115, 1840; Acapulco, Mexico, and south to Ecuador.

Genus TRITONALIA Fleming.

TRITONALIA BUXEA Broderip.

1832. *Murex buxeus* BRODERIP, Proc. Zool. Soc., p. 194.—SOWERBY, Con. Ill., *Murex*, pl. 61, fig. 28, 1834. Pacasmayo, Peru, and south to Iquique, Chile.

TRITONALIA CRASSILABRUM Gray.

1829. *Murex crassilabrum* GRAY, Spicil. Zool., vol. 1, p. 4.—SOWERBY, Con. Ill., *Murex*, fig. 14, 1834. Peruvian coast and southward to Valparaiso, Chile.

TRITONALIA HAMATA Hinds.

1844. *Murex hamatus* Hinds, Zool. Sulph. Voy., p. 8, pl. 3, figs. 11, 12. Guayaquil, Ecuador, and south to Paita, Peru.

Genus PURPURA Martyn.

PURPURA FONTAINEI Tryon.

1880. *Murex fontainei* Tryon, Man., vol. 2, p. 126, pl. 35, figs. 384, 385. Paita, Peru.

PURPURA PINNIGERA Broderip.

1832. *Murex pinniger* Broderip, Proc. Zool. Soc., p. 174.—*M. cristatus* Gray, Con. Ill., fig. 50, 1834. Jipijapa, Ecuador.

Genus TYPHIS Montfort.

TYPHIS CORONATUS Broderip.

1832. Proc. Zool. Soc., p. 178.—Sowerby, Con. Ill., pl. 200, figs. 3, 4, 1841. Salango, Ecuador.

TYPHIS CUMINGII Broderip.

1832. Proc. Zool. Soc., p. 177.—Sowerby, Con. Ill., pl. 200, figs. 1, 2, 1841. Bahia de Caraques, Ecuador.

TYPHIS QUADRATUS Hinds.

1843. Proc. Zool. Soc., p. 18; Zoöl. Sulph. Voy., p. 10, pl. 3, figs. 3, 4, 1844. Gulf of Panama, and south to Guayaquil.

Genus MURICIDEA Swainson.

MURICIDEA VITTATA Broderip.

1832. *Murex vittatus* Broderip, Proc. Zool. Soc., p. 176; Con. Ill., *Murex*, fig. 19, 1834. Manta, Ecuador, and south to Paita, Peru.

Genus EUPLEURA Adams.

EUPLEURA MURICIFORMIS Broderip.

1832. *Ranella muriciformis* Broderip, Proc. Zool. Soc., p. 179.—Reeve, Con. Icon., *Ranella*, fig. 41. Bay of Montijo, West Columbia, and north to Gulf of California.

EUPLEURA NITIDA Broderip.

1832. *Ranella nitida* Broderip, Proc. Zool. Soc., p. 179.—Reeve, Con. Icon., *Ranella*, fig. 45. Bahia de Caraques, Ecuador.

Genus THAIS Bolten.

THAIS BISERIALIS Blainville.

1832. *Purpura biserialis* Blainville, Mon. *Purpura*, p. 50, pl. 11, fig. 11. Cedros Island, west coast of Lower California, and southward to Callao, Peru.

THAIS CALLAÖENSIS Gray.

1828. *Purpura callaöensis* Gray, Spicil. Zoöl., p. 4, pl. 6, fig. 11.—Reeve, Con. Icon., *Purpura*, fig. 79, 1846. Gulf of Panama, and southward to Callao, Peru.

THAIS CHOCOLATA Duclos.

1832. *Purpura chocolata* DUCLOS, Ann. Sci. Nat., vol. 26, p. 108, pl. 2, fig. 7.—ORBIGNY, Voy. Am. Mér., vol. 5, p. 436, pl. 61, figs. 1–3, 1841. Paita, Peru, south to Valparaiso, Chile.

THAIS COLUMELLARIS Lamarck.

1822. *Purpura columellaris* LAMARCK, An. s. Vert., vol. 7, p. 236.—REEVE, Con. Icon., *Purpura*, pl. 2, fig. 9, 1846. Gulf of Panama to Peru and the Galapagos Islands.

THAIS COSTATA Blainville.

1832. *Purpura costata* BLAINVILLE, Nouv. Ann. du Mus., vol. I, p. 231, pl. 11, fig. 8. Mazatlan, Mexico, to Paita, Peru.

THAIS CRASSA Blainville.

1832. *Purpura crassa* BLAINVILLE, Nouv. Ann. du Mus., vol. 1, p. 241, pl. 12, fig. 4 (March).—*P. melones* DUCLOS, Ann. Sci. Nat., vol. 26, p. 105, pl. 1, fig. 2 (May), 1832. Gulf of Panama to Callao, Peru, and the Galapagos Islands.

THAIS DELESSERTIANA Orbigny.

1841. Voy. Am. Mér., p. 439, pl. 77, fig. 7. Cedros Island, Lower California, south to the Chincha Islands, Peru.

THAIS KIOSQUIFORMIS Duclos.

1832. *Purpura kiosquiformis* DUCLOS, Ann. Sci. Nat., vol. 26, pl. 1, fig, 5.—KIENER, Icon., *Purpura*, p. 59, pl. 15, fig. 40. Magdalena Bay, Lower California, southward to Tumbes, Peru.

THAIS PATULA Linnæus.

1758. *Buccinum patulum* LINNÆUS, Syst. Nat., 10th ed., p. 739; 12th ed., p. 1202, 1767.—REEVE, Con. Icon., *Purpura*, fig. 3. Gulf of California to Panama and the Galapagos. Peru (Tschudi). West Indies.

THAIS PERUËNSIS Dall, new name.

1909. *Purpura peruviana* EYDOUX and SOULEYET, Voy. Bonite, Zoöl., vol. 2, p. 606, pl. 40, figs. 1–3, 1852. Not of BLAINVILLE, 1832. Paita and Pacasmayo, Peru.

THAIS PLANOSPIRA Lamarck.

1822. *Purpura planospira* LAMARCK, An. s. Vert., vol. 7, p. 240.—REEVE, Con. Icon., *Purpura*, pl. 3, fig. 14, 1846. Lower California, and southward to Peru, and the Galapagos Islands.

THAIS TRIANGULARIS Blainville.

1832. *Purpura triangularis* BLAINVILLE, Nouv. Ann. du Mus., vol. 1, p. 223, pl. 11, fig. 4. Mazatlan, Mexico, and south to Paita, Peru, and the Galapagos Islands.

Genus CYMIA Morch.

CYMIA TECTUM Wood.

1828. *Buccinum tectum* WOOD, Ind. Test., suppl. pl. 4, fig. 13.—SOWERBY, Gen. Sh., *Purpura* (*callosa*), fig., 1834. Gulf of Panama to Manta, Ecuador.

Genus CONCHOLEPAS Lamarck.

CONCHOLEPAS CONCHOLEPAS Bruguière.

1789. *Buccinum concholepas* BRUGUIÈRE, Encycl. Méth., p. 252. *Purpura peruviana* BLAINVILLE, Mon., *Purpura*, p. 55, 1832.—TRYON, Man. Con., vol. 2, p. 199, pl. 162, figs. 314–316, 1880. West coast of Mexico (v. Martens); Callao, Peru, and southward to Magellan Straits.

Genus ACANTHINA Fischer.

ACANTHINA BREVIDENTATA Mawe.

1828. *Buccinum brevidentatum* MAWE, in Wood, Index Test., suppl. pl. 4, fig. 10. Gulf of Panama to Paita, Peru.

ACANTHINA CALCAR-LONGUM Martyn.

1784. *Buccinum calcar-longum* MARTYN, Univ. Conch., pl. 50. *B. unicorne* BRUGUIÈRE, Enc. Méth., p. 254, pl. 396, fig. 2, 1789. Peruvian coast, south to the island of Chiloë, Chile.

ACANTHINA MURICATA Broderip.

1832. *Purpura muricata* BRODERIP, Proc. Zool. Soc., p. 125.—REEVE, Con. Icon., *Monoceros*, pl. 2, fig. 7, 1846. Mazatlan, Mexico, to Guayaquil, Ecuador.

ACANTHINA TUBERCULATA Gray.

1835. SOWERBY, Con. Ill., *Monoceros*, pl. 82, fig. 9. Mazatlan, Mexico, to Paita, Peru, and the Galapagos Islands.

Genus CHORUS Gray.

CHORUS GIGANTEUS Lesson.

1829. *Monoceros giganteus* LESSON, Voy. Coq., Moll., p. 405, pl. 11, fig. 4. Concepcion, Chile.

Family CORALLIOPHILIDÆ.

Genus CORALLIOPHILA H. and A. Adams.

CORALLIOPHILA CARDUUS Broderip.

1832. *Murex carduus* BRODERIP, Proc. Zool. Soc., p. 175.—SOWERBY, Con. Ill., *Murex*, pl. 61, fig. 22, 1834. Pacasmayo, Peru, from a coral reef 12 miles off shore.

CORALLIOPHILA SCALARIFORMIS Lamarck.

1822. *Purpura scalariformis* LAMARCK, An. s. Vert., vol. 7, p. 241.—KIENER, Icon., *Purpura*, p. 74, pl. 19, fig. 55. Guayaquil.

Suborder STREPTODONTA.

Superfamily PTENOGLOSSA.

Family SCALIDÆ.

Genus EPITONIUM Bolten.

EPITONIUM DUCALE Mörch.

1875. *Scalaria ducalis* MÖRCH, Mal. Blätt., vol. 22, p. 143.—SOWERBY, Thes. Con., *Scalaria*, p. 88, pl. 34, fig. 75, 1847; as *S. principalis* (not of PALLAS, 1774). Jipijapa, Ecuador.

EPITONIUM ELENENSE Sowerby.

1844. *Scalaria elenensis* SOWERBY, Proc. Zool. Soc., p. 29; Thes. Con., *Scalaria*, p. 98, pl. 34, fig. 102, 1847. Santa Elena, Bay of Guayaquil, Ecuador.

EPITONIUM OBTUSUM Sowerby.

1844. *Scalaria obtusa* SOWERBY, Proc. Zool. Soc., p. 29; Thes. Con., *Scalaria*, p. 98, pl. 33, fig. 54, 1847. Santa Elena, Bay of Guayaquil, Ecuador.

EPITONIUM ORBIGNYI Nyst.

1873. *Scalaria orbignyi* NYST, Tabl., p. 48; *S. elegans* ORBIGNY, Voy. Am. Mér., p. 389, pl. 54, figs. 1, 2, 1840; not of RISSO, 1826. Southern Chile.

EPITONIUM POLITUM Sowerby.

1844. *Scalaria polita* SOWERBY, Proc. Zool. Soc., p. 30; Thes. Con., *Scalaria*, p. 100, pl. 34, fig. 99, 1847. Jipijapa, Ecuador.

EPITONIUM STATUMINATUM Sowerby.

1844. *Scalaria statuminata* SOWERBY, Proc. Zool. Soc., p. 30; Thes. Con., *Scalaria*, p. 102, pl. 35, fig. 127, 1847. Bay of Guayaquil, southward to Paita, Peru.

Family JANTHINIDÆ.

Genus JANTHINA Bolten.

JANTHINA EXIGUA Lamarck.

1822. An. s. Vert., vol. 6, pt. 2, p. 206.—TRYON, Man., vol. 9, p. 37, pl. 10, figs. 17–22, 1887. Chile; also Atlantic and Pacific oceans. Pelagic.

JANTHINA JANTHINA Linnæus.

1758. *Helix janthina* LINNÆUS, Syst. Nat., 10th ed., p. 772.—ORBIGNY, Voy. Am. Mér., p. 413, pl. 61, figs. 8–10, 1841. Pelagic. N. Lat. 42° to S. lat. 36° in the Pacific Ocean.

JANTHINA PALLIDA Harvey.

1817. Thompson's Ann. Phil. Nat. Hist., vol 5, p. 96, pl. 2, fig. 2. Pelagic in the tropical Pacific and Atlantic.

Superfamily GYMNOGLOSSA.

Family EULIMIDÆ.

Genus EULIMA Risso.

EULIMA HASTATA Sowerby.

1834. Proc. Zool. Soc., p. 7.—REEVE, Con. Icon., *Eulima*, fig. 9.—SOWERBY, Con. Ill., *Eulima*, fig. 10, 1841. Santa Elena, Bay of Guayaquil, Ecuador.

EULIMA PUSILLA Sowerby.

1834. Proc. Zool. Soc., p. 7; Con. Ill., *Eulima*, fig. 6, 1841. Santa Elena, Bay of Guayaquil, Ecuador.

EULIMA VARIANS Sowerby.

1834. Proc. Zool. Soc., p. 8.—REEVE, Con. Icon., *Leiostraca*, fig. 1.—SOWERBY, Con. Ill., *Eulima*, fig. 14, 1841. Jipijapa, Ecuador.

Genus NISO Risso.

NISO IMBRICATA Sowerby.

1834. *Eulima imbricata* SOWERBY, Proc. Zool. Soc., p. 1.—REEVE, Con. Icon., *Niso*, fig. 3. Santa Elena, Bay of Guayaquil, Ecuador.

NISO SPLENDIDULA Sowerby.

1834. *Eulima splendidula* SOWERBY, Proc. Zool. Soc., p. 6.—REEVE, Con. Icon., *Niso*, fig. 7. Santa Elena, Bay of Guayaquil, Ecuador. Also western Atlantic and Gulf of Mexico.

Genus ENTOCOLAX Voight.

ENTOCOLAX SCHIEMENZII Voight.

1901. Zool. Anz., vol. 24, pp. 285–292, illustrated. Chile. (Ento-parasitic in *Chirodota pisanii*.)

Family PYRAMIDELLIDÆ.

Genus TURBONILLA Risso.

TURBONILLA (PYRGISCUS) ANNETTÆ Dall and Bartsch.

1909. Mon. W. Am. Pyr., Bull. U. S. Nat. Mus., No. 68, p. 76, pl. 7, fig. 7.

Off Manta, Ecuador.

TURBONILLA (PYRGISCUS) CORA Orbigny.

1840. *Chemnitzia cora* ORBIGNY, Voy. Am. Mér., p. 398, pl. 76, figs. 7–9. Paita, Peru.

Genus ODOSTOMIA Fleming.

ODOSTOMIA (MENESTHO) CHILENSIS Dall and Bartsch.

1909. Mon. W. Am. Pyr., Bull. U. S. Nat. Mus., No. 68, p. 189, pl. 21, fig. 6.

Tomé, Chile, in 14 fathoms.

Superfamily NUCLEOBRANCHIATA.

Family ATLANTIDÆ.

Genus ATLANTA Lesueur.

ATLANTA PERONII Lesueur.

1836. Voy. Am. Mér., p. 171, pl. 12, figs. 1–15. Eastern Pacific. Pelagic. Also Atlantic.

ATLANTA TURRICULATA Orbigny.

1836. Voy. Am. Mér., p. 173, pl. 20, figs. 5–11. Eastern Pacific, lat. 30° S. Pelagic.

Genus OXYGYRUS Benson.

OXYGYRUS RANGII Eydoux and Souleyet.

1841. Voy. Bonite, Atlas, pl. 18, figs. 18–24; text, Zool., vol. 2, p. 369, 1852. Southeastern Pacific. Pelagic.

Family PTEROTRACHEIDÆ.

Genus PTEROTRACHEA Forskål.

PTEROTRACHEA PERONII Orbigny.

1836. *Firola* (*Anops*) *peronii* Orbigny, Voy. Am. Mér., p. 149, pl. 10, figs. 8–10. Eastern Pacific, lat. 20° S. Pelagic.

Genus FIROLOIDA Lesueur.

FIROLOIDA LESUEURI Orbigny.

1836. *Firola* (*Cerophora*) *lesueuri* Orbigny, Voy. Am. Mér., p. 151, pl. 10, figs. 11–12. Eastern Pacific, lat. 30° S. Pelagic.

Genus CARINARIA Lamarck.

CARINARIA PUNCTATA Orbigny.

1836. Voy. Am. Mér., p. 160, pl. 11, figs. 6–15. Off Juan Fernandez Island, S. lat. 33°. Pelagic.

Superfamily TÆNIOGLOSSA.

Family SEPTIDÆ.

Genus DISTORTIO Bolten.

DISTORTIO CONSTRICTUS Broderip.

1833. *Triton constrictus* Broderip, Proc. Zool. Soc., p. 5.—Reeve, Con. Icon., *Triton*, pl. 12, fig. 41, 1844. Acapulco, Mexico, south to the coast of Ecuador.

Genus CYMATIUM Bolten.

CYMATIUM GIBBOSUM Broderip.

1833. *Triton gibbosum* Broderip, Proc. Zool. Soc., p. 7.—Reeve, Con. Icon., *Triton*, pl. 11, fig. 38, 1844. Panama to Guayaquil.

CYMATIUM LIGNARIUM Broderip.

1833. *Triton lignarius* BRODERIP, Proc. Zool. Soc., p. 5.—REEVE, Con. Icon., *Triton*, pl. 13, fig. 40, 1844. Gulf of Panama to Ecuador.

CYMATIUM PILEARE Linnæus.

1758. *Murex pilearis*, LINNÆUS, Syst. Nat., 10th ed., p. 749; *Triton pilearis* LAMARCK; Küster, Con. Cab., 2d ed., *Triton*, p. 196, pl. 42, figs. 3, 4; pl. 56, fig. 4, 1878. Peru (Tschudi). Indo-Pacific and Atlantic, West Indies.

CYMATIUM COSTATUM Born.

1778. *Murex costata* BORN, Ind. Mus. Vind., p. 295.—*Murex olearium* LINNÆUS, 1767, not 1758.—KOBELT, Icon. Europ. Meeresconch., vol. 2, pl. 38, figs. 1, 2; pl. 39, fig. 1, 1901. Paita, Peru; Galapagos Islands. Cosmopolitan.

CYMATIUM VESTITUM Hinds.

1844. *Triton vestitus* HINDS, Zool. Sulph. Voy., p. 11, pl. 4, fig. 1. West Coast of Central America to the Chincha Islands, Peru.

CYMATIUM CINGULATUM Lamarck.

1822. *Cassidaria cingulata* LAMARCK, An. s. Vert., vol. 7, p. 216.—REEVE, Con. Icon., vol. 2, *Triton*, fig. 35. Peru (Tschudi). Indo-Pacific region.

CYMATIUM WIEGMANNI Anton.

1839. *Triton wiegmanni* ANTON, Verz., p. 77.—REEVE, Con. Icon., *Triton*, fig. 37. Mazatlan, Mexico, to Paita, Peru.

Genus ARGOBUCCINUM Mörch.

ARGOBUCCINUM RUDE Broderip.

1833. *Triton rudis* BRODERIP, Proc. Zool. Soc., p. 6.—REEVE, Con. Icon., *Triton*, fig. 53. Iquique to Valparaiso, Chile.

ARGOBUCCINUM SCABRUM King.

1831. *Triton scaber* KING, Zool. Journ., vol. 5, p. 348.—*Pollia scabra* GRAY, Zool. Beechey's Voy., p. 111, pl. 36, fig. 16, 1837. Coast of Ecuador, south to Valparaiso, Chile.

ARGOBUCCINUM VEXILLUM Sowerby.

1841. *Ranella vexillum* SOWERBY, Proc. Zool. Soc., p. 51; Con. Ill., *Ranella*, fig. 13, 1841. Southern Chile.

Family RANELLIDÆ.

Genus BURSA Bolten.

BURSA CÆLATA Broderip.

1832. *Ranella cælata* BRODERIP, Proc. Zool. Soc., p. 179.—REEVE, Con. Icon., *Ranella*, fig. 4. Panama. Peru (Tschudi).

BURSA VENTRICOSA Broderip.

1832. *Ranella ventricosa* BRODERIP, Proc. Zool. Soc., p. 178.—SOWERBY, Con. Ill., pl. 92, fig. 16, 1836. West coast of Nicaragua, south to Callao, Peru.

Family CASSIDIDÆ.

Genus CASSIDEA Bruguière.

CASSIDEA (BEZOARDICA) ABBREVIATA Lamarck.

1822. *Cassis abbreviata* LAMARCK, An. s. Vert., vol. 7, p. 224.—REEVE, Con. Icon., *Cassis*, fig. 18, 1848. Central American coast and south to Guayaquil.

Family DOLIIDÆ.

Genus MALEA Valenciennes.

MALEA RINGENS Swainson.

1822. *Dolium ringens* SWAINSON, Bligh Cat. app., p. 4.—REEVE, Con. Icon., *Dolium*, pl. 4, fig. 5, 1848. Acapulco, Mexico, and south to Paita, Peru, and the Galapagos Islands.

Family AMPHIPERASIDÆ.

Genus SIMNIA Risso.

SIMNIA RUFA Sowerby.

1832. *Ovula rufa* SOWERBY, Proc. Zool. Soc., p. 173; Con. Ill., fig. 58, 1836. Bahia de Caraques, Ecuador.

Genus CYPHOMA Bolten.

CYPHOMA EMARGINATA Sowerby.

1830. *Ovula emarginata* SOWERBY, Species Con., pt. 1, p. 7, figs. 54, 55; Thes. Con., *Ovulum*, figs. 11, 12. Panama to Guayaquil.

Family CYPRÆIDÆ.

Genus CYPRÆA Linnæus.

CYPRÆA ALBUGINOSA Gray.

1824. Zoöl. Journ., vol. 1, p. 510, pl. 7, fig. 2, p. 12, fig. 2.—SOWERBY, Con. Ill., *Cypræa*, p. 6, no. 45, 1832. Gulf of California to the Galapagos Islands.

CYPRÆA ANNETTÆ Dall.

1909. Dall, Nautilus, vol. 22, no. 12, p. 125.—*C. sowerbyi* KIENER, 1845, Icon., *Cypræa*, p. 38, pl. 7, fig. 3; not of GRAY, 1832. Gulf of California and southward to Sechura Bay, Peru.

CYPRÆA ARABICULA Lamarck.

1810. An. du Mus., vol. 16, p. 100, no. 54; An. s. Vert., vol. 7, p. 399.—SOWERBY, Thes. Con., *Cypræa*, p. 16, pl. 7, figs. 38, 39, 1859. Gulf of California to Paita, Peru.

CYPRÆA EXANTHEMA Linnæus.

1767. Syst. Nat., 12th ed., p. 1172.—SOWERBY, Thes. Con., *Cypræa*, p. 5, pl. 22, fig. 181, 1859. Gulf of California to Paita, Peru, and the Galapagos Islands.

CYPRÆA NIGROPUNCTATA Gray.

1828. Zoöl. Journ., vol. 4, p. 81.—SOWERBY, Con. Ill., *Cypræa*, fig. 22, 1832. Manta, Ecuador, south to Paita, Peru (Chile, Hidalgo), and the Galapagos Islands.

CYPRÆA ROBERTSI Hidalgo.

1906. Mon. *Cypræa*, pp. 161, 220.—*C. punctulata*, GRAY, Zoöl. Journ., vol. 1, p. 387, 1824; not of GMELIN, Syst. Nat., p. 3404, 1791.—SOWERBY, Con. Ill., *Cypræa*, pl. 4, fig. 20, 1832. Gulf of California to Paita, Peru.

Family TRIVIIDÆ.

Genus TRIVIA Gray.

TRIVIA ACUTIDENTATA Gaskoin.

1835. Proc. Zool. Soc., p. 201.—BUTTON, Nautilus, vol. 19, p. 132, 1906. (Unfigured.) Guayaquil and the Galapagos Islands.

TRIVIA FUSCA Gray.

1832. In SOWERBY, Con. Ill., fig. 37. Mazatlan to Guayaquil and the Galapagos Islands.

TRIVIA PACIFICA Gray.

1832. Proc. Zool. Soc., p. 185.—SOWERBY, Thes. Con. *Cypræa*, p. 45, pl. 34, figs. 441, 443, 1859. Gulf of California to Panama and the Galapagos Islands.

TRIVIA PULLA Gaskoin.

1846. Proc. Zool. Soc., p. 24; 1848, p. 97.—SOWERBY, Thes. Con., *Cypræa*, p. 48, pl. 26. figs. 490, 491, 1859. Gulf of California to Guayaquil and the Galapagos Islands.

TRIVIA RADIANS Lamarck.

1810. *Cypræa radians* LAMARCK, Ann. du Mus., vol. 16, p. 102.—SOWERBY, Con. Ill., pl. 119, fig. 146, 1837. Gulf of California to Peru and Chile and the Galapagos Islands.

TRIVIA RUBESCENS Gray.

1832. Proc. Zool. Soc., p. 185.—SOWERBY, Con. Ill., *Cypræa*, fig. 31, 1832. Gulf of California to Panama and the Galapagos Islands.

TRIVIA SANGUINEA Gray.

1832. In SOWERBY, Con. Ill., p. 13, fig. 32. Gulf of California to Guayaquil, Ecuador.

TRIVIA SOLANDRI Gray.

1832. In SOWERBY, Con. Ill., p. 15, pl. 7, fig. 43. Santa Barbara Islands, California, and south to Panama and Peru.

Genus ERATO Risso.

ERATO (ERATOPSIS) SCABRIUSCULA Gray.

832. In SOWERBY, Con. Ill., *Cypræa*, fig. 45; Thes. Con., *Erato*, p. 81, pl. 210, figs. 14–16, 1859. Cape St. Lucas, Lower California, and southward to Peru.

Family STROMBIDÆ.

Genus STROMBUS Linnæus.

STROMBUS GRACILIOR Gray.

1828. Wood, Index Test., suppl. pl. 4, fig. 1. Gulf of California to Manta, Ecuador.

STROMBUS GRANULATUS Gray.

1828. Wood, Index Test., suppl. pl. 4, fig. 21.—Sowerby, Thes. Con., *Strombus*, p. 33, pl. 9, fig. 100, 1847. Mazatlan, Mexico, and southeast to Guayaquil.

STROMBUS PERUVIANUS Swainson.

1831. Zoöl. Ill., pl. 39.—Sowerby, Thes. Con., vol. 1, p. 34, pl. 10, fig. 110, 1847. Manta, Ecuador, to Paita, Peru.

Family CERITHIIDÆ.

Genus CERITHIUM Bruguière.

CERITHIUM ADUSTUM Kiener.

1841. Icon., *Cerithium*, p. 37, pl. 13, fig. 2. Mazatlan to Panama and the Galapagos Islands.

CERITHIUM INTERRUPTUM Menke.

1850. Zeitschr. f. Mal., p. 178.—Sowerby, Thes. Con., vol. 2, p. 869, figs. 155, 156, 1855. Gulf of California to Manta, Ecuador, and the Galapagos Islands.

CERITHIUM MACULOSUM Kiener.

1841. Icon., *Cerithium*, p. 36, pl. 13, fig. 3. Panama to Guayaquil and the Galapagos Islands.

CERITHIUM OCELLATUM Bruguière.

1792. Encycl. Méth., p. 499, no. 43.—Tryon, Man., vol. 9, p. 13, pl. 24, fig. 19, 1887. Mazatlan, Mexico, to Panama and the Galapagos Islands.

CERITHIUM PACIFICUM Sowerby.

1833. Sowerby, Gen. Shells, *Cerithium*, part xlii, fig. 9. Panama and south to Valparaiso, Chile.

CERITHIUM STERCUSMUSCARUM Valenciennes.

1833. Humboldt Voy., Zool., vol. 2, p. 278. Cedros Island, Lower California, and southward to Tumbes, Peru, and the Galapagos Islands.

Genus BITTIUM (Leach) Gray.

BITTIUM PERUVIANUM Orbigny.

1841. *Cerithium peruvianum* Orbigny, Voy. Am. Mér., p. 443, pl. 77, figs. 9, 10. Arica, Chile.

BITTIUM (STYLIDIUM) SULCIFERUM Troschel.

1852. *Rissoina sulcifera* Troschel, Arch. f. Naturg., vol. 18, pt. 1, p. 154, pl. 5, fig. 1. Peru (Tschudi).

Genus CERITHIDEA Swainson.

CERITHIDEA MONTAGNEI Orbigny.

1841. *Cerithium montagnei* ORBIGNY, Voy. Am. Mér., p. 443, pl. 63, figs. 3, 4. Gulf of California, and south to Panama and Chile.

Family CERITHIOPSIDÆ.

Genus SEILA A. Adams.

SEILA ASSIMILATA C. B. Adams.

1852. *Cerithiopsis assimilata* ADAMS, Panama Sh., pp. 150, 309.—SOWERBY, Thes. Con., vol. 2, p. 881, pl. 184, fig. 246, 1855. Catalina Island, California, south to the Gulf of California, Panama, and Sechura Bay, Peru.

Family MODULIDÆ.

Genus MODULUS Gray.

MODULUS PERLATUS Dillwyn.

1817. Cat. Rec. Sh., vol. 2, p. 788.—EYDOUX and SOULEYET, Voy. Bonite, Zoöl., vol. 2, p. 598, pl. 37, figs. 25–31, 1852. Isla Puna, Guayaquil. Peru (Tschudi).

Family PLANAXIDÆ.

Genus PLANAXIS Lamarck.

PLANAXIS PLANICOSTATUS Sowerby.

1825. Tankerville Cat., app., p. xiii; Con. Icon., *Planaxis*, fig. 26. Mazatlan, Mexico, south to Panama and the Galapagos Islands. Peru (Tschudi).

Family VERMETIDÆ.

Genus BIVONIA Gray.

BIVONIA COMPACTA Carpenter.

1864. Rep. Brit. Assoc. for 1863, pp. 628, 654; Ann. Mag. Nat. Hist., 3rd ser., vol. 14, p. 427, Dec., 1864. (Unfigured.) Vancouver Island, British Columbia, and southward to Paita, Peru.

Genus SERPULORBIS Sacco.

SERPULORBIS SQUAMIGERUS Carpenter.

1856. Proc. Zool. Soc., p. 226.—TRYON, Man., vol. 8, p. 181, pl. 54, figs. 73, 74, 1886. San Diego, California, and southward to Paita, Peru.

Family TURRITELLIDÆ.

Genus TURRITELLA Lamarck.

TURRITELLA CINGULATA Sowerby.

1825. Tankerville Cat., app., p. xiii.—REEVE, Con. Icon., *Turritella*, fig. 23, 1849. Manta, Ecuador, south to the island of Chiloë, Chile.

TURRITELLA GONIOSTOMA Valenciennes.

1833. Humboldt Voy., Zoöl., vol. 2, p. 275.—REEVE, Con. Icon., *Turritella*, figs. 10*a–b*, 1849. Gulf of California, to the Lobos Islands, Peru.

TURRITELLA RADULA Kiener.

1840. Icon., *Turritella*, p. 13, pl. 2, fig. 1. Bay of Guayaquil.

TURRITELLA RUBESCENS Reeve.

1849. Con. Icon., *Turritella*, fig. 63. Gulf of Panama.

Family LITTORINIDÆ.

Genus LITTORINA Ferussac.

LITTORINA ARAUCANA Orbigny.

1840. Voy. Am. Mér., p. 393, pl. 53, figs. 3, 4. Coast of Nicaragua, and south to Paita, Valparaiso, and the island of Chiloë.

LITTORINA PERUVIANA Lamarck.

1822. *Phasianella peruviana* LAMARCK, An. s. Vert., vol. 7, p. 53.—GRAY, Beechey's Voy., p. 138, pl. 36, fig. 8, 1839. Coast of Nicaragua, and southward to Valdivia, Chile, and the Galapagos Islands.

LITTORINA PULCHRA Sowerby.

1832. Gen. Sh., *Littorina*, figs. 2, 3.—REEVE, Con. Icon., *Littorina*, fig. 17. Panama to Guayaquil.

LITTORINA THERSITES Reeve.

1857. Conch. Icon., *Littorina*, fig. 78. "Chile and Peru" (Reeve).

LITTORINA UMBILICATA Orbigny.

1840. Voy. Am. Mér., p. 394, pl. 76, fig. 1–3. Coast of Ecuador and Peru, south to Cobija, Chile.

LITTORINA VARIA Sowerby.

1832. Gen. Sh., *Littorina*, vol. 38, fig. 3.—PHILIPPI, Abb., vol. 2, *Littorina*, pl. 1, figs. 2–3. Gulf of California to Casma, Peru. (Chiloë?).

LITTORINA ZICZAC Gmelin.

1791. *Trochus ziczac* GMELIN, Syst. Nat., vol. 8, p. 3587.—*Littorina glabrata* PHILIPPI, Abb., vol. 3, p. 62, pl. 7, fig. 5, 1848. Paita, Peru.

Genus TECTARIUS Valenciennes.

TECTARIUS GALAPAGIENSIS Stearns.

1892. Nautilus, vol. 6, no. 8, Dec., p. 87; Proc. U. S. Nat. Mus., vol. 16, p. 396, pl. 51, fig. 7, 1893. Manta, Ecuador, and the Galapagos Islands.

Family SOLARIIDÆ.

Genus ARCHITECTONICA Bolten.

ARCHITECTONICA GRANULATA Lamarck.

1822. *Solarium granulatum* LAMARCK, An. s. Vert., vol. 7, p. 3. Encycl. Méth., pl. 446, fig. 5*a–b*.—KIENER, Icon., *Solarium*, p. 4, pl. 2, fig. 2. Lower California to Panama and Peru (Tschudi).

ARCHITECTONICA KOCHII Dall, new name.

1909. *Solarium nanum* (KOCH ms.) PHILIPPI, Conch. Cab., 2d ed., Mon. *Solarium*, 1853, p. 27, pl. 4, fig. 5; not *Solarium nanum* Grateloup, 1838. Chile.

Family RISSOIDÆ.

Genus RISSOA Fréminville.

RISSOA (ALVANIA) CARPENTERI Weinkauff.

1885. *Alvania carpenteri* WEINKAUFF, Conch. Cab., 2d ed., *Rissoa*, p. 192. *A. reticulata* CARPENTER, 1864, not of MONTAGU, 1804. Neah Bay, Washington, to the Galapagos Islands.

Genus RISSOINA Orbigny.

RISSOINA CANCELLATA Philippi.

1847. Zeitschr. Mal., p. 127.—SCHWARTZ VON MOHR., Mon. *Rissoina*, p. 89, pl. 7, fig. 52, 1860. Coast of Ecuador and Peru. Also in the West Indies.

RISSOINA COSTATA A. Adams.

1851. Proc. Zool. Soc., p. 266.—SCHWARTZ VON MOHR., Mon. *Rissoina*, p. 53, pl. 2, fig. 16, 1860. Cobija, Chile.

RISSOINA INCA Orbigny.

1840. Voy. Am. Mér., p. 395, pl. 53, figs. 11–16. Peru, and the Galapagos Islands, and south to the island of Chiloë.

Family CALYPTRÆIDÆ.

Genus CHEILEA Modeer.

CHEILEA EQUESTRIS Linnæus.

1758. Syst. Nat., 10th ed., p. 780; 12th ed., p. 1257, 1767.—*C. varia* BRODERIP, Trans. Zoöl. Soc. London, vol. 1, p. 197, pl. 27, fig. 3, 1834. Mazatlan, Mexico, to Arica, Chile, and the Galapagos Islands. Cosmopolitan.

CHEILEA CORRUGATA Broderip.

1884. Trans. Zoöl. Soc. London, vol. 1, p. 197, pl. 27, fig. 2.—Reeve, Con. Icon., *Trochita*, fig. 9. Gulf of California, south to Callao, Peru, and the Galapagos Islands.

Genus CALYPTRÆA Lamarck.

CALYPTRÆA LICHEN Broderip.

1834. Trans. Zoöl. Soc. London, vol. 1, p. 201, pl. 28, fig. 4. Muerte Island, Guayaquil.

CALYPTRÆA MAMILLARIS Broderip.

1834. Trans. Zoöl. Soc. London, vol. 1, p. 201, pl. 28, fig. 5. Muerte Island, Guayaquil.

Genus TROCHITA Schumacher.

TROCHITA INTERMEDIA Orbigny.

1841. *Calyptræa intermedia* Orbigny, Voy. Am. Mér., p. 463., pl. 59, figs. 4–6. Islay, Peru, 20 fathoms.

TROCHITA TROCHIFORMIS Gmelin.

1791. *Patella trochiformis* Gmelin, Syst. Nat., vol. 8, p. 3693.—Sowerby, Gen. Sh., *Calyptræa*, fig. 9, 1824. Panama to Valparaiso, Chile.

Genus CRUCIBULUM Schumacher.

CRUCIBULUM IMBRICATUM Sowerby.

1824. *Calyptræa imbricata* Sowerby, Gen. Sh., fig. 5.—Broderip, Trans. Zoöl. Soc. London, vol. 1, p. 198, pl. 27, fig. 7, 1834. Gulf of California, and southward to Callao, Peru, and the Galapagos Islands.

CRUCIBULUM QUIRIQUINÆ Lesson.

1830. Voy. Coq., vol. 2, pt. 1, p. 397.—Broderip, Trans. Zoöl. Soc. London, vol. 1, pl. 27, fig. 9, 1834. Gulf of California, southward to the Straits of Magellan.

CRUCIBULUM SPINOSUM Sowerby.

1824. *Calyptræa spinosa* Sowerby, Gen. Sh., figs. 4, 7. –Broderip, Trans. Zoöl. Soc. London, vol. 1, pl. 28, fig. 8, 1834. California (at Monterey), south to northern Chile.

Genus CREPIDULA Lamarck.

CREPIDULA ACULEATA Gmelin.

1791. *Patella aculeata* Gmelin, Syst. Nat., vol. 8, p. 3693.—Favanne, Conch., vol. 1, p. 564, pl. 4, fig. F 2.—Broderip, Trans. Zoöl. Soc. London, vol. 1, pl. 29, fig. 1, 1834. California to Lobos Islands, Peru; West Indies, Africa, Japan. Cosmopolitan.

CREPIDULA CREPIDULA Linnæus.

1764. *Patella crepidula* Linnæus, Mus. Lud. Ulricæ, p. 689.—Favanne, Conch., pl. 4, fig. lower D. Mazatlan, Mexico, to Callao, Peru. West Indies. Cosmopolitan.

CREPIDULA DILATATA Sowerby.

1824. *C. dilatata* (LAMARCK Ms.) SOWERBY, Gen. Sh., *Crepidula*, fig. 5.—DELESSERT, Rec. de Coq. pl. 24, fig. 4*a–c*. California, and southward to Magellan straits.

CREPIDULA DORSATA Broderip.

1834. *Calyptræa dorsata* BRODERIP, Trans. Zoöl. Soc. London, vol. 1, p. 202, pl. 28, fig. 10. California, south to Valparaiso, Chile.

CREPIDULA EXCAVATA Broderip.

1834. Trans. Zoöl. Soc. London, vol. 1, p. 225, pl. 29, fig. 7. Gulf of California and south to the Chilean coast.

CREPIDULA INCURVA Broderip.

1834. Proc. Zoöl. Soc., p. 40; Trans. Zoöl. Soc. London, vol. 1, pl. 29, fig. 6. Mazatlan, Mexico, to Paita, Peru.

CREPIDULA ONYX Sowerby.

1824. Gen. Shells, *Crepidula*, fig. 2. San Pedro, California, south to Arica, Chile.

CREPIDULA SQUAMA Broderip.

1834. Proc. Zoöl. Soc., p. 40; Trans. Zoöl. Soc. London, vol. 1, p. 205, pl. 29, fig. 10, 1834. Straits of Fuca south to Patagonia.

Family CAPULIDÆ.

Genus CAPULUS Montfort.

CAPULUS UNGARICOIDES Orbigny.

1841. Voy. Am. Mér., p. 457, pl. 78, fig. 4. Paita, Peru.

Family HIPPONICIDÆ.

Genus HIPPONIX Defrance.

HIPPONIX ANTIQUATA Linnæus.

1767. *Patella antiquata* LINNÆUS, Syst. Nat., 12th ed., p. 1259.—SOWERBY, Thes., vol. 1, p. 369, pl. 73, figs. 18–20, 1847. Santa Barbara, California, and south to Peru and the Galapagos Islands. Also West Indies.

HIPPONIX BARBATA Sowerby.

1835. Proc. Zoöl. Soc., p. 5; Thes. Con., vol. 1, p. 369, pl. 73, figs. 26–27, 1847. Mazatlan, Mexico, and south to Guayaquil and the Galapagos Islands. Also Indo-Pacific.

HIPPONIX GRAYANA Menke.

1853. Zeitschr. f. Mal., p. 115.—TRYON, Man., vol. 8, p. 135, pl. 40, figs. 4, 5, 1886. Mazatlan, Mexico, to Guayaquil and the Galapagos Islands.

HIPPONIX SUBRUFA Lamarck.

1819. *Pileopsis subrufa* LAMARCK, An. s. Vert., vol. 6, pt. 2, p. 16.—SOWERBY, Thes. Con., vol. 1, p. 370, pl. 73, figs. 21–23, 1847. Panama and south to the Lobos Islands, Peru; Indo-Pacific. Also West Indies.

Family NATICIDÆ.

Genus NATICA Scopoli.

NATICA BRODERIPIANA Recluz.

1847. Proc. Zool. Soc., p. 205.—Reeve, Con. Icon., *Natica*, fig. 66a. Mazatlan, Mexico, and southward to the Ecuador coast.

NATICA ELENÆ Recluz.

1843. Proc. Zool. Soc., p. 205.—Reeve, Con. Icon., *Natica*, fig. 94a. Panama to Santa Elena, Ecuador.

NATICA UNDATA Philippi.

1852. Arch. f. Naturg., vol. 1, p. 160.—Küster, Con. Cab., 2d. ed., *Natica*, pl. 11, fig. 12, 1852. Peru (Tschudi).

NATICA UNIFASCIATA Lamarck.

1822. An. s. Vert., vol. 6, pt. 2, p. 201.—Reeve, Con. Icon., *Natica*, fig. 49, 1855. Gulf of California, Panama and (*fide* Tschudi) Peru.

Genus POLINICES Montfort.

POLINICES ALVEATUS Troschel.

1852. *Natica alveata* Troschel, Arch. f. Naturg., p. 159, pl. 5, fig. 3. Peru (Tschudi).

POLINICES CORA Orbigny.

1840. *Natica cora* Orbigny, Voy. Am. Mér., p. 401, pl. 76, figs. 10, 11. Callao, Peru, to Caldera, Chile.

POLINICES DUBIUS Recluz.

1843. *Natica dubia* Recluz, Proc. Zool. Soc., p. 209.—Reeve, Con. Icon., *Natica*, fig. 41. Paita, Peru, to Mejillones del Sur, Chile.

POLINICES OTIS Broderip.

1829. *Natica otis* Broderip, Zool. Journ., vol. 5, p. 372.—Gray, Beechey's Voy., Zool., pl. 34, fig. 13; pl. 37, fig. 3, 1839, Gulf of California, and south to Paita, Peru, and the Galapagos Islands.

POLINICES PHILIPPIANUS Nyst.

1845. *Natica philippiana* Nyst, Bull. Acad. de Bruxelles, vol. 12, pt. 2, p. 153, n. n. for *N. acuta* Philippi, Abb., vol. 2, pl. 2, fig. 3, 1847; not *N. acuta* Deshayes, 1825. Galapagos Islands, Peru, and southern Chile.

POLINICES RAVIDUS Eydoux and Souleyet.

1852. *Natica ravida* Eydoux and Souleyet, Voy. Bonite, Zool., vol. 2, p. 582, pl. 35, figs. 12–15. Santa Elena, Ecuador, to Paita, Peru.

POLINICES UBER Valenciennes.

1833. *Natica uber* Valenciennes, Humboldt Voy., vol. 2, p. 266.—Orbigny, Voy. Am. Mér., p. 401, pl. 55, figs. 12–14, 1840. Gulf of California, south to Callao, Peru, and the Galapagos Islands.

POLINICES (EUSPIRA) AGUJANUS Dall.

1908. Bull. Mus. Comp. Zool., vol. 43, no. 6, p. 334, pl. 9, fig. 2 (young). Gulf of Panama to Sechura Bay, Peru.

POLINICES (EUSPIRA) PISIFORMIS Recluz.

1843. *Natica pisiformis* Recluz, Proc. Zool. Soc., p. 213.—Sowerby, Thes. Con., *Natica*, fig. 163. Valparaiso.

POLINICES (NEVERITA) GLAUCA Humboldt.

1826. *Natica glauca* Humboldt, Ms., in Lesson, Voy. Coq., Atlas, pl. 11, fig. 1; text, Zool., p. 369, 1830. Acapulco, Mexico, to Callao, Peru.

POLINICES (NEVERITA) RECLUZIANA Deshayes.

1839. *Natica recluziana* Deshayes, Rev. Zool. Soc. Cuv., p. 361.—Guerin, Mag. de Zool., pl. 37, 1841. Catalina Island, California, south to Mexico (and Chile, Philippi).

Genus SINUM Bolten.

SINUM CONCAVUM Lamarck.

1822. *Sigaretus concavus* Lamarck, An. s. Vert., vol. 6, pt 2, p. 208.—Sowerby, Gen. Sh., *Sigaretus*, fig. 1, 1823.—Philippi, Abb., vol. 1, pl. 1, fig. 1, 1844. Capon, Peru, the Galapagos Islands, and south on the mainland to S. lat. 25° 30′, at Taltal, Chile.

Family MARSENIIDÆ.

Genus MARSENIOPSIS Bergh.

MARSENIOPSIS PACIFICA Bergh.

1886. Die Marseniaden, vol. 1, pp. 19–22, pl. 1, figs. 17–27. Magellan straits and northward to Calbuco, Chile.

Superfamily DOCOGLOSSA.

Family PATELLIDÆ.

Genus PATELLA Linnæus.

PATELLA MAGELLANICA Gmelin.

1791. Syst. Nat., vol. 8, p. 3703.—Reeve, Con. Icon., *Patella*, fig. 19, 1854. Magellanic Province, and northward to Puerto Montt, Chiloë Island, and the Dalcahue channel.

PATELLA MEXICANA Broderip and Sowerby.

1829. Zool. Journ., vol. 4, p. 369.—Pilsbry, Man. Con., vol. 13, p. 108, pl. 31, figs. 59–62, 1891. Gulf of California, south to Paita, Peru.

Genus NACELLA Schumacher.

NACELLA CLYPEATER Lesson.

1830. *Patella clypeater* Lesson, Voy. Coq., vol. 2, p. 419.—Pilsbry, Man. Con., vol. 13, p. 122, pl. 50, figs. 40–43, 1891. Valparaiso, and northward (to Peru, Tschudi), southward to the Magellanic region.

Genus HELCIONISCUS Dall.

HELCIONISCUS NIGRISQUAMATUS Reeve.

1854. *Patella nigrisquamata* REEVE, Con. Icon., *Patella*, fig. 3. Concepcion, Chile.

Family ACMÆIDÆ.

Genus SCURRIA Gray.

SCURRIA MESOLEUCA Menke.

1851. *Acmæa mesoleuca* MENKE, Zeitschr. f. Mal., p. 38.—*Patella striata* REEVE, Con. Icon., *Patella*, fig. 99; not *P. striata* QUOY. Gulf of California, and south to Guayaquil and the Galapagos Islands.

SCURRIA PARASITICA Orbigny.

1841. *Patella parasitica* ORBIGNY, Voy. Am. Mér., p. 481, pl. 81, figs. 1–3; not of REEVE. Mollendo, Peru, and south to Valparaiso, Chile.

SCURRIA SCURRA Lesson.

1830. *Patella scurra* LESSON, Voy. Coq., p. 421.—ORBIGNY, Voy. Am. Mér., p. 478, pl. 64, fig. 11, 1841. From Callao, Peru, south to S. lat. 41°, living on the stalks of *Macrocystis*.

SCURRIA ZEBRINA Lesson.

1830. *Patella zebrina* LESSON, Voy. Coq., p. 417.—*Acmæa zebrina* ORBIGNY, Voy. Am. Mér., p. 480, pl. 65, figs. 1–3, 1841. Mollendo, Peru, and south to the Magellanic region.

Genus ACMÆA Eschscholtz.

ACMÆA ALBESCENS Phillippi.

1846. Zeitschr. f. Mal., p. 50. Abb., vol. 3, p. 118, pl. 2, fig. 7. 1849. Central Chile.

ACMÆA ARAUCANA Orbigny.

1841. Voy. Am. Mér., p. 482, pl. 65, figs. 4–6; not of REEVE. Paita, Peru, and south to Valparaiso, Chile.

ACMÆA CECILIANA Orbigny.

1841. *Patella ceciliana* ORBIGNY, Voy. Am. Mér., p. 482, pl. 81, figs. 4–6. Antofagasta to Valparaiso, Chile.

ACMÆA COFFEA Reeve.

1855. *Patella coffea* REEVE, Con. Icon., *Patella*, fig. 139. Valparaiso.

ACMÆA ORBIGNYI Dall, new name.

1909. *Acmæa scutum* ORBIGNY, Voy. Am. Mér., p. 479, pl. 64, figs. 8, 9, 1841. Not of ESCHSCHOLTZ, Zoöl. Atlas, part 5, p. 19, pl. 23, figs. 1–3, 1833. Salaverri, Peru, and the Galapagos Islands, and south to the Magellanic region.

ACMÆA VARIABILIS Sowerby.

1839. Zoöl. Beechey's Voy., p. 147, pl. 39, fig. 5 (only). Whole Peruvian Province, and the Galapagos Islands.

ACMÆA VIRIDULA Lamarck.

1822. *Patella viridula* LAMARCK, An. s. Vert., vol. 7, p. 539. *Acmæa pretrei* ORBIGNY, Voy. Am. Mér., p. 481, pl. 78, figs. 15, 16, 1841. Paita, Peru, the Lobos Islands, and south to Valparaiso, Chile.

Superfamily RHIPIDOGLOSSA.

Family PHASIANELLIDÆ.

Genus PHASIANELLA Lamarck.

PHASIANELLA (TRICOLIA) PERFORATA Philippi.

1848. Zeitschr. f. Mal., p. 164.—PILSBRY, Man. Con., vol. 10, p. 172, pl. 39*a*, fig. 12, 1888; not of CARPENTER. Paita, Peru.

PHASIANELLA (EULITHIDIUM) MINIMA Philippi.

1860. Reise Atacama, p. 186, pl. 7, fig. 17; Paita, Peru, south to Chimba Bay, Chile, in S. lat. 23° 37′.

Family TURBINIDÆ.

Genus LEPTOTHYRA (Carpenter MS.) Dall.

LEPTOTHYRA CUNNINGHAMI Smith.

1881. *Collonia cunninghami* E. A. SMITH, Proc. Zool. Soc., p. 33, pl. 4, figs. 10, 10*a*. Chiloë, and southward.

Genus TURBO Linnæus.

TURBO MAGNIFICUS Jonas.

1847. Zeitschr. f. Mal., p. 167.—PHILIPPI, Abb., vol 2, p. 25, pl. 6, fig. 1, 1847. Manta, Ecuador, and south to Callao, Peru, and the Lobos Islands.

TURBO (PRISOGASTER) NIGER Wood.

1828. WOOD, Index Test., suppl. pl. 6, no. 1.—SOWERBY, Beechey's Voy., p. 143, pl. 36, fig. 1, 1839; Gen. Shells, *Turbo*, fig. 7, 1832. Pacasmayo, Peru, south to the Magellan straits.

TURBO (PRISOGASTER) ELEVATUS Eydoux and Souleyet.

1852. Voy. Bonite, Zool., vol. 2, p. 594, pl. 37, figs. 15–19. Caldera, Chile, south to Valparaiso.

TURBO (SENECTUS) SQUAMIGER Reeve.

1842. Proc. Zool. Soc., p. 186.—REEVE, Con. Icon., *Turbo*, fig. 21. Gulf of California, south to Paita, Peru, and the Galapagos Islands.

TURBO (CALLOPOMA) FLUCTUOSUS Wood.

1828. Index Test., suppl. pl. 6, fig. 44. Gulf of California, and Cedros Island, south to Paita, Peru.

TURBO (CALLOPOMA) SAXOSUS Wood.

1828. Index Test., suppl. pl. 6, fig. 45. Mazatlan, Mexico, and south to Paita, Peru, and the Galapagos Islands.

Genus ASTRÆA Bolten.

ASTRÆA (CYCLOCANTHA) BABELIS Fischer.

1874. *Turbo babelis* FISCHER, in Kiener, Icon., *Trochus*, pl. 78, fig. 2.—PILSBRY, Man. Con., vol. 10, p. 238, pl. 52, figs. 21–22, 1888. Santa Elena and south to Guayaquil.

ASTRÆA (UVANILLA) BUSCHII Philippi.

1844. *Trochus buschii* PHILIPPI (not KIENER) in Küster, Con. Cab., 2d ed., *Trochus*, p. 213, pl. 32, fig. 1. Gulf of California, south to Paita, Peru.

Family LIOTIIDÆ.

Genus LIOTIA Gray.

LIOTIA CANCELLATA Gray.

1829. *Delphinula cancellata* GRAY, Spicil. Zoöl., p. 3.—PILSBRY, Man. Con., vol. 10, p. 109, pl. 36, fig. 2, 1888. Arica to Coquimbo, Chile.

Family TROCHIDÆ.

Genus TEGULA Lesson.

TEGULA ATRA Lesson.

1830. *Trochus ater* LESSON, Voy. Coq. Zool., p. 344, pl. 16, fig. 2.—PHILIPPI, Abb., vol. 1, p. 188, pl. 5, fig. 6, 1844. Pacasmayo, Peru, south to Magellan straits, and the Chincha Islands.

TEGULA EURYOMPHALUS Jonas.

1844. *Trochus euryomphalus* JONAS, Zeitschr. f. Mal., p. 113.—PHILIPPI, Abb., vol. 2, p. 27, pl. 6, fig. 4, 1847. Peru (Tschudi) south to Talcahuano, Chile.

TEGULA FUSCESCENS Philippi.

1844. *Trochus fuscescens* PHILIPPI, Abb., vol. 1, p. 92, pl. 3, fig. 8 (not of CARPENTER). Chile and Peru.

TEGULA GAUDICHAUDI Hupé.

1854. Hist. de Chile, vol. 8, p. 146, pl. 4, fig. 4. Valparaiso.

TEGULA LUCTUOSA Orbigny.

1841. *Trochus luctuosus* ORBIGNY, Voy. Am. Mér., p. 409, pl. 76, figs. 16–19. Ancon, Peru, and south to Valparaiso, Chile.

TEGULA LUGUBRIS Philippi.

1844. *Trochus lugubris* PHILIPPI, Abb., vol. 1, p. 91, pl. 3, fig. 7. Chile.

TEGULA MELALEUCA Jonas.

1844. *Trochus melaleucos* JONAS, Zeitschr. f. Mal., p. 169.—PHILIPPI, Abb., vol. 2, *Trochus*, p. 16, pl. 6, fig. 7, 1847. Peru.

TEGULA MOESTA Jonas.

1844. *Trochus moestus* JONAS, Zeitschr. f. Mal., p. 113.—HUPÉ, Hist. de Chile, Zoöl., pl. 4, fig. 6, 1854. Pacasmayo, Peru, south to Antofagasta, Chile.

TEGULA PANAMENSIS Philippi.

1848. *Trochus (Phorcus) panamensis* PHILIPPI, Zeitschr. f. Mal., p. 127; Conch. Cab., 2d ed., *Trochus*, p. 311, pl. 44, fig. 15. Panama to Paita, Peru.

TEGULA PATAGONICA Orbigny.

1840. *Trochus patagonicus* ORBIGNY, Voy. Am. Mér., p. 408, pl. 55, fig. 1–4; Phil., Conch. Cab., 2d ed., *Trochus*, p. 225, pl. 34, fig. 12. Lobos de Afuera Island, Peru, south to San Blas, Patagonia (Chile).

TEGULA QUADRICOSTATA Gray.

1828. WOOD, Index Test., suppl. pl. 5, fig. 16.—ORBIGNY, Voy. Am. Mér., p. 408, 1840. Peru and south to Valparaiso, Chile.

TEGULA RETICULATA Gray.

1828. *Trochus reticulatus* WOOD, Index Test., suppl. pl. 6, fig. 38. Panama, and south to Guayaquil, and the Galapagos Islands.

TEGULA SMITHII Tapparone-Canefri.

1874. *Omphalius smithii* TAPPARONE-CANEFRI, Viag. Magenta, p. 166, pl. 1, figs. 13, *a-b*. Peru.

TEGULA TRIDENTATA Potiez and Michaud.

1838. *Trochus tridentatus* POTIEZ AND MICHAUD, Gal. de Douai, vol. 1, p. 321, pl. 29, figs. 16, 17.—KIENER, Icon., *Trochus*, pl. 57, fig. 2. Sechura Bay, Peru, and southward to the Chonos archipelago, southern Chile.

Genus MONODONTA Lamarck.

MONODONTA (DILOMA) CRUSOEANA Pilsbry.

1889. Man. Conch., vol. 11, p. 98, pl. 35, figs. 19–21. Pacasmayo, Peru, south to Coquimbo, Chile, and Juan Fernandez Island.

MONODONTA (DILOMA) NIGERRIMA Gmelin.

1791. *Trochus nigerrimus* GMELIN, Syst. Nat., vol. 8, p. 3597.—ORBIGNY, Voy. Am. Mér., pl. 55, figs. 5–8, 1841.—PHILIPPI, Conch. Cab., 2d ed., *Trochus*, p. 149, pl. 24, fig. 14. Salaverri, Peru, south to the straits of Magellan.

Genus CALLIOSTOMA Swainson.

CALLIOSTOMA FONKII Philippi.

1860. *Trochus fonkii* PHILIPPI, Atacama Reise, p. 185, pl. 7, fig. 22.—PILSBRY, Man. Conch., vol. 11, p. 371, pl. 57, fig. 48, 1889. Peru, and south to the island of Chiloë.

Family VITRINELLIDÆ.

Genus CIRCULUS Jeffreys.

CIRCULUS COSMIUS Bartsch.

1907. Proc. U. S. Nat. Mus., vol. 32, no. 1520, p. 173, fig. 8. Atacamas, Ecuador, 30 fathoms.

Family NERITIDÆ.

Genus NERITA (Linnæus) Lamarck.

NERITA BERNHARDI Recluz.

1850. Journ. de Conchyl., vol. 1, p. 285 (name only).—REEVE, Con. Icon., *Nerita*, pl. 12, fig. 27, 1855. Panama to Peru.

NERITA CEROSTOMA Troschel.

1852. Arch f. Naturg., vol. 18, pt. 1, p. 179, pl. 5, fig. 5. Peru.

NERITA SCABRICOSTA Lamarck.

1822. An. s. Vert, vol. 6, pt. 2, p. 194.—TRYON, Man. Con., vol. 10, pl. 6, fig. 6, 1888. Lower California and south to Ecuador and the Galapagos Islands. Peru (Tschudi).

Genus NERITINA Lamarck.

NERITINA OWENII Mawe.

1828. WOOD, Index Test., suppl. pl. 8, fig. 16. Costa Rica, and south to Paita, Peru.

NERITINA SOBRINA Recluz.

1849. In SOWERBY, Thes. Con., *Neritina*, p. 536, pl. 112, fig. 100. Chile.

Superfamily ZYGOBRANCHIA.

Family FISSURELLIDÆ.

Genus FISSURELLA Bruguière

FISSURELLA BRIDGESII Reeve.

1849. Conch. Iconica, *Fissurella*, fig. 15. Paposo to Valparaiso, Chile.

FISSURELLA CLYPEUS Sowerby.

1834. Proc. Zool. Soc. p. 128; Con. Ill., *Fissurella*, fig. 77, 1835. Santa Elena, Guayaquil, Ecuador.

FISSURELLA COSTATA Lesson.

1830. Voy. Coq., vol. 2, p. 410.—SOWERBY, Con. Ill., *Fissurella*, fig. 36, 1835 (as *F. chilensis*). Mollendo, Peru, to Valparaiso.

FISSURELLA CRASSA Lamarck.

1822. An. s. Vert., vol. 6, pt. 2, p. 11.—SOWERBY, Con. Ill., *Fissurella*, fig. 11, 1834; not fig. 2, nor figure in SOWERBY, Genera Sh., 1823. Galapagos and Pescadores Islands, Peru, and southward to the Magellanic region.

FISSURELLA FULVESCENS Sowerby.

1834. Proc. Zool. Soc., p. 127; Con. Ill., *Fissurella*, fig. 49, 1835. Valparaiso.

FISSURELLA LATA Sowerby.

1834. Proc. Zool. Soc., p. 124; Con. Ill., *Fissurella*, fig. 5, 1834. Valparaiso, and south to the Magellanic region.

FISSURELLA LATIMARGINATA Sowerby.

1834. Proc. Zool. Soc., p. 126; Con. Ill., *Fissurella*, fig. 69. Peru, and south to Valparaiso, Chile.

FISSURELLA LIMBATA Sowerby.

1834. Proc. Zool. Soc., p. 123; Con. Ill., *Fissurella*, fig. 74, 1835. Antofagasta to Valparaiso, Chile.

FISSURELLA MAXIMA Sowerby.

1834. Proc. Zool. Soc., p. 123; Con. Ill., *Fissurella*, fig. 18, 1834. Manta, Ecuador, to Valparaiso, Chile.

FISSURELLA NIGRA Lesson.

1830. Voy. Coq., Zoöl., vol. 2, p. 412.—REEVE, Con. Icon., *Fissurella*, fig. 11, 1850. Callao, Peru, south to Magellan straits.

FISSURELLA OBOVALIS Lesson.

1830. Voy. Coq., Zoöl., vol. 2, p. 411. (Unfigured.) Concepcion, Chile.

FISSURELLA ORIENS Sowerby.

1834. Proc. Zool. Soc., p. 124; Con. Ill., *Fissurella*, fig. 25, 1834. Chiloë Island, Chile.

FISSURELLA PERUVIANA Lamarck.

1822. An. s. Vert., vol. 7, pt. 2, p. 15 (not of Delessert, Rec. pl. 24, fig. 7).—REEVE, Con. Icon., *Fissurella*, fig. 26, 1849. Pacasmayo, Peru, south to Coquimbo, Chile.

FISSURELLA PHILIPPIANA Reeve.

1849. Con. Icon., *Fissurella*, fig. 37; *errata*. Concepcion, Chile.

FISSURELLA PICTA Gmelin.

1791. *Patella picta* GMELIN, Syst. Nat., vol. 8, p. 3729.—PILSBRY, Man. Con., vol. 12, p. 144, pl. 45, figs. 9–11, 1890. Manta, Ecuador, and south to the straits of Magellan.

FISSURELLA PULCHRA Sowerby.

1834. Proc. Zool. Soc., p. 124; Con. Ill., *Fissurella*, fig. 24, 1834. Paposo, Chile, and south to Valparaiso.

FISSURELLA PUNCTATISSIMA Pilsbry.

1890. Man. Conch., vol. 12, p. 150, pl. 58, figs. 21–23. Valparaiso.

FISSURELLA RUGOSA Sowerby.

1835. Con. Ill., *Fissurella*, fig. 51. Mazatlan, Mexico, and south to Paita, Peru, and the Galapagos Islands.

FISSURELLA STELLATA Reeve.

1850. Con. Icon., *Fissurella*, fig. 80. Valparaiso.

FISSURELLA (CREMIDES) ASPERELLA Sowerby.

1834. Proc. Zool. Soc., p. 127; Con. Ill., *Fissurella*, fig. 71. Lobos Islands, Peru.

FISSURELLA (CREMIDES) MACROTREMA Sowerby.

1834. Proc. Zool. Soc., p. 125; Con. Ill., *Fissurella*, fig. 41. Panama south to the Lobos Islands, Peru, and the Galapagos Islands.

FISSURELLA (CREMIDES) OBSCURA Sowerby.

1834. Proc. Zool. Soc., p. 125; Con. Ill., *Fissurella*, fig. 27. Gulf of Panama southward to Lambayeque, Peru, and the Galapagos Islands.

FISSURELLA (CREMIDES) VIRESCENS Sowerby.

1834. Proc. Zool. Soc., p. 125; Con. Ill., *Fissurella*, fig. 51. Mazatlan, Mexico, south to Paita, Peru, and the Galapagos Islands.

Genus MEGATEBENNUS Pilsbry.

MEGATEBENNUS COKERI Dall.

1909. Proc. U. S. Nat. Mus., vol. 37, p. 178, pl. 5, figs. 3, 7. Lobos de Afuera Island, Peru.

Genus FISSURIDEA Swainson.

FISSURIDEA ALTA C. B. Adams.

1852. *Fissurella alta* C. B. Adams, Panama Sh., pp. 236, 320.—Sowerby, Thes. Con., *Fissurella*, p. 194, pl. 7, figs. 154–6, 1866. Mazatlan, Mexico, to Paita, Peru, and the Galapagos Islands.

FISSURIDEA ASPERIOR Dall, new name.

1909. *Fissurella aspera* Sowerby, Proc. Zool. Soc., 1834, p. 127; Con. Ill., *Fissurella*, fig. 46. Not of Eschscholtz, Zoöl. Atlas, 1833. Pacasmayo, Peru.

FISSURIDEA FONTAINEANA Orbigny.

1841. *Fissurella fontaineana* Orbigny, Voy. Am. Mér., p. 477, pl. 78, figs. 12, 13, Islay, Peru.

FISSURIDEA INÆQUALIS Sowerby.

1834. *Fissurella inæqualis* Sowerby, Proc. Zool. Soc., p. 126; Con. Ill., *Fissurella*, fig. 45, 1835. Lower California to Panama and the Galapagos Islands.

FISSURIDEA SATURNALIS Carpenter.

1864. *Glyphis saturnalis* Carpenter, Ann. Mag. Nat. Hist., p. 479. (Unfigured.) Cape St. Lucas, and south to the Galapagos Islands.

Genus LUCAPINELLA Pilsbry.

LUCAPINELLA ÆQUALIS Sowerby.

1834. *Fissurella æqualis* Sowerby, Proc. Zool. Soc., p. 127; Con. Ill., *Fissurella*, fig. 56, 1841. Santa Elena, Guayaquil, Ecuador.

LUCAPINELLA CALLOMARGINATA Carpenter.

1872. *Clypidella callomarginata* (Carpenter Ms.) Dall, Am. Journ. Conch., vol. 7, p. 133, pl. 15, fig. 8.—Pilsbry, Man. Con., vol. 12, p. 196, pl. 44, figs. 3, 4, 5; pl. 61, figs. 1–5, 1890. Lobitas, California, and southward to Paita, Peru, and Valparaiso, Chile.

Genus PUNCTURELLA Lowe.

PUNCTURELLA FALKLANDICA A. Adams.

1862. *Cemoria falklandica* ADAMS, Thes. Con., *Fissurellidæ*, p. 208, pl. 245, fig. 14. Falkland Islands, Patagonia, and southern Chile.

Family STOMATELLIDÆ.

Genus GENA Gray.

GENA, species.

1900. "*Gena planulata* Lamarck" T. v. BAYERN, Nachrbl. Mal. Ges., vol. 32, p. 53. Antofagasta, Chile.

Subclass ISOPLEURA.

Order POLYPLACOPHORA.

Superfamily MESOPLACOPHORA.

Family ISCHNOCHITONIDÆ.

Genus TONICELLA Carpenter.

TONICELLA (MOPALIELLA) STIGMATA Dall, new name.

1909. *Chiton bipunctatus* SOWERBY, Proc. Zool. Soc., 1832, p. 104; Con. Ill., *Chiton*, fig. 27, 1833; not of G. FISCHER, Tabl. Syn. Zoög. p. 11, 1808. Lobos Islands, Peru.

Genus CHÆTOPLEURA Shuttleworth.

CHÆTOPLEURA BENEVENTEI Plate.

1899. Zool. Jahrb., Suppl. Bd. 4, p. 194, pl. 2, fig. 143, pl. 11, fig. 305–306. Tumbes; Iquique, Chile.

CHÆTOPLEURA FERNANDENSIS Plate.

1899. Zool. Jahrb., Suppl. Bd. 4, p. 197, fig. Juan Fernandez Island.

CHÆTOPLEURA HENNAHI Gray.

1828. *Chiton hennahi* GRAY, Spicil. Zool., p. 6, no. 11.—SOWERBY, Con. Ill., *Chiton*, figs. 1, 33, 1833. Callao, Peru, 5–7 fathoms.

CHÆTOPLEURA LURIDA Sowerby.

1832. *Chiton luridus* SOWERBY, Proc. Zool. Soc., p. 26; Con. Ill., *Chiton*, fig. 20, 1833. Gulf of California, and southward to Islay, Peru.

CHÆTOPLEURA PERUVIANA Lamarck.

1819. *Chiton peruvianus* LAMARCK, An. s. Vert., vol. 6, pt. 1, p. 321; Encycl. Méth., pl. 163, figs. 7, 8.—SOWERBY, Con. Ill., *Chiton*, fig. 44. Tumbes, Peru, to Valparaiso, Chile.

Genus VARIOLEPIS Plate.

VARIOLEPIS IQUIQUENSIS Plate.

1899. Fauna Chilensis, vol. 1, p. 200, fig.; pl. 11, figs. 307–311. Iquique, Chile.

Genus ISCHNOCHITON Gray.

ISCHNOCHITON CATENULATUS Sowerby.

1832. *Chiton catenulatus* SOWERBY, Proc. Zool. Soc., p. 104; Con. Ill., *Chiton*, fig. 145, 1840. Lobos Islands, Peru.

ISCHNOCHITON FIMBRIATUS Sowerby.

1840. *Chiton fimbriatus* SOWERBY, Mag. Nat. Hist., p. 293; Con. Ill., *Chiton*, fig. 137. Peru.

ISCHNOCHITON IMITATOR Smith.

1881. Proc. Zool. Soc., p. 35, pl. 4, fig. 13. Tumbes, Chile, to the Magellanic region and the Falkland Islands.

ISCHNOCHITON INCA Orbigny.

1841. *Chiton inca* ORBIGNY, Voy. Am. Mér., p. 486, pl. 65, figs. 20–24. Islay, Peru.

ISCHNOCHITON KEILI Plate.

1899. Fauna Chilensis, vol. 2, p. 108, pl. 2, fig. 145; pl. 7, figs. 227–230. Juan Fernandez Island.

ISCHNOCHITON (STENOPLAX) LIMACIFORMIS Sowerby.

1832. *Chiton limaciformis* SOWERBY, Proc. Zool. Soc., p. 26; Con. Ill., *Chiton*, fig. 38, 1833. Mazatlan, Mexico, to the Lobos Islands, Peru; also in the West Indies, and perhaps Japan.

ISCHNOCHITON PUNCTULATISSIMUS Sowerby.

1832. *Chiton punctulatissimus* SOWERBY, Proc. Zool. Soc., p. 58; Con. Ill., *Chiton*, fig. 9, 1833. Tumbes, Peru, and southward to Mejillones del Sur, Chile.

ISCHNOCHITON PUSILLUS Sowerby.

1832. *Chiton pusillus* SOWERBY, Proc. Zool. Soc., p. 57; Con. Ill., *Chiton*, fig. 31. Pacasmayo, Peru, in 17 fathoms, 9 miles off shore.

ISCHNOCHITON BOOGI Haddon.

1886. Challenger Chitons, p. 16, 1886.—*Chiton roseus* SOWERBY, Proc. Zool. Soc., 1832, p. 58; not of BLAINVILLE, 1825; Con. Ill., *Chiton*, fig. 14, 1833. Ecuador and Peru. Also Atlantic.

ISCHNOCHITON RUGULATUS Sowerby.

1832. *Chiton rugulatus* SOWERBY, Proc. Zool. Soc., p. 58; Con. Ill., *Chiton*, fig. 42, 1833. Gulf of Panama to the Lobos Islands, Peru.

ISCHNOCHITON STRAMINEUS Sowerby.

1832. *Chiton stramineus* SOWERBY, Proc. Zool. Soc., p. 104; Con. Ill., *Chiton*, fig. 28. Chiloë Island, Chile.

ISCHNOCHITON VARIANS Plate.

1899. Fauna Chilensis, p. 113, fig. Tumbes, Chile, to Chiloë Island and Juan Fernandez.

Genus CALLISTOCHITON Carpenter.

CALLISTOCHITON ELENENSIS Sowerby.

1832. *Chiton elenensis* SOWERBY, Proc. Zool. Soc., p. 27; Con. Ill., *Chiton*, fig. 69, 1840. Panama to Santa Elena, Ecuador.

CALLISTOCHITON INFORTUNATUS Pilsbry.

1892. Man. Con., vol. 14, p. 266, pl. 59, figs. 37–42. Gulf of California to Ecuador.

CALLISTOCHITON PULCHELLUS Gray.

1828. *Chiton pulchellus* GRAY, Spicil. Zool., vol. 1, pt. 1, p. 6, pl. 3, fig. 9 (not of ORBIGNY). Islay, Peru, to Arica, Chile.

CALLISTOCHITON VIVIPARUS Plate.

1899. Fauna Chilensis, p. 154, pl. 9, figs. 267–281. Near Coquimbo, Chile.

Family MOPALIIDÆ.

Genus PLACIPHORELLA Carpenter.

PLACIPHORELLA BLAINVILLEI Broderip.

1832. *Chiton blainvillei* BRODERIP, Proc. Zool. Soc., p. 27; Con. Ill., *Chiton*, fig. 6, 1833. Galapagos, Cocos, and Lobos islands.

Genus PLAXIPHORA Gray.

PLAXIPHORA SETIGER, var. FREMBLII Broderip.

1832. *Chiton frembli* BRODERIP, Proc. Zool. Soc., p. 28; Con. Ill., *Chiton*, fig. 4, 1833. Valparaiso, Chile.

PLAXIPHORA FERNANDEZI Thiele.

1909. Zoologica, vol. 22, p. 22, pl. 3, figs. 1–8. Juan Fernandez Island.

Family ACANTHOCHITIDÆ.

Genus ACANTHOCHITES Risso.

ACANTHOCHITES HIRUDINIFORMIS Sowerby.

1832. *Chiton hirudiniformis* SOWERBY, Proc. Zool. Soc., p. 59; Con. Ill., *Chiton*, figs. 23, 142. Paita to Islay, Peru, and the Galapagos Islands.

Superfamily TELEOPLACOPHORA.

Family CHITONIDÆ.

Genus CHITON Linnæus.

CHITON BRODERIPI Potiez and Michaud.

1838. Galérie de Douai, vol. 1, p. 533 (unfigured, relations unknown). Chile.

CHITON CUMINGSII Frembly.

1827. Zool. Journ., vol. 3, p. 198, suppl. pl. 16, fig. 3.—SOWERBY, Con. Ill., *Chiton*, fig. 32, 1833.—*Amaurochiton* THIELE, Gebiss d. Schn., vol. 2, p. 362, 1893. Callao, Peru, to Chiloë Island, Chile.

CHITON GLAUCOCINCTUS Frembly.

1827. Zool. Journ., vol. 3, p. 201, suppl. pl. 17, fig. 2. Valparaiso, Chile.

CHITON GRANOSUS Frembly.

1827. Zool. Journ., vol. 3, p. 200, suppl. pl. 17, fig. 1.—REEVE, Con. Icon., *Chiton*, pl. 5, fig. 27.—*Chondroplax*, THIELE, Gebiss d. Schn., vol. 2, p. 364, 1893. Callao, Peru, to the Magellanic region.

CHITON GRANULOSUS Frembly.

1827. Zoöl. Journ., vol. 3, p. 201; suppl. pl. 17, fig. 3. Isla Blanca, Peru, to Concepcion, Chile.

CHITON LATUS Sowerby.

1825. (Jan.) Tankerville Cat., app. p. v; not of LOWE (April, 1825) or GUILDING, 1829.—REEVE, Con. Icon., *Chiton*, pl. 1, fig. 3 (as *C. magnificus*). Valparaiso and Coquimbo, Chile.

CHITON PUSIO Sowerby.

1832. Proc. Zool. Soc., p. 105.—*C. murrayi* HADDON, Challenger Chitons, p. 21, pl. 1, fig. 7, pl. 3, fig. 7*a*–7*e*, 1886. Callao, Peru, to Valparaiso, Chile.

CHITON STOKESII Broderip.

1832. Proc. Zool. Soc., p. 25.—SOWERBY, Con. Ill., *Chiton*, fig. 24, 1833. Guaymas, Mexico, south to Arica, Chile.

CHITON SUBFUSCUS Sowerby.

1832. Proc. Zool. Soc., p. 26; Con. Ill., *Chiton*, figs. 3, 41, 1833 (as *C. striatus*, BARNES). Southern Chile; Puerto Montt; Chiloë Island.

Section RADSIA Gray.

CHITON BARNESII Gray.

1828. Spicil. Zoöl., vol. 1, p. 3, pl. 6, fig. 22.—SOWERBY, Con. Ill., *Chiton*, fig. 2, 1833. Coquimbo, Chile.

CHITON GOODALLI Broderip.

1832. Proc. Zool. Soc., p. 25.—SOWERBY, Con. Ill., *Chiton*, figs. 34, 40, 1833. Galapagos Islands.

CHITON SULCATUS Wood.

1815. Gen. Conch., p. 16, pl. 3, fig. 1.—SOWERBY, Con. Ill., *Chiton*, fig. 12. Galapagos Islands.

Genus TONICIA Gray.

TONICIA ARGYROSTICTA Philippi.

1845. *Chiton argyrosticta* PHILIPPI, Arch. f. Naturg., p. 49; Atacama Reise, p. 179, pl. 7, fig. 4, 1860. Isla Blanca, Peru, to Magellan Straits.

TONICIA CALBUCENSIS Plate.

1897. Fauna Chilensis, p. 205, fig. Calbuco, Chile, S. lat. 41°.

TONICIA CHILENSIS Frembly.

1827. *Chiton chilensis* FREMBLY, Zoöl. Journ., vol. 3, p. 204, suppl. pl. 17, fig. 8. Coquimbo, Tumbes, Valparaiso, Chile.

TONICIA DISJUNCTA Frembly.

1827. *Chiton disjunctus* FREMBLY, Zoöl. Journ., vol. 3, p. 203, suppl. pl. 17, fig. 5. Tumbes and Valparaiso, Chile.

TONICIA ELEGANS Frembly.

1827. *Chiton elegans* FREMBLY, Zoöl. Journ., vol. 3, p. 203, suppl. pl. 17, fig. 6.—SOWERBY, Con. Ill., *Chiton*, fig. 75, 1840. Callao, Peru, and south to Chiloë Island, Chile.

TONICIA FONTAINEI Rochebrune.

1882. Bull. Soc. Philom., Paris, p. 193. (Unfigured.) Chile.

TONICIA GAUDICHAUDI Rochebrune.

1883. Bull. Soc. Philom., Paris, p. 35. (Unfigured.) Chile.

TONICIA GRANIFERA Sowerby.

1832. *Chiton graniferus* SOWERBY, Proc. Zool. Soc., p. 104.—REEVE, Con. Icon., *Chiton*, pl. 15, fig. 86. Concepcion, Chile, 9 fathoms.

TONICIA GRAYI Sowerby.

1832. *Chiton grayi* SOWERBY, Proc. Zool. Soc., p. 57; Con. Ill., *Chiton*, figs. 8, 16. Callao Bay, Peru.

TONICIA LINEOLATA Frembly.

1827. *Chiton lineolatus* FREMBLY, Zoöl. Journ., vol. 3, p. 204, suppl. pl. 17, fig. 7.—SOWERBY, Con. Ill., *Chiton*, fig. 154, 1840. Valparaiso and Talcahuano Bay, Chile.

TONICIA RUBIDENS Pilsbry.

1892. Man. Con., vol. 14, p. 202, pl. 44, figs. 65–67. Callao, Peru, Chile (U. S. Expl. Exp.).

TONICIA SWAINSONI Sowerby.

1832. *Chiton swainsoni* SOWERBY, Proc. Zool. Soc., p. 27; Con. Ill., *Chiton*, fig. 5, 1833. Callao, Peru, to Iquique, Chile.

Genus ACANTHOPLEURA Guilding.

ACANTHOPLEURA ECHINATA Barnes.

1823. *Chiton echinatus* BARNES, Am. Journ. Sci., vol. 7, p. 71, pl. 3, figs. 4, 4*a*.—SOWERBY, Con. Ill., *Chiton*, fig. 47 (as *C. spiniferus*). Paita, Peru, and south to Valparaiso, Chile, and the Galapagos Islands.

Genus ENOPLOCHITON Gray.

ENOPLOCHITON NIGER Barnes.

1823. *Chiton niger* BARNES, Am. Journ. Sci., vol. 7, p. 71, pl. 3, fig. 3. Mollendo, Peru, and south to Valparaiso.

Class SCAPHOPODA.

Order SOLENOCONCHA.

Family DENTALIIDÆ.

Genus DENTALIUM Linnæus.

DENTALIUM ÆQUATORIUM Pilsbry and Sharp.

1897. Man. Con., vol. 17, p. 112, pl. 21, fig. 43. Off Manta, Ecuador.

DENTALIUM INNUMERABILE Pilsbry and Sharp.

1897. Man. Con., vol. 17, p. 119, pl. 18, figs. 6–8. Magdalena Bay, Lower California, and southward to Panama and Guayaquil.

DENTALIUM NUMEROSUM Dall.

1897. Man. Con., vol. 17, p. 25, pl. 10, figs. 70–73. Todos Santos Bay, Lower California, and southward to Panama and the Galapagos Islands.

DENTALIUM QUADRANGULARE Sowerby.

1832. Proc. Zool. Soc., p. 29; Thes. Con., vol. 3, p. 103, pl. 224, fig. 31, 1860. West Coast of Nicaragua and south to Jipijapa, Ecuador.

DENTALIUM TESSARAGONUM Sowerby.

1832. Proc. Zool. Soc., p. 29.—Pilsbry and Sharp, Man. Con., vol. 17, p. 34, pl. 4, fig. 1, 1897. Gulf of Panama and south to Jipijapa, Ecuador.

Genus CADULUS Philippi.

CADULUS ALBICOMATUS Dall.

1889. Proc. U. S. Nat. Mus., vol. 12, p. 259, pl. 9, fig. 8. Gulf of Panama to vicinity of Manta, Ecuador.

CADULUS PERPUSILLUS Sowerby.

1832. *Dentalium perpusillum* Sowerby, Proc. Zool. Soc., p. 29.—Pilsbry and Sharp, Man. Con., vol. 17, p. 191, pl. 36, figs. 23, 24, 1847. Off Lower California, N. lat. 23° 33′, and south to Panama and Guayaquil.

CADULUS PLATYSTOMA Pilsbry and Sharp.

1897. Man. Con., vol. 17, p. 180, pl. 35, figs. 17, 18. Off Manta, Ecuador.

Class PELECYPODA.

Order PRIONODESMACEA.

(FOLIOBRANCHIATA.)

Superfamily NUCULACEA.

Family NUCULIDÆ.

Genus NUCULA Lamarck.

NUCULA COLOMBIANA Dall.

1908. Albatross Rep., p. 371. Panama to Patagonia.

NUCULA DECLIVIS Hinds.

1843. Proc. Zool. Soc., p. 97; Zoöl. Voy. Sulph., p. 63, pl. 18, fig. 8, 1844. Panama to Magellan Straits.

NUCULA EXIGUA Sowerby.

1832. Proc. Zool. Soc., p. 198; Con. Ill., *Nucula*, figs, 24, 24*, 1833. Acapulco, Mexico, south to Ecuador and to the Magellanic region.

NUCULA GRAYI Orbigny.

1841. Voy. Am. Mér., p. 625.—Sowerby, Con. Ill., *Nucula*, fig. 21. Valparaiso, Chile.

NUCULA PAYTENSIS A. Adams.

1856. Proc. Zool. Soc., p. 51.—Hanley, Thes. Con., *Nucula*, p. 50, pl. 5, figs, 160–161, 1860. Paita, Peru.

NUCULA PISUM Sowerby.

1832. Proc. Zool. Soc., p. 198; Con. Ill., *Nucula*, fig. 23, 1841.—Orbigny, Voy. Am. Mér., p, 624 (as *N. semiornata*), pl. 84, figs. 27–29, 1846. Valparaiso to San Blas, Chile.

Family LEDIDÆ.

Genus LEDA Schumacher.

LEDA ACUTA Conrad.

1831. *Nucula acuta* Conrad, Am. Mar. Con., p. 32, pl. 6, fig. 3 (not of Sowerby, 1839).—Sowerby, Con. Ill., *Nucula*, fig. 15 (as *N. cuneata*). California, the Gulf of Panama, and south to Valparaiso, Chile. Also Atlantic.

LEDA CALLIMENE Dall.

1908. *Leda* (*Jupiteria*) *callimene* Dall, Albatross Rep., p. 342, pl. 17, figs. 3, 4. Gulf of Panama to Tomé, Chile.

LEDA EBURNEA Sowerby.

1832. *Nucula eburnea* Sowerby, Proc. Zool. Soc., p. 198; Con. Ill., *Nucula*, fig. 10, 1833. Gulf of Panama to the Bay of Caraques, Ecuador.

LEDA ELENENSIS Sowerby.

1832. *Nucula elenensis* SOWERBY, Proc. Zool. Soc., p. 198; Con. Ill., *Nucula*, fig. 14, 1833. Santa Elena, Ecuador.

LEDA GIBBOSA Sowerby.

1832. *Nucula gibbosa* SOWERBY, Proc. Zool. Soc., p. 198; Con. Ill., *Nucula*, fig. 9, 1833. Gulf of Panama to Paita, Peru.

LEDA ORNATA Orbigny.

1846. Voy. Am. Mér., p. 546, pl. 82, figs. 4–6. Paita, Peru.

Genus YOLDIA Mörch.

YOLDIA (ADRANA) SOWERBYANA Orbigny.

1846. Voy. Am. Mér., p. 544.—SOWERBY, Con. Ill., *Nucula*, fig. 1 (as *lanceolata*), 1833.—HANLEY, Thes. Con., *Nuculidæ*, Leda No. 2, fig. 33, 1860. Jipijapa, Ecuador.

YOLDIA (ADRANA) CRENIFERA Sowerby.

1832. *Nucula crenifera* SOWERBY, Proc. Zool. Soc., p. 197; Con. Ill., *Nucula*, fig. 3. Jipijapa, Ecuador.

YOLDIA (ADRANA) ELONGATA Sowerby.

1832. *Nucula elongata* SOWERBY, Proc. Zool. Soc., p. 197; Con. Ill., *Nucula*, fig. 2, 1833. Coast of Ecuador.

Genus MALLETIA Desmoulins.

MALLETIA CHILENSIS Desmoulins.

1832. Actes Soc. Linn. de Bordeaux, vol. 5, p. 85, pl. 1. Coquimbo, south to Talcahuano Bay, Chile.

Genus TINDARIA Bellardi.

TINDARIA SULCULATA Couthouy.

1852. *Nucula sulculata* COUTHOUY, Wilkes Exp. Sh., p. 424, pl. 37, figs. 539 *a-e*. Talcahuano, Chile, south to the Magellanic region.

(FILIBRANCHIATA.)

Superfamily ARCACEA.

Genus ARCA Linnæus.

ARCA ANGULATA King.

1831. Zoöl. Journ., vol. 5, p. 336.—STEMPELL, Fauna Chilensis, vol. 2, p. 219, pl. 12, figs. 1–9, 1899. Juan Fernandez Island.

ARCA MUTABILIS Sowerby.

1833. Proc. Zool. Soc., p. 17.—REEVE, Con. Icon., *Arca*, pl. 13, fig. 35, 1844. Gulf of California to Guayaquil.

ARCA PACIFICA Sowerby.

1833. *Byssoarca pacifica* SOWERBY, Proc. Zool. Soc., p. 17.—REEVE, Con. Icon., *Arca*, pl. 11, fig. 75, 1844. Gulf of California to Paita, Peru.

ARCA ALTERNATA Sowerby.

1833. *Byssoarca alternata* SOWERBY, Proc. Zool. Soc., p. 17.—REEVE, Con. Icon., *Arca*, pl. 13, fig. 88, 1844. Panama to Ecuador.

ARCA GRADATA Broderip and Sowerby.

1829. Zoöl. Journ., vol. 4, p. 365.—REEVE, Con. Icon., *Arca*, pl. 14, fig. 92, 1844. Mazatlan, Mexico, to Iquique, Chile, and the Galapagos Islands.

ARCA PUSILLA Sowerby.

1833. *Byssoarca pusilla* SOWERBY, Proc. Zool. Soc., p. 18.—REEVE, Con. Icon., *Arca*, pl. 16, fig. 112, 1844. Coast of Ecuador, and south to S. lat. 23° 37′.

ARCA SOLIDA Sowerby.

1833. Proc. Zool. Soc., p. 18.—REEVE, Con. Icon., *Arca*, pl. 16, fig. 106, 1844. Gulf of California, to Paita, Peru, and the Galapagos Islands.

ARCA (BARBATIA) BIANGULATA Sowerby.

1833. *Arca biangulata* SOWERBY, Proc. Zool. Soc., p. 21. Guayaquil.

ARCA (BARBATIA) DECUSSATA Sowerby.

1833. *Byssoarca decussata* SOWERBY, Proc. Zool. Soc., p. 18.—REEVE, Con. Icon., *Arca*, pl. 12, fig. 81, 1844. Galapagos Islands.

ARCA (BARBATIA) LITHODOMUS Sowerby.

1833. *Byssoarca lithodomus* SOWERBY, Proc. Zool. Soc., p. 16.—REEVE, Con. Icon., *Arca*, pl. 12, fig. 76, 1844. (*Barbatia* grown in a *Lithodomus* burrow?) Monte Cristi, Ecuador.

ARCA (BARBATIA) LURIDA Sowerby.

1833. *Byssoarca lurida* SOWERBY, Proc. Zool. Soc., p. 19.—REEVE, Con. Icon., *Arca*, pl. 14, fig. 95, 1844. Santa Elena, Guayaquil.

ARCA (BARBATIA) REEVIANA Orbigny.

1846. *Arca reeviana* ORBIGNY, Voy. Am. Mér., p. 635.—*Arca helblingi* REEVE, Con. Icon., *Arca*, pl. 14, fig. 90, 1844; not of BRUGUIÈRE, 1789. From Manta, Ecuador, south to Paita, Peru.

ARCA (BARBATIA) VELATA Sowerby.

1833. *Byssoarca velata* SOWERBY, Proc. Zool. Soc., p. 18.—REEVE, Con. Icon., *Arca*, fig. 79, 1844. Indo-Pacific. Peru (Tschudi).

ARCA (CUCULLARIA) PLATEI Stempell.

1899. *Arca* (*Barbatia*) *platei* STEMPELL, Fauna Chilensis, vol. 2, p. 220, pl. 12, figs. 10–12. Juan Fernandez Island.

ARCA (SCAPHARCA) AVICULOIDES Reeve.

1844. *Arca aviculoides* REEVE, Con. Icon., *Arca*, pl. 10, fig. 63 (and pl. 6, fig. 35 as *A. auriculata* SOWERBY, not LAMARCK). Panama to Guayaquil.

ARCA (SCAPHARCA) BREVIFRONS Sowerby.

1833. Proc. Zool. Soc., p. 22.—REEVE, Con. Icon., *Arca*, pl. 1, fig. 6, 1844. Gulf of California to Tumbes, Peru.

ARCA (SCAPHARCA) CEPOIDES Reeve.

1844. Con. Icon., *Arca*, pl. 10, fig. 66. San Miguel, Ecuador.

ARCA (SCAPHARCA) EMARGINATA Sowerby.

1833. Proc. Zool. Soc., p. 20.—REEVE, Con. Icon., *Arca*, pl. 4, fig. 26, 1844. Gulf of California, and south to Atacames, Ecuador, and Guayaquil.

ARCA (SCAPHARCA) FORMOSA Sowerby.

1833. Proc. Zool. Soc., p. 20.—HANLEY, Rec. Biv. Sh., p. 160, pl. 19, fig. 9, 1843. Lower California to Paita, Peru.

ARCA (SCAPHARCA) LABIATA Sowerby.

1833. Proc. Zool. Soc., p., 21.—REEVE, Con. Icon., *Arca*, pl. 1, fig. 7, 1844. San Diego, California, to Tumbes, Peru.

ARCA (SCAPHARCA) LABIOSA Sowerby.

1833. Proc. Zool. Soc., p. 21.—REEVE, Con. Icon., *Arca*, pl. 10, fig. 67, 1844. Tumbes, Peru.

ARCA (SCAPHARCA) NUX Sowerby.

1833. Proc. Zool. Soc., p. 19.—REEVE, Con. Icon., *Arca*, pl. 1, fig. 1, 1844. Panama to Ecuador. Jipijapa, 12 fathoms.

ARCA (SCAPHARCA) OBESA Sowerby.

1833. Proc. Zool. Soc., p. 21.—REEVE, Con. Icon., *Arca*, pl. 1, fig. 3, 1844. Ecuador coast.

ARCA (SCAPHARCA) TUBERCULOSA Sowerby.

1833. Proc. Zool. Soc., p. 19.—PHILIPPI, Abb., vol. 1, p. 44, pl. 1, fig. 2, 1843. Ballenas lagoon, Lower California, to Tumbes, Peru.

ARCA (CUNEARCA) ÆQUATORIALIS Orbigny.

1846. Voy. Am. Mér., p. 636.—*Arca ovata* REEVE (not GMELIN, 1791), Con. Icon., *Arca*, pl. 8, fig. 49, 1844. Santa Elena, Ecuador.

ARCA (CUNEARCA) CARDIIFORMIS Sowerby.

1833. Proc. Zool. Soc., p. 22.—REEVE, Con. Icon., *Arca*, pl. 3, fig. 17, 1844. Gulf of California to Paita, Peru.

ARCA (ANADARA) GRANDIS Broderip and Sowerby.

1829. Zool. Journ., vol. 4, p. 365.—REEVE, Con. Icon., *Arca*, pl. 1, fig. 4, 1844. Magdalena Bay, Lower California, to Tumbes, Peru.

ARCA (NOËTIA) REVERSA Sowerby.

1833. Proc. Zool. Soc., p. 20.—REEVE, Con. Icon., *Arca*, pl. 1, fig 5, 1844. Gulf of California to Tumbes, Peru.

Genus GLYCYMERIS Da Costa.

GLYCYMERIS CHEMNITZII Dall, new name.

1909. *Pectunculus minor* ORBIGNY, Voy. Am. Mér., 1846, p. 628, not of I. LEA, 1833. Gulf of California, south to Monte Cristi, Ecuador.

GLYCYMERIS INÆQUALIS Sowerby.

1832. *Pectunculus inæqualis* SOWERBY, Proc. Zool. Soc., p. 196 (not of SOWERBY, 1839).—REEVE, Con. Icon., *Pectunculus*, pl. 4, fig. 16, 1843. Mazatlan, Mexico, south to Sechura Bay, Peru.

GLYCYMERIS MULTICOSTATA Sowerby.

1832. *Pectunculus multicostatus* SOWERBY, Proc. Zool. Soc., p. 195.—REEVE, Con. Icon., *Pectunculus*, pl. 5, fig. 24, 1843. Mazatlan, Mexico, to Guayaquil.

GLYCYMERIS OVATA Broderip.

1832. *Pectunculus ovatus* BRODERIP, Proc. Zool. Soc., p. 126.—REEVE, Con. Icon., *Pectunculus*, pl. 1, fig. 2, 1843. Lobos Islands, Peru, to Coquimbo, Chile.

GLYCYMERIS STRIGILATA Sowerby.

1832. *Pectunculus strigilatus* SOWERBY, Proc. Zool. Soc., p. 196.—REEVE, Con. Icon., *Pectunculus*, pl. 6, fig. 31, 1843. Santa Elena, Ecuador.

GLYCYMERIS TESSELLATA Sowerby.

1832. *Pectunculus tessellatus* SOWERBY, Proc. Zool. Soc., p. 196.—REEVE, Con. Icon., *Pectunculus*, pl. 6, fig. 29, 1843. Cape St. Lucas, Lower California, to Monte Cristi, Ecuador.

Superfamily PTERIACEA.

Family PINNIDÆ.

Genus PINNA Linnæus.

PINNA LANCEOLATA Sowerby.

1835. Proc. Zool. Soc., p. 84.—REEVE, Con. Icon., *Pinna*, pl. 31, fig. 58, 1858. Gulf of California, and south to Guayaquil.

PINNA MAURA Sowerby.

1835. Proc. Zool. Soc., p. 84.—REEVE, Con. Icon., *Pinna*, pl. 29, fig. 54, 1858. Gulf of California to Panama. Peru (Tschudi).

Family MELINIDÆ.

Genus MELINA Retzius.

MELINA LEGUMEN Gmelin.

1791. *Ostrea legumen* GMELIN, Syst. Nat., vol. 8, p. 3399.—REEVE, Con. Icon., *Perna*, pl. 5, fig. 22, 1858. Galapagos Islands.

MELINA QUADRANGULARIS Reeve.

1858. *Perna quadrangularis* REEVE, Con. Icon., *Perna*, pl. 2, fig. 6. Galapagos Islands.

Family PTERIIDÆ.

Genus PTERIA Scopoli.

PTERIA PERUVIANA Reeve.

1857. *Avicula peruviana* REEVE, Con. Icon., *Avicula*, pl. 14, fig. 53. Gulf of California to Paita, Peru.

Genus MARGARITIPHORA Megerle.

MARGARITIPHORA CUMINGI Reeve.

1857. *Avicula cumingi* REEVE, Con. Icon., pl. 4, fig. 6. Paita, Peru, and the Galapagos Islands.

Superfamily OSTRACEA.

Family OSTREIDÆ.

Genus OSTREA Linnæus.

OSTREA ÆQUATORIALIS Orbigny.

1846. Voy. Am. Mér., p. 672. Bay of Guayaquil (on trees). Paita, Peru.

OSTREA CALLICHROA Hanley.

1845. Proc. Zool. Soc., p. 107.—SOWERBY, Con. Icon., *Ostrea*, pl. 4, fig. 6, 1870. Chiloë Island, Chile.

OSTREA CHILENSIS Philippi.

1845. Con. Cab., ed. 2, *Ostrea*, p. 74, pl. 13, figs. 7, 8. Coast of Ecuador, south to Chiloë Island, Chile.

OSTREA COLUMBIENSIS Hanley.

1845. Proc. Zool. Soc., p. 107.—SOWERBY, Con. Icon., *Ostrea*. pl. 7, fig. 10*a–b*, 1871. Gulf of California, south to Coquimbo, Chile.

OSTREA LONGIUSCULA Hupé.

1854. Hist. de Chile, Zoöl., Mol., p. 282, pl. 5, fig. 3. Coquimbo, Chile.

OSTREA MEGODON Hanley.

1845. Proc. Zool. Soc., p. 106.—SOWERBY, Con. Icon., *Ostrea*, pl. 12, fig. 24, 1871. Scammon Lagoon, Lower California, to Sechura Bay, Peru. Fossil, Antilles.

OSTREA VINOLENTA Hupé.

1854. Hist. de Chile, Zoöl., Mol., p. 282, pl. 5, fig. 2. Coquimbo, Chile.

Superfamily PECTINACEA.

Family PECTINIDÆ.

Genus PECTEN Müller.

PECTEN DENTATUS Sowerby.

1835. Proc. Zool. Soc., p. 109; Thes. Con., vol. 1, *Pecten*, p. 49, pl. 15, figs. 105, 106, 1843. Santa Elena, Ecuador, to Paita, Peru.

PECTEN DIGITATUS Hinds.

1844. Zoöl. Sulph. Voy., Moll., p. 61, pl. 17, fig. 2. Bay of Guayaquil.

PECTEN PATAGONICUS King.

1831. Zoöl. Journ., vol. 5, p. 337.—SOWERBY, Thes. Con., vol. 1, p. 54, pl. 13, fig. 60, 1842. Magellanic Region, north to Chiloë Island and Puerto Montt.

PECTEN PURPURATUS Lamarck.

1819. An. s. Vert., vol. 6, pt. 1, p, 166.—SOWERBY, Thes. Con., vol. 1, p. 53, pl. 15, fig. 113; pl. 16, figs. 123–125, 1843. Panama and south to Coquimbo, Chile.

PECTEN ROSACEUS Stempell.

1899. Fauna Chilensis, p. 228.—*P. australis* PHILIPPI, Arch. f. Naturg., vol. 11, p. 56, 1845; not of SOWERBY, 1842. Calbuco, Chiloë, and the Chonos Islands.

PECTEN SUBNODOSUS Sowerby.

1835. Proc. Zool. Soc., p. 109, no. 1; Thes. Con., *Pecten*, p. 65, pl. 15, figs. 97, 112. Gulf of California to Guayaquil and the Galapagos Islands.

PECTEN TUMBEZENSIS Orbigny.

1846. Voy. Am. Mér., p. 663.—*P. aspersus* SOWERBY (not of LAMARCK), Thes. Con., *Pecten*, p. 51, pl. 19, figs. 198–9, 1843. Tumbes and Paita, Peru.

PECTEN VENTRICOSUS Sowerby.

1842. Thes. Con., *Pecten*, p. 51, pl. 12, figs. 18, 19, 26. Gulf of of Panama, south to Paita, Peru.

Family SPONDYLIDÆ.

Genus SPONDYLUS Linnæus.

SPONDYLUS CRASSISQUAMA Lamarck.

1819. An. s. Vert., vol. 6, p. 191.—SOWERBY, Thes. Con., *Spondylus* (as *S. pictorum* CHEMNITZ), p. 422, pl. 85, fig. 17; pl. 86, fig. 28; pl. 88, fig. 45, 1847. Panama to Guayaquil.

Genus PLICATULA Lamarck.

PLICATULA DUBIA Hanley.

1847. SOWERBY, Thes. Con., *Plicatula*, p. 437, pl. 91, fig. 19.—HANLEY, Rec. Biv. Sh., p. 289, 1856. Panama to Guayaquil.

Family LIMIDÆ.

Genus LIMA Cuvier.

LIMA ANGULATA Sowerby.

1843. Proc. Zool. Soc., p. 23; Thes. Con., vol. 1, p. 86, pl. 22, figs. 39, 40, 1843. Gulf of Panama and southward to Juan Fernandez Island.

LIMA GALAPAGENSIS Pilsbry and Vanatta.

1902. Proc. Wash. Acad. Sci., vol. 4, p. 556, pl. 35, fig. 4. Galapagos Islands.

LIMA PACIFICA Orbigny.

1846. Voy. Am. Mér., p. 654.—*L. arcuata* SOWERBY (not GEINITZ, 1840), Thes. Con., vol. 1, p. 86, pl. 22, figs. 41–42, 1843. Panama to Guayaquil and the Galapagos Islands.

Superfamily ANOMIACEA.

Family ANOMIIDÆ.

Genus ANOMIA Linnæus.

ANOMIA ADAMAS Gray.

1849. Proc. Zool. Soc., p. 117.—REEVE, Con. Icon., *Anomia*, pl. 3, fig. 15, 1859. Gulf of California to Sechura Bay, Peru, and the Galapagos Islands.

ANOMIA PACILUS Gray.

1849. Proc. Zool. Soc., p. 117.—REEVE, Con. Icon., *Anomia*, pl. 4, fig. 19, 1859. Tumbes, Peru.

ANOMIA PERUVIANA Orbigny.

1846. Voy. Am. Mér., p. 673.—PHILIPPI, Abb., vol. 3, p. 211, pl. 1, fig. 2, 1850. San Pedro, California, south to Panama, and to Paita, Peru.

Genus MONIA Gray.

MONIA FOLIATA Broderip.

1834. *Placunanomia foliata* BRODERIP, Proc. Zool. Soc., p. 2.—REEVE, Con. Icon., *Placunanomia*, pl. 1, fig. 5, 1859. San Pedro, California, and south to Guayaquil.

Superfamily MYTILACEA.

Family MYTILIDÆ.

Genus MYTILUS Linnæus.

MYTILUS ADAMSIANUS Dunker.

1856. Proc. Zool. Soc., p. 360.—REEVE, Con. Icon., *Mytilus*, pl. 11, fig. 55. Gulf of Panama, to the Galapagos Islands.

MYTILUS ATER Molina.

1782. Stor. Nat. Chile, p. 203.—*M. orbignyanus* HUPÉ, Hist. de Chile, Mol., p. 211, pl. 5, fig. 5, 1854. Manta, Ecuador, and south to Talcahuano, Chile, with the Galapagos Islands.

MYTILUS CHILENSIS Hupé.

1854. Hist. de Chile, Mol., p. 309, pl. 5, fig. 4. Valparaiso, Chile, and southward to the Magellanic region.

MYTILUS CHORUS Molina.

1782. Stor. Nat. Chile, p. 202.—REEVE, Con. Icon., *Mytilus*, fig. 4. Pacasmayo, Peru, south to Coquimbo, Chile.

MYTILUS DACTYLIFORMIS Hupé.

1854. Hist. de Chile, Mol., p. 310, pl. 5, fig. 6. Isla Blanca del Chimba, Chile, to Corral.

MYTILUS GRANULATUS Hanley.

1844. Proc. Zool. Soc., p. 17; Rec. Biv. Sh., p. 246, pl. 24, fig. 33, 1844.—HUPÉ, Hist. de Chile, Mol., p. 312, pl. 5, fig. 7, 1854. Lobos Islands, Peru, and south to the island of Chiloë.

MYTILUS MAGELLANICUS Lamarck.

1819. An. s. Vert., vol. 6, pt. 1, p. 119; Encycl. Méth. pl. 217, fig. 2. Callao, Peru, south to the Magellanic region.

MYTILUS PATAGONICUS Orbigny.

1889. In CLESSIN, Conch. Cab., 2d ed. *Mytilacea*, p. 82, pl. 18, figs. 5, 6. Chile and southward.

MYTILUS PILOSUS Reeve.

1858. (RECLUZ, ms. in) REEVE, Con. Icon., *Mytilus*, pl. 8, fig. 35. Iquique to Coquimbo, Chile, and Juan Fernandez Island.

MYTILUS SPLENDENS Dunker.

1856. Proc. Zool. Soc., p. 368. Peru.

MYTILUS STEARNSII Pilsbry and Raymond.

1898. Nautilus, vol. 12, no. 6, p. 70, pl. 4, figs. 1, 2, 3. San Diego, California, and southward. (Chile, Dautzenberg, Oahu, Conrad.)

Genus MODIOLUS Lamarck.

MODIOLUS ARCIFORMIS Dall.

1909. Proc. U. S. Nat. Mus., vol. 37, p. 152, pl. 28, fig. 2. Huaquilla, Ecuador.

MODIOLUS GUYANENSIS Lamarck.

1819. *Modiola guyanensis* LAMARCK, An. s. Vert., vol. 6, pt. 1, p. 112.—REEVE, Con. Icon., *Modiola*, pl. 4, fig. 17, 1857. Lower California to Tumbes, Peru. Also Guiana, and Brazil at Rio Janeiro.

MODIOLUS MUTABILIS Carpenter.

1856. *Modiola* (*braziliensis* var. ?) *mutabilis* CARPENTER, Mazatlan Cat., p. 122. Mazatlan to Ecuador.

MODIOLUS PURPURATUS Lamarck.

1819. An. s. Vert., vol. 6, p. 113.—CLESSIN, Conch. Cab., 2d ed., p. 128, (*ovalis*) pl. 33, figs. 4, 5, 1889. Ecuador, south to Concepcion, Chile.

MODIOLUS SPECIOSUS Dunker.

1889. Conch. Cab., 2d ed., *Mytilacea*, p. 112, pl. 81, fig. 1. Panama, south to Paita, Peru.

Genus ADULA H. and A. Adams.

ADULA SOLENIFORMIS Orbigny.

1846. *Mytilus soleniformis* ORBIGNY, Voy. Am. Mér., p. 649, pl. 85, fig. 17, 18. Paita, Peru.

Genus LITHOPHAGA Bolten.

LITHOPHAGA ARISTATA Dillwyn.

1817. *Mytilus aristatus* (SOLANDER Ms.) DILLWYN, Rec. Shells, I, p. 303.—WOOD, Index Test., pl. 12, fig. 8, 1825. Gulf of California south to the Chilean coast. Red Sea, Senegal, West Indies.

LITHOPHAGA ATTENUATA Deshayes.

1836. *Modiola attenuata* DESHAYES, An. s. Vert., 2d ed., vol. 7, p. 28.—SOWERBY, Gen. Sh., *Lithodomus*, fig. 3, 1824.—PHILIPPI, Abb., vol. 2, p. 148, pl. 1, fig. 6, 1847. Coast of Peru (at Callao, in nullipore) and Chile.

LITHOPHAGA INCA Orbigny.

1846. *Lithodomus inca* ORBIGNY, Voy. Am. Mér., p. 651. Paita, Peru.

LITHOPHAGA PERUVIANA Orbigny.

1846. *Lithodomus peruvianus* ORBIGNY, Voy. Am. Mér., p. 651. Callao, Peru, and Arica, Chile.

Order ANOMALODESMACEA.

Superfamily ANATINACEA.

Family PERIPLOMATIDÆ.

Genus PERIPLOMA Schumacher.

PERIPLOMA LENTICULARIS Sowerby.

1834. Proc. Zool. Soc., p. 87. Muerte Island, Ecuador.

PERIPLOMA PLANIUSCULA Sowerby.

1834. Proc. Zool. Soc., p. 87.—HANLEY, Rec. Biv. Sh., pp. 21, 339; suppl. pl. 10, fig. 33, 1842. Santa Elena, Ecuador.

Family PANDORIDÆ.

Genus PANDORA Schumacher.

PANDORA RADIATA Sowerby.

1830. Species Conch., figs. 23. 24; Proc. Zool. Soc., p. 94, 1835. Muerte Island, Ecuador.

Genus CLIDIOPHORA Carpenter.

CLIDIOPHORA ARCUATA Sowerby.

1830. *Pandora arcuata* SOWERBY, Species Conch., figs. 27, 28; Proc. Zool. Soc., p. 93, 1835. Santa Elena, Ecuador.

Family LYONSIIDÆ.

Genus ENTODESMA Philippi.

ENTODESMA CUNEATA Gray.

1828. *Anatina cuneata* GRAY, Spicil. Zool., vol. 1, pl. 3, fig. 14. Coast of Ecuador, south to the Magellanic region.

(SEPTIBRANCHIATA.)

Superfamily POROMYACEA.

Family CUSPIDARIIDÆ.

Genus CUSPIDARIA Nardo.

CUSPIDARIA COSTATA Sowerby.

1834. *Anatina costata* SOWERBY, Proc. Zool. Soc., p. 87. Coast of Costa Rica, and south to Santa Elena, Ecuador.

Order TELEODESMACEA.

(NASSIBRANCHIATA.)

Superfamily ASTARTACEA.

Family CRASSATELLITIDÆ.

Genus CRASSATELLITES Krüger.

CRASSATELLITES GIBBOSUS Sowerby.

1832. *Crassatella gibbosa* SOWERBY, Proc. Zool. Soc., p. 56.—REEVE, Con. Icon., *Crassatella*, pl. 1, fig. 1, 1843. Gulf of California, south to Paita, Peru.

Superfamily CYRENACEA.

Family CYRENIDÆ.

Genus CYRENA Lamarck.

CYRENA ANOMALA Deshayes.

1854. Proc. Zool. Soc., p. 21.—PRIME, Mon. Corbic., p. 30, fig. 24, 1865.—REEVE, Con. Icon., *Cyrena*, pl. 19, fig. 109, 1876. Coasts of Ecuador and Peru.

CYRENA CHILINA Prime.

1867. Ann. Lyc. N. Hist. N. York, vol. 8, p. 418. Chile.

CYRENA CORDIFORMIS Recluz.

1853. Journ. de Conchyl., vol. 4, p. 251, pl. 7, fig. 9. Paita, Peru.

CYRENA FONTAINEI Orbigny.

1844. Voy. Am. Mér., p. 569, pl. 83, figs. 14–15. Guayaquil, Ecuador.

CYRENA FORTIS Prime.

1861. Journ. de Conchyl., vol. 9, p. 355; vol. 10, p. 387, pl. 14, fig. 2, 1862. Ecuador.

CYRENA ISOCARDIOIDES Deshayes.

1854. Proc. Zool. Soc., p. 22.—PRIME, Mon. Corbic., p. 25, 1865; Proc. U. S. Nat. Mus., vol. 37, p. 159, pl. 26, fig. 4. Ecuador coast. Estero Bendito, Tumbes, Peru.

CYRENA MERIDIONALIS Prime.

1865. Mon. Corbiculidæ, p. 19, fig. 14. Paita, Peru.

CYRENA NOTABILIS Deshayes.

1854. Proc. Zool. Soc., p. 21.—SOWERBY, Con. Icon., *Cyrena*, pl. 18, fig. 107, 1876, Paita, Peru.

Superfamily CARDITACEA.

Family CARDITIDÆ.

Genus CARDITA Bruguière.

CARDITA GRAYI Dall.

1903. Proc. Acad. Nat. Sci. Phila. for 1902, p. 706.—REEVE, Con. Icon., *Cardita*, pl. 7, fig. 32, 1843.—*Cardita crassa* GRAY, Beechey's Voy., 1839, not of LAMARCK, 1819. Gulf of California to Guayaquil and the Galapagos Islands.

CARDITA LATICOSTATA Sowerby.

1832. Proc. Zool. Soc., p. 195.—REEVE, Con. Icon., *Cardita*, pl. 7, fig. 36, 1843. Guaymas, Mexico, to Panama and Guayaquil, Ecuador.

CARDITA (GLANS) NAVIFORMIS Reeve.

1843. *Cardita naviformis* REEVE, Con. Icon., *Cardita*, pl. 9, fig. 45. Arica to Valparaiso, Chile.

Genus CARDITAMERA Conrad.

CARDITAMERA RADIATA Sowerby.

1832. *Cardita radiata* SOWERBY, Proc. Zool. Soc., p. 195.—REEVE, Con. Icon., *Cardita*, pl. 1, figs. 5*a–b*, 1843. Costa Rican coast and southward to Guayaquil, Ecuador.

Genus VENERICARDIA Lamarck.

VENERICARDIA COMPRESSA Reeve.

1843. *Cardita compressa* REEVE, Con. Icon., *Cardita*, pl. 9, fig. 46. Valparaiso, Chile, and southward.

VENERICARDIA CRASSICOSTATA Sowerby.

1825. *Cardita crassicostata* SOWERBY, Tankerville Cat., app. p. iv.—REEVE, Con. Icon., *Cardita*, pl. 5, figs. 25–26; pl. 8, fig. 38, 1843. Gulf of California, and southward to Ecuador and the Galapagos Ids.

VENERICARDIA PÆTELIANA Clessin.

1888. *Cardita paeteliana* CLESSIN, Con. Cab., 2d ed., *Cardita*, p. 20, pl. 6, figs 7–8. Iquique, Chile.

VENERICARDIA SPURCA Sowerby.

1832. Proc. Zool. Soc., p. 195.—REEVE, Con. Icon., *Cardita*, pl. 7, fig. 32, 1843. Callao, Peru, and southward to the Magellanic region.

VENERICARDIA VELUTINA E. A. Smith.

1881. Proc. Zool. Soc., p. 42, pl. 5, fig. 8. Chiloë Island and southward to Punta Arenas.

Family CONDYLOCARDIIDÆ.

Genus CARDITELLA Smith.

CARDITELLA PYGMÆA Philippi.

1860. *Cardium pygmæum* PHILIPPI, Atacama Reise, p. 176, Zoöl., pl. 7, figs. 3*a–c*. Isla Blanca, Chile, S. lat. 23° 30′.

CARDITELLA SEMEN Reeve.

1843. *Cardita semen* REEVE, Con. Icon., *Cardita*, pl. 9, fig. 43, 1843. Cobija, Chile, south to Isla Blanca.

CARDITELLA TEGULATA Reeve.

1843. *Cardita tegulata* REEVE, Con. Icon., *Cardita*, pl. 9, fig. 48. Callao, Peru, to Valparaiso, Chile.

Genus CARDITOPSIS Smith.

CARDITOPSIS FLABELLUM Reeve.

1843. *Cardita flabellum* REEVE, Con. Icon., *Cardita*, pl. 9, fig. 47. Callao, Peru, to Valparaiso, and southward to Magellan Straits.

Superfamily CHAMACEA.

Family CHAMIDÆ.

Genus CHAMA Bruguière.

CHAMA ECHINATA Broderip.

1835. Trans. Zoöl. Soc. London, vol. 1, p. 305, pl. 39, figs. 5–7. Panama and southward to Piata, Peru.

CHAMA FRONDOSA Broderip.

1835. Trans. Zoöl. Soc. London, vol. 1, p. 302, pl. 38, figs. 1, 2. Gulf of Panama to Guayaquil and the Galapagos Islands.

CHAMA PELLUCIDA Broderip.

1834. Proc. Zoöl. Soc., p. 50; Trans. Zoöl. Soc. London, vol. 1, p. 302, pl. 38, fig. 3, 1835. San Pedro, California, south to Valparaiso, Chile, and Juan Fernandez Island.

Superfamily LUCINACEA.

Family LUCINIDÆ.

Genus PHACOIDES Blainville.

PHACOIDES FENESTRATUS Hinds.

1844. *Lucina fenestrata* HINDS, Zoöl. Sulph. Voy., Moll., p. 66, pl. 19, fig. 2. Lower California to Panama and to Tumbes, Peru.

PHACOIDES TELLINOIDES Reeve.

1850. *Lucina tellinoides* REEVE, Con. Icon., *Lucina*, pl. 9, fig. 56. Magdalena Bay, Lower California, to Guayaquil, Ecuador.

Family DIPLODONTIDÆ.

Genus DIPLODONTA Bronn.

DIPLODONTA ARTEMIDIS Dall.

1909. Proc. U. S. Nat. Mus., vol. 37, p. 156, pl. 28, fig. 8. Capon, Peru.

DIPLODONTA CÆLATA Reeve.

1850. *Lucina cælata* REEVE, Con. Icon., *Lucina*, pl. 6, fig. 27. Bay of Guayaquil.

DIPLODONTA INCONSPICUA Philippi.

1842. Arch. f. Naturg., p. 74.—HUPÉ, Hist. de Chile, Zoöl., p. 357, pl. 8, fig. 4, 1854. Mejillones, Chile, south to Chiloë Island.

DIPLODONTA PUNCTATA Say.

1822. *Amphidesma punctata* SAY, Journ. Acad. Nat. Sci. Phila., I, p. 308.—REEVE, Con. Icon., *Lucina*, pl. 8, fig. 43, 1850. Chiloë Island and Atlantic coast.

DIPLODONTA SERICATA Reeve.

1850. *Lucina sericata* REEVE, Con. Icon., *Lucina*, pl. 9, fig. 25, 1850. Gulf of California to Guayaquil, Ecuador.

Family THYASIRIDÆ.

Genus THYASIRA Leach.

THYASIRA TOMEANA Dall.

1901. Proc. U. S. Nat. Mus., vol. 23, p. 818, pl. 39, fig. 3. Tomé, Chile.

Family LEPTONIDÆ.

Genus ERYCINA (Lamarck) Recluz.

ERYCINA? DUBIA Deshayes.

1855. Proc. Zool. Soc., p. 183. Guayaquil.

Genus BORNIA Philippi.

BORNIA? PAPYRACEA Deshayes.

1855. *Erycina papyracea* DESHAYES, Proc. Zool. Soc., p. 183. Santa Elena, Bay of Guayaquil.

BORNIA PLATEI Stempell.

1899. *Lepton platei* STEMPELL, Fauna Chilensis, vol. 2, pt. 1, p. 233, figs. 20–21. Juan Fernandez Island.

Genus KELLIA Turton.

KELLIA BULLATA Philippi.

1845. Arch. f. Naturg., vol. 11, p. 51; Reise Atacama, p. 175, Zoöl., pl. 7, figs. 1*a–c*, 1860. Cobija, Chile, and south to Punta Arenas.

KELLIA SUBORBICULARIS Montagu.

1804. *Mya suborbicularis* MONTAGU, Test. Brit., pp. 39, 564, pl. 2, fig. 6.—TURTON, Dithyra Brit., p. 56, pl. 11, figs. 5, 6, 1822. Straits of Fuca, British Columbia, south to Panama, Ecuador, and Peru. Also Antilles.

KELLIA TUMBESIANA Stempell.

1899. *Diplodontina tumbesiana* STEMPELL, Fauna Chilensis, Bd. 2, pt. 1, p. 232, pl. 12, figs. 18, 19, 19*a*. Tumbes peninsula, near Talcahuano, Chile.

Genus ROCHEFORTIA Vélain.

ROCHEFORTIA COQUIMBENSIS Hanley.

1856. *Montacuta coquimbensis* HANLEY, Proc. Zoöl. Soc., p. 340, Coquimbo, Chile.

Genus LASÆA Leach.

LASÆA PETITIANA Recluz.

1843. *Poronia petitiana* RECLUZ, Rev. Sci. Soc. Cuv., p. 175.—*Kellia miliaris* PHILIPPI, Reise Atacama, p. 175, Zoöl., pl. 7, figs. 2*a–c*, 1860. Callao, Peru, south to Magellan Straits and Juan Fernandez.

Family KELLIELLIDÆ.

Genus ALIGENA H. C. Lea.

ALIGENA COKERI Dall.

1909. Proc. U. S. Nat. Mus., vol. 37, p. 155, pl. 28, figs. 5, 6. Attached to wormcases by a byssus, at the "inside beach," Capon, Peru.

Superfamily CARDIACEA.

Family CARDIIDÆ.

Genus CARDIUM (Linnæus) Lamarck.

CARDIUM (TRACHYCARDIUM) CONSORS Broderip and Sowerby.

1833. *Cardium consors* BRODERIP and SOWERBY, Proc. Zool. Soc., p. 85.—SOWERBY, Con. Ill., *Cardium*, p. 3, no. 40, pl. 47, fig. 8, 1833. Gulf of California to Guayaquil and the Galapagos Islands.

CARDIUM (TRACHYCARDIUM) MACULOSUM Wood.

1815. Gen. Conch., p. 218, pl. 52, fig. 3; not of SOWERBY, 1833? Con. Ill., vol. 1, p. 4, pl. 182, fig. 63, 1840. Gulf of Panama to Guayaquil.

CARDIUM (TRACHYCARDIUM) SENTICOSUM Sowerby.

1833. *Cardium senticosum* SOWERBY, Proc. Zool. Soc., p. 84; Con. Ill., *Cardium*, pl. 47, fig. 10, 1840. Gulf of California to Paita, Peru.

CARDIUM (RINGICARDIUM) PROCERUM Sowerby.

1832. *Cardium procerum* SOWERBY, Proc. Zool. Soc., p. 83; Con. Ill., vol. 1, p. 5, pl. 50, fig. 23, 1834. Cedros Island, Lower California, south to the Lobos Islands, Peru.

CARDIUM (TRIGONIOCARDIA) GRANIFERUM Broderip and Sowerby.

1829. *Cardium graniferum* BRODERIP and SOWERBY, Zool. Journ., vol. 4, p. 367. Con. Ill., *Cardium*, p. 3, no 38, pl. 49, fig. 17, 1834. Gulf of California and south to Guayaquil.

CARDIUM (TRIGONIOCARDIA) OBOVALE Sowerby.

1833. *Cardium obovale* SOWERBY, Proc. Zool. Soc., p. 84; Con. Ill., *Cardium*, pl. 46, fig. 4, 1833. Magdalena Bay, Lower California, and south to the coast of Ecuador.

CARDIUM (FRAGUM) BIANGULATUM Sowerby.

1829. *Cardium biangulatum* SOWERBY, Zool. Journ., vol. 4, p. 367. Con. Ill., *Cardium*, fig. 2, 1833. Catalina Island, California, south to Guayaquil.

CARDIUM (FRAGUM) MAGNIFICUM Deshayes.

1857. CARPENTER, Rep. Brit. Assoc., 1857, p. 187.—*C. planicostatum* SOWERBY, Con. Ill., *Cardium*, no. 83, pl. 50, fig. 25, 1834. Lower California south to Paita, Peru.

CARDIUM (PAPYRIDEA) ASPERSUM Sowerby.

1833. *Cardium aspersum* SOWERBY, Proc. Zool. Soc., p. 85; Con. Ill., *Cardium*, fig. 15, 1834. Magdalena Bay, Lower California, to Guayaquil.

CARDIUM (LÆVICARDIUM) ELENENSE Sowerby.

1840. *Cardium elenense* SOWERBY, Proc. Zool. Soc., p. 109; Con. Ill., *Cardium*, pl. 181, fig. 58, 1840. Gulf of California to Guayaquil and Clarion Island.

Superfamily VENERACEA.

Family VENERIDÆ.

Genus DOSINIA Scopoli.

DOSINIA DUNKERI Philippi.

1844. *Cytherea dunkeri* PHILIPPI, Abb., vol. 1, p. 4, pl. 2, fig. 9.—SOWERBY, Thes. Con., *Artemis*, pl. 140, fig. 5. Gulf of California, south to Tumbes, Peru, and the Galapagos Islands.

DOSINIA PONDEROSA Gray.

1838. *Artemis ponderosa* GRAY, in Analyst, vol. 8, p. 309.—PHILIPPI, Abb., vol. 1, *Cytherea*, p. 171.—SOWERBY, Thes. Con., *Artemis*, p. 656, pl. 140, fig. 2, 1852. Magdalena Bay, Lower California, south to Paita, Peru.

Genus TIVELA Link.

TIVELA BYRONENSIS Gray.

1838. *Trigona byronensis* GRAY, Analyst, vol. 8, p. 302–9, no. 24. Scammon Lagoon, Lower California, south to Guayaquil.

TIVELA HIANS Philippi.

1851. *Donax hians* PHILIPPI, Zeitschr. f. Mal., vol. 8, p. 74.—ROEMER, Mon. *Venus*, p. 9, pl. 3, fig. 3, 1869. Magdalena Bay, Lower California, south to Valparaiso, Chile.

TIVELA PLANULATA Broderip and Sowerby.

1829. *Cytherea planulata* BRODERIP and SOWERBY, Zool. Journ., vol. 5, p. 48.—SOWERBY, Thes. Con., *Cytherea*, pl. 127, fig. 13, 1851. Gulf of California south to Coquimbo, Chile.

Genus MACROCALLISTA Meek.

MACROCALLISTA AURANTIACA Sowerby.

1831. *Cytherea aurantiaca* SOWERBY, Gen. Sh., vol. 33, fig. 6; Thes. Con., *Cytherea*, pl. 132, fig. 97 *bis*, 1853. Gulf of California to Guayaquil.

MACROCALLISTA PANNOSA Sowerby.

1835. *Cytherea pannosa* SOWERBY, Proc. Zool. Soc., p 47; Thes. Con., *Cytherea*, pl. 138, figs. 140–142; pl. 163, figs. 202–203, 1851. Gulf of California south to Valparaiso, Chile.

MACROCALLISTA SQUALIDA Sowerby.

1835. *Cytherea squalida* SOWERBY, Proc. Zool. Soc., p. 23; Thes. Con., *Cytherea*, p. 629, pl. 131, figs. 87–89, 1851. Cedros Island, Lower California, south to Peru.

Genus PITARIA Roemer.

PITARIA INCONSPICUA Sowerby.

1835. *Cytherea inconspicua* SOWERBY, Proc. Zool. Soc., p. 47; Thes. Con., *Cytherea*, pl. 133, figs. 133–134, 1852. Paita, Peru, and south to Talcahuano, Chile.

PITARIA POLLICARIS Carpenter.

1864. *Callista pollicaris* CARPENTER, Ann. Mag. Nat. Hist., vol. 13, p. 475.—REEVE, Con. Icon., *Dione* (*prora*), fig. 45. Gulf of California to Callao, Peru.

PITARIA TOMEANA Dall.

1902. Proc. U. S. Nat. Mus., vol. 26, p. 402, pl. 15, fig. 2. Gulf of Panama to Tomé, Chile, and the Galapagos Islands.

PITARIA (LAMELLICONCHA) CIRCINATA Born.

1780. *Venus circinata* BORN, Test. Mus. Vind., p. 61, pl. 4, fig. 8.—SOWERBY, Thes. Con., *Cytherea*, pl. 132, figs. 104–106, 1853. Gulf of California to Paita, Peru.

PITARIA (LAMELLICONCHA) CONCINNA Sowerby.

1835. *Cytherea concinna* SOWERBY, Proc. Zool. Soc., p. 23; Thes. Con., *Cytherea*, pl. 132, figs. 99–100, 1851. Magdalena Bay, Lower California, to Paita, Peru.

PITARIA (LAMELLICONCHA) CUMINGI Orbigny.

1846. *Venus cumingi* ORBIGNY, Voy. Am. Mér., p. 563.—*Cytherea modesta* SOWERBY, Thes. Con., *Cytherea*, pl. 136, fig. 184, 1851. Jipijapa, Ecuador.

PITARIA (HYSTEROCONCHA) LUPANARIA Lesson.

1830. *Cytherea lupanaria* LESSON, Voy. Coq., p. 430.—CHENU, Illustr. Con., *Cytherea*, pl. 9, fig. 9. Ballenas Lagoon, Lower California, to Paita, Peru.

PITARIA (HYSTEROCONCHA) MULTISPINOSA Sowerby.

1851. *Cytherea multispinosa* SOWERBY, Thes. Con., *Cytherea*, p. 632, pl. 132, fig. 112. Gulf of Panama, south to Paita, Peru.

Genus CYTHEREA Bolten.

CYTHEREA MULTICOSTATA Sowerby.

1835. *Venus multicostata* SOWERBY, Proc. Zool. Soc., p. 22; Thes. Con., *Venus*, pl. 152, fig. 10, 1853. Gulf of California to Panama and the Galapagos Islands.

CYTHEREA (VENTRICOLA) MACTRACEA Broderip.

1835. *Venus mactracea* BRODERIP, Proc. Zool. Soc., p. 44 (unfigured). Valparaiso, Chile.

Genus CYCLINELLA Dall.

CYCLINELLA KROYERI Philippi.

1848. *Venus kroyeri* PHILIPPI, Abb., vol. 3, p. 78, pl. 7, fig. 9. Gulf of California to Valparaiso, Chile.

CYCLINELLA SUBQUADRATA Hanley.

1845. *Artemis subquadrata* HANLEY, Proc. Zool. Soc., p. 11.—SOWERBY, Thes. Con., *Artemis*, pl. 161, fig. 22, 1852. Guaymas, Mexico, south to Guayaquil.

Genus CHIONE Megerle.

CHIONE ALVAREZII Orbigny.

1846. *Venus alvarezii* ORBIGNY, Voy. Am. Mér., p. 557, pl. 83, figs. 3, 4. Peru (Tschudi); Patagonia (Orbigny).

CHIONE ANTIQUA King.

1831. *Venus antiqua* KING, Zool. Journ., vol. 5, p. 336.— *V. discrepans* PHILIPPI, Abb., vol. 1, p. 174, pl. 3, fig. 2, 1844; not of SOWERBY, 1835. Callao, Peru, south to the Magellanic region.

CHIONE COMPTA Broderip.

1835. *Venus compta* BRODERIP, Proc. Zool. Soc., p. 43.—SOWERBY, Thes. Con., *Venus*, pl. 154, figs. 32–34, 1853. Gulf of California to Sechura Bay, Peru.

CHIONE CRENIFERA Sowerby.

1835. *Venus crenifera* SOWERBY, Proc. Zool. Soc., p. 43; Thes. Con., *Venus*, p. 156, figs. 73–74, 1853. Mazatlan, Mexico, to Paita, Peru; also Atlantic coast.

CHIONE ELLIPTICA Lamarck.

1818. *Venus elliptica* LAMARCK, An. s. Vert., vol. 5, p. 590, no. 20. Encycl. Méth, pl. 267, fig. 5 *a–b*. Talcahuano to Chiloë, Chile.

CHIONE GNIDIA Broderip and Sowerby.

1829. *Venus gnidia* BRODERIP and SOWERBY, Zool. Journ., vol. 4, p. 364.—SOWERBY, Thes. Con., *Venus*, pl. 154, fig. 25, 1853. Cedros Island, Lower California, to Paita, Peru.

CHIONE SPURCA Sowerby.

1835. *Venus spurca* SOWERBY, Proc. Zool. Soc., p. 23; Thes. Con., *Venus*, pl. 156, fig. 97 only, 1853. Valparaiso, Chile.

CHIONE SUBROSTRATA Lamarck.

1818. *Venus subrostrata* LAMARCK, An. s. Vert., vol. 5, p. 588; Encycl. Méth., pl. 267, fig. 7.—SOWERBY, Thes. Con., *Venus*, pl. 154, fig. 39, 1853. Mazatlan, Mexico, to Paita, Peru; also Atlantic coast.

CHIONE UNDATELLA Sowerby.

1835. *Venus undatella* SOWERBY, Proc. Zool. Soc., p. 22; Thes. Con., *Venus*, pl. 153, fig. 22, 1853. San Pedro, California, south to Paita, Peru, and the Galapagos Islands.

CHIONE (TIMOCLEA) ASPERRIMA Sowerby.

1835. *Venus asperrima* SOWERBY, Proc. Zool. Soc., p. 42; Thes. Con., *Venus*, pl. 155, figs. 57–58, 1853. Gulf of California to the Lobos Islands, Peru.

CHIONE (TIMOCLEA) COLUMBIENSIS Sowerby.

1835. *Venus columbiensis* SOWERBY, Proc. Zool. Soc., p. 21; Thes. Con., *Venus*, pl. 155, figs. 53–54, 1853. Gulf of California to Pacasmayo, Peru.

CHIONE (TIMOCLEA) TUMIDA Sowerby.

1852. *Tapes tumida* SOWERBY, Thes. Con., *Tapes*, p. 697, pl. 146, fig. 42 (not var. *tumida* Carpenter). Panama to Guayaquil.

CHIONE (LIROPHORA) DISCREPANS Sowerby.

1835. *Venus discrepans* SOWERBY, Proc. Zool. Soc., p. 22; Thes. Con., *Venus*, pl. 155, fig. 65, 1853. Not *V. discrepans* PHILIPPI, 1853. Islay, Peru.

CHIONE (LIROPHORA) MARIÆ Orbigny.

1846. *Venus mariæ* ORBIGNY, Voy. Am. Mér., p. 563.—SOWERBY, Thes. Con., *Venus*, pl. 157, fig. 113, 1853. Gulf of California to Guayaquil.

CHIONE (LIROPHORA) PERUVIANA Sowerby.

1835. *Venus peruviana* SOWERBY, Proc. Zool. Soc., p. 22; Thes. Con., *Venus*, pl. 155, fig. 66, 1853. Callao and south to the Chilean coast.

CHIONE (CLAUSINELLA) GAYI Hupé.

1854. *Venus gayi* HUPÉ, Hist. de Chile, Zoöl., Mol., vol. 8, p. 337, pl. 6, fig. 5. Valparaiso, south to Chiloë Island.

Genus ANOMALOCARDIA Schumacher.

ANOMALOCARDIA SUBIMBRICATA Sowerby.

1835. *Venus subimbricata* SOWERBY, Proc. Zool. Soc., p. 21; Thes. Con., *Venus*, pl. 154, figs. 35–37, 1853. Gulf of California, south to Paita, Peru.

ANOMALOCARDIA SUBRUGOSA Sowerby.

1834. *Venus subrugosa* SOWERBY, Gen., *Venus*, fig. 2; Thes. Con., *Venus*, pl. 155, fig. 63, 1853. Magdalena Bay, Lower California, to Valparaiso, Chile.

Genus MARCIA (Adams) Fischer.

MARCIA LENTICULARIS Sowerby.

1835. *Venus lenticularis* SOWERBY, Proc. Zool. Soc., p. 42; Thes. Con., *Venus*, pl. 161, fig. 194, 1853. Valparaiso and Coquimbo, Chile.

MARCIA RUFA Lamarck.

1818. *Cytherea rufa* LAMARCK, An. s. Vert., vol. 5, p. 570 (not of SOWERBY, 1853); Thes. Con., *Tapes*, pl. 150, fig. 123, 1852. Gulf of Panama and south to Concepcion, Chile.

Genus PAPHIA Bolten.

PAPHIA (PROTOTHACA) CINERACEA Hupé.

1854. *Venus cineracea* HUPÉ, Hist. de Chile, Zoöl., Mol., p. 334, pl. 6, fig. 2. Callao, Peru, to northern Chile.

PAPHIA (PROTOTHACA) GRATA Say.

1831. *Venus grata* SAY, Am. Con., pt. 3, pl. 26. Lower California, south to Antofagasta, Chile.

PAPHIA (PROTOTHACA) THACA Molina.

1782. *Chama thaca* MOLINA, Saggio Hist. de Chile, p. 178.—PHILIPPI, Abb., vol. 1, p. 127, pl. 2, fig. 1; pl. 3, fig. 3, 1844. Ancon, Peru, and south to the Chonos Archipelago, Chile.

Genus VENERUPIS Lamarck.

VENERUPIS OBLONGA Lamarck.

1834. *Petricola oblonga*, SOWERBY, Proc. Zool. Soc., p. 46; Thes. Con., *Venerupis*, p. 765, pl. 165, fig. 21, 1854. Gulf of Panama to Pacasmayo, Peru.

VENERUPIS FERNANDEZIANA Stempell.

1899. Fauna Chilensis, suppl. Bd. 4, fasc. 1, p. 237, pl. 12, figs. 22–23. Juan Fernandez Islands.

Family PETRICOLIDÆ.

Genus PETRICOLA Lamarck.

PETRICOLA CONCINNA Sowerby.

1834. Proc. Zool. Soc., p. 46; Thes. Con., *Petricola*, p. 773, pl. 166, fig. 3, 1854. Monte Cristi, Ecuador, to Arica, Chile.

PETRICOLA DENTICULATA Sowerby.

1834. Proc. Zool. Soc., p. 46; *P. dactylus* in Thes. Con., *Petricola*, p. 773, pl. 166, figs. 6, 7, 1854; not of SOWERBY, Gen. Sh. 1823. Gulf of California to Paita, Peru.

PETRICOLA DISCORS Sowerby.

1834. Proc. Zool. Soc., p. 46. (Unfigured.) Lambayeque, Peru.

PETRICOLA ELLIPTICA Sowerby.

1834. Proc. Zool. Soc., p. 46; Thes. Con., *Petricola*, p. 774, pl. 166, fig. 10, 1854. Paita, Peru, to Arica, Chile.

PETRICOLA ROBUSTA Sowerby.

1834. Proc. Zool. Soc., p. 47; Thes. Con., *Petricola*, p. 775, pl. 166, figs. 16, 17, 1854. Panama to Guayaquil.

PETRICOLA RUGOSA Sowerby.

1834. Proc. Zool. Soc., p. 47; Thes. Con., *Petricola*, p. 773, pl. 166, figs. 13–14, 1854. Lambayeque, Peru, to Chiloë Island, Chile.

Superfamily TELLINACEA.

Family TELLINIDÆ.

Genus TELLINA Linnæus.

TELLINA COLUMBIENSIS Hanley.

1844. Proc. Zool. Soc., p. 71; Thes. Con., *Tellina*, p. 307, pl. 65, fig. 246, 1846. Monte Cristi, Ecuador.

TELLINA CRYSTALLINA Wood.

1815. Gen. Con., p. 149; Index Test., pl. 3, fig. 10, 1825. Panama, Guayaquil; also West Indies.

TELLINA EBURNEA Hanley.

1844. Proc. Zool. Soc., p. 61; Thes. Con., *Tellina*, p. 241, pl. 58, fig. 91, 1846. Gulf of California, to Paita, Peru.

TELLINA HIBERNA Hanley.

1844. Proc. Zool. Soc., p. 148; Thes. Con., *Tellina*, p. 282, pl. 57, fig. 53, 1846. Panama to Guayaquil.

TELLINA INÆQUISTRIATA Donovan.

1802. Brit. Shells, vol. 4, pl. 123. Guayaquil.

TELLINA LYRA Hanley.

1844. Proc. Zool. Soc., p. 68; Thes. Con. *Tellina*, p. 271, pl. 62, fig. 187, 1846. Lower California to Tumbes, Peru.

TELLINA PRINCEPS Hanley.

1844. Proc. Zool. Soc., p. 62; Thes. Con., *Tellina*, p. 238, pl. 63, fig. 206, 1846. Peru.

TELLINA PRORA Hanley.

1844. Proc. Zool. Soc., p. 61; Thes. Con., *Tellina*, p. 243, pl. 60, fig. 152, 1846. Bay of Guayaquil.

TELLINA RUBESCENS Hanley.

1844. Proc. Zool. Soc., p. 60; Thes. Con., *Tellina*, p. 242, pl. 60, fig. 153, 1846. Gulf of Panama to Tumbes, Peru.

Genus TELLIDORA Mörch.

TELLIDORA BURNETI Broderip and Sowerby.

1829. *Tellina burneti* Broderip and Sowerby, Zool. Journ., vol. 4, p. 362, pl. 9, fig. 2. Mazatlan, Mexico, to Salango, Ecuador.

Genus METIS H. and A. Adams.

METIS DOMBEYI Hanley.

1844. *Tellina dombeyi* HANLEY, Proc. Zool. Soc., p. 144 and index; Thes. Con., *Tellina*, p. 323, pl. 62, fig. 182, 1846. Gulf of Panama to Peru.

METIS EXCAVATA Sowerby.

1867. *Tellina excavata* SOWERBY, Con. Icon., *Tellina*, pl. 26, fig. 138. Gulf of California, to Paita, Peru, and the Galapagos Islands.

Genus MACOMA Leach.

MACOMA GRANDIS Hanley.

1844. Proc. Zool. Soc., p. 181; Thes. Con., *Tellina*, p. 327, pl. 65, fig. 247, 1846. Tumbes, Peru.

MACOMA HUPEANA Dall.

1908. Dall, Albatross Rep., p. 421.—*Tellina inornata* HUPÉ, Hist. de Chile, vol. 8, Zool., Mol., p. 356, pl. 8, fig. 2, 1854; not of Hanley, 1844. Southern Chile.

MACOMA INORNATA Hanley.

1844. *Tellina inornata* HANLEY, Proc. Zool. Soc., p. 144; Thes. Con., *Tellina*, p. 315, pl. 59, fig. 123, 1846. Gulf of California, to Concepcion, Chile.

MACOMA PUMILA Hanley.

1844. *Tellina pumila* HANLEY, Proc. Zool. Soc., p. 69; Thes. Con., *Tellina*, p. 279, pl. 57, fig. 41, 1846. Valparaiso, Chile.

MACOMA UNDULATA Hanley.

1844. *Tellina undulata* HANLEY, Proc. Zool. Soc., p. 72; Thes. Con., *Tellina*, p. 310, pl. 59, fig. 107, 1846. Gulf of California, and south to Santa Elena, Ecuador.

Family SEMELIDÆ.

Genus SEMELE Schumacher.

SEMELE CORRUGATA Sowerby.

1832. *Amphidesma corrugata* SOWERBY, Proc. Zool. Soc., p. 200; Con. Ill., *Amphidesma*, fig. 18, 1833. Gulf of Panama, to Valparaiso, Chile.

SEMELE ELLIPTICA Sowerby.

1830. Spec. Con., *Amphidesma*, fig. 17.—*Amphidesma ellipticum* SOWERBY, Proc. Zool. Soc., p. 200, 1832 (not of KOCH, 1837). Monte Cristi, Ecuador.

SEMELE FORMOSA Sowerby.

1832. *Amphidesma formosum* SOWERBY, Proc. Zool. Soc., p. 199; Con. Ill., *Amphidesma*, fig. 8, 1833. Santa Elena, Bay of Guayaquil, Ecuador.

SEMELE LÆVIS Sowerby.

1832. *Amphidesma lævis* SOWERBY, Proc. Zool. Soc., p. 199; Con. Ill., *Amphidesma*, fig. 6, 1833. Jipijapa, Ecuador.

SEMELE LENTICULARIS Sowerby.

1832. *Amphidesma lenticularis* SOWERBY, Proc. Zool. Soc., p. 200; Con. Ill., *Amphidesma*, fig. 9, 1833. Santa Elena, Guayaquil.

SEMELE PALLIDA Sowerby.

1832. *Amphidesma pallidum* SOWERBY, Proc. Zool. Soc., p. 199; Con. Ill., *Amphidesma*, fig. 3, 1833. Salango, Ecuador.

SEMELE PULCHRA Sowerby.

1832. *Amphidesma pulchrum* SOWERBY, Proc. Zool. Soc., p. 57; Con. Ill., *Amphidesma*, fig. 2, 1833. Bay of Caraques, Ecuador.

SEMELE PURPURASCENS Sowerby.

1832. *Amphidesma purpurascens* SOWERBY, Proc. Zool. Soc., p. 199; Con. Ill., *Amphidesma*, fig. 5, 1833. Santa Elena, Bay of Guayaquil.

SEMELE ROSEA Sowerby.

1832. *Amphidesma roseum* SOWERBY, Proc. Zool. Soc., p. 199; Con. Ill., *Amphidesma*, fig. 1, 1833. Tumbes, Peru.

SEMELE RUPIUM Sowerby.

1832. *Amphidesma rupium* SOWERBY, Proc. Zool. Soc., p. 199; Con. Ill., *Amphidesma*, fig. 11, 1833. California, south to Guayaquil and the Galapagos Islands.

SEMELE SOLIDA Gray.

1828. *Amphidesma solidum* GRAY, Spicil. Zool., pl. 6, fig. 6.—HUPÉ, Hist. de Chile, Mol., pl. 7, fig. 1. Callao, Peru, south to the Chonos Archipelago.

SEMELE VARIEGATA Lamarck.

1818. *Amphidesma variegatum* LAMARCK, An. s. Vert., vol. 5, p. 490; Encycl. Méth., pl. 291, fig. 3.—HUPÉ, Hist. de Chile, vol. 8, Mol., p. 359, pl. 7, fig. 2, 1854. Pèru and Chile.

Genus CUMINGIA Sowerby.

CUMINGIA LAMELLOSA Sowerby.

1833. Proc. Zool. Soc., p. 34; Con. Icon., *Cumingia*, pl. 1, fig. 5, 1873. Gulf of Panama to Paita, Peru, and to northern Chile.

CUMINGIA MUTICA Sowerby.

1833. Proc. Zool. Soc., p. 34; Con. Icon., *Cumingia*, pl. 1, fig. 3, 1873. Bay of Guayaquil to Paita, Peru, and south to Concepcion, Chile.

Family PSAMMOBIIDÆ.

Genus PSAMMOBIA Lamarck.

PSAMMOBIA LATA Deshayes.

1854. Proc. Zool. Soc., p. 318.—REEVE, Con. Icon., *Psammobia*, pl. 1, fig. 7, 1857. Bay of Guayaquil.

PSAMMOBIA SOLIDA Gray.

1828. *Solecurtus solidus* GRAY, Spicil. Zool., pl. 3, fig. 12.—*Psammobia solida* PHILIPPI, Abb., vol. 1, *Psammobia*, pl. 1, fig. 1, 1844. Callao, Peru, to the Chonos Archipelago.

Genus SANGUINOLARIA Lamarck.

SANGUINOLARIA HANLEYI Bertin.

1878. *Tellina hanleyi* BERTIN, Revis. Tell., p. 268.—*Tellina rufescens* HANLEY, Thes. Con., *Tellina*, p. 307, pl. 53, fig. 213, 1846; not of CHEMNITZ. Lower California, south to Panama and to Tumbes, Peru.

Genus TAGELUS Gray.

TAGELUS (MESOPLEURA) DOMBEYI Lamarck.

1818. *Solen dombeii* LAMARCK, An. s. Vert., vol. 5, p. 454; Encycl. Méth., pl. 224, fig. 1.—HUPÉ, Hist. de Chile, vol. 8, Mol., p. 366, pl. 7, fig. 5, 1854. Tumbes, Peru, south to Valdivia, Chile.

Family DONACIDÆ.

Genus DONAX Linnæus.

DONAX ARICANA Dall, new name.

1909. *D. radiatus*, VALENCIENNES, Humb. Voy.,vol. 2, p. 221, pl. 50, figs. 3, 4, 1833.—BERTIN, Revis. Donacidées, p. 95, pl. 3, fig. 1*a–b*, 1879; not of GMELIN, Syst. Nat., p. 3266, 1791. Paita, Peru, to Arica, Chile.

DONAX ASPERA Hanley.

1845. *Donax asper* HANLEY, Proc. Zool. Soc., p. 14.—SOWERBY, Thes. Con., *Donax*, p. 307, pl. 1, fig. 24, 1862. Gulf of Panama to Tumbes, Peru.

DONAX GRACILIS Hanley.

1845. Proc. Zool. Soc., p. 15.—SOWERBY, Thes. Con., *Donax*, p. 314, pl. 3, figs. 76–79, 1862. California, south to Guayaquil.

DONAX OBESA Orbigny.

1846. Voy. Am. Mér., p. 541, pl. 81, figs. 28–30; not *D. obesus* GOULD, 1851. Gulf of Panama to Paita, Peru.

DONAX OBESULA Deshayes.

1854. Proc. Zool. Soc., p. 352.—REEVE, Con. Icon., *Donax*, pl. 5, fig. 30, 1858. Peru (Deshayes).

DONAX PAYTENSIS Orbigny.

1846. Voy. Am. Mér., p. 541 (unfigured). Panama to Paita, Peru, and Arica, Chile.

DONAX PETALINA Deshayes.

1854. Proc. Zool. Soc., p. 350.—SOWERBY, Thes. Con., *Donax*, p. 315, pl. 3, fig. 86, 1866. Chile.

Genus IPHIGENIA Schumacher.

IPHIGENIA ALTIOR Sowerby.

1832. Proc. Zool. Soc., p. 196 (as *Capsa*).—ROEMER, Mon. Donacidæ, p. 114, pl. 21, figs. 1–4, 1869. Gulf of California to Tumbes, Peru.

Superfamily SOLENACEA.

Family SOLENIDÆ.

Genus SOLEN Linnæus.

SOLEN GAUDICHAUDI Chenu.

1843. Illustr. Con., *Solen*, pl. 2, fig. 7. Valparaiso and Coquimbo, Chile.

SOLEN MACHA Molina.

1782. Hist. Nat. de Chile, p. 178.—HUPÉ, Hist. de Chile, vol. 8, Mol., p. 369, pl. 8, fig. 6, 1854. Valparaiso to Chiloë, and Puerto Montt, Chile.

Superfamily MACTRACEA.

Family MACTRIDÆ.

Genus MACTRA (Linnæus) Lamarck.

MACTRA (MACTRODERMA) VELATA Philippi.

1848. *M. velata* PHILIPPI, Zeitschr. f. Mal., p. 153, no. 7; Abb., vol. 3, p. 137, pl. 3, fig. 5, 1850. Gulf of California and south to Paita, Peru, and the Galapagos Islands.

Genus MULINIA Gray.

MULINIA BICOLOR Gray.

1838. Loudon's Mag. N. Hist., new ser., vol. 1, p. 375.—HANLEY, Rec. Biv. Sh., pl. 10, fig. 31, 1842.—PHILIPPI, Ann. Mus. Nac. de Chile, Zool., vol. 4, p. 11, pl. 3, figs. 9, 10, 1893. Copiapó to Valparaiso.

MULINIA BYRONENSIS Gray.

1838. Loudon's Mag. N. Hist., new ser., vol. 1, p. 376, fig. 33; Zool. Beechey's Voy., p. 154, pl. 44, fig. 11, 1839. Salaverri, Peru, and south to Talcahuano, Chile.

MULINIA EDULIS King.

1831. *Mactra edulis* KING, Zool. Journ., vol. 5, p. 335.—*Mactra byronensis* HUPÉ, Hist. de Chile, vol. 8, Mol., pl. 8, fig. 1, 1854 (not of Gray, 1838). Callao, Peru, and south to Magellan straits.

MULINIA PALLIDA Broderip and Sowerby.

1829. *Mactra pallida* BRODERIP and SOWERBY, Zool. Journ., vol. 4, p. 360.—REEVE, Con. Icon., *Mactra*, pl. 9, fig. 34, 1854. Gulf of California and south to Panama and Manta, Ecuador.

Family MESODESMATIDÆ.

Genus MESODESMA Deshayes.

MESODESMA DONACIUM Lamarck.

1818. *Mactra donacia* LAMARCK, An. s. Vert., vol. 5, p. 479.—CHENU, Man., vol. 2, p. 79, fig. 341, 1862. Sechura Bay, Peru, south to Valparaiso, Chile.

Superfamily MYACEA.

Family CORBULIDÆ.

Genus CORBULA Bruguière.

CORBULA BICARINATA Sowerby.

1833. Proc. Zool. Soc., p. 35.—REEVE, Conch. Icon., *Corbula*, pl. 3, fig. 23, 1844. Panama to Guayaquil.

CORBULA BIRADIATA Sowerby.

1833. Proc. Zool. Soc., p. 35.—REEVE, Con. Icon., *Corbula*, pl. 1, fig. 3, 1844. Gulf of Panama to Guayaquil.

CORBULA NASUTA Sowerby.

1833. Proc. Zool. Soc., p. 35.—REEVE, Con. Icon., *Corbula*, pl. 1, fig. 1, 1844 (not of Conrad). Gulf of Panama to Jipijapa, Ecuador.

CORBULA OVULATA Sowerby.

1833. Proc. Zool. Soc., p. 35.—REEVE, Con. Icon., *Corbula*, pl. 1, fig. 7, 1844. Gulf of Panama to Guayaquil.

Family SAXICAVIDÆ.

Genus SAXICAVA F. de Bellevue.

SAXICAVA PURPURASCENS Sowerby.

1834. Proc. Zool. Soc., p. 88; Thes. Con., *Saxicava*, p. 133, pl. 471, fig. 7, 1884. Bay of Guayaquil.

SAXICAVA SOLIDA Sowerby.

1834. Proc. Zool. Soc., p. 88; Thes. Con., *Saxicava*, p. 133, pl. 471, fig. 12, 1884. Bay of Guayaquil and south to Punta Arenas, Magellan straits.

Family GASTROCHÆNIDÆ.

Genus GASTROCHÆNA Spengler.

GASTROCHÆNA DENTICULATA Deshayes.

1854. Proc. Zool. Soc., p. 327; Thes. Con., *Gastrochæna*, p. 129, pl. 470, fig. 7, 1884. Ecuador coast.

GASTROCHÆNA OVATA Sowerby.

1834. Proc. Zool. Soc., p. 21; Thes. Con., *Gastrochæna*, p. 128, pl. 470, fig. 9, 1884. Panama to La Plata Island, Ecuador, Also Atlantic.

GASTROCHÆNA RUGULOSA Sowerby.

1834. Proc. Zool. Soc., p. 22; Thes. Con., *Gastrochæna*, p. 128, pl. 470, fig. 25, 1884. Galapagos Islands.

Genus SPENGLERIA Tryon.

SPENGLERIA TRUNCATA Sowerby.

1834. Proc. Zool. Soc., p. 21; Thes. Con., *Gastrochæna*, p. 130, pl. 470, fig. 13, 1884. Panama and southward.

Superfamily ADESMACEA.

Family PHOLADIDÆ.

Genus PHOLAS Linnæus.

PHOLAS CHILOËNSIS Molina.

1782. Saggio stor. nat. de Chile, pp. 104 (note), p. 348.—PHILIPPI, Abb., vol. 3, p. 134, pl. 1, figs. 4, 5, 1849.—HUPÉ, Hist. de Chile, vol. 8, Mol., p. 381, pl. 6, fig. 3, 1854. Gulf of Panama to Peru, and south to Chiloë Island.

Genus BARNEA Leach.

BARNEA CRUCIGERA Sowerby.

1834. *Pholas cruciger* SOWERBY, Proc. Zool. Soc., p. 69; Thes. Con., *Pholas*, p. 489, pl. 104, figs. 24–26, 1849. Gulf of Panama to Guayaquil. Also Atlantic.

BARNEA SUBTRUNCATA Sowerby.

1834. *Pholas subtruncatus* SOWERBY, Proc. Zool. Soc., p. 69.—*P. lamellosa* ORBIGNY, Voy. Am. Mér., p. 498, pl. 77, figs. 20, 21, 1846. Guayaquil and southward to Paita, Peru, Magellan strait, and the Atlantic coast of southern Argentina.

BARNEA PACIFICA Stearns.

1871. *Pholas pacifica* STEARNS, Proc. Cal. Acad. Sci., vol. 5, p. 81, pl. 1, figs. 6, *a–c*. San Francisco Bay, Cal., and south to Paita, Peru, and the coast of Chile.

Genus PHOLADIDEA Turton.

PHOLADIDEA (NETTASTOMELLA) DARWINI Sowerby.

1849. Thes. Con., *Pholas*, p. 490, pl. 107, figs. 76–77. Esquimault, British Columbia, and south to Chiloë Island, Chile.

PHOLADIDEA (HATASIA) MELANURA Sowerby.

1834. *Pholas melanura* SOWERBY, Proc. Zool. Soc., p. 70; Thes. Con., *Pholas*, p. 499, pl. 107, figs. 78–79, 1849. Gulf of California and south to Ecuador.

PHOLADIDEA PENITA Conrad.

1837. *Pholas penita* CONRAD, Journ. Acad. Nat. Sci. Phila., vol. 7, p. 237, pl. 18, fig. 7. California, south to Guayaquil.

PHOLADIDEA QUADRA Sowerby.

1834. *Pholas quadra* SOWERBY, Proc. Zool. Soc., p. 71; Thes. Con., *Pholas*, p. 499, pl. 106, figs. 62, 63, 1849. Monte Cristi, Ecuador.

PHOLADIDEA TRIDENS Gray.

1851. *Pholas tridens* GRAY, Ann. Mag. Nat. Hist., 2nd ser., vol. 8, p. 385.—SOWERBY, Thes. Con., *Pholas*, p. 498, pl. 106, figs. 60, 61, 1849. Ecuador coast.

PHOLADIDEA TUBIFERA Sowerby.

1834. *Pholas tubifera* SOWERBY, Proc. Zool. Soc., p. 71; Thes. Con., *Pholas*, p. 499, pl. 106, figs. 64, 65, 1849. Gulf of Panama to Paita, Peru.

Genus JOUANNETIA Desmoulins.

JOUANNETIA PECTINATA Conrad.

1849. *Pholadopsis pectinata* CONRAD, Proc. Acad. Nat. Sci. Phila, for 1849 (August) p. 156; Journ. Acad. Nat. Sci. Phila., 2d ser., vol. 1, p. 279, pl. 39, fig. 3, 1850. Guayaquil and Gulf of Panama.

Genus MARTESIA Leach.

MARTESIA CURTA Sowerby.

1834. *Pholas curta* SOWERBY, Proc. Zool. Soc., p. 71; Thes. Con., *Pholas*, p. 494, pl. 104, figs. 33, 34; pl. 108, fig. 105, 1849. Gulf of Panama to Tumbes, Peru. Also Atlantic and Antilles.

Genus XYLOTOMEA Dall.

XYLOTOMEA GLOBOSA Sowerby.

1835. *Xylophaga globosa* SOWERBY, Proc. Zool. Soc., p. 110; Thes. Con., *Pholas*, p. 503, pl. 108, figs. 101–102, 1849. Panama south to Valparaiso and Juan Fernandez Island.

Family TEREDINIDÆ.

Genus TEREDO Linnæus.

? TEREDO NAVALIS Linnæus.

1854. *Teredo navalis* HUPÉ, Hist. de Chile, vol. 8, Mol. p. 384, 1854 (? not of Linnæus). Valparaiso.

Genus XYLOTRYA Leach.

XYLOTRYA DRYAS Dall.

1909. Proc. U. S. Nat. Mus., Vol. 37, p. 162, pl. 25, figs. 2, 3, 5, 6, 7. Tumbes, Peru, at Estero del Palo Santo, boring in the heart of living mangroves.

XYLOTRYA MARTENSI Stempell.

1899. *Teredo* (X.) *martensi* STEMPELL, Fauna Chilensis. Suppl. Bd. 4, fasc. 1, p. 240, pl. 12, figs. 24–27. Punta Arenas, Chile.

XYLOTRYA SAULII Wright.

1884. *Teredo saulii* (WRIGHT MS.) SOWERBY, Thes. Con., *Teredo*, p. 123, pl. 469, fig. 18. Callao.

SUBKINGDOM MOLLUSCOIDEA.

Class BRACHIOPODA.

Order ATREMATA.

Superfamily LINGULACEA.

Family LINGULIDÆ.

Genus GLOTTIDIA Dall.

GLOTTIDIA AUDEBARDI Broderip.

1833. *Lingula audebardi* BRODERIP, Proc. Zool. Soc., p. 125; Trans. Zool. Soc. Lond., vol. 1, p. 143, pl. 23, fig. 14, 1834. Gulf of California, south to Guayaquil.

GLOTTIDIA SEMEN Broderip.

1833. *Lingula semen* BRODERIP, Proc. Zool. Soc., p. 125. Trans. Zool. Soc. Lond., vol. 1, p. 144, pl. 23, fig. 17, 1834. Bay of Guayaquil.

Order NEOTREMATA.

Superfamily DISCINACEA.

Family DISCINIDÆ.

Genus DISCINISCA Dall.

DISCINISCA CUMINGI Broderip.

1833. *Orbicula cumingi* BRODERIP, Proc. Zool. Soc., p. 124; Trans. Zool. Soc., vol. 1, p. 143, pl. 23, fig. 1, 1834. Gulf of California, to Paita, Peru.

DISCINISCA LÆVIS Sowerby.

1822. *Orbicula lævis* SOWERBY, Trans. Linn. Soc., vol. 13, pt. 2, p. 468, pl. 26, figs. 1*a–d*.—REEVE, Con. Icon., *Orbicula*, pl. 1, fig. 4, 1862. Guayaquil to Callao, Peru.

DISCINISCA LAMELLOSA Broderip.

1833. *Orbicula lamellosa* BRODERIP, Proc. Zool. Soc., p. 124; Trans. Zool. Soc. Lond., vol. 1, p. 142, pl. 23, fig. 2, 1834. Guayaquil and southward throughout the Peruvian Province.

Order TELOTREMATA.

Superfamily TEREBRATULACEA.

Family TEREBRATULIDÆ.

Genus LIOTHYRINA Oehlert.

LIOTHYRINA UVA Broderip.

1834. *Terebratula uva* BRODERIP, Trans. Zool. Soc. Lond., p. 142, pl. 23, fig. 2. Coast of Guatemala, and south to Peru and the Galapagos Islands.

Genus TEREBRATELLA Orbigny.

TEREBRATELLA DORSATA Gmelin.

1791. *Anomia dorsata* GMELIN, Syst. Nat., vol. 8, p. 3348.—*T. chilensis* BRODERIP, Trans. Zool. Soc. Lond., vol. 1, p. 141, pl. 22, fig. 1, 1834. Valparaiso, Chile, to Magellan Straits.

Genus MAGELLANIA Bayle.

MAGELLANIA VENOSA Solander.

1788. *Anomia venosa* SOLANDER, Dixon's Voy., p. 355, pl. 11.—DAVIDSON, Rec. Brach., Trans. Linn. Soc., 2nd ser., vol. 4, p. 49, pl. 8, figs. 1–5, 1886. Southern Chile, and the Magellanic region.

SYNONYMOUS NAMES.

The student of the preceding list, familiar with the names contained in Orbigny's "Voyage," will miss a number of names which he would naturally have expected to find. It would have broken up the unity and conciseness of the faunal list to have it include any synonymy not necessary to the references given, i. e., the name used at the time of the description of the species and that used in connection with one or more good figures of the species. In order that the student may be able to identify synonyms with the name adopted in the list, an alphabetical summary of the chief synonyms is here given. The summary does not claim to contain all synonyms, for the work of bringing them together would have amounted to a monograph of the Peruvian provincial mollusk fauna, for which at present time could not be spared. Nor is the accuracy of this summary more exact than it could be made during the search of the literature and the comparison of the species in the collection of the U. S. National Museum. A thorough and complete study of the fauna would doubtless reveal the necessity for a certain number of changes. The present summary may be regarded as a step toward a future monograph. I have profited much in preparing it by the data given in Tryon's Manual, especially the volumes due to Dr. H. A. Pilsbry, without invariably accepting the decisions in that work. The works cited in the bibliography preceding the Faunal List have been carefully examined, together with many others which will be found cited in the List, and it is believed that nearly all the conspicuous synonyms will be found in the following summary. In adopting generic names the International Code of Rules for Zoological Nomenclature has been rigidly adhered to, and, while it would be too much to expect that absolute accuracy has been attained, the author has done his best in that direction. Eight hundred and sixty-nine species are cited in the Faunal List, and for the whole about 650 synonyms have been noted. This would indicate that the nomenclature is in a tolerably satisfactory state.

SUMMARY OF THE CHIEF SYNONYMS.

Acmaea cymbula Hupé=*Scurria scurra* Lesson.
Acmaea nisoria Philippi=*A. viridula* Lamarck.
Acmaea plana Philippi, not Reeve=*A. viridula* Lamarck.
Acmaea pretrei Orbigny=*A. viridula* Lamarck.
Acmaea punctatissima Philippi=*Scurria parasitica* Orbigny.
Acmaea spectrum Wimmer=*A. variabilis* Sowerby.
Aeolis auctorum, cf. *Aeolidia* Cuvier.
Amalthea Schumacher, not *Amaltheus* Montfort=*Hipponix* Defrance.
Amphidesma croceum Gould=*Semele solida* Gray.
Amphidesma orbiculare Hupé=*Semele solida* Gray.
Amyxa Troschel=*Prisogaster* Mörch.
Anomia electus Gray=*A. peruviana* Orbigny.

Anomia hamillus Gray=*A. peruviana* Orbigny.
Anomia lampe Gray=*A. peruviana* Orbigny.
Anomia larbas Gray=*A. peruviana* Orbigny.
Aplysia Linnæus, 1767=*Tethys* Linnæus, 1758.
Arca brasiliensis Reeve, not Lamarck=*A. cardiiformis* Sowerby.
Arca hemicardium Koch=*A. reversa* Sowerby.
Arca inaequivalvis Reeve, not Bruguière=*A. cardiiformis* Sowerby.
Arca sowerbyi Orbigny=*A. biangulata* Sowerby, not *A. biangula* Lamarck.
Artemis macilenta Reeve=*Cyclinella kroyeri* Philippi.
Artemis tenuis Sowerby, 1852, not Recluz=*Cyclinella subquadrata* Hanley.
Arthemis saccata Gould=*Cyclinella subquadrata* Hanley.
Astralium, see *Astræa*.
Auricula nigra Philippi=*Marinula marinella* Küster.
Avicula Lamarck, see *Pteria* Scopoli.
Barnea truncata Tryon, not Say=*B. pacifica* Stearns.
Buccinum bolivianum Souleyet, see *Cantharus bolivianus*.
Buccinum cochlidium Kiener, cf. *B. paytensis* Kiener.
Buccinum cribrarium Lamarck, see *Nitidella ocellata*, Gmelin.
Buccinum fusiforme Souleyet=*Solenosteira fusiformis* Blainville.
Buccinum insignis Reeve, 1846=*Cantharus elegans* Gray.
Buccinum pagodus Reeve=*Solenosteira fusiformis* Blainville.
Buccinum parvulum Dunker=*Nitidella ocellata* Carpenter.
Buccinum pristis Deshayes, 1844=*Northia northiæ* Gray.
Buccinum serratum Dufresne, 1834, not of Brocchi, 1814, see *Northia*.
Bulla Linnæus, 1758, p. 725, not p. 425=*Bullaria* Rafinesque.
Bulla ampulla Troschel, not Linnæus=*B. gouldiana?*
Bulla nebulosa Gould, 1852, not Schröter, 1804=*B. gouldiana?*
Bulla panamensis Philippi, 1848=*B. aspersa?*
Bulla punctata A. Adams, 1850=*B. punctulata* Adams.
Bulla striata Orbigny, 1837=*B. punctulata?*
Cadulus panamensis Pilsbry and Sharp, cf. *C. perpusillus* Sowerby.
Callista longispina Mörch=*Pitaria multispinosa*.
Calyptræa, see also *Crucibulum* and *Crepidula*.
Calyptræa amygdala Valenciennes=*Crepidula onyx* Sowerby.
Calyptræa araucana Lesson=*Trochita trochiformis* Gmelin.
Calyptræa cornea Broderip=*Cheilea equestris* Linnæus.
Calyptræa dilatata Sowerby, 1824=*Trochita trochiformis* Gmelin.
Calyptræa echinus Broderip=*Crepidula aculeata* Gmelin.
Calyptræa foliacea Broderip=*Crepidula dilatata* Sowerby.
Calyptræa hystrix Broderip=*Crepidula aculeata* Gmelin.
Calyptræa rudis Broderip=*Cheilea equestris* Linnæus.
Calyptræa rugosa Deshayes, not Lesson=*Crucibulum quiriquinæ* Lesson.
Calyptræa sordida Broderip=*Trochita trochiformis* Gmelin.
Calyptræa strigata Broderip=*Crepidula dilatata* Sowerby.
Calyptræa tubifera Lesson=*Crucibulum spinosum* Sowerby.
Calyptræa umbrella Deshayes=*Cheilea equestris* Linnæus.
Calyptræa umbrella Deshayes (part)=*Crucibulum imbricatum* Sowerby.
Calyptræa unguis Broderip=*Trochita, testa juvenis.*
Calyptræa varia Broderip=*Cheilea equestris* Linnæus.
Cancellaria ovata Sowerby, 1832=*C. obesa* Sowerby.
Cancellaria unifasciata Orbigny, cf. *C. uniplicata* Sowerby.
Cardita arcella Valenciennes=*C. radiata* Sowerby.
Cardita flammea Michaud=*Venericardia crassicostata* Sowerby.
Cardita tricolor Sowerby, 1832=*C. laticostata* Sowerby var.

Cardita tumida Broderip=*Venericardia crassicostata* Sowerby.
Cardita turgida Valenciennes, 1846=*C. laticostata* Sowerby.
Cardita varia Broderip=*Venericardia crassicostata* Sowerby.
Cardium aspersum Sowerby, cf. *C. spinosum* Meuschen.
Cardium laticostatum Sowerby=*C. procerum* Sowerby.
Cardium panamense Sowerby=*C. procerum* Sowerby.
Cardium planicostatum Sowerby, 1833, not of Sedgwick and Murchison, 1829=*C. magnificum* Deshayes.
Cardium rastrum Reeve=*C. senticosum* Sowerby.
Cardium rotundatum Carpenter=*C. procerum* junior.
Cardium subelongatum Valenciennes, 1846, not of Sowerby, 1840.
Cassis lactea Kiener=*Phalium abbreviatum* Lamarck.
Cerithidea fortiuscula Bayle=*C. montagnei* Orbigny.
Cerithidea valida C. B. Adams=*C. montagnei* Orbigny.
Cerithidea varicosa Sowerby, not Defrance=*C. montagnei* Orbigny.
Cerithium galapaginis Adams=*C. interruptum* Menke.
Cerithium humboldtii Valenciennes=*C. pacificum* Sowerby.
Cerithium irroratum Gould=*C. stercusmuscarum* Valenciennes.
Cerithium nebulosum Sowerby, not Philippi=*C. maculosum.*
Chætopleura hahni Rochebrune=*Chiton fremblyi* Broderip.
Chama thaca Molina, see *Paphia thaca* Dall.
Chione antiqua King, cf. *Chione alvarezii* Orbigny.
Chione biradiata Gray=*Macrocallista squalida* Sowerby.
Chione tumens Verrill=*Anomalocardia subimbricata* Sowerby.
Chionella, see *Paradione.*
Chiton aculeatus Sowerby, in Beechey's Voyage, not of Linnæus.
Chiton bicostatus Orbigny=*C. pulchellus* Gray.
Chiton coquimbensis Frembly=*Enoplochiton niger* Barnes.
Chiton glaber Clessin, cf. *Tonicia elegans* Frembly.
Chiton magnificus Deshayes=*C. latus* Sowerby.
Chiton olivaceus Frembly=*C. latus* Sowerby.
Chiton patulus Sowerby=*C. stokesii* Broderip.
Chiton scabriculus Sowerby=*Chætopleura lurida* Sowerby.
Chiton spiniferus Frembly=*C. echinatus* Barnes.
Chiton striatus Barnes, 1823, not of Lamarck, 1819, nor of Fischer, 1809.
Chiton tuberculiferus Sowerby=*C. echinatus* Barnes.
Chlorostoma, cf. *Tegula.*
Chlorostoma tropidophorum Adams=*Tegula luctuosa* Orbigny.
Columbella argus Orbigny=*Nitidella ocellata* Gmelin.
Columbella castanea Gould=*C. unicolor* Sowerby.
Columbella costata Duclos=*Anachis fluctuata* Sowerby.
Columbella ebenum Gould, cf. *C. unifasciata* Sowerby.
Columbella fusiformis Hinds=*Strombina lanceolata.*
Columbella gibbosula Broderip=*Strombina gibberula* Sowerby.
Columbella meleagris Duclos=*C. fuscata* Sowerby.
Columbella nodalina Duclos=*C. fuscata* Sowerby.
Columbella paytalida Duclos=*C. paytensis* Lesson.
Columbella recurva Sowerby, cf. *Strombina lanceolata.*
Columbella sordida Orbigny=*C. unicolor* Sowerby.
Columbella spurca Sowerby, 1832=*C. paytensis* Lesson.
Columbella suturalis Gray=*Anachis fluctuata* Sowerby.
Columbella tessellata C. B. Adams, not of Gaskoin=*C. guatemalensis* Reeve.
Columbella triomphalia Duclos=*Cantharus distortus.*
Columbella unizonalis Gray=*C. unifasciata* Sowerby.

Columbella venilia Duclos=*C. labiosa* Sowerby.
Concholepas imbricatus Küster=*C. concholepas* Bruguière.
Concholepas oblongus Reeve=*C. concholepas*, var.
Concholepas peruvianus Lamarck=*C. concholepas* Bruguière.
Conovulus columbiensis Anton, 1839=*M. luteus* Quoy.
Conus diadema Sowerby=*C. brunneus* Mawe.
Conus incurvus Sowerby, 1841=*C. recurvus* Broderip.
Conus interruptus Broderip and Sowerby, 1829, not of Mawe, 1828.
Conus reticulatus Sowerby, 1841=*C. lucidus* Mawe.
Crepidula adolphei Lesson=*C. dilatata* Sowerby.
Crepidula arcuata Orbigny=*C. dilatata* Sowerby.
Crepidula arenata Broderip=*C. onyx* Sowerby.
Crepidula cerithicola C. B. Adams=*C. onyx* Sowerby.
Crepidula costata Menke=*C. aculeata* Menke.
Crepidula fimbriata Reeve=*C. squama* Broderip.
Crepidula hepatica C. B. Adams=*C. onyx* Sowerby.
Crepidula hepatica Menke=*C. incurva* Broderip.
Crepidula lessoni Broderip=*C. squama* Broderip.
Crepidula nivea C. B. Adams=*C. squama* Broderip.
Crepidula pallida Broderip=*C. dilatata* Sowerby.
Crepidula patula Deshayes=*C. dilatata* Sowerby.
Crepidula peruviana Lamarck=*C. dilatata* Sowerby.
Crepidula plana Say=*C. crepidula* Linnæus.
Crepidula striolata Menke=*C. squama* Broderip.
Crepidula unguiculus Broderip=*C. squama* Broderip.
Crepidula unguiformis Lamarck=*C. crepidula* Linnæus.
Crucibulum auritum Reeve=*C. quiriquinæ* Lesson.
Crucibulum cinereum Gray=*C. tubiferum* Lesson.
Crucibulum dentatum Carpenter=*C. imbricatum* Sowerby.
Crucibulum ferrugineum Reeve=*C. quiriquinæ* Lesson.
Crucibulum hispidum Broderip=*C. tubiferum* Lamarck.
Crucibulum lignarium Broderip=*C. quiriquinæ* Lesson.
Crucibulum maculatum Broderip, not Quoy=*C. quiriquinæ* Lesson.
Crucibulum pectinatum Carpenter=*C. imbricatum* Sowerby.
Crucibulum peziza Gray=*C. tubiferum* Lesson.
Crucibulum rude Broderip=*C. imbricatum* Sowerby.
Crucibulum rugosum Lesson=*C. imbricatum* Sowerby.
Crucibulum scratum Broderip, cf. *C. imbricatum* Sowerby.
Crucibulum striatum Broderip, not Say=*C. quiriquinæ* Lesson.
Crucibulum tenue Broderip=*C. quiriquinæ* Lesson.
Ctenoconcha nuculoides Valenciennes=*Malletia chilensis* Desmoulins.
Cuma, Cumia, Fasciolina=*Cymia* Mörch.
Cumingia cleryi Adams=*C. mutica* Sowerby.
Cumingia grandis Deshayes=*C. mutica* Sowerby.
Cumingia striata A. Adams=*C. mutica* Sowerby.
Cumingia trigonularis Sowerby=*C. lamellosa* Sowerby.
Cumingia ventricosa Sowerby=*C. mutica* Sowerby.
Cypræa cervinetta Kiener=*C. exanthema* Linnæus, var.
Cypræa ferruginosa Kiener, not Gmelin=*C. annettæ* Dall.
Cypræa irina Kiener=*C. nigropunctata* Gray.
Cypræa lathyrus Kiener=*Trivia sanguinea* Gray.
Cypræa punctulata Gray=*C. robertsi* Hidalgo.
Cypræa rota Weinkauff=*Trivia radians* Lamarck.
Cypræa zonata Sowerby, Con. Ill., not Lamarck=*C. annettæ* Dall.

Cyrena cardiformis Sowerby=*C. cordiformis* Recluz.
Cyrena peruviana Deshayes=*C. anomala* Deshayes.
Cytherea, see *Macrocallista* and *Pitaria*.
Cytherea affinis Broderip=*Pitaria concinna* Sowerby.
Cytherea aurantia Hanley=*C. aurantiaca* Sowerby.
Cytherea brevispinosa Sowerby=*C. multispinosa* Sowerby, var.
Cytherea chionæa Menke=*Macrocallista squalida* Sowerby.
Cytherea corbicula Menke, not Lamarck=*Tivela byronensis*.
Cytherea dionæa Gray=*Pitaria lupanaria* Lesson.
Cytherea gigantea Sowerby, not Gmelin=*Dosinia ponderosa* Gray.
Cytherea lutea Philippi=*Macrocallista pannosa* Sowerby.
Cytherea mactroides Lamarck, not Born=*Tivela planulata*.
Cytherea obliquata Rœmer=*Pitaria pollicaris* Carpenter.
Cytherea pacifica Troschel=*Dosinia dunkeri* Philippi.
Cytherea pallida Broderip=*Pitaria multispinosa* Sowerby.
Cytherea pulla Philippi=*Tivela byronensis* Gray.
Cytherea semilamellosa Gaudichaud=*Pitaria lupanaria* Lesson.
Cytherea stultorum Menke, not Mawe=*Tivela byronensis* Gray.
Cytherea subsulcata Menke=*Anomalocardia subrugosa* Sowerby.
Cytherea suppositrix Menke=*Pitaria concinna* Broderip.
Cytherea tortuosa Broderip=*Pitaria concinna*, var.
Cytherea undulata Sowerby=*Tivela planulata* Broderip and Sowerby.
Delphinula, see *Liotia*.
Dione brevispina Deshayes=*Pitaria multispinosa* Sowerby.
Dione exspinata Reeve=*Pitaria lupinaria* Lesson.
Dione prora Reeve, not Conrad=*Pitaria pollicaris* Carpenter.
Diplodonta tellinoides Reeve=*Phacoides tellinoides* Reeve.
Diplodontina, see *Kellia*.
Discina, see *Discinisca*.
Dolium latilabre Valenciennes=*Malea ringens* Swainson.
Donacilla chilensis Orbigny=*Mesodesma donacia* Lamarck.
Donax assimilis Hanley=*D. aspera* Hanley.
Donax cayennensis (part) Roemer=*D. obesula* Deshayes.
Donax lessoni Deshayes=*Tivela planulata* Broderip and Sowerby.
Donax panamensis Philippi=*D. paytensis* Orbigny.
Dosina antiqua Gray=*Chione antiqua* King.
Dosinia simplex Hanley, 1845=*D. dunkeri* Philippi, 1844.
Drillia duplicata Weinkauff, not Sowerby=*Surcula maura*.
Entodesma chilensis Philippi=*E. cuneata* Gray.
Entodesma (*saxicola* Baird) Carpenter=*Agriodesma* Dall, 1909, new name.
Euthria Gray, 1850=*Atractodon* Charlesworth, 1837.
Fissurella affinis Gray=*F. peruviana* Lamarck.
Fissurella atrata Reeve=*F. philippiana* Reeve.
Fissurella biradiata Frembly=*F. latimarginata* Sowerby, var.
Fissurella chilensis Sowerby=*F. costata* Lesson.
Fissurella chlorotrema Menke=*F. rugosa* Sowerby.
Fissurella concinna Philippi=*F. maxima* Sowerby.
Fissurella cumingii Reeve=*F. latimarginata* var.
Fissurella elegans "Phil." (inedit.?) Peru (Tschudi).
Fissurella excelsa Reeve=*Fissuridea alta* Adams.
Fissurella galericulum Reeve=*F. latimarginata* Sowerby, var.
Fissurella grandis Sowerby=*F. nigra* Lesson.
Fissurella humilis Menke=*F. rugosa* Sowerby.
Fissurella macrotrema Sowerby, cf. *F. longifissa* Sowerby.

Fissurella mus Reeve=*Fissuridea inæqualis* Sowerby var.
Fissurella nigra Philippi=*F. philippiana* Reeve.
Fissurella nigropunctata Sowerby=*F. virescens* Sowerby var.
Fissurella occidens Gould=*F. peruviana* Lamarck.
Fissurella oriens Sowerby, cf. *F. mexicana* Sowerby.
Fissurella pica Sowerby=*F. inæqualis* Sowerby, var.
Fissurella rudis Deshayes=*F. costata* Lesson.
Fissurella subrotunda Deshayes=*F. peruviana* Lamarck.
Fissurella viminea Menke, not Reeve, cf. *F. rugosa* Sowerby.
Fissurella violacea Eschscholtz=*F. nigra* Lesson.
Fusus alternatus Philippi, 1847=*Austrofusus fontainei* Orbigny.
Fusus fusiformis Potiez and Michaud=*Trophon cassidiformis.*
Fusus purpuroides Orbigny=*Solenosteira fusiformis* Blainville.
Fusus wiegmanni Philippi=*Cymatium wiegmanni.*
Gadinia pentegoniostoma Carpenter, 1857=*G. peruviana* Sowerby.
Gadinia stellata Sowerby, 1835=*G. peruviana* Sowerby.
Gena planulata Lamarck. Philippines. Australia.
Haminea natalensis Sowerby=*H. peruviana* Orbigny.
Hipponix australis Menke, not Deshayes=*H. barbata* Sowerby.
Hipponix mitrata Orbigny=*H. antiquata* Linnæus.
Hipponix mitrula Defrance=*H. antiquata* Linnæus.
Hipponix pilosus Deshayes, 1831, cf. *H. barbata* Sowerby, 1835.
Hipponix radiata Gray, not Quoy and Gray=*H. grayana* Menke.
Hyalæa australis Orbigny, not Person=*Clio antarctica* Dall.
Hyalæa flava Orbigny, 1836=*Cavolina gibbosa* Rang.
Hyalæa gegenbauri Pfeffer, 1880=*Cavolina gibbosa* Rang.
Hyalæa tridentata Forskål, 1775=*Cavolina telemus* Linnæus.
Infundibulum, cf. *Trochita.*
Kellia miliaris Philippi=*Lasæa*, cf. *petitiana* Recluz.
Lamellaria kerguelensis Studer=*Marseniopsis pacifica* Bergh.
Latirus nassatulus Schubert and Wagner. Indo-Pacific.
Latirus spadiceus Reeve, 1847=*L. concentricus* Reeve.
Latirus tuberculatus Broderip, 1833=*L. ceratus* Gray.
Lavignon coarctata Orbigny=*Cumingia lamellosa* Sowerby.
Leda inornata A. Adams=*L. acuta* Conrad.
Leda lugubris Adams=*Tindaria sulculata* Couthouy.
Leda orangica Mabille=*Tindaria sulculata* Couthouy.
Lima orientalis Adams=*L. angulata* Sowerby.
Liotia cobijensis Reeve=*L. cancellata* Gray, not Kiener.
Lithodomus, see *Lithophaga.*
Littorina costulata Souleyet=*L. varia* Sowerby.
Littorina fasciata Gray=*L. varia* Sowerby.
Littorina paytensis Philippi=*L. araucana* Orbigny.
Littorina striata King, cf. *L. peruviana* Lamarck.
Littorina variegata Souleyet=*L. varia* Sowerby.
Littorina zebra Philippi=*L. peruviana* Lamarck.
Lotorium Montfort=*Cymatium* Bolten.
Lottia conica Gould=*Scurria scurra* Lesson.
Lottia cymbiola Gould=*Scurria parasitica* Orbigny.
Lottia pallida Sowerby=*Scurria scurra* Lesson.
Lottia punctata (Gray) Orbigny, 1835, not of Lamarck, 1822.
Lucina brasiliensis Mittré=*Diplodonta punctata* Say.
Lucina cornea Reeve=*Diplodonta sericata* Reeve.
Lucina guaraniana Orbigny=*Diplodonta punctata* Say.

Lucina janeirensis Reeve=*Diplodonta punctata* Say.
Lucina nitens Reeve=*Diplodonta sericata* Reeve.
Lucina venezuelensis Dunker=*Diplodonta punctata* Say.
Lucinopsis kroyeri Poulsen is not *Cyclinella kroyeri* Philippi.
Lunatia Gray cf. *Euspira* Agassiz.
Lyonsia brevifrons Sowerby=*Entodesma cuneata* Gray.
Lyonsia cuneata Orbigny=*Entodesma cuneata* Gray.
Lyonsia patagonica Orbigny=*Entodesma cuneata* Gray.
Lyonsia picta Sowerby=*Entodesma cuneata* Gray.
Macoma occidentalis Dall=*M. undulata* Hanley.
Mactra calbucana Philippi, 1893=*Mulinia byronensis* Gray.
Mactra cibaria Philippi, 1893=*Mulinia edulis* King.
Mactra cuneola Gould=*Mulinia edulis* King.
Mactra epidermia Philippi, 1893=*Mulinia edulis* King.
Mactra jonasi Philippi, 1893=*Mulinia bicolor* Gray.
Mactra lotensis Philippi, 1893=*Mulinia edulis* King.
Mactra marcida Gould=*Mulinia edulis* King.
Mactra paitensis Philippi, 1893=*M. velata* Philippi, 1848.
Mactra pencana Philippi, 1893=*Mulinia byronensis* Gray.
Marginella cyprœola Sowerby=*Erato scabriuscula* Gray.
Marginella granum Kiener, 1835 not of Philippi 1850=*Erato scabriuscula* Gray.
Marinula callaöensis Petit, 1854=*M. marinella* Küster.
Meleagrina Lamarck, see *Margaritiphora* Megerle.
Melongena Schumacher, 1817=*Galeodes* Bolten, 1798.
Mesodesma chilensis Orbigny=*M. donacium* Lamarck.
Mitra chilensis Kiener, 1836=*M. orientalis* Gray.
Mitra foraminata Swainson, 1835=*M. lens* Mawe.
Mitra funiculata Reeve, 1844=*M. sulcata* Swainson.
Mitra inca Orbigny, 1841=*M. lens* Mawe.
Mitra lignaria Reeve, 1844=*M. lens* Mawe.
Mitra lineata Swainson, not Gmelin=*M. sulcata* Swainson.
Mitra maura Swainson, 1835=*M. orientalis* Gray.
Mitra rupicola Reeve, 1844=*M. lens* Mawe.
Mitularia, cf. *Cheilea*.
Mitularia cepacea Broderip=*Cheilea equestris* Linnæus.
Modiola caudigera Lamarck=*Lithophaga aristata* Dillwyn.
Modiola ovalis Clessin=*Modiolus purpuratus* Lamarck.
Modulus trochiformis Eydoux and Souleyet=*M. perlatus* Dillwyn.
Monoceros Lamarck, not Bloch=*Acanthina* Fischer.
Monoceros citrinum Sowerby=*Acanthina calcarlongum* Martyn.
Monoceros costatum Sowerby=*Acanthina calcarlongum* Martyn.
Monoceros crassilabrum Sowerby=*Acanthina calcarlongum* Martyn.
Monoceros cymatum Sowerby=*Acanthina lugubris* Sowerby.
Monoceros fusoides King=*Chorus giganteus* Gray.
Monoceros glabratum Deshayes=*Acanthina calcarlongum* Martyn.
Monoceros globulus Sowerby=*Acanthina calcarlongum* Martyn.
Monoceros imbricatum Sowerby=*Acanthina calcarlongum* Martyn.
Monoceros maculatum Gray=*Acanthina brevidentata* Mawe.
Monoceros muricatum Reeve=*Acanthina muricata* Broderip.
Monoceros unicorne Gray=*Acanthina calcarlongum* Martyn.
Monodonta carchidonius Lamarck, cf. *Modulus perlatus* Dillwyn.
Monodonta catenifera Potiez and Michaud, 1838, not of Kiener, 1836=*Tegula quadricostata* Gray.
Mouretia reticulata Sowerby, 1835=*Gadinia peruviana* Sowerby.

Mulinia angulata Carpenter, 1855=*Mulinia pallida* Broderip and Sowerby.
Mulinia bistrigata Mörch, 1862=*M. pallida* Broderip and Sowerby.
Mulinia carinulata (Deshayes) Reeve=*M. pallida* Broderip and Sowerby.
Mulinia coquimbana Philippi, 1893=*M. byronensis* Gray.
Mulinia donaciformis Gray, not Reeve=*M. pallida* Broderip and Sowerby.
Mulinia exalbida Gray=*M. byronensis* Gray.
Mulinia typica Gray=*M. edulis* King.
Murex boivini Kiener=*Trophon horridus* Broderip and Sowerby.
Murex crispus Broderip, 1832=*M. tortuosus* Sowerby.
Murex ducalis Broderip, 1833=*M. brassica* Lamarck.
Murex erinaceoides Valenciennes, 1846=*M. hamatus* Hinds.
Murex erythrostomus Swainson=*Phyllonotus bicolor* Valenciennes.
Murex exiguus Kiener, Reeve, Garrett, not of Broderip.
Murex hippocastanum Philippi=*Phyllonotus bicolor* Valenciennes.
Murex incisus Carpenter, not Broderip=*M. gemma* Sowerby.
Murex labiosus see *Tritonalia crassilabrum* Gray.
Murex labiosus Orbigny=*M. crassilabrum* Gray.
Murex lepidus Reeve, 1845=*M. vittatus* Broderip.
Murex lugubris Tryon, 1880, not of Broderip.
Murex monoceros Orbigny, 1841, not Sowerby=*M. fontainei* Tryon.
Murex multicostatus Dunker, 1869=*M. tortuosus* Sowerby.
Murex multicrispatus Dunker=*M. tortuosus* Sowerby.
Murex parthenopeus v. Salis=*Cymatium costatum* Sowerby.
Murex peruvianus Sowerby, 1840=*M. dipsaccus* Broderip.
Murex pliciferus Sowerby, 1840. West Africa, not Chile.
Murex radicatus Hinds, 1844=*M. lappa* Broderip.
Murex rhodocheilus King, 1831=*M. brassica* Lamarck.
Murex tortuus Catlow, 1845=*M. tortuosus* Sowerby.
Murex tricolor Valenciennes, 1833=*M. regius* Wood, 1828.
Murex vitellus Sowerby, 1870=*M. vittatus* Broderip.
Mytilus americanus Orbigny=*M. ater* Molina.
Mytilus augustanus Lamarck, cf. *M. ater* Molina.
Mytilus bifurcatus Conrad, part=*M. stearnsii* Pilsbry.
Mytilus bifurcatus Dautzenberg, 1896, Valparaiso. (=?)
Mytilus cordatus Gould=*M. granulatus* Hanley.
Mytilus cuneiformis Reeve=*M. ater* Molina.
Mytilus curvatus Stempell=*M. magellanicus* var.
Mytilus dactyloides Philippi, 1860=*M. dactyliformis* Hupé.
Mytilus hupéanus Mabille=*M. chilensis* Hupé.
Mytilus orbignyanus Hupé=*M. ater* Molina.
Mytilus ovalis Lamarck=*Modiolus purpuratus* Lamarck.
Mytilus pyriformis Gould=*M. magellanicus* Lamarck.
Mytilus ungulatus Valenciennes, not Lamarck=*M. chorus* Molina.
Mytilus violaceus Clessin, 1889, cf. *M. chilensis* Hupé.
Nassa Lamarck, 1799, not Bolten, 1798=*Alectrion* Montfort.
Nassa flammulata, Preston, 1909, cf. *Alectrion*, species.
Nassa fontainei Orbigny=*Nassa exilis* Powys.
Nassa gemma Philippi=*Alectrion complanatus*.
Nassa panamensis Adams=*N. exilis* Powys.
Nassa panamensis C. B. Adams=*N. exilis* Powys.
Nassa rubricata Gould=*Alectrion gayii* Kiener.
Nassa scabriuscula Adams, 1852=*Alectrion complanatus*.
Nassa tschudii Troschel, cf. *N. dentifera* Powys.
Nassa unidentata Powys=*N. dentifera* junior.

Nassa xanthostoma Gray, n. n. for *N. teleostoma* Broderip and Sowerby.
Natica atacamensis Philippi=*Polinices dubius* Recluz.
Natica bonplandi Valenciennes=*Polinices glaucus* Humboldt.
Natica chemnitzii Pfeffer=*N. unifasciata* junior.
Natica elongata Troschel=*Polinices cora* Orbigny.
Natica excavata Carpenter=*N. elenæ* Recluz.
Natica galapagana Recluz=*Polinices otis* Broderip.
Natica haneti Recluz=*N. elenæ* Recluz.
Natica iostoma Menke=*N. broderipiana* Recluz.
Natica patula Sowerby=*Polinices glaucus* Humboldt.
Natica perspicua Recluz=*Polinices otis* Broderip.
Natica prichardi Forbes=*N. unifasciata* junior.
Natica rapulum Reeve=*Polinices dubius* Recluz.
Natica salangoënsis Recluz=*Polinices otis* Broderip.
Natica taslei Recluz=*N. broderipiana* Recluz.
Nerita bernhardi Recluz, cf. *N. fulgurans* Gmelin.
Nerita deshayesii Recluz=*N. scabricosta* Lamarck.
Nerita fuscata Menke=*N. scabricosta* Lamarck.
Nerita multijugis Menke=*N. scabricosta* Lamarck.
Nerita ornata Sowerby, 1823=*N. scabricosta* Lamarck.
Nerita peruviana Philippi=*N. yoldii* Recluz. China.
Neritina fontaineana Orbigny=*N. owenii* Mawe.
Neritina globosa Broderip=*N. owenii* Mawe.
Neritina guayaquilensis Sowerby, cf. *N. owenii* Mawe.
Neritina intermedia Sowerby=*N. owenii* Mawe.
Neritina latissima Broderip=*N. owenii* Mawe.
Neritina zebra Sowerby, not Lamarck=*N. sobrina* Recluz.
Nettastoma see *Pholadidea*.
Nettastomella see *Pholadidea*.
Nitidella cribraria Lamarck=*N. ocellata* Gmelin.
Nucula cuneata Sowerby=*Leda acuta* Conrad.
Nucula lyrata Hinds=*Leda eburnea* Sowerby.
Nucula obliqua Gray, Sowerby, not of Lamarck=*N. grayi*.
Nucula semiornata Orbigny=*N. pisum* Sowerby.
Ocinebra (Leach) Gray, 1847=*Tritonalia* Fleming, 1828.
Oliva hiatula Gmelin, S. Africa, cf. *O. testacea* Lamarck.
Oliva razamola Duclos, 1835=*Olivella volutella* Lamarck.
Orbicula lamellata Troschel=*Discinisca lamellosa* Broderip.
Orbicula strigata Broderip=*Discinisca cumingi* Broderip.
Orbicula tenuis Sowerby, cf. *Discinisca lævis* Sowerby.
Ostrea chiloënsis Sowerby=*O. chilensis* Philippi.
Ostrea cibialis Hupé=*O. chilensis* Philippi.
Ovula Bruguière, cf. *Simnia* Risso.
Patella atramentosa Reeve=*P. magellanica* Gmelin.
Patella chiloënsis Reeve=*P. magellanica* Gmelin.
Patella concepcionis Lesson=*Scurria zebrina* Orbigny.
Patella diaphana Reeve=*Scurria mesoleuca* Menke.
Patella gorcënsis Gmelin, cf. *Crepidula crepidula* Linnæus.
Patella grammica Philippi=*Acmæa variabilis* Sowerby.
Patella lepas Gmelin=*Concholepas concholepas* Bruguière.
Patella leucophæa Philippi=*Scurria parasitica* Orbigny.
Patella lineata Philippi=*Acmæa variabilis* Sowerby.
Patella maxima Orbigny=*P. mexicana* Broderip and Sowerby.
Patella meridionalis Rochebrune=*P. magellanica* Gmelin.

Patella metallica Rochebrune=*P. magellanica* Gmelin.
Patella penicillata Reeve=*Acmæa variabilis* Sowerby.
Patella plana Reeve, not Philippi=*Acmæa araucana* Orbigny.
Patella pupillata Rochebrune=*P. magellanica* Gmelin.
Patella scutellata Gray, Wood=*Crucibulum imbricatum* Sowerby.
Patella striata Reeve=*Scurria mesoleuca* Menke.
Patella venosa Reeve=*P. magellanica* Gmelin.
Patella vespertina Reeve=*Scurria mesoleuca* Menke.
Pecten aspersus Sowerby=*P. tumbezensis* Orbigny.
Pecten inca Orbigny=*P. ventricosus* Sowerby.
Pecten magnificus Sowerby=*P. subnodosus* var.
Pecten pomatia Valenciennes cf. *P. ventricosus* Sowerby.
Pecten sowerbii Reeve, 1852=*P. tumbezensis* Orbigny.
Pecten tumidus Sowerby, 1835=*P. ventricosus* Sowerby.
Pectunculus Lamarck=*Glycymeris* Da Costa.
Pectunculus assimilis Sowerby=*Glycymeris inæqualis* Sowerby.
Pectunculus inæqualis Sowerby, 1839, not 1832=*P. bicolor* Reeve.
Pectunculus intermedius Broderip=*P. ovatus* Broderip.
Pectunculus pectiniformis Wood, not Lamarck=*P. inæqualis* Sowerby.
Penitella conradi Valenciennes=*P. penita* Conrad.
Penitella wilsoni Conrad=*Pholadidea melanura* Sowerby.
Peraclis bispinosa Pelseneer, 1888=*P. reticulata* Orbigny.
Perna Lamarck, see *Melina* Retzius.
Petricola chiloënsis Philippi=*P. rugosa* Sowerby.
Petricola nivea Gmelin. Indo-Pacific—Nicobar Islands.
Petricola ovata Troschel=*P. rugosa* Sowerby.
Petricola solida Sowerby=*P. elliptica* Sowerby.
Petricola tenuis Sowerby=*P. rugosa* Sowerby.
Petricola ventricosa Deshayes=*P. denticulata* Sowerby.
Philippina Dall, 1901=*Entodesma* Philippi, 1845.
Pholadopsis, see *Jouannetia*.
Pholas beauiana Recluz=*Martesia curta* Sowerby.
Pholas concamerata Deshayes=*Pholadidea penita* Conrad.
Pholas crucifera Sowerby, Thes., see *Barnea crucigera* Sowerby.
Pholas cucullata Gray=*Pholadidea penita* Conrad.
Pholas gibbosa Orbigny=*Xylotomea globosa* Sowerby.
Pholas grayana Sowerby, cf. *Martesia curta* Sowerby.
Pholas lamellosa Orbigny=*Barnea subtruncata* Sowerby.
Pholas laqueata Sowerby, 1849=*P. chiloënsis* Molina.
Pholas parva Sowerby, 1834=*P. chiloënsis* Molina, var.
Pholas pulcherrima Sowerby=*Jouannetia pectinata* Conrad.
Pileopsis pilosus Deshayes=*Hipponix* sp.
Pileopsis subrufa Lamarck, see *Hipponix*.
Pleurotoma, Lamarck, 1799=*Turris* Bolten, 1798.
Pleurotoma cincta Sowerby, not Lamarck=*P. zonulata* Reeve
Pleurotoma cornuta Sowerby, 1833=*P. nigerrima* Sowerby.
Pleurotoma corrugata Sowerby, not Kiener=*P. sowerbyi* Reeve.
Pleurotoma incrassata Sowerby, 1833=*Drillia bottæ* Valenciennes.
Pleurotoma turricula Sowerby, 1833=*P. sowerbyi* Reeve.
Pneumodermon violaceum Boas, part=*P. boasi* Pelseneer.
Pollia hæmastoma Gray=*Cantharus sanguinolentus* Duclos.
Psammobia crassa Hupé=*P. solida* (Gray) Philippi.
Psammosolen Hupé, see *Tagelus* Gray.

Purpura Lamarck, 1799, not of Martyn, 1784=*Thais* Bolten, 1798.
Purpura Martyn, 1784, not Lamarck, 1799=*Cerostoma* Conrad, 1837.
Purpura angulifera Duclos=*Cymia tectum* Wood.
Purpura biscostalis Reeve, 1846=*P. biserialis* Blainville, 1832.
Purpura blainvillei Deshayes, 1846=*Thais delessertiana* Orbigny.
Purpura callaöensis Blainville=*Thais delessertiana* Orbigny.
Purpura callaöensis Kiener=*P. biserialis* Blainville.
Purpura carolensis Reeve, 1846=*Thais triangularis* Blainville.
Purpura concholepas Orbigny=*Concholepas* Bruguière.
Purpura cornigera Blainville=*Acanthina brevidentata* Mawe.
Purpura diadema Reeve, 1846=*Thais costata* Blainville.
Purpura fasciolaris Lamarck, Mediterranean, not Peru.
Purpura hæmastoma Tryon, Peru=*Thais peruensis* Dall, n. n.
Purpura janellii Valenciennes=*Cantharus sanguinolentus* Duclos.
Purpura lepas v. Martens=*Concholepas concholepas* Bruguière.
Purpura melo Duclos=*Thais crassa* Blainville.
Purpura occllata Kiener=*Acanthina brevidentata* Mawe.
Purpura orbignyi Reeve, 1846=*Solenosteira fusiformis* Blainville.
Purpura peruviana Blainville=*Concholepas concholepas* Bruguière.
Purpura peruviana Lesson, cf.=*Trophon cassidiformis* Blainville.
Purpura peruviana Souleyet=*Thais delessertiana* Orbigny.
Purpura truncata Duclos=*Acanthina muricata* Broderip.
Purpura xanthostoma Broderip, 1833=*Trophon cassidiformis* Blainville, 1832.
Pyrula ochroleuca Philippi=*Trophon cassidiformis* Blainville.
Ranella kingi Orbigny=*Argobuccinum vexillum* Sowerby.
Ranella tenuis Potiez and Michaud=*Bursa ventricosa* Broderip.
Ranella triquetra Reeve=*Eupleura muriciformis* Broderip.
Rissoina pulchra C. B. Adams=*R. cancellata* Philippi.
Saxicava antarctica Philippi=*S. solida* Sowerby.
Saxicava chilensis Hupé=*S. solida* Sowerby.
Saxicava solida Sowerby, cf. *S. arctica* Linnæus.
Saxicava tenuis Sowerby, 1834=*S. solida* Sowerby.
Saxidomus squalidus Deshayes, not Carpenter=*Marcia rufa* Lamarck.
Scala (anonymous)=*Epitonium* Bolten.
Scalaria simillima Tapparone-Canefri, 1876=*S. ducalis* Mörch.
Sigaretus Lamarck, 1799, cf. *Sinum* Bolten, 1798.
Sigaretus cymba Menke=*Sinum concavum* Lamarck.
Sigaretus grayi Deshayes=*Sinum concavum* Lamarck.
Sigaretus maximus Philippi=*Sinum concavum* Lamarck.
Siphonaria æquilirata Carpenter, 1856=*S. maura* Sowerby.
Siphonaria characteristica Reeve, 1842=*S. gigas* Sowerby.
Siphonaria concinna Sowerby. Gambia and Mauritius.
Siphonaria lecanium Philippi, 1846=*S. maura* Sowerby.
Siphonaria palmata Carpenter, 1856=*S. maura* Sowerby.
Siphonaria scutellum Deshayes, 1841. New Zealand.
Solecurtus coquimbensis Sowerby=*Tagelus dombeyi* Lamarck.
Solen gladiolus Gray, 1839=*S. macha* Molina, 1782.
Solenella norrisii Sowerby=*Malletia chilensis* Desmoulins.
Spondylus dubius Broderip=*S. crassisquama* Lamarck.
Spondylus ducalis Lamarck. Philippines, not Peru.
Spondylus leucacantha Broderip=*S. crassisquama* Lamarck.
Spondylus pictorum Sowerby=*S. crassisquama* Lamarck.
Spondylus princeps Broderip=*S. crassisquama* Lamarck.
Strombus gibberulus Linnæus, is Indo-Pacific (Peru, Tschudi).

Strombus luhuanus Linnæus, is Indo-Pacific (Peru, Tschudi).
Styliola recta Gray, 1850=*S. acicula* Rang.
Talena Gray, see *Pholadidea.*
Tectarius atyphus Stearns=*T. galapagiensis* Stearns.
Tegula atra Lesson, var., cf. *T. mœsta* Jonas.
Tellina coarctata Philippi=*T. lacunosa* Hanley. West Africa.
Tellina sanguinea Wood=*T. inæquistriata* Donovan.
Terebra belcheri Smith, 1873, not of Philippi, 1851.
Terebra chilensis Deshayes, 1859=*T. gemmulata* Kiener.
Terebra elongata Wood, 1828=*T. strigata* Sowerby.
Terebra flammea Lesson, 1830=*T. strigata* Sowerby.
Terebra patagonica Orbigny, 1841; cf. *T. gemmulata* Kiener.
Terebra zebra Kiener=*T. strigata* Sowerby.
Terebratula chilensis Orbigny, not Broderip=*Magellania venosa* Solander.
Terebratula dilatata Lamarck=*Magellania venosa* Solander.
Terebratula eximia Philippi=*Magellania venosa* Solander.
Terebratula fontaineana Orbigny=*Magellania venosa* Solander.
Terebratula gaudichaudi Blainville=*Magellania venosa* Solander.
Terebratula globosa Lamarck=*Magellania venosa* Solander.
Terebratula kochii Kuster=*Magellania venosa* Solander.
Terebratula physema Valenciennes=*Magellania venosa* Solander.
Tivela radiata Sowerby, not Megerle=*T. byronensis* Gray.
Tivela suffusa Sowerby=*T. planulata* Broderip and Sowerby.
Trigona hindsii Hanley=*Tivela byronensis* Gray.
Trigona semifulva Menke=*Tivela byronensis* Gray.
Triomphalia Sowerby=*Jouannetia* Desmoulins.
Triton, auctorum, cf. *Cymatium* Bolten.
Triton chemnitzii Gray=*Cymatium wiegmanni* Anton.
Triton ranelliformis King, not Sismonda=*Argobuccinum vexillum* Sowerby.
Triton succinctus Lamarck=*Cymatium costatum* Born.
Tritonium cancellatum Valenciennes=*Distorsio constrictus* Broderip.
Trivia costispunctata Gaskoin=*Trivia radians* Lamarck?
Trochus araucanus Orbigny=*Monodonta nigerrima* Gmelin.
Trochus bicarinatus Potiez and Michaud=*T. luctuosus* Orbigny.
Trochus brasilianus Menke=*Tegula reticulata* Gray.
Trochus buschii Philippi=*Astræa buschii* Philippi.
Trochus carinatus Koch=*T. luctuosus* Orbigny.
Trochus kieneri Hupé=*T. euryomphalus* Jonas.
Trochus microstomus Orbigny=*T. tridentatus* Potiez and Michaud.
Trochus perlatus Dillwyn=*T. tectum* Gmelin, part.
Trochus radians Lamarck=*Trochita trochiformis* Gmelin.
Trochus stenomphalus Jonas=*T. tridentatus* Potiez and Michaud.
Trochus torulosus Philippi=*T. quadricostatus* Gray.
Trochus tridens Menke=*T. tridentatus* Potiez and Michaud.
Trochus unidens Chemnitz=*T. tectum* Gmelin, part.
Turbinella ardeola Valenciennes, 1833=*Vasum cæstus* Broderip.
Turbinella muricata Born, 1780=*Vasum cæstus* Broderip.
Turbo assimilis Kiener=*T. fluctuosus* Wood.
Turbo atrum Kiener=*Tegula atra* Lesson.
Turbo brevispinosus Sowerby=*Astræa buschii* Philippi.
Turbo depressus Carpenter=*T. fluctuosus* Wood.
Turbo fluctuatus Reeve=*T. fluctuosus* Wood.
Turbo inermis Lamarck, not Kiener=*Astræa buschii* Philippi.
Turbo lugubris King=*T. niger* Wood.

Turbo lugubris Philippi, not King, cf. *Tegula atra* junior.
Turbo moltkeanus Reeve, not Gmelin=*T. fluctuosus* Wood.
Turbo nigerrimus Philippi=*Monodonta araucana* Orbigny.
Turbo propinquus Hupé=*T. elevatus* Eydoux and Souleyet.
Turbo quoyi Kiener=*Monodonta araucana* Orbigny.
Turbo tessellatus Kiener=*T. fluctuosus* Wood.
Turritella banksii Reeve=*T. goniostoma* Valenciennes.
Turritella broderipiana Reeve=*T. goniostoma* Valenciennes.
Turritella lentiginosa Reeve=*T. goniostoma* Valenciennes.
Turritella marmorata Kiener=*T. goniostoma* Valenciennes.
Turritella punctata Kiener=*T. goniostoma* Valenciennes.
Turritella tricarinata King=*T. cingulata* Sowerby.
Turritella ungulata err. typ. pro *T. cingulata* Sowerby.
Venerupis fernandeziana Stempell, cf. *V. oblonga* Sowerby.
Venerupis fimbriata Sowerby, cf. *V. oblonga* Sowerby.
Venus alternata Broderip=*Pitaria circinata* Born.
Venus beaui Recluz=*Chione subrostrata* Lamarck.
Venus bilineata Reeve, cf. *Anomalocardia subimbricata* Sowerby.
Venus californica Carpenter=*Chione compta* Broderip.
Venus cardioides Lamarck, cf. *Chione asperrima* Sowerby.
Venus chilensis Sowerby=*Paphia thaca* Molina.
Venus costellata Sowerby=*Chione antiqua* King.
Venus crenifera Sowerby=*Chione subrostrata* Lamarck.
Venus cycloides Orbigny=*Dosinia ponderosa* Gray.
Venus cypria Sowerby, 1835, not Brocchi, 1814=*V. marix* Orbigny.
Venus discors Sowerby=*Paphia grata* Say.
Venus discrepans Philippi, not Sowerby, cf. *Chione antiqua* King.
Venus dombeyi Lamarck=*Paphia thaca* Molina.
Venus entobapta Jonas=*Chione undatella* Sowerby.
Venus excavata Carpenter=*Chione undatella* Sowerby.
Venus expallescens Philippi=*Marcia rufa* Lamarck.
Venus histrionica Sowerby=*Paphia grata* Say.
Venus ignobilis Philippi=*Paphia thaca* Molina.
Venus intersecta Sowerby, cf. *Chione asperrima* Sowerby.
Venus lithoida Jonas=*Marcia rufa* Lamarck.
Venus modesta Sowerby=*Pitaria cumingi* Orbigny.
Venus neglecta Sowerby=*Chione subrostrata* Lamarck.
Venus nuttalli Conrad=*Chione undatella* Sowerby.
Venus opaca Sowerby=*Marcia rufa* Lamarck.
Venus paytensis Orbigny=*Pitaria concinna* Sowerby.
Venus pectunculoides Valenciennes=*Chione asperrima* Sowerby.
Venus perdix Valenciennes=*Chione undatella* Sowerby.
Venus portesiana Orbigny=*Chione subrostrata* Lamarck.
Venus similima Sowerby=*Chione undatella* Sowerby.
Venus solangensis Orbigny=*Tivela byronensis* Gray.
Venus subrostrata Reeve, not Lamarck=*Chione undatella* Sowerby.
Venus thouarsi Valenciennes=*Cytherea multicostata* Sowerby.
Venus triradiata Anton=*Anomalocardia subrugosa* Sowerby.
Voluta coerulea Hanley's Index Test.=*Olivella volutella* Lamarck.
Waldheimia, see *Magellania*.
Xylophaga Turton, not *Xylophagus* Meuschen=*Xylotomea* Dall.
Xylophaga dorsalis Stempell=*Xylotomea globosa* Sowerby.

EXPLANATION OF PLATES.

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PLATE 21.

FIG. 1. *Loligo gahi* Orbigny, length 30 cm 181
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4. *Cyrena isocardioides* Deshayes, natural size 159
5. *Pecten purpuratus* Lamarck, $\frac{1}{2}$ natural size 149
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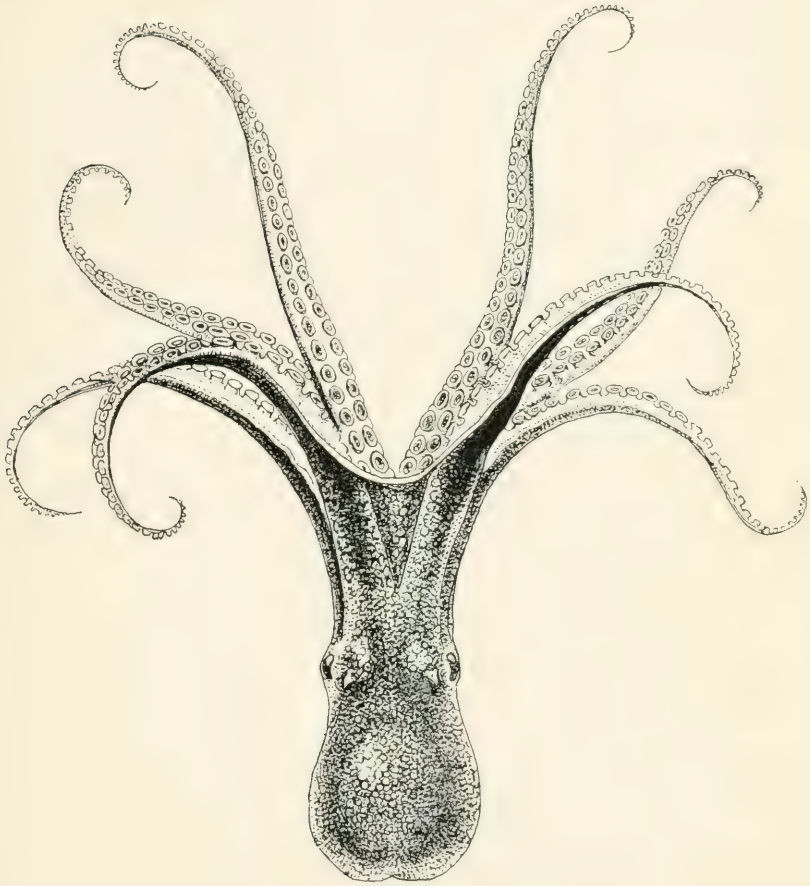
PLATE 27.

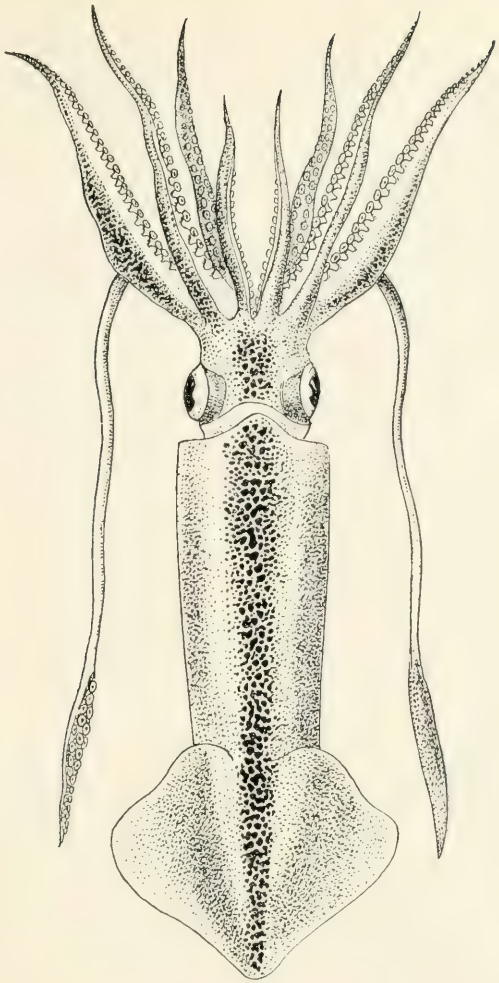
PLATE 28.



1

POLYPUS FONTAINEANUS ORBIGNY.

FOR EXPLANATION OF PLATE SEE PAGE 181.



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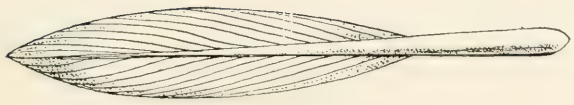
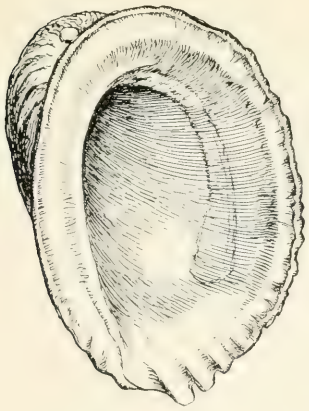


2

LOLIGO GAHI ORBIGNY.

FOR EXPLANATION OF PLATE SEE PAGE 181.



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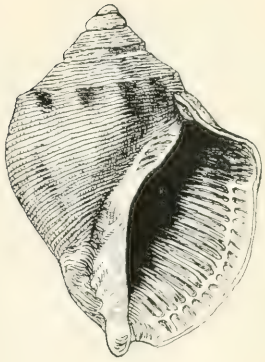

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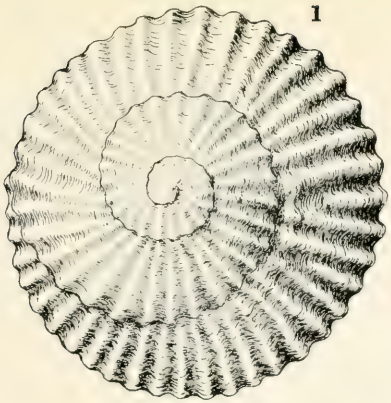
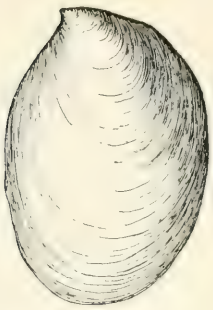
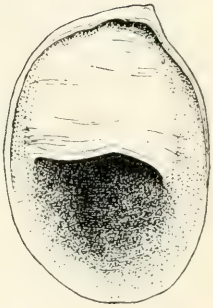
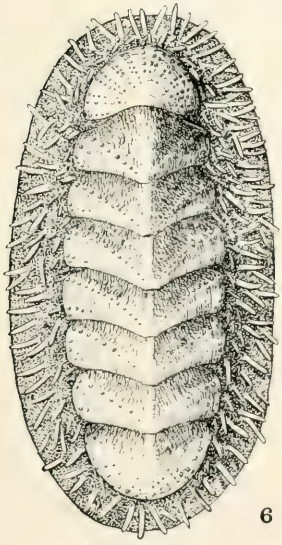
PERUVIAN GASTROPODS.

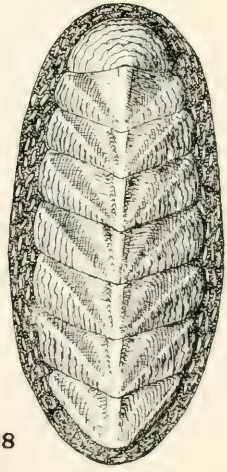
FOR EXPLANATION OF PLATE SEE PAGES 167, 168, 169, 170.





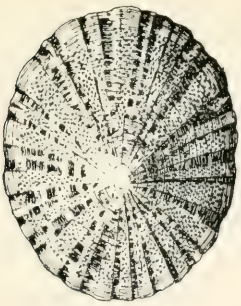






PERUVIAN GASTROPODS.

FOR EXPLANATION OF PLATE SEE PAGES 164, 165, 172, 174, 175, 180, 181.



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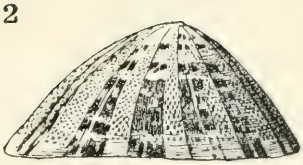

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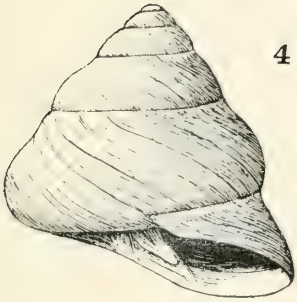

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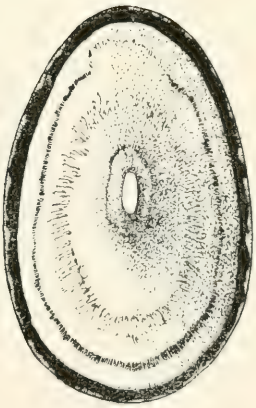

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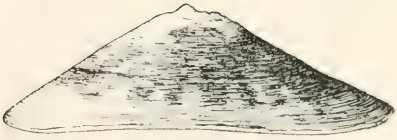
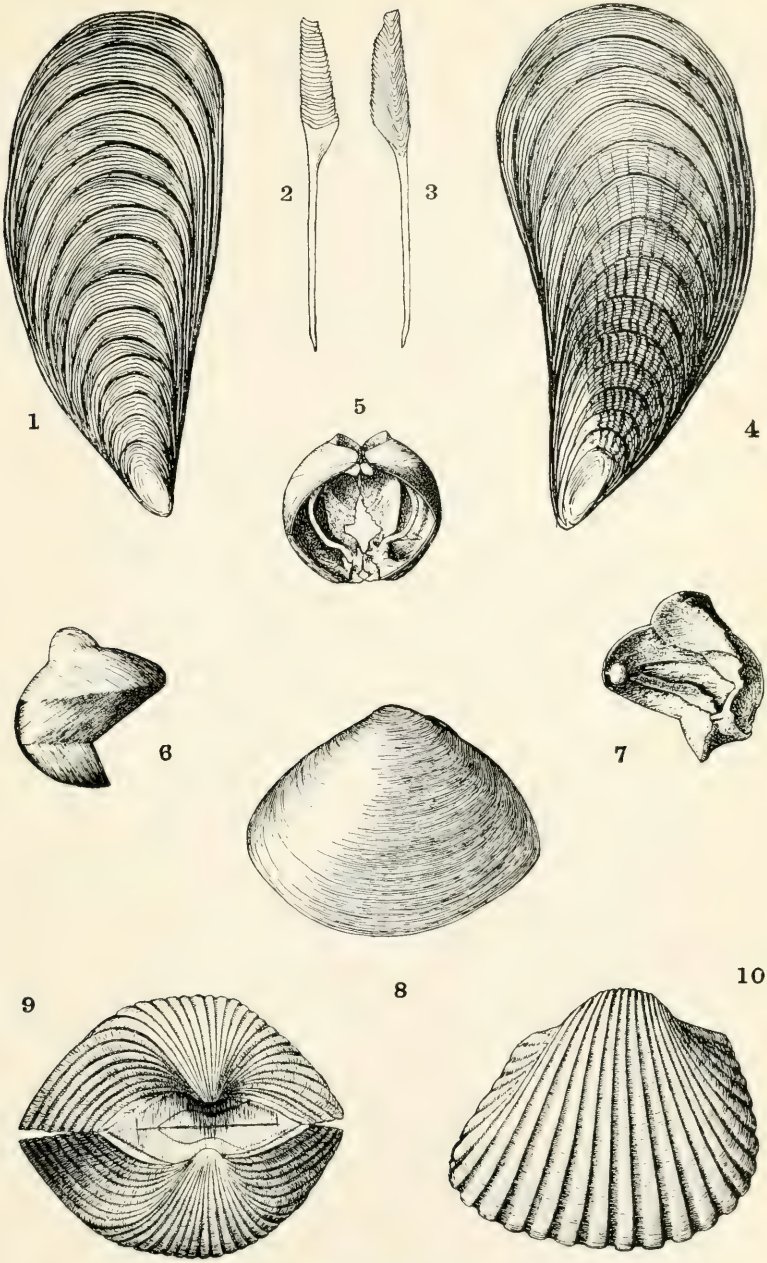


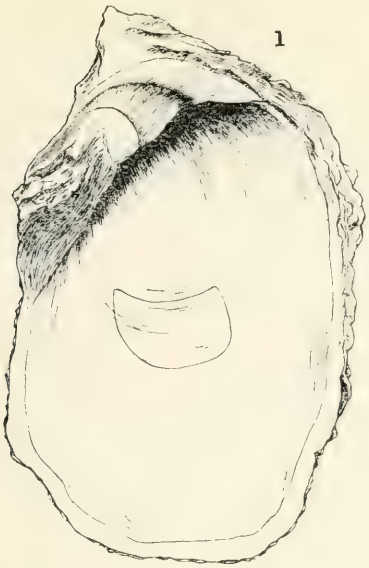
PERUVIAN GASTROPODS.

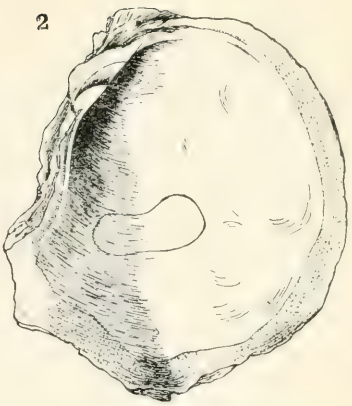
FOR EXPLANATION OF PLATE SEE PAGES 176, 177, 178.

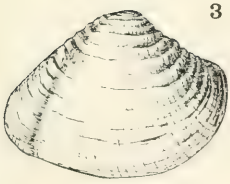


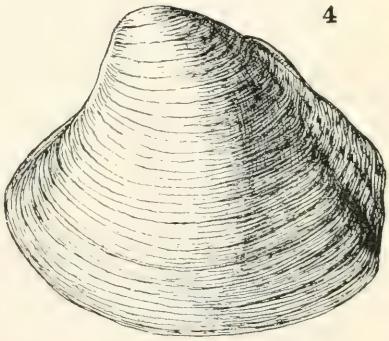
PERUVIAN PELECYPODS.

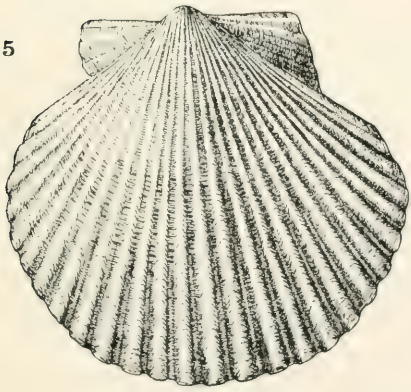
FOR EXPLANATION OF PLATE SEE PAGES 151, 154, 159, 162.

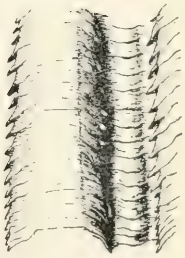








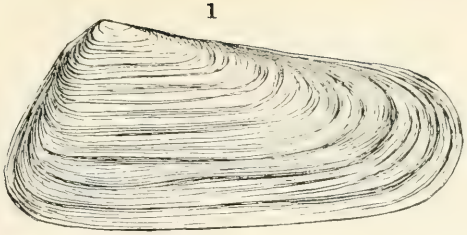




PERUVIAN PELECYPODS.

FOR EXPLANATION OF PLATE SEE PAGES 148, 149, 158, 159.

1



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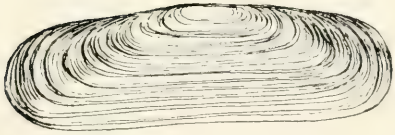

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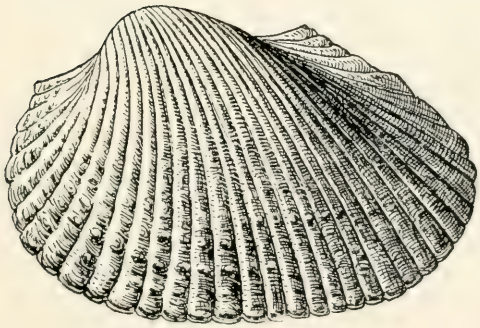
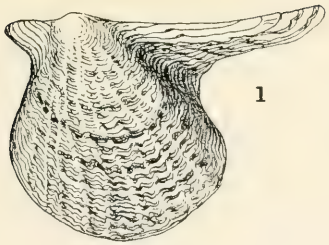
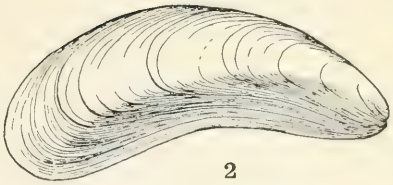
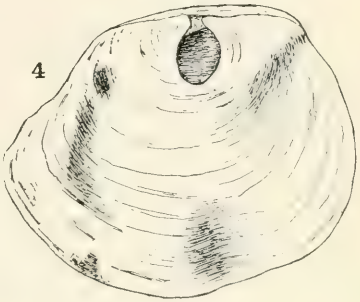


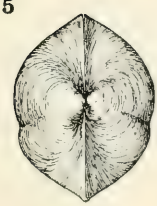
PERUVIAN PELECYPODS.

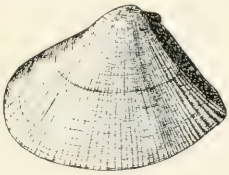
FOR EXPLANATION OF PLATE SEE PAGES 152, 154 160, 161.

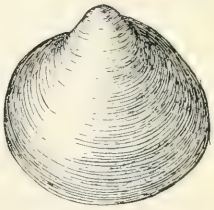


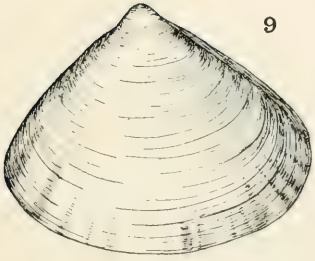












PERUVIAN PELECYPODS.

FOR EXPLANATION OF PLATE SEE PAGES 148, 150, 152, 155, 156, 157, 159, 160.

FOUR NEW LAND SHELLS FROM THE PHILIPPINE ISLANDS.

By Paul Bartsch,
Assistant curator, Division of Mollusks, U. S. National Museum.

The Philippine Bureau of Science, through the honorable the Secretary of the Interior, Dean C. Worcester, has recently transmitted a large consignment of mollusks to the U. S. National Museum for report. Among these are a number of new forms, four of which are here described.

COCHLOSTYLA WORCESTERI, new species.

Plate 29, figs. 14, 16.

Shell elongate-ovate. Nuclear whorls one and one-fourth, almost smooth. Post-nuclear whorls moderately rounded, with closely appressed summits. Sutures moderately impressed. Periphery of the last whorl with a faint angulation. Aperture quite oblique, oval, outer lip moderately expanded and reflected to form a somewhat thickened peristome. Columella slender and twisted. Parietal wall glazed with a weak callus. Entire surface marked by retractive lines of growth and exceedingly fine spiral striations, the last confined to the very thin epidermis.

Color.—Early whorls provided with a peripheral brown band which is strongest on the first and gradually weakens, being lost altogether on the fourth turn. The band renders the first one and one-half whorls of the spire almost brown, after which it appears as a mere suggestion above the sutures. A second brown band, varying in strength in different individuals, is situated at the summits of the whorls. Ground color of early whorls bluish-white; of the later ones straw-colored. Surface covered with irregular axial stripes of a thin opaque yellowish-white epidermis; stripes usually wider than the interspaces and extending from the summits to the umbilical area. These stripes obscure the brown band at the summit, where they cross it and make it appear as an interrupted line of dots. Reflected tip and umbilical area dark chocolate brown; columellar edge pale rose color. Interior bluish-white.

The type (Cat. No. 205213, U.S.N.M.) has six whorls, and measures—length, 37 mm.; diameter, 23 mm.; aperture, length, 19.5 mm.; diameter, 14.9 mm.

This species occurs upon the island of Bantayan, where 893 specimens were collected by Mr. R. C. McGregor of the Philippine Bureau of Science.

There is quite a bit of variation among the members of the lot before us. In a few the dark band at the summit is indicated only on the early whorls. In several the peripheral band persists at maturity.

The range of measurements can be best judged from the appended table, the twenty-five specimens being taken from the lot at random.

Length.	Diameter.	Length.	Diameter.
mm.	*mm.*	*mm.*	*mm.*
38.6	23.7	32.6	20.0
36.4	22.7	35.4	21.5
33.0	19.8	34.4	19.5
36.0	21.6	30.5	19.9
35.0	22.1	39.7	23.8
34.0	21.2	32.4	20.4
31.7	19.0	33.0	21.5
35.0	22.0	33.0	20.5
34.6	21.0	34.5	20.0
35.0	21.0	30.5	20.0
36.4	21.7	33.5	20.9
34.5	22.3		
31.4	19.0	Average..34.3	21.37
31.0	19.1		

Named for the Honorable Dean C. Worcester.

COCHLOSTYLA ANNULATA FUGENSIS, new subspecies.

Plate 29, figs. 2, 3, 8, 11, and 12.

Shell similar to *Cochlostyla annulata*, but uniformly more broadly conic and less elevated. In color this form presents all the phases noted in *annulata*. In the present form the yellow phase predominates (there are only six of the white phase in the lot). The umbilical area, too, is uniformly lighter in color than in *C. annulata*.

Specimens were collected by R. C. McGregor, of the Philippine Bureau of Science, on Fuga Island, one of the Babuyan group north of Luzon. *C. annulata* comes from northern Luzon.

Twenty-four specimens of *C. a. fugensis* taken at random give the following measurements:

Length.	Diameter.	Length.	Diameter.
mm.	*mm.*	*mm.*	*mm.*
20.7	19.1	20.9	19.0
21.4	19.4	22.8	20.2
22.0	19.0	21.0	18.0
21.0	20.0	20.3	19.1
20.5	19.0	21.0	19.5
22.0	19.8	23.0	20.0
19.6	17.8	18.4	17.5
20.8	18.5	23.0	20.9
21.3	19.2	21.9	20.0
21.3	19.0	22.6	20.0
21.4	19.6	22.2	20.6
18.1	17.5		
21.8	20.4	Average..21.12	19.29

Seven specimens of *Cochlostyla annulata* Sowerby, from von Möllendorff's collection (now Cat. No. 195389, U.S.N.M.), collected at Ilocos, Luzon, measure:

Height.	Diameter.	Height.	Diameter.
mm.	*mm.*	*mm.*	*mm.*
26.3	19.0	24.0	20.0
24.0	20.3	21.7	19.0
27.0	21.5		
23.7	19.7	Average..24.38	20.07
24.0	21.0		

Five of these are figured on pl. 29, figs. 1, 4, 5, 10, 13.

LEPTOPOMA FREERI, new spceies.

Plate 29, figs. 6, 7, 9.

Shell broadly conic, translucent, bluish-white. Nuclear whorls two and one-half, marked by five slender spiral lirations, which are promptly lost as the shell passes to the post-nuclear stage. Post-nuclear whorls well rounded, marked by many (about 82 on the last whorl between the sutures) fine, subequal and subequally spaced, wavy, spiral striations. In addition to these, the whorls are marked between the sutures by four obsolete spiral keels. Sutures weakly impressed. Periphery of the last whorl marked by a strong, acutely compressed keel. The lines of growth on the spire are strongly retractively curved and vary somewhat in strength: the stronger appearing as subdiaphanous lines. Base of last whorl well rounded, narrowly openly umbilicated, marked by faint lines of growth and numerous subequal and subequally spaced fine wavy spiral striations. Aperture very oblique, irregularly semi-oval, outer lip broadly expanded and slightly reflected, somewhat grooved on the flat surface and drawn out slightly into a claw at the peripheral keel; columella equaling the lip in strength: curved, excavated, and reflected; the junction with the basal lip forming an angle. Parietal wall covered by a thin callus. Operculum thin, horny, multispiral, marked by many fine retractive, incremental lines.

The type and fifty-three specimens were collected by Mr. R. C. McGregor, of the Philippine bureau of science, on Calayan Island, one of the Babuyan group.

The type (Cat. No. 205215, U.S.N.M.) has 7 whorls and measures—length 18 mm., diameter 19.6 mm.; aperture, length 11.8 mm., diameter 11 mm.

Twenty-five of the remaining specimens, taken at random, measure:

Length.	Diameter.	Length.	Diameter.
mm.	*mm.*	*mm.*	*mm.*
16.0	19.0	17.7	17.8
16.6	19.4	17.3	18.7
16.0	19.8	17.4	19.3
15.8	18.5	18.2	19.6
16.7	18.2	18.2	19.3
17.1	18.8	17.8	19.4
17.1	19.0	17.3	18.7
16.9	19.0	17.6	19.5
18.4	20.0	17.2	18.7
18.3	19.0	19.0	19.6
18.0	18.8	18.2	19.0
18.2	19.6		
18.6	20.3	Average..17.45	19.05
16.6	18.2		

Named for Dr. Paul C. Freer, Director of the Philippine Bureau of Science.

COPTOCHEILUS McGREGORI, new species.

Plate 29, fig. 15.

Shell pupiform, translucent, chocolate brown. Nuclear whorls two and one-half, dextral, smooth, coiled like the rest of the shell, but much lighter in color. Post-nuclear whorls strongly rounded and appressed at the summits, separated by decidedly constricted sutures, crossed by fine, retractive, incremental lines, which are strongest near the summit; the first three and one-half or four whorls are marked also by fine lightly impressed spiral striations. Periphery of the last whorl faintly angulated. Base well rounded, narrowly umbilicated. Aperture subcircular, expanded and reflected to form a thick, continuous peritreme, the parietal side of which is attached to the body wall. Peritreme double color, the inner separated from the outer by a strong deeply incised line, the notch in the inner being a little deeper than in the outer columellar wall. Operculum thin, horny multispiral.

Thirty-one specimens were collected by Mr. R. C. McGregor, of the Philippine bureau of science, on Semerara Island. The type (Cat. No. 205181, U.S.N.M.) has 8 whorls, and measures—length 20.5 mm., diameter 7.5 mm.; length of aperture 6.8 mm.; diameter of aperture 6.6 mm.

Twenty-five of the specimens measure:

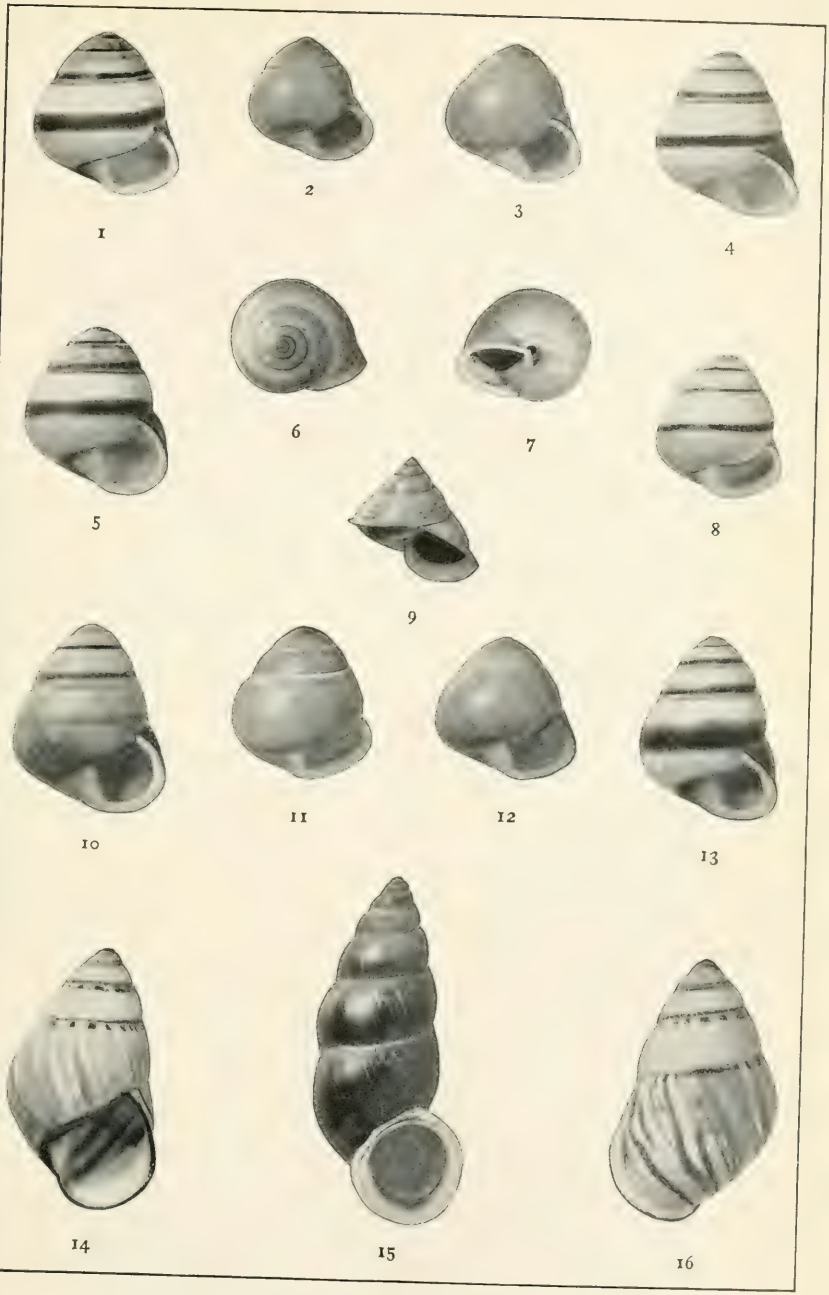
Length.	Diameter.	Length.	Diameter.
mm.	*mm.*	*mm.*	*mm.*
21.4	7.5	21.3	7.8
20.8	7.8	20.0	7.5
20.7	7.5	19.1	7.3
19.5	7.4	20.0	7.4
20.2	7.5	20.6	7.8
19.3	7.3	20.4	7.7
20.5	7.4	21.0	7.7
21.6	7.8	20.9	7.0
19.8	7.0	20.4	7.3
20.5	7.7	20.2	7.3
19.6	7.3	20.5	7.5 type.
22.3	7.8		
20.4	7.4	Average..20.42	7.49
19.6	7.5		

Named for R. C. McGregor, of the Philippine Bureau of Science.

EXPLANATION OF PLATE 29.

All figures natural size.

Figs. 1, 4, 5, 10, 13. *Cochlostyla annulata* Sowerby.
Figs. 2, 3, 8, 11, 12. *Cochlostyla annulata fugensis* Bartsch.
Figs. 6, 7, 9. *Leptopoma freeri* Bartsch.
Figs. 14, 16. *Cochlostyla worcesteri* Bartsch.
Fig. 15. *Cochlostyla mcgregori* Bartsch



NEW LAND SHELLS FROM THE PHILIPPINE ISLANDS.

FOR EXPLANATION OF PLATE SEE PAGE 299.

CŒLENTERATES FROM LABRADOR AND NEWFOUNDLAND, COLLECTED BY MR. OWEN BRYANT FROM JULY TO OCTOBER, 1908.

By Henry B. Bigelow,

Of the Museum of Comparative Zoology, Cambridge, Massachusetts.

The cœlenterates described in the following pages were collected by Mr. Owen Bryant at various points along the east coast of Labrador and the south and east coasts of Newfoundland during the summer of 1908. The collection consists of twelve species of Craspedotæ, one siphonophore, three Scyphomedusæ, and three ctenophores. None of the species are new, but inasmuch as the medusa fauna of this region has not previously been studied, the records are of importance from the standpoint of geographical distribution. As might have been expected from our knowledge of other groups of animals, several of the species were previously known only from Greenland and from northern Europe. Such are *Sarsia princeps* and *Ptychogastria polaris*. *Catablema vesicaria*, *Bougainvillea superciliaris*, *Staurophora laciniata*, and *Aglantha rosea* were already known from both sides of the north Atlantic, so that the occurrence of these forms in the region in question, bridging over the gap in their known distribution, was to be expected. The capture of *Æginopsis laurentii* is of especial interest, since there was already good reason to believe that this species would be found to be of general boreal occurrence when the Arctic coasts of North America were more thoroughly explored from the faunistic standpoint.

Although all the species are well known, two, *Catablema vesicaria* and *Æginopsis laurentii*, are of great systematic interest. Fortunately both are represented by such good series that, in the former, I have been able to make a study of the tentacles and of the gonads, and in the latter to verify many points of anatomy important in the general classification of the Narcomedusæ. It has been a pleasure to work on specimens of Medusæ so excellently preserved as those prepared by Mr. Bryant.

LIST OF SPECIES.

CRASPEDOTÆ.

SIPHONOPHORÆ.

SCYPHOMEDUSÆ.

CTENOPHORÆ.

DESCRIPTION OF SPECIES.

CRASPEDOTÆ.

ANTHOMEDUSÆ.

SARSIA MIRABILIS L. Agassiz.

Plate 30, fig. 2.

Sarsia mirabilis L. Agassiz, '49, p. 228, pls. 4, 5.

One specimen, about 10 mm. high, from St. Pierre, off Newfoundland, October 1, probably belongs to this well-known species, judging from its size and from the color of its tentacular bulbs and ocelli. Unfortunately, however, both manubrium and tentacles are so strongly contracted as to make positive identification impossible.

S. mirabilis is known not only from the Atlantic coast of North America, Baffin's Bay, Greenland, and probably northern Europe (Hartlaub, :07, p. 39), but also from the Pacific coast of North America, a fact omitted in my summary of the Pacific *Sarsiæ* (:09). It is likewise recorded, though with reservation as to its true identity, from the coast of Chile, by Hartlaub (:07, p. 39).

SARSIA PRINCEPS (Haeckel).

Plate 30, fig. 1.

Codonium princeps HAECKEL, '79, p. 13, pl. 1, fig. 3.

For the synonymy of this species, see Hartlaub, :07, p. 47.

One specimen, 14 mm. high, St. Pierre, off Newfoundland, October 1. I entirely agree with Browne (:03) and Hartlaub (:07) that this species is a typical *Sarsia*, and that the genus *Codonium* of Haeckel ('79) is a synonym of *Sarsia*. For the history of the species, see Hartlaub, :07, p. 47.

The single individual (pl. 30, fig. 1) is readily identified with *S. princeps* on account of its close resemblance to Hartlaub's figure. This species is one of the best defined in the difficult genus *Sarsia*, being distinguishable by its large size, the pronounced apical projection of the gelatinous bell, the presence of a "stiel-canal," and especially by the jagged outlines of the radial canals. The latter are visible in the photograph (pl. 30, fig. 1); they seem, however, to have been overlooked by both Browne (:03) and Grönberg ('98), although recently mentioned and figured by Hartlaub (:07). In the single specimen both manubrium and tentacles are contracted, but in the former the distal gastric portion is sharply defined from the more proximal region which bears the sexual products.

Color.—Manubrium and tentacles, after preservation with formalin, are reddish, the minute ocelli black.

This species, known from various localities on the Arctic coasts of Europe, from Barents Sea, and from Spitzbergen, has also been recorded by Vanhöffen ('97) from the west coast of Greenland, so that its occurrence in Labrador and Newfoundland was to be expected.

TIARA PILEATA (Forskål).

Plate 30, fig. 5; plate 31, fig. 7.

Medusa pileata FORSKÅL, 1775, p. 110; 1776, pl. 33, fig. D.
Tiara pileata L. AGASSIZ, '62, p. 347.

This species is represented in the collection by nine specimens, taken 30 miles southeast of Nain, Labrador, August 18, ranging in diameter from 6–15 mm. The largest specimen is apparently sexually mature and has 37 tentacles. Differences in the shape of the basal bulbs of the tentacles offer a ready distinction between this species and *Catablema vesicaria*, and are of much assistance in instances where both margin and gonads are damaged (compare pl. 30, fig. 5, with pl. 31, fig. 7). *Tiara pileata* is one of the most widely distributed of Atlantic Hydromedusæ. On the coast of Europe it is common from Norway to the Mediterranean (Haeckel, '79; Browne, :03) and in American waters it has been recorded from Maine to Rhode Island (Fewkes, *Turris episcopalis*).

CATABLEMA VESICARIA (A. Agassiz).

Plate 30, figs. 3, 4; plate 31, fig. 6.

Turris vesicaria A. AGASSIZ, '62a, p. 97.
Catablema vesicaria HAECKEL, '79, p. 64.

This interesting boreal species is represented in the collection by 27 specimens in various stages of development. The adult has been so well described and figured by A. Agassiz ('65), by Haeckel ('79 "*C. campanula*") and by Maas (:04) that no extended account is necessary here. However, young stages have not previously been described, so far as I am aware.

In general form the series agrees closely with the figures of A. Agassiz and of Maas, an extreme development of the apical gelatinous projection (pl. 30, figs. 3, 4) being an important characteristic of the species.

Tentacles.—The largest specimen (19 mm. high by 17 mm. in diameter), which is in about the stage figured by A. Agassiz ('65, fig. 262), has twenty-two well-developed tentacles and twenty rudimentary tentacular knobs rather irregularly distributed. In another specimen of nearly as great size (18 by 14.5 mm.) the development of the tentacles has progressed somewhat further, there being thirty-seven large and only two rudimentary tentacles. According to Haeckel from thirty-six to forty-eight tentacles are finally formed. The smallest specimen, 3 mm. high by 3 mm. in diameter, has four large radial tentacles, four somewhat smaller interradial tentacles, and eight minute adradial tentacular knobs. This condition indicates that the order of development of tentacles is successively radial, interradial, adradial. In normal development subradial rudiments next appear. But in all the present specimens the development of additional tentacles, after the first three series, is irregular, no two quadrants of any specimen being precisely alike. Thus in an individual 10 mm. high by 9 mm. in diameter, in which the first traces of gonads are visible, inter- and adradial tentacles have alone appeared in one quadrant, while in all the other quadrants subradial rudiments are also present. In still later stages the development of additional tentacles is so irregular that the normal succession is entirely masked.

The tentacular bases are laterally compressed and bear spurs clasping the exumbrella (pl. 31, fig. 6, *T. Ra.*). It is not unlikely that their outline, which appears constant, will prove to be of specific significance. Ocelli are recorded for this species by A. Agassiz ('65), and can be determined on a few specimens in the present series. In most cases, however, none are distinguishable. In all probability they have disappeared as the result of preservation, since neither Haeckel ('79) nor Maas (:04) observed any such organs in the preserved specimens which they examined.

Gonads.—The most important character which distinguishes *Catablema* from the related genera *Pandea*, *Tiara*, and *Clavula*,[a] is the form of the gonads. In *C. vesicaria* these organs have been well figured both by A. Agassiz and by Maas, and the latter author has pointed out the importance of the gonads in the classification of the Tiaridæ. The sexual organs, as in all Tiaridæ, are purely interradial (though in adults this position is largely masked by their growth); and each gonad is primarily a horseshoe-shaped structure. The feature in which *Catablema* differs from related genera is that the interradial portion of each gonad (connecting the two arms of the horseshoe) consists of a series of distinct vertical folds (pl. 30, fig. 3, *go*).

Maas has considered an extreme development of lateral diverticulæ on the radial and circular canals as characteristic of *Catablema*. In this respect, however, the genus is so closely approached by *Clavula* that it is impossible to draw any line between the two. In the larger specimens in the present series the diverticulæ on the radial canals are well developed, some simple and some branched (pl. 31, fig. 6). On the circular canal, however, they are much less prominent, forming merely a jagged outline. This is a general condition no more complex than I have described and figured for the Pacific *Clavula fontata* (Bigelow, :09).

Color.—After preservation with formalin, stomach, canals, and tentacles are pale orange, and the gonads a deeper shade of the same color.

Catablema vesicaria is a purely boreal species. On the American coast it has once been recorded from Massachusetts Bay, and never from south of Cape Cod. It is common along the Labrador coast. Haeckel ('79) records it from Greenland, and Maas (:04) from the Arctic Ocean near Bear Island.

BOUGAINVILLEA SUPERCILIARIS (L. Agassiz).

Plate 31, fig. 2.

Hippocrene superciliaris L. Agassiz, '49, p. 273, pls. 1–3.
Bougainvillea superciliaris L. Agassiz, '62, pp. 289, 344, pl. 27, figs. 1–7.

Labrador, 30 miles southeast of Nain, surface; 5 specimens, all about 6.5 mm. high by 5 to 5.5 mm. in diameter.

I can add little to the excellent accounts and figures of this species which we owe to L. Agassiz ('49) and to Hartlaub ('97).

The specimens, though larger than any observed by L. Agassiz, are slightly smaller than the largest seen by Hartlaub, who records individuals 8 mm. in height. Haeckel ('79) has recorded specimens 12 mm. in height, but Hartlaub questions whether these, in view of

[a] For the medusan genus commonly known, since Lesson, as *Turris*, the name *Clavula*, applied by Strethill Wright (Proc. Edinburgh Phys. Soc., vol. 2, 1859) to the hydroid stage of *Turris neglecta* Lesson, must be used since the name "*Turris*" is preoccupied by Bolton for a genus of mollusca.

their large size and small number (10–15) of tentacles in each bundle, do not belong to a distinct variety.

The greatest number of tentacles in any bundle of the present series is fourteen; Agassiz figures 11–14, and Hartlaub has counted as many as twenty-two in larger individuals from Heligoland.

The oral tentacles agree in their branching with L. Agassiz' figures. In most cases they branch dichotomously four times, occasionally, however, five times. But this is not their final condition, since Hartlaub has observed instances in which branching took place six and seven times.

In the short squarish outline of the manubrium and in the fact that this organ is situated on a short peduncle (pl. 31, fig. 2), as well as in the thickness of the gelatinous substance of the bell, and in the broadness of the radial canals, the specimens agree closely with the accounts and figures of previous students.

The color is that recorded by Hartlaub, the entoderm of the manubrium being reddish brown, the tentacular bulbs brownish red, the ocelli black.

B. superciliaris is a species of wide distribution. On the Atlantic coast of America it is known to occur as far south as Woods Hole, Massachusetts, and it is a common species thence northward to Labrador, and perhaps to Greenland (Haeckel), and, as already noted, it is known from Heligoland (Hartlaub).

LIZZIA OCTOPUNCTATA (Sars).

Plate 31, figs. 3–5.

Cytæis octopunctata SARS, '35, p. 28, pl. 6, fig. 14.
Lizzia octopunctata FORBES, '48, p. 64; pl. 12, fig. 13.

The generic distinctions between the Bougainvilleidæ with eight tentacle groups have been well drawn by Maas (:05), who recognizes two genera, *Lizzia* and *Rathkea*, separated by the structure of the labial arms, as well as by the number of marginal tentacles in each group. The various other genera founded by Haeckel, namely, *Lizusa*, *Lizzella*, and *Margellium* were, as shown by Vanhöffen ('89), founded upon young stages.

Thanks to the studies of A. Agassiz ('65, "*Lizzia grata*") and Browne ('96, "*Margellium octopunctatum*") the stages in growth of *L. octopunctata* from the liberation of the medusa-bud to the adult, are now well known, and to the latter author I refer the reader for its complex synonymy ('96, p. 477).

The collection contains a series of about 200 specimens of this species from Fogo Island, Newfoundland, July 28, including both budding and sexual phases, as well as numerous young stages.

Sexual and budding phases are of about the same size, the largest specimens of each being about 4 mm. high by 3.5 mm. in diameter.

In most of the specimens the oral appendages are in the condition shown in the photograph (pl. 31, fig. 5), there being four sessile nematocyst knobs at each corner of the mouth. Earlier stages, such as are figured by A. Agassiz ('65, fig. 257) are to be seen in smaller specimens. In the adult condition, according to A. Agassiz, there are seven nematocyst organs in each cluster and the same condition is recorded by Browne ('96). This type of oral appendage, as has been pointed out by Maas (:05) is entirely different from the branched oral tentacles of *Rathkea*, and forms sufficient grounds for separating the two genera.

The numbers recorded by A. Agassiz and by Browne for the groups of tentacles, five for each radial, three for each interradial group, appear to be the final ones. At least, I have never seen them surpassed.

In the earliest stage in the development of tentacles which I have observed, the bud being still attached to the manubrium of the parent, there is one tentacle in each group, radial or interradial, the radials being much the largest.

Young medusæ, at liberation, have three tentacles in each radial group, the central one being much the largest, and one in each interradial group. The adult number of tentacles is usually attained, as described by A. Agassiz ('65), by the development of an additional pair of lateral tentacles in each group, radial or interradial, but the formation of additional tentacles is rather irregular, as Browne has observed.

Color.—In the preserved specimens the manubrium in the budding phase is very pale reddish, in the sexual phase its entoderm is of a much deeper reddish brown tint. In both phases the tentacular bulbs are of a deep chocolate brown. These structures are recorded by Hargitt (:05) as being "pinkish, tending to brown, and even blackish in rare cases."

This species was previously known to occur commonly in Massachusetts Bay and south of Cape Cod in the Woods Hole region and at Newport, Rhode Island. It is not known from south of Long Island Sound. In European waters it is known from Norway south to the coast of France.

LEPTOMEDUSÆ.

STAUROPHORA LACINIATA L. Agassiz.

Staurophora laciniata L. Agassiz, '49, p. 308, pl. 7.

One specimen, 70 mm. in diameter; Fogo Island, Newfoundland, July 28; surface.

The single specimen, which has well-developed gonads, is of only medium size, since this species frequently attains a diameter of 150 mm.

Stauroplora laciniata is a common boreal species. On the American coast it occurs only occasionally south of Cape Cod. Hartlaub ('97) has recorded what is probably the young of this species from Heligoland, and it is probable that the *S. arctica* of Haeckel ('79) from Spitzbergen is identical with *S. laciniata*.

MELICERTUM CAMPANULA (Fabricius).

Plate 31, fig. 1; plate 32, fig. 1.

Medusa campanula FABRICIUS, 1780, No. 360.
Melicertum campanula A. AGASSIZ, '62*a*, p. 96; '65, p. 130, figs. 202–214.

Haeckel ('79) has pointed out that the identity of Fabricius' specimens with those subsequently described by A. Agassiz ('65) under the name *Melicertum campanula* is doubtful, owing to the unsatisfactory nature of Fabricius' account. But since it is improbable that any better identification of Fabricius' material can ever be made, it will add to the stability of nomenclature to accept the identification of A. Agassiz, who has fully described and figured the species.

This common northern form is represented in the collection as follows:

Fogo Island, Newfoundland, July 19, nine specimens in early growth.

St. Pierre, off Newfoundland, three specimens, all about 15 mm. high by 12 mm. in diameter, with mature sexual products.

Although this species has been thoroughly figured and described by A. Agassiz ('65), the structure of the tentacular organs deserves fresh study, since Maas (:05) has raised the question whether or not there are cirri and knobs as well as developed tentacles. Haeckel ('79) has made the presence or absence of such secondary marginal organs the basis for generic distinction, *Melicertidium* having, *Melicertum* lacking them. Maas ('97, :05), however, has abandoned this criterion, and suggests, from A. Agassiz' figures, that on fresh examination, cirri and knobs will be found in *M. campanula*. The evidence in the present series indicates, however, that there is only one class of marginal organ in this species, *i. e.*, tentacles, though these develop continuously and it is probable that not all ever reach the final condition.

In the earliest stage in the present series (specimen 1.75 mm. high by 2 mm. in diameter), there are eight large radial tentacles, eight well-developed, though smaller, interradial tentacles, and in each octant two adradial elements which show all stages from mere knobs to very small tentacles with basal bulbs and terminal filaments. Several of the smallest elements, moreover, closely resemble the cirrus-like structures figured by A. Agassiz.

At a slightly later stage the adradials in seven octants have attained their definitive tentacular form, though they are still smaller than the interradials. In the eighth octant, however, one of the radials is still a mere knob. In seven octants a fourth series of marginal structures, subradials, ranging from minute knobs to fully formed, though small, tentacles, has likewise appeared. In the eighth octant, however, no subradials are yet present.

From this stage onward new members of the tentacular series are formed in irregular succession. In an individual 5.5 mm. in diameter by 6 mm. high there are, besides the radials, thirty-six tentacles, respectively 5, 4, 4, 4, 4, 6, 4, 5, to the octant, and these show all stages in development. In a slightly larger individual (6.5 mm. in diameter by 6 mm. high) the six subradials in one octant have all attained tentacular form, although in other octants both knobs and cirri are present.

In the most advanced specimen (15 mm. high by 12 mm. in diameter) there is a total of 129 tentacular structures, of which 72 have attained full tentacular form, the remainder showing early stages in growth. In one octant of this specimen (pl. 31, fig. 1) there are, between the two radial canals, nine large tentacles (T^1), four small tentacles (T^2), cirri (*ci*), and knobs.

This series shows that there is no morphologic distinction in this species, between the various marginal structures, knobs and cirri being merely early stages, partly perhaps contraction phases, in the growth of tentacles. But, inasmuch as even in mature specimens many such early stages are present, and since additional members of the tentacular series are formed continuously, I doubt whether a stage is ever reached in which only fully developed tentacles are present. However, although we can draw no sound distinction between knobs and cirri on the one hand and tentacles on the other, I agree with Maas that the distinction between the two genera *Melicertum* and *Melicertidium* is invalid, though on a different ground, namely, that the knobs and cirri in *Melicertidium* and in *Melicertum proboscifera* (Maas '97) are probably nothing more than early stages in the growth of tentacles, just as they are in *M. campanula*.

M. campanula is an abundant species in American waters from Labrador to Cape Cod, and it is known to occur as far south as Woods Hole, Massachusetts. A closely allied form, *M. octocostata* Sars, is known along the European coast from Norway to England. The latter was made by Haeckel ('79), the type of his genus *Melicertidium*, but from the brief account of Browne ('95) it is evident that the "knobs" are nothing more than young tentacles. It is not improbable that *M. octocostata* may finally prove identical with *M. campanula*, but until it is better known it is wisest to retain both species.

OBELIA GENICULATA (Linnæus).

Sertularia geniculata LINNÆUS, 1776, No. 1312.
Obelia geniculata ALLMAN, '64, p. 372.

The collection contains many specimens of *Obelia* from St. Pierre, off Newfoundland, October, and from Fogo Island, Newfoundland, July 28.

They are all far advanced in development. In the position of the gonads they resemble the figures of *O. geniculata* given by Böhm ('78, pl. 3, figs. 1–34). This species has already been recorded by Nutting ('99) from Woods Hole, Massachusetts, and on the coast of Europe is widely distributed. The identification can, however, be only provisional, inasmuch as a knowledge of the hydroid stages is essential for final determination.

TRACHOMEDUSÆ.

The collection contains two species of Trachomedusæ, one belonging to the remarkable and still obscure genus *Ptychogastria*, the other to *Aglantha*.

PTYCHOGASTRIA POLARIS Allman.

Ptychogastria polaris ALLMAN, '78, p. 290, figs. 1–3.

Four specimens, 13 to 21 mm. in diameter, from between Cape Mugford and Hebron, Labrador, August 23, in the dredge, from 60 fathoms. Unfortunately, all of the specimens are in such poor condition that I can do little more than corroborate the excellent account of this species which we owe to Browne (:03), who has shown that the description by Haeckel ('79, '81, *Pectyllis arctica*) is incorrect in several particulars. Its synonymy and history have recently been discussed by Maas (:06, p. 582). The most remarkable feature of *Ptychogastria* is the fact (demonstrated by Browne) that although the presence of free club-like otocysts undoubtedly places it among the Trachomedusæ, the gonads are situated not on the radial canals, but on folds of the walls of the manubrium. Maas, it is true, has doubted whether the sexual organs are truly stomachic. But my examination of the present specimens, in which the manubria were fairly well preserved, has convinced me that Browne is correct in maintaining that the gonads belong exclusively to the walls of the stomach and that no sexual products are developed on the radial canals.

The question whether or not there are sixteen distinct gonads, as Browne maintains, or whether Maas (:06, p. 483) is correct in saying that there are only eight, but that "Jede der 8 Gonaden erscheint übrigens durch die Ansatzlinie der Mesenteriums scharf zweigeteilt so dass man eigentlich von 16 Gonadenlamellen sprechen könnte"

is one that can be answered only after a study of the development of these organs. It is certain, however, that in the adult the sexual organs are entirely discontinuous along the narrow line of attachment of the mesenteries to the manubrium, as well as in the interradii. In other words, in the adult the sixteen sexual masses are adradial. They may, however, be formed by the fission of eight primary gonads. Maas, in discussing the probable relationship of this genus, especially to *Crossota*, has suggested that possibly the eight radial ridges of the manubrium which bear the gonads are in reality basal dilations of the radial canals, so that "die 8 Aussackungen die die Gonaden versorgen, dem Boden der Radiärkanäle entsprechen, auch wenn letztere selbst, wie die Schnittbilder Browne's lehren, davon ganz anabhängig verlaufen" (:06, p. 483). But the conditions in the adult seem to me to lend no actual support to such a view, although a study of the development of the species may give a different result.

No sense organs were to be found in the present specimens. Browne, however, observed them, and found that their number was probably sixteen.

Tentacles.—I can add nothing to Browne's account except to note that in one specimen there is a single very large filiform tentacle about twice as long as the bell is high, arising from the tentacular scar between two of the tentacle groups. Allman, in the original account of the species, figured these large tentacles, but in Browne's specimens they were all broken off.

Ptychogastria polaris is certainly not an abyssal form, since all recent records of its capture are from comparatively shoal water. It has never, however, been taken on the surface, so far as I know. Judging from the presence of sucking pads on certain of its tentacles, Browne is probably correct in suggesting that it attaches itself to the bottom, as its near relative, *Pectanthis asteroides*, was seen to do by Haeckel ('81). However, as Browne has pointed out, the high degree of muscular development suggests that the species may be an active swimmer.

It is not worth while to speculate on the affinities of this remarkable genus until the young stages have been worked out, for only in that way can the nature of gonads and mesenteries be determined. In the meantime we may well follow Vanhöffen (:02) and Maas (:06) in associating it with *Crossota*, to which it is related by the arrangement of the several rows of tentacles.

Genus AGLANTHA.

Recent researches on this difficult genus have led most students to agree that in the North Atlantic two species are recognizable, *A. digitale*, with only four otocysts, of large size, and of Arctic dis-

tribution, and *A. rosea*, with eight otocysts, of much smaller size and of somewhat more southerly occurrence. Up to the present time the greatest size attained by *A. rosea* was supposed to be about 12 mm., whereas *A. digitale*, which has three or four well-marked geographical races, is known to grow to at least twice that height. Both species are known from both sides of the North Atlantic, but *A. rosea* has been recorded from the coast of America only once (Hargitt :05, *A. conica*, Woods Hole, Massachusetts). Inasmuch as *A. digitale* has been recorded from Massachusetts Bay and northward I expected the series in the present collection to belong to that species. But to my surprise all the specimens examined have eight otocysts, one in each octant, and must therefore be referred to *A. rosea*.

AGLANTHA ROSEA (Forbes).

Circe rosea FORBES, '48, p. 34, pl. 1, fig. 2.
Aglantha rosea BROWNE, '97, p. 833.

For the synonymy and history of this species, see Maas (:06).

Between Cape Sable and Cape Race, July 19, about 700 specimens, 1.5–8 mm. high; St. Pierre, off Newfoundland, October 1, about 100 specimens, 2–10 mm. high; Fogo Island, off Newfoundland, July 29, about 275 specimens, 2–7 mm. high; Gready Harbor, Labrador, 13 specimens, 13–25 mm. high; Cape Harrison, Labrador, August 13, 1 specimen, 21 mm. high; 30 miles southeast of Nain, Labrador, August 15, 129 specimens, 8.5–29 mm. high.

The series is extremely interesting, since it suggests that with regard to size and number of tentacles *Aglantha rosea* falls into two distinct races. The smaller of these agrees with *A. rosea*, as described by Browne (:03) and by Maas (:06). In this form gonads are first visible in specimens 2–3 mm. high, and are well developed in individuals 6–8 mm. high with 75–80 tentacles. The second race, in dimensions and number of tentacles, closely resembles *A. digitale*, var. *occidentalis* Maas, from which it can be distinguished only by the number of otocysts. Fortunately the present specimens were so well preserved that I was able to count these organs in many of the large individuals; otherwise I would no doubt have recorded them under the latter name. In this race, as is shown in the table, gonads first appear in specimens 7–10 mm. high, and they are well developed in specimens 14 mm. or more high. The largest individual in the series is 29 mm. high, a size previously thought to be attained, in this genus, only by *A. digitale*. In this specimen there are 214 tentacles. Such individuals, except for the number of otocysts, are indistinguishable from *A. digitale* as described by A. Agassiz ('65).

Measurements of specimens.

Locality.	Diameter.	Height.	Tentacles.	Otocysts.	Gonads.
	mm.	*mm.*			
Between Cape Sable and Cape Race, Newfoundland	1.5	2.0	23	4	None.
Do	2.0	3.5	34	6	Do.
Do	3.0	5.0	57	8	Very minute.
Fogo Island, Newfoundland	3.5	5.5	62	8	2 mm. long, male.
Do	4.0	7.0	71	7+	2 mm. long; large eggs.
Between Cape Sable and Cape Race, Newfoundland	4.5	7.0	73	8	Very small; sex?
Woods Hole, Massachusetts	5.0	14.0	108	7+	2 mm. long, male.
30 miles southeast of Nain Labrador	6.0	10.0	115	8	Very minute.
Do	7.5	14.5	131	7+	Large female.
Do	8.0	22.0	163	8	Do.
Do	9.5	20.0	184	8	Do.
Gready Harbor, Labrador	11.0	22.5	167	8	Large male.
Do	13.0	23.0	173	8	Large female.
30 miles southeast of Nain, Labrador	13.0	29.0	214	6+	Large male.

The localities of capture suggest that the occurrence of these two races may indicate a geographic separation, inasmuch as all the specimens (between 1,000 and 1,100) from the south and east coasts of Newfoundland belong to the smaller, while all the specimens from north of the straits of Belle Isle belong to the larger race. But this distinction may prove to be of less significance than now appears, since it is impossible to distinguish the youngest stages of the two races, and since among the southern specimens several are apparently the young of the larger race. So far as the present collection goes there is no evidence that the difference between the two races is a seasonal one, because the smaller was taken in October as well as in July. I may further point out that should the difference between the two prove to be a case of geographic variation the distribution of the two, as illustrated by this collection, would indicate an entirely unexpected division, because the oceanographic conditions on the south coast of Newfoundland, where the effect of the Gulf Stream is often felt, differ markedly from those on the east coast, whereas there is no surface temperature change of importance between the east coast of Newfoundland and that of Labrador.

To settle definitely the question as to the relationship of the two races requires a more complete knowledge of their distribution than we now possess, and particularly a fresh study of their occurrence off the New England coast. In the meantime it is best not to burden the nomenclature of the genus with a fresh varietal name which may soon be found to be unwarranted.

NARCOMEDUSÆ.

The collection contains only one species of this order, *Æginopsis laurentii* Brandt.

ÆGINOPSIS LAURENTII Brandt.

Plate 32, figs. 2–6.

Æginopsis laurentii BRANDT, '38, p. 363, pl. 6.

Fogo Island, Newfoundland, July 28, 43 specimens, 1.5–7 mm. in diameter; Gready Harbor, Labrador, 1 specimen, 6 mm. in diameter; 30 miles southeast of Nain, Labrador, 1 specimen, 4 mm. and 1 specimen 13 mm. in diameter, the latter with well-developed gonads.

Though often recorded, certain anatomical features of this species are still imperfectly known. Especially is it desirable to determine whether or not a canal system is present, inasmuch as this point has never been examined in serial sections, although Maas (:06) has noted that surface views give no indication of the presence of either ring or peronial canals.

In general appearance the older specimens (pl. 3, fig. 2) closely resemble the figures given by Brandt ('38, pl. 6), the bell being of moderate height, and the tentacles arising fron the exumbral surface at a very high level.

Tentacles.—The most important feature of this genus is the fact that while there are only four tentacles, there are eight peroniæ, a fact clearly shown in Brandt's figures and accepted by all later authors.

Gastrovascular system.—The condition of the gastric pockets has been figured by Brandt ('38) and described by Maas (:06) (pl. 32, figs. 2, 3).

The series shows strong evidence that the sixteen gastric pockets of the adult are derived by subdivision from eight primary perradial pockets, one opposite each peronia. In the youngest specimen in the series, 2 mm. in diameter (pl. 32, fig. 4), the condition is as follows: opposite each of the four tentacles the primary pockets are bifid, but opposite the four peroniæ without tentacles the pockets are undivided, exactly as they are in the Cunanthidæ. At a slightly later stage (specimen 3 mm. in diameter) these latter pockets have become subdivided by shallow radial notches at their outer margins. Finally as growth proceeds a condition is reached (pl. 32, fig. 2) in which all eight primary gastric pockets are bifid to the same degree. Judging from these two stages it is reasonable to assume that there are originally four pockets opposite the tentacles, only that in their case the bifid condition is attained earlier than in the four pockets opposite the peroniæ without tentacles.

That the pockets are primarily radial in all the genera now grouped by Maas and by myself (:09) as Æginidæ is a generalization already proposed by Maas on theoretic grounds. But while it is no doubt true for *Æginopsis*, in view of the condition in *Ægina alternans* Bigelow (:09) in which there are only four interradial pockets, the question whether it holds for the entire family must remain open for the present.

A study of serial sections of the marginal region shows that there is no peripheral canal system in this genus. This fact strengthens the view upheld by Maas (:09) and by myself (:09) that the presence or absence of canals is of little value in classification, for while *Æginopsis* and *Solmundella* lack them entirely, *Ægina*, to which they are closely allied by the conformation both of the gastric pockets and of the sense organs, has this system well developed (Maas :05; Vanhöffen :08). This conclusion is opposed to the views of Vanhöffen (:08), who makes the presence or absence of canals a feature of prime importance in classification.

The structure of the sense organs is of interest, since they have not been described previously in this genus. The otocysts are of the ordinary æginid type (pl. 32, fig. 6), containing from 1 to 3 large otoliths and situated on prominent pads of the marginal ring, without otoporpæ. Since the latter organs do not occur, so far as known, in any of the Æginidæ, their absence is to be regarded as an important character. In the smallest individual there are sixteen otocysts, two in each octant. In older specimens octants were observed with three and with four otocysts, the latter number being the largest counted. The greatest number of otocysts in any one individual was twenty-six, in a specimen 7 mm. in diameter. Curiously enough in the largest specimen, 13 mm. in diameter, with mature gonads, there are only sixteen otocysts, two in each octant.

Gonads.—In the mature specimen, the only individual in which gonads are present, the sexual products, variously and irregularly lobed, occupy most of the surface of the gastric pockets (pl. 32, fig. 5). In the quadrant figured they overlap so much as to obscure in aboral views the septa separating the pockets, particularly in the case of the one in the radius of the peronia between the two tentacles.

The occurrence of this species on the coasts of Labrador and Newfoundland was to be expected since it is no doubt of general boreal distribution. It has previously been recorded from various localities off the north coast of Europe and from Greenland, as well as from Bering Strait (Brandt). It is probable also that the record of *Æ. mertensii* (Haeckel '79) from Japan belongs to this species.

SIPHONOPHORÆ.

DIPHYOPSIS CAMPANULIFERA (Eschscholtz).

Diphyes campanulifera Eschscholtz, '29, p. 137.
Diphyopsis campanulifera Chun, '88, p. 1159.

A single characteristic anterior nectophore of this species was taken on the surface at Fogo Island, Newfoundland, July 28. The record of this typical warm-water form is of interest as indicating the northward extent of the warm waters of the Gulf Stream.

SCYPHOMEDUSÆ.

HALICLYSTUS AURICULA H. J. Clark.

Haliclystus auricula H. J. Clark, '63, p. 559.

Six specimens, St. Pierre, off Newfoundland, October 1; 5 fathoms. There are also specimens of this species in the Museum of Comparative Zoölogy, Cambridge, Massachusetts, from Indian Harbor, Labrador.

AURELIA FLAVIDULA Péron and Lesueur.

Aurelia flavidula Péron and Lesueur, '09, p. 47.

The collection contains five immature specimens from Gready Harbor, Labrador, and from Indian Harbor, Labrador. The smallest specimens show the earliest stages in the formation of the canal system, in which they agree closely with the figures of L. Agassiz ('62).

CYANEA ARCTICA Péron and Lesueur.

Cyanea arctica Péron and Lesueur, '09, p. 51.

The collection contains two young specimens of this common species from Indian Harbor, Labrador, August 12; surface.

CTENOPHORÆ.

PLEUROBRACHIA PILEUS (Fabricius).

Beroe pileus Fabricius, 1780, p. 361.
Pleurobrachia pileus Vanhöffen, '95, p. 21.

St. Pierre, Newfoundland, October 1, 6 specimens, all about 14 mm. high.

This species is common in both American and European waters, as well as in Greenland. (Chun, '98, p. 15.)

MERTENSIA OVUM (Fabricius).

Beroe ovum Fabricius, 1780, p. 362.
Mertensia ovum Mörch, '57, p. 97.

This well-known boreal species is represented by three specimens from 30 miles southeast of Nain, Labrador, August 15, and two specimens from Gready Harbor, Labrador, August 8, all 8–10 mm.

in height. The voracity of this form is well illustrated by the fact that one individual had entirely engulfed a young sculpin (*Acanthocottus grœnlandicus* Fabricius) no less than 21 mm. long, the victim being doubled up so as to fit into the digestive cavity of its captor.

M. ovum is a common species in the cold waters north of Cape Cod, whither it is swept by the Labrador current, but it is of only sporadic occurrence south of that dividing line. So far as known the Woods Hole region marks the extreme limit of its southward dispersal in American waters. It is known both from Greenland and from Spitzbergen, and is probably of circumpolar occurrence (Chun, '98, p. 10).

BEROE CUCUMIS Fabricius.

Beroe cucumis FABRICIUS, 1780, p. 361.

Between Cape Sable and Cape Race, July 19, about 100 small specimens, 3–14 mm. high; St. Pierre, off Newfoundland, October 1, 1 specimen, 15 mm. high; Fogo Island, Newfoundland, July 29, 5 specimens, 40–50 mm. high.

Unfortunately the large specimens were all so fragmentary that it was impossible to trace the course of the stomachic canals with any accuracy. However, since these appear to end blindly, the specimens must be referred to *B. cucumis* rather than to *B. ovata*. In the small specimens the blind terminations of the canals were easily traced. *B. cucumis* was taken on the Plankton Expedition in the Labrador current (Chun, '98, p. 27), and is known to be widely distributed throughout Arctic regions. On the coast of the United States it is known to occur as far south as Cape Cod, whither it is no doubt carried by the Labrador current.

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EXPLANATION OF PLATES.

(All figures are from photographs of preserved specimens.)

PLATE 30.

Fig. 1. *Sarsia princeps*, specimen 14 mm. high. The jagged outlines of the radial canals are visible. *c. ap.*, apical canal.

2. *Sarsia mirabilis*, specimen 10 mm. high. *o*, ocellus.

3. *Catablema vesicaria*. A mature specimen 17 mm. in diameter. The bell is opened and its walls turned aside to show the manubrium and the vertical sexual folds (*go.*) in the interradii. *c. ra.*, radial canal; *L*, lip.

4. *Catablema vesicaria*, young specimen 9 mm. in diameter. The radial canals (*c. ra.*) already bear glandular diverticula, but the margin of the circular canal (*c. c.*) is still smooth.

5. *Tiara pileata*. Segment of bell-wall and margin. The radial canal (*c. ra.*) shows lateral diverticula, but the circular canal (*c. c.*) is smooth.

PLATE 31.

Fig. 1. *Melicertum campanula*. One octant of bell margin of specimen 12 mm. in diameter showing fully developed tentacles (T^1), small tentacles (T^2), and rudimentary tentacles in the form of cirri (*ci*). *go*, gonad.

2. *Bougainvillea superciliaris*. Side view of specimen 5.5 mm. in diameter.

3. *Lizzia octopunctata*. Side view of a budding individual 3.5 mm. in diameter.

4. Oral view of another individual of the same size. *T. Ra.*, radial, *T. ira.*, interradial tentacle-group.

5. *Lizzia octopunctata*. Lip (*L*) showing nematocyst knobs (*nem.*).

6. *Catablema vesicaria*. Segment of bell showing glandular diverticula on both radial canal (*c. ra.*) and circular canal (*c. c.*), and the form of the basal tentacular bulbs, especially in the case of the radial tentacle (*T. Ra.*), which is turned to one side. *g*, gelatinous substance of bell.

7. *Tiara pileata*. Dissection of margin of bell to show lateral aspect of tentacular bulb. *c. c.*, lumen of circular canal. *g*, gelatinous substance of bell.

PLATE 32.

Fig. 1. *Melicertum campanula*. One octant of margin of medium-sized individual 6 mm. in diameter showing tentacles in various stages of development. *go.*, gonad.

2. *Æginopsis laurentii*. Side view of specimen 7 mm. in diameter, showing the conformation of the gastric pockets (*g. p.*) and their separation in the radii of the peroniæ (*Per.*). *T*, tentacle.

3. Aboral view of another individual of about the same size. *Per.*, peronia.

4. Oral view of gastric wall of individual 1.5 mm. in diameter. Lettering as in fig. 2, *L*, lip.

5. Oral view of gastric wall of specimen 13 mm. in diameter, to show sexual folds (*go.*). *Per.*, peronia; *g*, gelatinous substance; *L*, lip; *T*, tentacle.

6. Otocyst, with otolith (*otl.*). × 200.

Fig. 1.

Fig. 2

Fig. 3.

Fig. 4

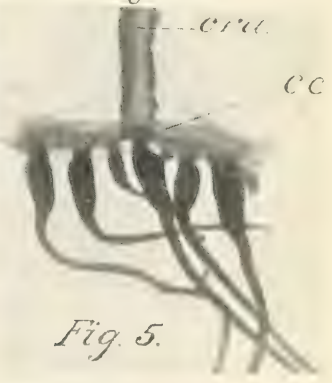


Fig. 5.

LABRADOR AND NEWFOUNDLAND MEDUSÆ.

FOR EXPLANATION OF PLATE SEE PAGE 320.

Fig. 1.

Fig. 2.

Fig. 3.

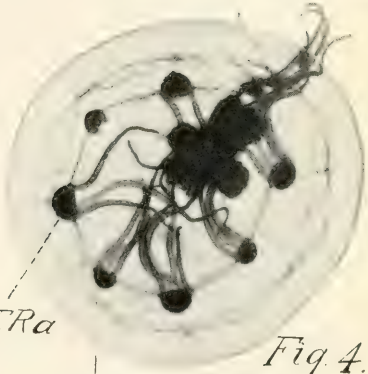


Fig. 4.

T.ira

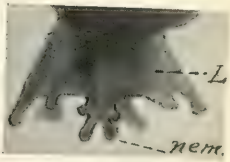


Fig. 5.

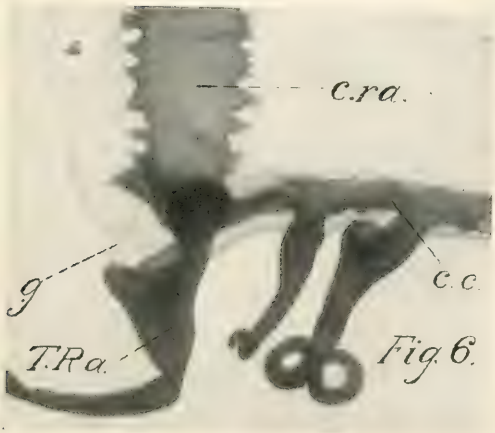


Fig. 6.

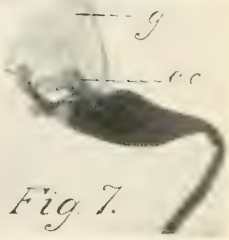


Fig. 7.

LABRADOR AND NEWFOUNDLAND MEDUSÆ.

FOR EXPLANATION OF PLATE SEE PAGE 320.

Fig. 1.

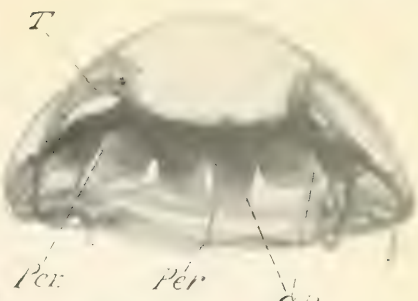


Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

LABRADOR AND NEWFOUNDLAND MEDUSÆ.

FOR EXPLANATION OF PLATE SEE PAGE 320.

THREE NEW LAND SHELLS FROM MEXICO AND GUATEMALA.

By Paul Bartsch,
Assistant Curator, Division of Mollusks, U. S. National Museum.

Among the mollusks collected by Messrs. E. W. Nelson and E. A. Goldman in Mexico and H. Pittier in Guatemala are several new forms which are characterized below.

EUGLANDINA NELSONI, new species.

Plate 33, figs. 1, 3, 4, 6.

Shell elongate, ovate, semitranslucent, light horn yellow. Nuclear whorls, two and one-half, smooth. Post-nuclear whorls slightly rounded, appressed at the summit, marked by numerous slender, slightly retractive axial riblets which are about as wide as the shallow spaces that separate them. These riblets are strongest near the suture which they render feebly crenulate, and least developed on the base. There is no indication of spiral sculpture. Sutures well marked. Outer lip of aperture sigmoid in outline, the middle portion being built out; columella evenly, gently curved.

There are four specimens of this species before me, cotypes (Cat. No. 207784 U.S.N.M.), collected by Nelson and Goldman at Acaponeta, Tepic, Mexico. They vary considerably in size and outline.

The following table gives their measurements:

Number of whorls.	Length.	Diameter.	Length of aperture.[a]	
	mm.	*mm.*		
7	39.0	15.0	12.2	
6	37.0	15.5	19.6	
6	31.7	15.5	17.3.	Apex deformed.
6	30.0	14.0	16.0.	Not quite mature.

[a] The length of aperture is taken from the posterior angle to the most anterior point of the outer lip.

Named for E. W. Nelson.

OMPHALINA PITTIERI, new species.

Plate 33, figs. 2, 7, 8.

Shell with depressed broadly conic spire, thin, semitransparent, of light olive color. Nuclear whorls two and one-fourth, vitreous with a few feeble distant axial striations in the early portion. On the later they become gradually stronger and closer spaced until they assume the character of the sculpture of the succeeding turns. Postnuclear whorls well rounded, marked by numerous quite regular, closely crowded, decidedly retractive, axial riblets. Sutures well impressed. Periphery of the last whorl well rounded, marked by the continuations of the axial riblets. Base broadly, openly, umbilicated, well rounded, marked by the continuations of the axial riblets, which are less strong here than on the upper surface. In addition to these riblets the base is marked by quite evenly distributed, strongly impressed axial lines which lend it the appearance of being rather coarsely ribbed. These impressed lines are much more distantly spaced than the riblets on the spire and are strongest within the umbilicus. Entire surface minutely spirally striated. Aperture subcircular, its walls very thin.

The type (Cat. No. 207783 U.S.N.M.) was collected by Prof. H. Pittier at Alta Vera Paz, in the vicinity of Secanquim, Guatemala, at an altitude of 550 meters. It has 6¼ whorls and measures: Altitude 21.0 mm., greatest diameter 33.4 mm., lesser diameter 29.0 mm.

The present species is related to *O. euryomphala* Pfeffer, but is smaller and has the whorls more rounded. This difference in the whorls renders the aperture of *euryomphala* oval, while that of *pittieri* is almost circular.

Named for Henry Pittier.

EUGLANDINA PILSBRYI, new species.

Plate 33, fig. 5.

Shell elongate ovate, chocolate brown. Nuclear whorls four, marked by fine retractive axial riblets, which have a tendency to form two series, one a little stronger than the other, the two alternating. Succeeding whorls almost four, moderately rounded, shouldered at the summit, marked by irregular and irregularly slanting sinuous, strong axial riblets, which extend equally strong over the entire surface of the whorl. In addition to the axial sculpture the intercostal spaces show traces of spiral striation at irregular intervals. Sutures strongly marked. Periphery and base well rounded, the latter slightly produced. Aperture auriculate, chocolate brown with a bluish cast within; posterior angle acute; outer lip thin, sinuous,

somewhat produced at the periphery; columella short, curved, revolute, truncated anteriorly; parietal wall glazed with a thin callus.

The type (Cat. No. 207776 U.S.N.M.) was collected by Nelson and Goldman near Bolanos, Jalisco, Mexico. It measures: Length 63.7 mm., diameter 27.5 mm., length of aperture 31.0 mm.

Named for Henry A. Pilsbry.

EXPLANATION OF PLATE 33.

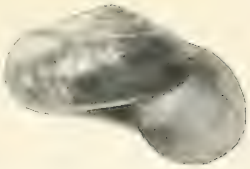
All figures natural size.

Figs. 1, 3, 4, and 6. *Euglandina nelsoni* Bartsch.

Figs. 2, 7, and 8. *Omphalina pittieri* Bartsch.

Fig. 5. *Euglandina pilsbryi* Bartsch.

1



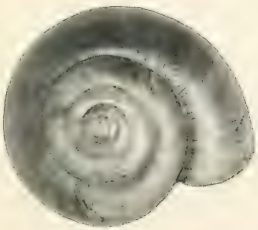
2

3

4

5

6



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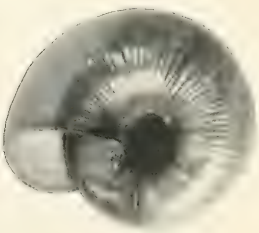


8

LAND SHELLS FROM MEXICO AND GUATEMALA.

FOR EXPLANATION OF PLATE SEE PAGE 323.

STUDIES OF NORTH AMERICAN WEEVILS.

By W. Dwight Pierce,

Of the Bureau of Entomology, U. S. Department of Agriculture.

While in Washington during the winter of 1908–9 it was my pleasure, through the courtesy of Dr. L. O. Howard and Mr. E. A. Schwarz, to study the collections of weevils in the U. S. National Museum. The following notes present the records of all determined specimens in the collections of North American weevils as they are at present arranged in those groups preceding the true Curculionidæ.

The most recent writers on the Rhynchophora seem to agree in the main in considering only four families—Curculionidæ, Anthribidæ, Brenthidæ, and Ipidæ (Scolytidæ). This arrangement necessitates the subdivision of the Curculionidæ into a very large number of subfamilies. In all probability each of these families will soon be raised to superfamily rank, and the tribes of LeConte and Horn will in many cases become families or subfamilies.

Recognizing the Curculionidæ as a family at present, I shall follow Sharp and Champion in the use of groups where LeConte and Horn used tribes. The order of these groups is kept practically as now recognized in America.

Family CURCULIONIDÆ.

Subfamily RHINOMACERINÆ.

KEY TO GENERA.

Maxillary palpi filiform and flexible.....*Rhinomacer* Fabricius.
Maxillary palpi normal.....*Diodyrrhynchus* Schönherr.

Genus RHINOMACER Fabricius.

KEY TO SPECIES OF RHINOMACER.

Pubescence long and coarse.
  Prothorax not longer than wide .....*pilosus* LeConte.
  Prothorax longer than wide .....*elongatus* LeConte.
Pubescence short and fine.
  Prothorax evenly rounded from base, considerably narrower than elytra, *comptus* LeConte.
Pubescence long and sparse, head very convex, eyes protuberant.*bombifrons* LeConte.

RHINOMACER PILOSUS LeConte.

This is included in the U. S. National Museum from Cambridge, Massachusetts; Washington, District of Columbia, May 9; Marquette, Michigan, June, July; Eagle Harbor, Lake Superior, June; all from the Hubbard and Schwarz collection; and from Agricultural College, Mississippi, November (Weed).

RHINOMACER ELONGATUS LeConte.

Durham, New Hampshire (Weed and Fiske); Washington, District of Columbia, April, May; Marquette, Michigan, July (Hubbard and Schwarz); Bayfield, Wisconsin; Ontario (Wickham); Eufaula, Alabama, February, on pine trees; Meridian, Mississippi, February; Jackson, Mississippi, February (Hubbard and Schwarz); Texas.

RHINOMACER COMPTUS LeConte.

Veta Pass, Colorado, June; Tenino, Washington (Hubbard and Schwarz).

RHINOMACER BOMBIFRONS LeConte.

This species is not represented.

Genus DIODYRRHYNCHUS Schönherr.

DIODYRRHYNCHUS BYTUROIDES LeConte.

Monterey County, California, January, on needles of *Pinus radiata* (Coleman); The Dalles, Oregon, May (Hubbard and Schwarz).

Subfamily ALLOCORYNINÆ.

Genus ALLOCORYNUS Sharp.

ALLOCORYNUS SLOSSONI Schaeffer.

Biscayne Bay, Florida (Mrs. A. T. Slosson).

Subfamily RHYNCHITINÆ.

Genus AULETES Schönherr.

KEY TO SPECIES OF AULETES.

Antennæ inserted at middle of beak; last joint of club triangular, pointed, as wide as the preceding; body black, coarsely punctured, thinly pubescent. . . . *ater* LeConte.

Antennæ inserted at about basal third of beak.

Body black, finely punctured, thinly pubescent; beak nearly as long as head and prothorax; last joint of antennæ narrower than the preceding, obtuse, *nasalis* LeConte.

Body pale yellowish throughout; pubescence sparse, short, semierect; beak twice as long as head; last joint of antennal club about as wide as tenth, slightly wider than long and obtusely rounded at apex; the tenth joint fully as long as wide. . . . . *laticollis* Casey.

Body black, with disk of elytra red, finely punctured, sparsely pubescent; beak as long as prothorax and occiput; last joint of antennal club a little narrower than preceding, longer than wide, rounded at tip.....*rufipennis*, new species.

Antennæ inserted within basal fourth of beak.

Body greenish, lustrous, rather coarsely punctured, thinly clad with short, semierect pubescence; beak as long as prothorax; last joint of antennal club slightly narrower than the preceding, as long as wide, obtusely rounded at apex, *viridis*, new species.

Body bluish black, densely punctured, thinly pubescent.....*congruus* Walker.

Very small, brown, irregularly pubescent.....*cassandræ* LeConte.

AULETES ATER LeConte.

Milton, Massachusetts, June; Warwick, Rhode Island, May (E. S. Calder); New York (Linell); Toronto, Canada, May (R. J. Crew); Port Huron, Michigan, June (Hubbard and Schwarz); Cadet, Missouri (J. G. Barlow).

AULETES NASALIS LeConte.

This species is not represented.

AULETES LATICOLLIS Casey.

This species is not represented.

AULETES RUFIPENNIS, new species.

Described from one specimen collected by D. W. Coquillett, in Los Angeles County, California (922).

Length 2 mm. Three-fourths longer than wide, slightly convex; black, with elytra, except a wide band along the suture and lateral edges, reddish brown, and with antennal funicle, tip of beak and legs more or less piceous, or testaceous; punctuation fine; pubescence sparce, short, semierect, whitish. Head with occiput wider than long, convex; feebly convex between the eyes; occiput finely, transversely, lineolately rugose; punctuation between the eyes shallow, sparse, several of the median punctures open in front; eyes large, convex, and prominent. Beak as long as thorax and occiput, one-third as wide as head, slightly arcuate behind base of antennæ, somewhat flattened above and below, medianly shallowly sulcate, laterally punctato-sulcate; scrobes deep, beginning in a point at above middle and almost as wide as depth of beak at base; antennæ inserted just within the basal third of the beak, two basal joints stout, others small, becoming shorter; club large, very loosely jointed, first and second joints subquadrate and equal, third a little narrower and constricted at base, longer than wide and rounded at tip. Prothorax widest at basal third, barely one-third wider than long, sides strongly arcuate at base, more strongly convergent and straighter toward apex; apex straight, more than three-fourths as wide as base; base broadly and feebly arcuate; disk evenly and feebly convex,

transversely impressed near base, finely, feebly, sparsely and unevenly punctate with traces of median sulcus on impunctate line. Elytra broadly and separately rounded at apex, one-half longer than wide, two-thirds wider than prothorax, sides parallel and nearly straight; humeri narrowly rounded; disk convex, impressed along suture, feebly and irregularly punctate, rather finely and more coarsely so near suture. Claws armed with a large tooth.

Type.—Cat. No. 12589, U.S.N.M.

AULETES VIRIDIS, new species.

Described from three specimens collected in July in Siskiyou County, California, by A. Koebele. Another specimen in the Hubbard and Schwarz collection is labeled from Colorado.

Length 2 mm. Twice as long as wide, slightly convex; greenish, lustrous throughout, antennæ piceous, beak violaceous; punctuation coarse and generally rather close; pubescence moderate, short, semierect, whitish. Head almost flat between the eyes; punctuation behind the eyes very minute, but between them close and coarse; front sulcate; eyes large, convex, and prominent. Beak short, stout, as long as prothorax, over one-third as wide as the head, evenly arcuate, cylindrical, rugosely punctate, finely above and more coarsely on the sides; scrobes deep, broad, anterior opening broad, rounded, not narrowed to a point as in *rufipennis*, beginning at basal third of beak; antennæ inserted at basal fourth, 11-jointed, scape and first funicular joint short and stout, second funicular longer than broad, last four becoming shorter and transverse; club three-jointed, as long as the preceding portion of the antennæ and three times as broad, first two joints quadrate, third slightly narrower, as long as wide, obtusely rounded at apex. Prothorax widest at basal third, wider than long, sides strongly arcuate at base, more strongly convergent and straighter toward apex; apex straight, three-fourths as wide as base; base broadly, feebly arcuate; disk evenly and feebly convex, transversely impressed near base, coarsely, closely, and unevenly punctate with a smooth impunctate line in front, becoming a sulcus behind the middle. Elytra separately rounded at apex, one-half longer than wide, two-thirds wider than the prothorax, sides nearly straight, humeri narrowly rounded; disk almost flat, somewhat impressed along suture, coarsely, closely, and unevenly punctate. Claws armed with a large tooth.

Type.—Cat. No. 12588, U.S.N.M.

AULETES CONGRUUS Walker. (SUBCŒRULEUS LeConte.)

Fort McKenny, Wyoming; National Park, Wyoming, August (Hubbard and Schwarz); Leavenworth Valley, Colorado, June (Wickham); Moscow, Idaho (Aldrich).

AULETES CASSANDRÆ LeConte.

Durham, New Hampshire; Webster, New Hampshire; Nottingham, New Hampshire (Fiske); Holderness, New Hampshire (Hubbard and Schwarz); Marion, Massachusetts; Oswego, New York, July, August; Dundee, New York, June (Hubbard and Schwarz); Water Gap, Pennsylvania; Detroit, Michigan (Hubbard and Schwarz); Bayfield, Wisconsin (Wickham); Crescent City, Florida; Key West, Florida, April; Mobile, Alabama, June (Hubbard and Schwarz); Mississippi (Soltau).

Genus EUGNAMPTUS Schönherr.

KEY TO SPECIES OF EUGNAMPTUS.

Elytral interspaces very narrow.....*striatus* LeConte.
Elytral interspaces wider than the striae.
Front not channeled.
Head feebly punctured, narrowed behind.....*angustatus* Gyllenhal.
Head feebly punctured, not narrowed behind.....
collaris Gyllenhal; *pallidus* Schaeffer.
Head more strongly punctured, antennæ stouter.....*puncticeps* LeConte.
Front distinctly channeled.
Head nearly smooth, slightly narrowed behind.....*nigriventris* Schaeffer.
Head feebly punctured, narrowed behind.....*sulcifrons* Gyllenhal.

EUGNAMPTUS STRIATUS LeConte.

Hanover, Florida, March; Crescent City, Florida (Hubbard and Schwarz).

EUGNAMPTUS ANGUSTATUS Gyllenhal.

Chicopee, Massachusetts, July; Lime Rock, Pennsylvania (Wickham); Washington, District of Columbia, June; Afton, Virginia; Harper's Ferry, West Virginia, May; St. Catherine Island, Georgia, April; Retreat, North Carolina, May; Port Huron, Michigan, June; Detroit, Michigan (Hubbard and Schwarz); Iowa City, Iowa, June (Wickham); Kansas; Kenosha, Nebraska (Shimek); West Point, Nebraska, June (Bruner).

EUGNAMPTUS COLLARIS Gyllenhal.

Marion, Massachusetts, July; Montgomery, Massachusetts (Wickham); Lime Rock, Pennsylvania; Washington, District of Columbia, June, July; Retreat, North Carolina; St. Catherine Island, Georgia, April; Jacksonville, Florida; Oak Grove, Alabama (Hubbard and Schwarz); Iowa; Texas (Belfrage); Pinal Mountains, Arizona (Wickham).

EUGNAMPTUS PALLIDUS Schaeffer.

Not represented.

EUGNAMPTUS PUNCTICEPS LeConte.

Washington, District of Columbia, June (Hubbard and Schwarz); Arizona (Morrison).

EUGNAMPTUS NIGRIVENTRIS Schaeffer.

Chiricahua Mountains, Arizona, June; Santa Rita Mountains, Arizona, May (Hubbard and Schwarz); Huachuca Mountains, Arizona, July (Schaeffer).

EUGNAMPTUS SULCIFRONS Gyllenhal.

Alexandria, Virginia, July (Palmer); Jacksonville, Florida; Oak Grove, Alabama, June (Hubbard and Schwarz); Meridian, Mississippi, June (Soltau); Texas (Belfrage); Onaga, Kansas, June (Crevecoeur).

Genus RHYNCHITES Herbst.

KEY TO SPECIES OF RHYNCHITES.

Pubescent species.
- Pubescence coarse, white, prostrate; thorax black, elytra violet coppery, *velatus* LeConte.
- Pubescence short.
  - Black, prothorax red, elytral intervals very finely punctured, *palmii* Schaeffer.
  - Entirely red above ..... *bicolor* Fabricius.
- Pubescence long, erect.
  - Beak bistriate and carinate at base.
    - Striæ distant, not very distinct.
      - Color black bronzed; pubescence long ..... *æneus* Boheman.
      - Color blue; pubescence long ..... *mexicanus* Gyllenhal.
      - Color golden, tinged with green; pubescence not so long, *eximius* LeConte.
    - Striæ composed of large deep punctures.
      - Elytral intervals serially punctulate; beak narrow; color bluish-black ..... *hirtus* Fabricius.
      - Elytral intervals not serially punctulate; beak much longer; pronotal punctuation denser; color greenish ..... *naso* Casey.
  - Beak flattened, not carinate at base; color green ..... *planifrons* LeConte.

Pubescence very fine, inconspicuous and decumbent, or absent.
- Legs yellow or reddish; body coppery golden ..... *aureus* LeConte.
- Legs dark colored.
  - Bronzed; frontal fovea deep ..... *fossifrons* LeConte.
    (This may have been an extreme variation. *Rh. æratoides* sometimes displays a frontal fovea, and may possibly be a synonym of this species).
  - Frontal fovea usually obsolete.
    - Blue bronzed; head strongly punctured ..... *cyanellus* LeConte.
    - Æneus or coppery; head more or less feebly punctured.
      - First three ventral segments of male with median impressed line; elytra very feebly depressed behind base; beak medianly sulcate; color greenish-æneus ..... *æratoides* Fall.

First three ventral segments of male smooth.

Beak in both sexes longer than prothorax; elytra viewed in profile strongly depressed behind base, median line sinuate; beak opaque, longitudinally impressed, long and slender; color coppery ..... *aratus* Say.

Beak in male only three-quarters as long as prothorax, in female longer than the prothorax, more or less distinctly sulcate, sulcus sometimes extending onto front; elytra viewed in profile slightly depressed behind base; hind femora of female more or less swollen; color ranging from black to green or æneus; size varies from 1.3 to 2.3 mm.. *macrophthalmus* Schaeffer.

RHYNCHITES VELATUS LeConte.

Not represented.

RHYNCHITES PALMII Schaeffer.

Arizona (Charles Palm).

RHYNCHITES BICOLOR Fabricius.

Mount Tom and Boston, Massachusetts; Durham, New Hampshire; Washington, District of Columbia; Iowa City, Index, Sioux City, and Spirit Lake, Iowa; Minnesota; Wisconsin; Winnipeg and Aweme, Manitoba; Volga and Brookings, South Dakota; University, North Dakota; Havre and Kalispell, Montana; Breckenridge, Berkeley, and Ouray, Colorado; Cheyenne and National Park, Wyoming; American Fork, American Fork Canyon, and Fort Douglas, Utah; Pocatello, Idaho; Kaslo and North Bend, British Columbia; Victoria, Vancouver; Oregon; Everett, Easton, Seattle, and Takoma, Washington; Eureka, Los Gatos, San Francisco, Kaweah, Dunsmuir, San Mateo County, San Diego County, and Los Angeles County, California; Williams and Prescott, Arizona; Santa Fe, New Mexico.

RHYNCHITES ÆNEUS Boheman.

Lake City, Florida; Big Springs, Texas; Detroit, Michigan; Wisconsin; Chicago and Bloomington, Illinois; Arkansas; Iowa; Volga, South Dakota; West Point, Nebraska; Ottawa, Kansas; Brandon and Winnipeg, Manitoba; Oregon.

RHYNCHITES MEXICANUS Gyllenhal.

San Antonio, Texas, May, on *Coreopsis cardaminefolia* (Pierce); San Diego, Texas, October (Schwarz); Catalina Springs, Arizona, April, on *Eucillia farinosa* (Hubbard and Schwarz).

RHYNCHITES EXIMIUS LeConte.

Colorado Springs, Colorado, June, on *Thelesperma gracilia* (Wickham); Flagstaff, Arizona, July (Hubbard and Schwarz).

RHYNCHITES HIRTUS Fabricius.

Boston, Massachusetts, June (Ormonde); New York (Linell); Washington, District of Columbia, June, July; Haulover, Florida, March; Enterprise, Florida, May; Tampa, Florida, April; Michigan (Hubbard and Schwarz).

RHYNCHITES NASO Casey.

Los Angeles County, California, April, on *Juniperus californicus;* San Bernardino County, California, May (Coquillett).

RHYNCHITES PLANIFRONS LeConte.

Los Gatos, California (Hubbard and Schwarz).

RHYNCHITES AUREUS LeConte.

Oregon; Lake Tahoe, California, September (Koebele); Los Angeles County, California, July (Coquillett); Ojai Valley, Colorado (Hubbard and Schwarz).

RHYNCHITES CYANELLUS LeConte.

Webster, New Hampshire (Fiske); Toronto, Ontario, May (R. J. Crew); Detroit, Michigan; Eagle Harbor, Lake Superior, July (Hubbard and Schwarz); Bayfield, Wisconsin (Wickham); Iowa; West Point, Nebraska, June, on willow (Bruner); Bear Creek Canyon, Evans Peak Range, Colorado, July (E. J. Oslar).

RHYNCHITES ÆRATOIDES Fall.

Redondo, California, April, May (Fall); Los Angeles County, California (Coquillett).

RHYNCHITES ÆRATUS Say.

Bladensburg, Maryland, June; Washington, District of Columbia, May, June; North Carolina; St. Catherine Island, Georgia, April; Stone Creek, Lee County, Virginia (Hubbard and Schwarz); Missouri; Nebraska City, Nebraska, June.

RHYNCHITES MACROPHTHALMUS Schaeffer.

Ouray, Colorado, July; Colorado Springs, Colorado, June (Wickham); Brownsville, Texas, June (Townsend); Arizona (Morrison); Chiricahua Mountains, Arizona, June (Hubbard and Schwarz).

Genus DEPORAUS Samouelle.

DEPORAUS GLASTINUS LeConte.

Arizona (Morrison); Chiricahua Mountains, Arizona, June (Hubbard and Schwarz); Williams, Arizona, June (Barber and Schwarz); Ouray, Colorado, July (Wickham); Redwood Creek, Humboldt

County, California, June (Barber); Los Gatos, California (Hubbard and Schwarz); Los Angeles County, California, July (Coquillett); Santa Cruz Mountains, California (Koebele); American Fork Canyon, Utah, June (Hubbard and Schwarz); Washington (Morrison); Tenino, Washington (Hubbard and Schwarz).

Subfamily PTEROCOLINÆ.

Genus PTEROCOLUS Schönherr.

PTEROCOLUS OVATUS Fabricius.

Andover, Massachusetts; Dover, Massachusetts, June (Wickham); Atco, New Jersey, June; Lehigh Mountain, Pennsylvania, June; Washington, District of Columbia, June (Hubbard and Schwarz); Maryland; St. Catherine, Georgia, April; Crescent City, Florida; Haulover, Florida, March (Hubbard and Schwarz); Iowa City, Iowa (Wickham); Missouri (Riley); Texas.

Subfamily ATTELABINÆ.

Genus ATTELABUS Linnæus.

ATTELABUS ANALIS Illiger.

Toronto, Canada (R. J. Crew); Rawdon, Ontario, July (Hastings); Winton, New Hampshire, August; Springfield, Massachusetts, June; Chicopee, Massachusetts, July; Wellesley, Massachusetts, July; Melton, Massachusetts; Merchantville, New Jersey, June; Allegheny, Pennsylvania; Washington, District of Columbia, June; Pennington Gap, Virginia, June; Afton, Virginia; Biscayne, Florida, May; Haulover, Florida, March (Hubbard and Schwarz); Archer, Florida; Columbus, Texas, June; Detroit, Michigan (Hubbard and Schwarz); Indiana; Iowa City, Iowa (Wickham).

ATTELABUS NIGRIPES LeConte.

Marion, Massachusetts, July; Bladensburg, Maryland, July; Great Falls, Maryland, May (Hubbard and Schwarz); Virginia, June; Berkeley, West Virginia; Iowa City, Iowa (Wickham); St. Louis, Missouri (Riley); Kansas; Colorado.

ATTELABUS BIPUSTULATUS Fabricius.

West Springfield, Massachusetts, June; Boston, Massachusetts, June (Ormonde); Marion, Massachusetts, July; Atco, New Jersey, June; Allegheny, Pennsylvania; Washington, District of Columbia, June; Berkeley, West Virginia; Retreat, North Carolina, May; Marquette, Michigan, June; Detroit, Michigan (Hubbard and Schwarz); Bayfield, Wisconsin (Wickham); St. Louis, Missouri (M. Schuster); Arkansas; Texas.

ATTELABUS GENALIS LeConte.

This species is not represented in the collection.

ATTELABUS RHOIS Boheman.

Holderness, New Hampshire, September, on *Alnus;* Durham, New Hampshire (Weed and Fiske); Lewiston, Maine (Hubbard and Schwarz); Springfield, Massachusetts, July; Lawrence, Massachusetts; Marion, Massachusetts, July; Halifax, Nova Scotia (Wickham); Pennington, Virginia, July; Marquette, Michigan, July (Hubbard and Schwarz); Bayfield, Wisconsin (Wickham); Southern Illinois, on *Corylus americana;* Iowa City, Iowa (Wickham); Onaga, Kansas (Crevecoeur); Baldwin, Kansas (Baldwin); West Point, Nebraska, June (Bruner); Chiricahua Mountains, Arizona, June (Hubbard and Schwarz).

Subfamily THECESTERNINÆ.

Genus THECESTERNUS Say.

This genus has long been left alone because of doubt as to the specific characters available. The majority of specimens in the collections are badly rubbed or else matted with dirt. It is not advisable to attempt a determination of rubbed specimens. There are, however, several distinct species in the series of eighty-four specimens which I examined in the National Museum collection. I have some hesitation in describing them, because I realize that possibly one or two may be synonymous with LeConte's species. Valid descriptions are, however, necessary. How many of LeConte's species are good I can not say, although I consider that *rectus* is a synonym of *humeralis*, while *rudis* and *crosus* are possibly variations of *affinis*. The four species herein described as new are all from the extreme southwestern semiarid and arid portions of the country.

KEY TO SPECIES OF THECESTERNUS.

I. Elytra without clusters of erect black setæ; prothorax at widest part as wide as, or wider than the elytra at humeri, not strongly narrowed on sides at front, very feebly elevated in front; humeral angles prominent, but never produced.

Setæ white, decumbent; prothorax very coarsely pitted; elytra coarsely pitted and tuberculate.....*foveolatus*, new species.

Setæ brown and white, erect; prothorax coarsely punctured, tuberculate; elytra coarsely pitted and densely tuberculate; entire body bristling with erect setæ.....*hirsutus*, new species.

(Prothorax unequal, less deeply impressed on sides, hardly transversely elevated at apex, elytra not produced at humeri.....*morbillosus* LeConte.)

II. Elytra with clusters of erect black scales; prothorax at widest part rarely as wide as the elytra at humeri.

Prothorax one-third longer than wide, very gradually narrowed at base and tip, with four dorsal impressions, and strong lateral impression; elytra only moder-

ately emarginate at base, with humeri only slightly produced, and somewhat acute.....*longior* LeConte.

Prothorax wider than long, strongly narrowed on sides at apex, with elevated apical ridge; humeral angles more or less prominent, produced.

Humeral angles very prominently produced to at least basal fourth of prothorax; elytra in outline sinuate from tip of humeri; setæ brown and white, suberect.....*humeralis* Say (*rectus* LeConte).

Humeral angles only slightly produced forward.

Elytra only slightly more than twice as long as prothorax, sides slightly convex; humeral angles very short; setæ dark and white, more or less prominent.....*maculosus*, new species.

Elytra at least two and a half times as long as prothorax, sides subparallel; humeral angles twice as long as in preceding species; setæ dark and white, erect.....*albidus*, new species.

Elytra not two and a half times as long as prothorax, sides convex; humeral angles moderate, generally covering basal angles of prothorax; setæ dark and white.....*affinis* LeConte (*rudis* LeConte) (*erosus* LeConte).

THECESTERNUS FOVEOLATUS, new species.

Described from a series of seven specimens in the collection of the Southern Field Crop Insect and Tick Investigations, collected by J. D. Mitchell and R. A. Cushman at Marfa, Texas, June 5, 1908.

Length 8–10 mm. Black, densely clothed with white scales below, and on head; with scaly vestiture above mottled in distinct patterns; without any clusters of erect black scales on elytra; sparsely clothed with white bristles, which are, however, never prominent.

Large, robust, outline almost straight from anterior portion of thorax to posterior third of elytra, thence sinuate, apex broadly rounded. Head convex; densely clothed with narrow white scales radiating from center of occiput; punctuation in three series, largest punctures very shallow and ill defined, between these are sharp fine punctures, and finally the entire surface is exceedingly minutely punctulate; front sulcate. Prothorax very large, slightly wider than long, widest at anterior third, where it is wider than the elytra at the humeri, rather abruptly narrowed in front of this point; base straight, apex arcuate; ocular lobes large, broadly rounded; a broad deep impression starts at the sides near the base, travels forward on the sides, upward at the apex, becomes very deep at sides of disk, just within the widest point and then crosses the disk, arching forward; the punctuation of the thorax has become pitting in this species, with the pits irregular, sometimes connected, and the partitions very thin; scaly vestiture very dense in front and at sides. Elytra with humeri very slightly prominent, more than twice as long as prothorax; striate, the first, third, and fifth and other alternate interspaces wider than the even series, with a double row of small tubercles; striæ wider than intervals, pitted with very large quadrate pits, separated by high transverse tubercles, each pit with a distinct round puncture in its center; bristles are borne on these tubercles

and on the interspaces; scaly vestiture condensed in transverse fasciæ. Under surface of abdomen deeply, moderately, and rather sparcely punctured, with squamiform setæ arising from each puncture; scaly vestiture dense except in punctures. Metathoracic sidepieces anteriorly prolonged obliquely upward and forward, causing a deep emargination of the elytra and sometimes extending over the elytral margin.

The markings of this species are very plain, being composed of blotches of black and white. It may readily be separated from the other species by the characters given in the table.

Type.—Cat. No. 12590, U.S.N.M.

THECESTERNUS HIRSUTUS, new species.

Described from a series of three specimens in the Hubbard and Schwarz collection, collected by E. A. Schwarz at San Diego, Texas, in April, May, and June.

Length 4.5–8.5 mm. Black, densely mottled above and below with brown and pale scales, intermixed and bristling with erect brown and white setæ, but with no patches of erect black scales.

Variable in size, oblong, very much resembling *Acalles* in form and color. Head convex, closely clad with narrow, elongate, appressed scales radiating from about the middle of the occiput in all directions, mixed with a few white setæ; punctuation very shallow and sparse in largest series, very finely, minutely, and closely punctulate; front sulcate. Prothorax about as long as wide, widest a little beyond the middle, where it is slightly wider than the humeri; broadly rounded on sides, especially toward apex, not suddenly constricted; base straight, slightly angulate at suture of elytra; apex convex; ocular lobes broad, prominent; sides moderately impressed behind, anterior transverse impression evident on sides and slightly so on disk; surface pitted with large, coarse, close pits, partitions tuberculate; vestiture close, composed of both scales and bristles. Elytra slightly emarginate at suture; humeri almost rectangular, very slightly enlarged; elytra twice as long as prothorax; striate as in preceding species, sometimes covered with many small tubercles; scaly vestiture close, mottled brown and light, surface bristling with brown and white setæ. Metathoracic sidepieces causing a rounded emargination of the elytra.

Type.—Cat. No. 12591, U.S.N.M.

THECESTERNUS HUMERALIS Say.

A series of sixteen specimens from Colorado, Nebraska, Kansas, and Missouri appear to answer to the description of this species.

The humeral angles are very prominent, although produced in varying degrees, always directed outward and forward, causing a sinuation of the lateral margin of the elytra. The thorax is deeply

emarginate on the sides in front, elevated into a broad rounded arcuate ridge in front, strongly depressed on the sides and in two spots on the disk behind the middle. The body is extremely densely clothed with a dull yellowish brown crust of closely appressed scales, with numerous semierect brown and white setæ, and with clusters of close dark scales pushing up through the crust on the third interspace especially.

The following are the records assigned distinctly to this species: Canyon City, Colorado (Wickham); Denver, Colorado (Dyar and Caudell); Fort Collins, Colorado, June 17; Colorado Springs, Colorado, June 15 (Wickham); Nebraska, Central Missouri, May (Riley), Kansas.

There is no essential difference in the sexes, as two pairs are before me from Denver, the males being considerably smaller.

THECESTERNUS MACULOSUS, new species.

Described from one specimen in the collection of the Southern Field Crop Insect and Tick Investigations, collected by J. D. Mitchell and R. A. Cushman at Marfa, Texas, June 6, 1908.

Length 7.5 mm. Black, clothed with black and white scales, mainly white below, mottled but arranged in more or less distinct transverse fasciæ with a black V on the base of the thorax; with black and white setæ more or less erect, and with erect masses of black scales especially on the third interspace.

Robust, outline broadly elliptic. Head convex, clothed with broad, flat scales, white on the front, and black on the occiput with three longitudinal lines of white and ochreous scales, setæ sparse; front sulcate. Prothorax a little wider than long, widest in front of middle where it is almost as wide as the humeri, abruptly emarginate and narrowed in front of this point; base slightly arcuate due to humeral angles, apex arcuate; ocular lobes broad; impressions as in *foveolatus;* vestiture dense; punctuation deep, irregular, and rather coarse. Elytral base broadly roundingly emarginate with a small triangular emargination at the suture; a little more than twice as long as the prothorax; sides convex; striæ deeply pitted, intervals more or less moderately tuberculate especially on the sides; scaly vestiture dense, with erect black and white setæ, and with masses of black scales on third interspace. Metathoracic sidepieces causing a rather strong emargination of the elytra.

This species is very differently colored from the next and has the elytra shorter in proportion and more convex on the sides. I have specimens at hand from Cotulla, Texas, May 11, 1906 (J. C. Crawford and F. C. Pratt); Beeville, Texas, October 22 (Hubbard and Schwarz); Big Springs, Texas (Wickham).

Type.—Cat. No. 12592, U.S.N.M.

THECESTERNUS ALBIDUS, new species.

Described from a series of four specimens in the U. S. National Museum, collected by H. Soltau at Albuquerque, New Mexico, February 20.

Length 9–11 mm. Black, densely clothed above and below with yellowish white scales, which are so dense that they give a spongy appearance; two black lines at middle of sides unite to form a triangle; thorax and elytra with occasional clusters of closely placed erect black scales; sparsely clothed with erect white squamiform bristles.

Large, robust, without continuous outline on thorax and elytra, generally elliptic, apex broadly rounded. Head spongily clothed with broad white and ochreous scales mixed with white bristles; front deeply sulcate. Prothorax large, slightly wider than long, widest at anterior third, not as wide as elytra at humeri; strongly narrowed in front with prominent arcuate ridge just behind apex; a deep impression passes downward on sides between the widest portion and the lateral ends of the arcuate ridge and describes a downward and backward arc, ending just below the humeral projections; two depressions also occur on the thoracic disk at the basal third; punctuation moderate, deep and course, but not nearly as large as in *foveolatus;* scaly vestiture spongy throughout, with a mass of black scales on each side of the median line at the base and two smaller masses more widely separated at middle of disk. Elytra with humeri prominent, more or less closely embracing prothorax, prolonged only one-sixth of the length of the prothorax; two and one-half times the length of the prothorax, sides impressed behind humeri; striate with alternate intervals elevated, but not as wide as striæ; even intervals very narrow or obsolete, giving the striæ the appearance of a double row of large punctures; scutellar angles prominently tuberculate, disk otherwise not tuberculate; scaly vestiture dense, spongy, white or ochreous, intermixed with scaly bristles and with raised spots of black erect scales on the alternate intervals. Under surface of abdomen deeply, moderately and rather sparsely punctured, with squamiform setæ arising from each puncture; scaly vestiture dense. Metathoracic side-pieces anteriorly prolonged obliquely upward and forward, causing a deep emargination of the elytra.

The markings of this species are distinct. The black Y formed by the two spots on the thorax and the scutellar spot, and the black triangles on the sides of the elytra are generally distinct.

Type.—Cat. No. 12593, U.S.N.M.

THECESTERNUS AFFINIS LeConte, RUDIS LeConte, EROSUS LeConte.

In addition to the species heretofore mentioned, there are in the collection others more or less varying, but in the main possessing the characters ascribed to *Lithodus affinis*, *rudis*, and *erosus* LeConte. The following are the National Museum records: Kentucky; Nashville, Tennessee, August (Wickham); central Missouri (Riley); west Kansas; north Colorado (Wickham); Denver, Colorado, November (E. J. Oslar); Dallas, Texas, May (A. W. Morrill); Texas (A. S. Fuller); Columbus, Texas, June (Hubbard and Schwarz); Alpine, Texas, July (Wickham).

These specimens are all robust and agree fairly well with *humeralis*, except that the humeral angles are short.

Subfamily OTIORHYNCHINÆ.

Tribe EPICÆRINI.

Genus GRAPHORHINUS Schönherr.

GRAPHORHINUS VADOSUS Say.

Grosvenor, Texas, March; Texas (Belfrage); Denver, Colorado, November; Fort Collins, Colorado, April (Soltau).

Genus EPICÆRUS Schönherr.

EPICÆRUS LUCANUS Horn.

San José del Cabo, Lower California (Fuchs). This species belongs in Casey's table next to *texanus*.

EPICÆRUS MEXICANUS Sharp.

Brownsville, Texas (Townsend). This species belongs in Casey's table near *sulcatus*, but has silky pubescence covering club.

EPICÆRUS IMBRICATUS Say.

Washington, District of Columbia; Atlanta, Georgia; St. Louis Missouri; Clay County, Kansas; Texas.

EPICÆRUS TEXANUS Casey.

Corpus Christi, Texas, April; Nueces, Texas, April (Marlatt); Victoria, Texas, June.

EPICÆRUS SULCATUS Casey.

Columbus, Texas, May; New Braunfels, Texas, August (Schwarz); Kansas; Colorado (Hubbard and Schwarz); New Mexico (Williams); Wasatch, Utah, June (Hubbard and Schwarz).

EPICÆRUS FORMIDOLOSUS Boheman.

Lake Poinsett, Florida, May; Hillsboro County, Florida, May (Hubbard and Schwarz).

The species of Epicærus have generally been confused as one species under the name *E. imbricatus*. There are still one or more distinct species in the southwest undescribed. This genus becomes very complex in Mexico and Central America.

Genus ANOMADUS Horn.

ANOMADUS OBLIQUUS Horn.

This species is not contained in the collection.

Genus BARYNOTUS Germar.

BARYNOTUS SCHŒNHERRI Zetterstedt.

St. Johns, New Brunswick, August (Hubbard and Schwarz).

Genus STAMODERES Casey.

STAMODERES UNIFORMIS Casey.

This species is not represented.

Genus HORMORUS Horn.

HORMORUS UNDULATUS Uhler.

Montreal, Canada, June; Chicopee, Massachusetts (Wickham); Berlin, Connecticut (N. Coleman); Flatbush, Long Island, New York, July (J. L. Zabriskie); Washington, District of Columbia, May, June; Pointe aux Pins, Lake Superior, July (Hubbard and Schwarz); Bayfield, Wisconsin; Iowa City, Iowa (Wickham).

Genus AGASPHÆROPS Horn.

AGASPHÆROPS NIGRA Horn.

This species is not represented.

Genus BRACHYDERES Schönherr.

BRACHYDERES INCANUS Linnæus.

This species is not represented.

Genus TRIGONOSCUTA Motschulsky.

TRIGONOSCUTA PILOSA Motschulsky.

Yuma, Arizona, May (Brown); San Diego, California, June; Palm Springs, California, March (Hubbard and Schwarz); Los Angeles, California; San Francisco, California, June, August (Wickham, Coquillett); Alameda County, California; Newport, Oregon, July (Wickham).

Genus CALYPTILLUS Horn.

CALYPTILLUS CRYPTOPS Horn.

McCook, Nebraska (Hubbard and Schwarz).

Tribe OPHRYASTINI.

Group OPHRYASTES.

KEY TO GENERA OF GROUP OPHRYASTES.

Rostrum with scrobes that are very deep and definite, even at their termination, passing rapidly inferior; eyes narrow and acute below.

1. Third tarsal joint broadly bilobed, and much wider than second, pubescent beneath.
   - a^1. Rostral striæ deep, the lateral ones strongly angulate at base of beak, meeting scrobes beneath eyes; second ventral segment nearly as long as third and fourth combined.....*Sapotes* Casey.
   - a^2. Rostral striæ not so sharply outlined, straight; second ventral segment much shorter than third and fourth combined.
     - b^1. Mentum concealing palpi entirely.....*Eupagoderes* Horn.
     - b^2. Palpi projecting beyond apex of mentum.....*Caccophryastes* Sharp.
2. Third tarsal joint not broadly bilobed, hardly wider than second, emarginate at apex, not pubescent beneath; rostral striæ straight.
   - a^1. Prothorax more or less tuberculate at sides and very little narrower than elytra, if at all; corbels of posterior tibiæ more or less imperfectly cavernous.....*Ophryastes* Schönherr.
   - a^2. Prothorax not tuberculate at sides, very much narrower than elytra; corbels of posterior tibiæ with laminate tip.....*Tosastes* Sharp.

Genus SAPOTES Casey.

Specimens of this genus are at hand, and invariably show a well defined fimbriation of the ocular lobes, although the fimbriæ are short.

SAPOTES PUNCTICOLLIS Casey.

Winslow, Arizona (Hubbard and Schwarz).

This species is very variable in color, so that the color characterization given by Colonel Casey should not be considered.

Specimens are at hand from Albuquerque, New Mexico, January 28 (H. Soltau), uniformly larger, but can not be distinguished by any valid character.

Genus EUPAGODERES Horn.

EUPAGODERES SPECIOSUS LeConte.

Yuma, Arizona, April 17 (Robert Brown), Phoenix, Arizona (J. S. Tait).

EUPAGODERES DECIPIENS LeConte.

Del Rio, Texas, July 13; El Paso, Texas (Wickham); Brewster County, Texas (Chisos Mountains), June 10 (Mitchell and Cushman); Tucson, Arizona, December 17; Catalina Springs, Arizona, May 1 (Hub-

bard and Schwarz); Colorado Canyon, July 31 (Barber and Schwarz); Palm Springs, California, February 14 (Hubbard and Schwarz).

This series very possibly contains more than one species.

EUPAGODERES LUCANUS Horn.

This species not represented.

EUPAGODERES DUNNIANUS Casey.

This species not represented.

EUPAGODERES SORDIDUS LeConte.

El Paso, Texas, July 8; Deming, New Mexico, July 11 (Wickham); Mesilla, New Mexico on *Larrea* (Cockerell); Albuquerque, New Mexico, January 28 (Soltau); Santa Rita Mountains, Arizona (Wickham); Winslow, Arizona (Soltau, Wickham); Los Angeles County, California; San Bernardino County, California (Coquillett).

EUPAGODERES WICKHAMI Sharp.

Tucson, Arizona (Wickham, Soltau); Utah (Soltau).

This species belongs near *speciosus*, but has thorax coarsely punctate, and markings like leopard spots.

EUPAGODERES ARGENTATUS LeConte.

Yuma, Arizona, April 2 (Robert Browne).

EUPAGODERES DESERTUS Horn.

Yuma, Arizona, April 2 (Robert Browne); Winslow, Arizona (Wickham); Death Valley, California, April (Koebele).

As far as I can make out these two species are synonymous. In a large series they vary considerably in size, color, and even the form of the corbels.

EUPAGODERES VARIUS LeConte.

Kern County, California (Hubbard and Schwarz); San Diego County, California (Coquillett); Indio, California.

EUPAGODERES GEMINATUS Horn.

Hawthorne, Nevada, July 27; Independence, California, July 17; Lancaster, California; Keeler, California, July 6 (Wickham); Los Angeles County, California (Coquillett); Panamint Valley, April (Koebele).

EUPAGODERES PLUMBEUS Horn.

Death Valley, California, April (Koebele); Independence, California, July 17 (Wickham).

Genus OPHRYASTES Schonherr.

OPHRYASTES VITTATUS Say.

Buffalo Gap, S. Dakota; New Castle, Wyoming; Wallace County, Kansas (Snow); Berkeley, Colorado, May 8 (E. J. Oslar); Greeley, Colorado; Colorado Springs, Colorado (Soltau); Holly, Colorado; Canyon City, Colorado (Wickham); Big Springs, Texas; Alpine, Texas (Wickham); Las Cruces, New Mexico (Cockerell); Deming, New Mexico, July 11; Gallup, New Mexico (Wickham); Albuquerque, New Mexico, March 14 (Soltau); Santa Fe, New Mexico; Winslow, Arizona; Globe, Arizona (Wickham).

OPHRYASTES TUBEROSUS LeConte.

Pocatello, Idaho; Canyon City, Colorado; Del Rio, Texas, June 22; Alpine, Texas, June 28; Deming, New Mexico, July 11 (Wickham).

OPHRYASTES SHUFELDTI Casey.

This species is not represented.

OPHRYASTES SULCIPENNIS Casey.

This species is not represented.

OPHRYASTES LATIROSTRIS LeConte.

Alpine, Texas, June 28 (Wickham); Albuquerque, New Mexico (Soltau); Gallup, New Mexico; Chiricahua Mountains, Arizona (Hubbard and Schwarz); Peach Springs, Arizona (Wickham); Winslow, Arizona, September 10; Holbrook, Arizona.

OPHRYASTES SULCIROSTRIS Say.

Bismarck, North Dakota (Wickham); Wyoming; Assiniboine, Montana, August 29 (Hubbard and Schwarz); Helena, Montana (Hubbard and Schwarz, Wickham); American Fork, Utah, June 24 (Hubbard and Schwarz); Cheyenne, Wyoming, April 21 (Soltau); Nebraska; Denver, Colorado, August 11; Greeley, Colorado, June 11; Colorado Springs, Colorado, April 4 (Soltau); Fort Collins, Colorado, May 22; Marfa, Texas, July 3; Alpine, Texas, July 20; Luna, New Mexico (Wickham); Albuquerque, New Mexico, January 28 (Soltau); Peach Springs, Arizona; Winslow, Arizona (Wickham); California (Hubbard and Schwarz).

OPHRYASTES POROSUS LeConte.

This species is not represented.

OPHRYASTES SYMMETRICUS Fall.

This species is not represented.

OPHRYASTES BITUBEROSUS Sharp.

San Diego, Texas, April 24 (Hubbard and Schwarz); Goliad, Texas; Beeville, Texas, October 22 (Schwarz); Deming, New Mexico, July 11 (Wickham).

Genus TOSASTES Sharp.

This genus can not be defined by the single row of spinules on the posterior tibial corbels, but may be distinguished by the characters given in the table and by the practically non-striate beak.

The Cimbocera group of the next tribe resembles this genus in the form of the antennæ and tarsi, and is mainly separated by the form of the scrobes.

KEY TO SPECIES OF TOSASTES.

Elytra with acute humeral angle.....*humeralis* Sharp.
[Chihuahua City, Mexico.]

Elytra with rounded humeri.

Corbels of posterior tibiæ with a single row of spines; elytra globular; thorax feebly sculptured.

Elytra with very obsolete sculpture, consisting of vague large pits, arranged serially.....*globipennis* Sharp.
[Guajuco, Nuevo Leon, Mexico.]

Elytra with striæ very fine, consisting of long, fine punctures; median line of thorax distinct.....*globularis*, new species.
[Albuquerque, New Mexico.]

Corbels of posterior tibiæ with a double row of spines; elytra globular with striæ consisting of large ill-defined punctures; thorax distinctly and coarsely punctate.....*ovalis*, new species.
[Del Rio, and Marathon, Texas.]

TOSASTES GLOBULARIS, new species.

Described from a series of twenty-two specimens collected by H. Soltau at Albuquerque, New Mexico, March 12.

This species resembles *T. globipennis* Sharp and *T. ovalis*, but differs in sculpture from both.

Length 4.5–6.2 mm. Black; elytra very convex, inflated; humeri rounded; clothed with pale gray or violaceous scales below, and above more or less longitudinally vittate, pale scales alternating with vittæ of dark-brown and black spots.

Eyes narrow, acute beneath; rostrum longer than head, not impressed at base, front flat, rostral striæ almost obsolete, very fine when present; scrobes deep, strongly arcuate, rapidly inferior; scape and first six funicular joints clad with broad flat scales, scape dark except at tip, funicular joints light; last funicular without scales, dark like club, and so closely applied as to appear a part of the club. Thorax strongly transverse; ocular lobes with very short fimbriæ; convex on sides with rather deep emargination in front of base and a lighter one before apex; surface smooth, not deeply or strongly

punctate, punctures very minute, median longitudinal impression sharp and distinct. Elytral striæ extremely fine, feebly impressed, punctures longitudinal and very fine, intervals feebly convex, with two series of setæ; elytra twice as wide as prothorax, only one-half longer than wide, evenly rounded from base almost to apex, apex slightly obtusely produced, elytra conjointly rounded. Second ventral segment short, first suture almost straight, third and fourth segments very short, but together greater than second. Hind tibiæ with a single row of spinules on apex of corbels, articular surface cavernous. Tarsi without pubescence on third joint, which is not broader than the second.

Type.—Cat. No. 12594, U.S.N.M.

TOSASTES OVALIS, new species.

Described from one specimen collected by F. C. Bishopp at Devil's River, Texas, May 3, 1907. Four specimens which are rather rubbed are at hand, collected by J. D. Mitchell and R. A. Cushman at Marathon, Texas, June 7, 1908.

This species resembles *T. globipennis* Sharp of Mexico in form, size, and coloration, but differs by the sculpture of the thorax and elytra, and by the double row of spines on the posterior corbels.

Length 6 mm. Black; elytra very convex, inflated; humeri rounded; clothed with thin grayish scales, polygonally crowded, and on the prothorax fused into a continuous indument, bearing numerous setæ, scales not overlapping.

Eyes narrow and acute beneath. Rostrum short, lightly transversely impressed at base, with very faint impressions at sides, but with no median groove; scrobes deep, strongly arcuate, rapidly inferior; scape and first six funicular joints clad with white scales, seventh dark like club without scales, and so closely applied thereto as to appear a part of it. Thorax strongly transverse; ocular lobes distinctly fimbriate; convex on sides with rather deep emargination in front of base and a lighter one before apex; sparsely but deeply and coarsely punctate, median impression vague. Elytral striæ fine, punctures rather large and shallow. Elytra twice as wide as prothorax, and only one-half longer than wide. Second ventral segment short, first suture almost straight, third and fourth segments very short, but together greater than second. Hind tibiæ with a double row of spinules on corbels, but apex hardly truncate. Tarsi without pubescence on third joint, which is not broader than the second.

This species has a very different appearance from *Ophryastes*, because of the greatly inflated elytra, but differs from *Tosastes* as defined by Sharp in the double row of spinules on the corbels of the posterior tibiæ. This last character is not of generic value.

Type.—Cat. No. 12595, U.S.N.M.

Group RHIGOPSES.

Genus RHIGOPSIS LeConte.

RHIGOPSIS EFFRACTA LeConte.

California (Wickham); Southern California.

RHIGOPSIS SCUTELLATA Casey.

Los Angeles County, California, May (Coquillett); San Diego, California (Hubbard and Schwarz, Coquillett); Southern California.

Group STRANGALIODES.

KEY TO GENERA OF GROUP STRANGALIODES.

Rostrum with scrobes feebly inferior, usually directed toward eyes, or visible from above and badly defined.

I. Seventh joint of funicle contiguous to club.

1. Third joint of tarsi feebly emarginate, scarcely broader than the preceding; tarsi sparsely setose beneath; beak distinctly separated from head by transverse depression ..... *Cimbocera* Horn.

2. Third joint of tarsi bilobed, distinctly wider than second; tarsi spinose beneath; beak not separated from head by deep depression... *Miloderes* Casey.

II. Seventh joint of funicle distant from club; third joint of tarsi broader than second, tarsi densely pubescent beneath.

1. Scrobes deep, well defined, at least moderately arcuate, passing inferiorly.

a^1. Scrobes strongly arcuate, passing beneath at a distance from the eyes.

b^1. First suture of abdomen straight; second segment never longer than the two following united; hind tibiæ mutic..... *Dichoxenus* Horn.

b^2. First suture of abdomen arcuate; second segment as long as and frequently longer than the two following united; hind tibiæ mutic.

c^1. Support of deciduous piece of mandible not prominent.

d^1. Anterior tibiæ denticulate within; surface of body scaly without hairs; corbels of hind tibiæ open..... *Orimodema* Horn.

d^2. Anterior tibiæ not denticulate, or indistinctly so; surface scaly or hairy.

e^1. Corbels subcavernous..... *Mimetes* Schönherr.

e^2. Corbels cavernous; alternate elytral intervals slightly more convex; ventral scales plumose ..... *Amotus* Casey.

c^2. Support of deciduous piece prominent; anterior tibiæ not denticulate; surface scaly, and with erect hairs.

f^1. Corbels of hind tibiæ cavernous; humeri entirely obliterated, *Diamimus* Horn.

f^2. Corbels of hind tibiæ open; humeri rectangular.. *Peritaxia* Horn.

a^2. Scrobes moderately arcuate, passing immediately beneath the eyes, *Anametis* Horn.

a^3. Scrobes narrow, deep and well defined throughout, obliquely descending to lower angle of eye, beak not depressed at base..... *Melbonus* Casey.

2. Scrobes evanescent posteriorly, badly defined, nearly straight or flexed gradually downward, directed toward lower angle of eye.

a^1. Metasternal side pieces rather wide, suture distinct.

b^1. First ventral suture very deep and widely impressed, generally straight or only slightly arcuate in the middle; second segment not longer than the next two combined.

c^1. Scutellum very short and broad, not entering the elytral disk.
d^1. Elytral intervals alternating in convexity throughout the length; serial punctures on elytra seldom squamigerous, usually setigerous; first ventral suture slightly arcuate at middle; hind tibiæ mucronate..... *Amnesia* Horn.
d^2. Elytral intervals not alternating in convexity; serial punctures on elytra each bearing a flat scale; first ventral suture straight or but slightly arcuate at middle; hind tibiæ more or less feebly mucronate; corbels open..... *Dyslobus* LeConte.
c^2. Scutellum small, triangular; first ventral suture straight; hind tibiæ distinctly mucronate; corbels cavernous..... *Melamomphus* Horn.
b^2. First ventral suture fine, not broadly impressed, broadly arcuate; body squamose and pubescent; scutellum distinct; second ventral segment much longer than the next two combined,
Thricomigus Horn; *Adaleres* Casey.
a^2. Metasternal side pieces indistinct, suture obliterated.
e^1. First suture of abdomen deep and widely impressed, straight; second segment not longer than the two following united; hind tibiæ not mucronate; corbels open..... *Panscopus* Schönherr.
e^2. First ventral suture fine, not broadly impressed, broadly arcuate; second segment as long as and frequently longer than the two following united; rostrum rather elongate.
f^1. Rostrum separated from head by transverse depression; body squamose, the elytra without erect hairs, the intervals alternating strongly in convexity and vestiture; scutellum extremely small, acute; second ventral segment not longer than the next two combined, metepisternal suture completely obliterated..... *Nomidus* Casey.
f^2. Front flat, rostrum continuous on the same plane and usually flattened above; metepisternal suture in great part obliterated.
g^1. Body above finely tuberculate, scales large,
Phymatinus LeConte.
g^2. Body not tuberculate, scales small and denser.. *Nocheles* Horn.

Genus CIMBOCERA Horn.

CIMBOCERA PAUPER Horn.

Laramie, Wyoming, March 18, May 20 (Soltau); Helena, Montana (Hubbard and Schwarz).

This species, like *Amotus*, has striate plumose scales beneath.

CIMBOCERA CONSPERSA Fall.

American Fork Canyon, Utah, June 25; Garland, Colorado, June 23 (Hubbard and Schwarz); Canyon City, Colorado, May 14; Gallup, New Mexico; Albuquerque, New Mexico (Soltau); Winslow, Arizona (Wickham); Holbrook, Arizona; Bright Angel, Arizona, July 10 (Barber and Schwarz).

The upper scales are striate, subplumose.

Genus MILODERES Casey.

MILODERES SETOSUS Casey.

Panamint Valley, California, April (Koebele).

MILODERES VIRIDIS, new species.

Described from a series of twelve specimens collected by A. W. Barber at the Keams Copper Mine, Navajo Indian Reservation, Arizona, April 23.

Length 4.5–6 mm. Black, covered with an indument of brilliant golden green scales; oblong-oval, much more slender than *setosus* Casey, convex; entire surface bristling with long erect golden setæ, not regularly arranged, more erect, longer and finer than in *setosus*.

This beautiful species may further be distinguished from *setosus* by the following characters: Beak slightly depressed at base. Elytra not greatly inflated, widest at basal fourth; sides thence very feebly convergent, abruptly and broadly rounded behind; posterior declivity perpendicular; humeri obsolete; disk convex, hardly one-quarter wider than the prothorax, at least one-half longer than wide, without a trace of serial punctuation, punctures very fine and inconspicuous.

Type.—Cat. No. 12596, U.S.N.M.

Genus DICHOXENUS Horn.

DICHOXENUS SETIGER Horn.

Columbus, Texas, May 22 (Schwarz); Tyler, Texas, June 9 and 28.

Genus ORIMODEMA Horn.

ORIMODEMA PROTRACTA Horn.

Veta Pass, Colorado, June 27 (Hubbard and Schwarz); Las Vegas Hot Springs, New Mexico, August 5–14; Flagstaff, Arizona, July 7; Williams, Arizona, July 24 (Barber and Schwarz).

Genus MIMETES Schönherr.

MIMETES SENICULUS Horn.

Scotia, California, May 20 (H. S. Barber).

Genus AMOTUS Casey.

AMOTUS LONGISTERNUS Casey.

Ventura County, California, April (Coquillett).

AMOTUS SETULOSUS LeConte (MIMETES SETULOSUS LeConte; AMOTUS GRACILIOR Casey).

Los Angeles County, California, March, April; Ventura County, California, April (Coquillett).

AMOTUS LONGIPENNIS, new species.

Described from two specimens in the Hubbard and Schwarz collection from Kern County, California.

This species differs from *longisternus* in the following particulars: Length 8 mm. Elongate oblong-oval, rather depressed above, densely clothed above with æneus, white and dark scales which are polygonally crowded and present a tessellate appearance. Head closely squamose; beak strongly medianly impressed in over apical half. Ocular lobes absent, vibrissæ long and conspicuous. Prothorax a little longer than wide, subcylindrical. Elytra about twice as long as wide, and three times as long as the prothorax.

Like the other two species in the genus, this species is clad with polygonal flat scales above, and with ogival, striate, plumose scales below. The alternate intervals of the elytra are slightly more prominent. The genus is also characterized in all three species by the short prosternum in front of the coxæ, and by the absence of ocular lobes, but presence of ocular vibrissæ.

Type.—Cat. No. 12597, U.S.N.M.

Genus DIAMIMUS Horn.

DIAMIMUS SUBSERICEUS Horn.

Probably several species are now included in the museum material which is from Laramie, Wyoming, April 25 (Soltau); Cheyenne, Wyoming; Helena, Montana; American Fork Canyon, Utah, June 25; Glenwood, Colorado, May 15 (Hubbard and Schwarz); Berkeley, Colorado, May 8 (E. J. Oslar); Winslow, Arizona, July 18 (Wickham).

Genus PERITAXIA Horn.

PERITAXIA RUGICOLLIS Horn.

Garland, Colorado, June 19 (Hubbard and Schwarz); Leadville, Colorado, July 7 (Wickham); Durango, Colorado, July 23; Tercio, New Mexico, May 9 (Hopkins); Dripping Springs, Organ Mountains, New Mexico, (Cockerell); Magdalena, New Mexico (Wickham); Arizona (Morrison).

PERITAXIA HISPIDA Horn.

Northern Colorado (Wickham); Colorado (Hubbard and Schwarz).

PERITAXIA PERFORATA Casey.

Big Springs, Texas (Wickham); Ranger, Texas, July 25.

Genus ANAMETIS Horn.

The species in this genus are clad beneath with broad, fan-shaped striate, plumose scales.

ANAMETIS GRISEA Horn.

Detroit, Michigan, June 25 (Hubbard and Schwarz); Independence, Iowa; Iowa City, Iowa, April 17, May 5 (Wickham); West Point, Nebraska, June (Bruner); Rock Bluff, Nebraska (Elliott); Kansas; Laramie, Wyoming (Wickham); Montana.

ANAMETIS SUBFUSCA Fall.

Las Vegas Hot Springs, New Mexico, August 10–12 (Barber and Schwarz).

Genus MELBONUS Casey.

MELBONUS SCAPALIS Casey.

This species is not represented.

MELBONUS DENTICULATUS, new species.

One specimen collected in the Chiricahua Mountains, Arizona, May 10, by Hubbard and Schwarz.

This species is essentially a member of the genus *Melbonus* because of the distinct scrobes reaching the lower edge of the eyes, the non-constricted beak, and all other important characters, except that very minute fimbriæ are visible, and the anterior tibiæ are strongly denticulate.

The following specific characters will serve to distinguish it from *scapalis* Casey. Head at least half as wide as prothorax, eyes prominent, separated by one and one-half times their own width; beak over one-fourth longer than wide, but hardly more than one-half as long as the prothorax; broadly depressed along middle from base, and more narrowly so on the sides. Elytra two and one-quarter times as long as wide, three times as long as prothorax; sides almost parallel, evenly and broadly arcuate; base straight, humeri rectangular, minute. Length 10 mm.; width 3.5 mm.

Type.—Cat. No. 12598, U.S.N.M.

Genus AMNESIA Horn.

AMNESIA SQUAMIPUNCTATA, new species.

Described from two specimens collected by H. S. Barber at Eureka, California, June 7.

Length 7 mm; width 2.7–3 mm. Elongate, ovoidal, widest at apical third of elytra, convex above, reddish or piceous throughout, undersides darkest; vestiture consisting of small rounded, striate scales densely covering the upper surface and disposed among the shining tubercles of the thorax, golden, brown or black in color, and intermingled with stiff suberect curved bristles especially on the elevated alternate intervals; scales on head both round and linear; elytral punctures each provided with oblong striate scales, almost as wide as, but longer than the interspace scales; scales mixed oval and oblong on the sides, but becoming long and very fine setæ along the middle of the venter.

The species is further separable from *tumida* Casey, the only other species with very elevated alternate intervals, by the following characters: Head two-thirds as wide as prothorax, the entire surface of

head and beak coarsely and densely punctate; beak tricarinate above; eyes separated by much less than twice their own width; antennal scape not reaching posterior margin of eyes, first funicular slightly longer than second, second not as long as the two following. Prothorax as wide as long, sides strongly and evenly arcuate; ocular lobes not nearly as densely fimbriate as in *tumida;* disk broadly and rather deeply impressed along median line, also with three large round impressions on each side of the middle, the central pair closer together than the others, disk rather closely covered with strong polished tubercles. Elytra with sides subparallel, slightly the widest at apical third; disk with alternate intervals strongly elevated, tuberculose, bristling with curved spines, most prominent at apical declivity, which is almost vertical in profile; striæ unimpressed, punctures moderate in size, each with a large scale, surface not conspicuously tuberculose.

In all other respects the phraseology used in the description of *tumida* will fit this species. It differs from all other *Amnesia* by the squamigerous serial punctures, thus resembling *Dyslobus.* It is arranged with *Amnesia* because of the alternate elevated intervals.

Type.—Cat. No. 12599, U.S.N.M.

AMNESIA TUMIDA Casey.

Santa Cruz Mountains, California.

AMNESIA GRANICOLLIS LeConte.

Victoria, Vancouver, June 1; Tenino, Washington (Hubbard and Schwarz); Washington (Morrison); Astoria, Oregon, May 25; Portland, Oregon, May 22 (Hubbard and Schwarz); Oregon (Koebele); Eureka, California, June 2; Fieldbrook, California, May 27 (Barber).

AMNESIA DISCORS Casey.

This is not represented.

AMNESIA SCULPTILIS Casey.

Washington.

AMNESIA DEBILIS Casey.

Oregon (Hubbard and Schwarz).

AMNESIA DECORATA LeConte.

Astoria, Oregon, May 25 (Hubbard and Schwarz).

AMNESIA GRANULATA Casey.

This species is not represented.

The following species referred to Amnesia do not have the alternate interspaces elevated:

AMNESIA SORDIDA Horn.

California (Hubbard and Schwarz); Alameda County, California (Coquillett).

AMNESIA URSINA Horn.

Victoria, Vancouver, June 1 (Hubbard and Schwarz); Cœur d'Alene, Idaho (Wickham); Portland, Oregon, May 22 (Hubbard and Schwarz).

AMNESIA RAUCA Horn.

Alameda County, California, March (Coquillett); San Francisco County, California, June.

AMNESIA DECIDUA Horn.

This species is not represented.

AMNESIA ALTERNATA Horn.

Montana (Hubbard and Schwarz).

AMNESIA TESSELLATA Casey.

This species is not represented.

AMNESIA ELONGATA Horn.

California.

Genus DYSLOBUS LeConte.

DYSLOBUS SEGNIS LeConte.

Sisson, California (Hubbard and Schwarz); Siskiyou County, California (Koebele).

DYSLOBUS LECONTEI Casey.

Tenino, Washington (Hubbard and Schwarz); Easton, Washington (Koebele); Hood River, Oregon, May 20 (Hubbard and Schwarz); Oregon (Koebele); Humboldt County, California (Barber).

DYSLOBUS VERRUCIGER Casey.

Victoria, Vancouver, June 2 (Hubbard and Schwarz); Kaslo, British Columbia, June 10 (Currie).

Genus MELAMOMPHUS Horn.

MELAMOMPHUS NIGER Horn.

This species is not represented.

Genus ADALERES Casey.

ADALERES OVIPENNIS Casey.

This species is not represented.

ADALERES HUMERALIS Casey.

Los Angeles, California (Coquillett); San Diego, California; Rainbow, California.

Genus THRICOMIGUS Horn.

THRICOMIGUS LUTEUS Horn.

Helena, Montana, April 26 (Hubbard and Schwarz).

Genus PANSCOPUS Schönherr.

PANSCOPUS ERINACEUS Say.

Buffalo, New York; Washington, District of Columbia; Berkeley, West Virginia; Lee County, Virginia; Round Knob, North Carolina; Detroit, Michigan, June (Hubbard and Schwarz).

PANSCOPUS ALTERNATUS Schaeffer.

This species is not represented.

Genus NOMIDUS Casey.

NOMIDUS ABRUPTUS Casey.

This species is not represented.

Genus PHYMATINUS LeConte.

PHYMATINUS GEMMATUS LeConte.

Astoria, Oregon, May 25; Portland, Oregon, May 22 (Hubbard and Schwarz).

Genus NOCHELES Horn.

NOCHELES TORPIDUS LeConte.

Portland, Oregon, May 22; Alta, Utah, June 29.

NOCHELES ÆQUALIS Horn.

Montana; Green River, Wyoming; National Park, Wyoming, August 1 (Hubbard and Schwarz); Nevada.

NOCHELES VESTITUS Casey.

Not represented.

Group PHYXELES.

Genus PHYXELIS Schönherr.

PHYXELIS RIGIDUS Say.

Marion, Massachusetts, July; Deer Park, Maryland, July 4; Washington, District of Columbia; Fort Pendleton, West Virginia, July 8 (Hubbard and Schwarz); Round Knob, North Carolina, June 28; Toronto, Ontario (R. J. Crew); Detroit, Michigan (Hubbard and Schwarz); Chicago, Illinois; Bloomington, Illinois, April 4; Iowa (Wickham).

Tribe OTIORHYNCHINI.

Genus AGRAPHUS Schönherr.

AGRAPHUS BELLICUS Say.

Crescent City, Florida; Capron, Florida, April 11; Tampa, Florida, April 29; Cedar Keys, Florida, June 29.

Genus OTIORHYNCHUS Germar.

OTIORHYNCHUS SULCATUS Fabricius.

Isle au Haut, Maine, August (Wickham); Cambridge, Massachusetts, March, April; Peekskill, New York, April 20 (Hubbard and Schwarz); Toronto, Canada, August 25 (R. J. Crew); Departure Bay, Vancouver (Wickham).

OTIORHYNCHUS OVATUS Linnæus.

Hampton, New Hampshire, February 28 (S. A. Shaw); Hanover, New Hampshire (C. M. Weed); Fitchburg, Massachusetts, June; Cambridge, Massachusetts (Hubbard and Schwarz); Boston, Massachusetts, June 5 (Ormonde); Marion, Massachusetts, July; Hartford, Connecticut; Buffalo, New York; Flatbush, New York, July 10 (J. L. Zabriskie); Long Island, New York; Illion, New York (A. H. Weeks); New Jersey; Toronto, Ontario (R. J. Crew); Port Hope, Ontario (Bethune); Detroit, Michigan, May 28, June 4 (Hubbard and Schwarz); Bloomington, Illinois, April 20; Independence, Iowa, August; Iowa City, Iowa, April 29 (Wickham); Laramie, Wyoming, June 14; Santa Fe, New Mexico, July (Cockerell).

OTIORHYNCHUS RUGIFRONS Gyllenhal.

New Jersey; Fredericksburg, Virginia, July 19 (Richardson); Toronto, Ontario (Wickham); Bethlehem, Pennsylvania.

OTIORHYNCHUS MAURUS Gyllenhal.

This species is not represented from North America.

OTIORHYNCHUS MONTICOLA Germar.

This species is not represented from North America.

Genus SCIOPITHES Horn.

SCIOPITHES OBSCURUS Horn.

I regard Colonel Casey's species *significans*,[1] *brumalis*,[2] *arcuatus*,[3] and *angustulus*[4] as one species, synonymous with *obscurus* Horn. They can not be separated by distribution, as is shown by the following records: Victoria,[1,2] Vancouver (Wickham); Tenino,[1,3,4] Washington; Ilwaco,[3] Washington, May 26, (Hubbard and Schwarz); Seattle,[3] Washington (S. Bethel); Astoria,[1,2,3] Oregon, May 24 (Hub-

bard and Schwarz); Corvallis,[1] Oregon (Wickham); Portland,[4] Oregon, May 23 (Hubbard and Schwarz); Eureka,[1,3] California, June 4 (H. S. Barber); Marin County,[1] California, August; Sacramento County,[1] California, February 12, on strawberry (M. Cook); San Mateo County,[1] California, August; Little River,[2,3] California, May 31 (Barber); Fieldbrook,[3] California, May 26 (Barber); Humboldt County,[4] California, June 19 (Barber). Those collected in the same series seem to be all one species with but slight color variation, but differing sufficiently in the relative lengths of the antennal joints to run to the different species in Colonel Casey's table.

SCIOPITHES SETOSUS Casey.

I also doubt the wisdom of separating this form from the preceding species: Humboldt County, California, June 19; Eureka, California, May 24, June 7 (H. S. Barber).

Genus AGRONUS Horn.

AGRONUS CINERARIUS Horn.

Lake Tahoe, California, July 8 (Hubbard and Schwarz); Siskiyou County, California, July; Tallac, California, July 11 (A. Fenyes).

AGRONUS DECIDUUS Horn.

Mount Shasta, California (Hubbard and Schwarz).

Genus NEOPTOCHUS Horn.

NEOPTOCHUS ADSPERSUS Boheman.

Lake Harney, Florida, May 7; Cedar Keys, Florida, June 5; Citrus County, Florida, July 25; Crescent City, Florida; Tampa, Florida, April 1 (Hubbard and Schwarz).

Genus PARAPTOCHUS Seidlitz.

PARAPTOCHUS SELLATUS Boheman.

North Bend, British Columbia, June 6; Hood River, Oregon, May 21 (Hubbard and Schwarz).

Genus STENOPTOCHUS Casey.

STENOPTOCHUS INCONSTANS Casey.

This species is not represented.

Genus ORTHOPTOCHUS Casey.

ORTHOPTOCHUS SQUAMIGER Casey.

This species is not represented.

Genus MYLACUS Schönherr.

MYLACUS SACCATUS LeConte.

Spokane Falls, Washington (Hubbard and Schwarz); Easton, Washington (Koebele).

Genus THRICOLEPIS Horn.

THRICOLEPIS INORNATA Horn.

Mill Creek, Utah, June 16; Salt Lake, Utah, June 13–15; American Fork Canyon, Utah, June 21; Alta, Utah, June 28 (Hubbard and Schwarz); Wasatch Mountains, Utah, June 20; Provo, Utah (Wickham); Ojai Valley, Colorado; Veta Pass, Colorado, June 27 (Hubbard and Schwarz); Ouray, Colorado, July 1 (Wickham); Pagosa Springs, Colorado (E. J. Oslar); Tenino, Washington; Los Gatos, California (Hubbard and Schwarz); Santa Clara County, California, May; Los Angeles County, California; Arizona (Morrison); Williams, Arizona, May 31, June 9; Flagstaff, Arizona, July 5; Prescott, Arizona, June 20 (Barber and Schwarz); Chiricahua Mountains, Arizona, June 24 (Hubbard and Schwarz).

THRICOLEPIS SIMULATOR Horn.

California; Arizona.

Genus PERITELOPSIS Horn.

PERITELOPSIS GLOBIVENTRIS LeConte.

This species is not represented.

Genus PERITELODES Casey.

PERITELODES OBTECTUS Casey.

This species is not represented.

Genus PERITELINUS Casey.

PERITELINUS VARIEGATUS Casey.

This species is not represented.

Genus GEODERCES Horn.

GEODERCES MELANOTHRIX Kirby.

Michipicoten Island, Lake Superior, July; Gargantua, Lake Superior, August; White Fish Point, Lake Superior; Marquette, Michigan, July 10 (Hubbard and Schwarz); Bayfield, Wisconsin (Wickham); Departure Bay, Vancouver; Massett, Queen Charlotte Islands, British Columbia (J. H. Keen).

GEODERCES INCOMPTUS Horn.

North Bend, British Columbia, June; Victoria, Vancouver, June 2; Tenino, Washington; Ilwaco, Washington, May 26; Astoria, Oregon, May 25 (Hubbard and Schwarz); Alameda County, California, January, April, October.

GEODERCES PUNCTICOLLIS Casey.

This species is not represented.

Genus GEODERCODES Casey.

GEODERCODES LATIPENNIS Casey.

This species is not represented.

Genus ARAGNOMUS Horn.

ARAGNOMUS GRISEUS Horn.

Montana; Garland, Colorado, June 25; Salem, Oregon, on pear, May 19; Placer County, California, June, September, October; Sacramento County, California, February; Los Angeles County, California, April; Siskiyou County, California; Bright Angel, Arizona, July 10 (Barber and Schwarz).

ARAGNOMUS HISPIDULUS Casey.

Los Angeles County, California, April, July.

Genus DYSTICHEUS Horn.

DYSTICHEUS INSIGNIS Horn.

This species is not represented.

Genus EUCYLLUS Horn.

EUCYLLUS VAGANS Horn.

Riverside, Arizona; Gila Bend, Arizona; Lancaster, California, August 10 (Wickham); Mojave, California (Soltau); Barstow, California.

Genus THINOXENUS Horn.

THINOXENUS SQUALENS Horn.

This species is not represented.

THINOXENUS NEVADENSIS Casey.

Laramie, Wyoming, February 28 (Soltau).

Genus RHYPODES Horn.

RHYPODES DILATATUS Horn.

Los Angeles County, California; Alameda County, California.

RHYPODES BREVICOLLIS Horn.

Garland, Colorado.

Genus CERCOPEUS Schönherr.

CERCOPEUS CHRYSORRHŒUS Say.

New York; Washington, District of Columbia, April 10; Afton, Virginia; Ann Arbor, Michigan; Detroit, Michigan (Hubbard and Schwarz); Cadet, Missouri, April 13 (J. G. Barlow).

Genus CHÆTECHUS Horn.

CHÆTECHUS SETIGER Horn.

Brookline, Massachusetts.

Genus TRACHYPHLŒUS Germar.

TRACHYPHLŒUS ASPERATUS Boheman.

Cadet, Missouri, June 9 (Barlow); St. Louis, Missouri, May 16 (Soltau); Onaga, Kansas, April 17 (Crevecoeur); Lincoln, Nebraska (Bruner).

Genus PANORMUS Casey.

PANORMUS SETOSUS Casey.

This species is not represented.

Tribe DIROTOGNATHINI.

Genus DIROTOGNATHUS Horn.

DIROTOGNATHUS SORDIDUS Horn.

Tucson, Arizona, January 13 (Hubbard and Schwarz).

Tribe TANYMECINI.

Genus PACHNÆUS Schönherr.

PACHNÆUS OPALUS Olivier.

Key West, Florida, April 6 (Schwarz) (Hubbard and Schwarz); June 17–July 1 (Wickham); Biscayne, Florida, May 11 (Hubbard and Schwarz); Florida (Ashmead).

PACHNÆUS DISTANS Horn.

Southern Pines, North Carolina (R. W. Collett); Wilmington, North Carolina (W. F. Wenzel); Crescent City, Florida; Lake Poinsett, Florida, May 1; Cedar Keys, Florida, June 6; Enterprise, Florida, June 9; Tampa, Florida, April 25; Bartow, Florida, July 16 (Hubbard and Schwarz).

Genus TANYMECUS Schönherr.

TANYMECUS LACÆNA Herbst.

Biscayne, Florida, May 8; Indian River, Florida; Jupiter, Florida, April 24 (Hubbard and Schwarz); Enterprise, Florida, May 26 (Hubbard and Schwarz, and Wickham); Miami, Florida; Capron, Florida.

TANYMECUS CONFERTUS Gyllenhal.

Washington, District of Columbia, June 6; Fort Monroe, Virginia, April 19 (Hubbard and Schwarz); Pennsylvania; Tennessee; Kentucky (Sanborn); southern Illinois; Iowa City, Iowa (Wickham);

Cadet, Missouri, June 9 (Barlow); Nebraska; Winnipeg, Manitoba; Williston, North Dakota, June 8; Glendive, Montana (Wickham); Eddyville, Idaho; South McAlester, Oklahoma, June 11 (Wickham); Bayou Sara, Louisiana (Hubbard and Schwarz); Columbus, Texas, May 22 (Hubbard and Schwarz, Wickham); Gainesville, Texas, April 11 on *Œnothera;* Brownsville, Texas, July, September 16 (Wickham, Townsend); Cameron County, Texas, September.

Genus HADROMERUS Schönherr.

HADROMERUS OPALINUS Horn.

Arizona.

Genus MINYOMERUS Horn (PSEUDELISSA Casey).

MINYOMERUS INNOCUUS Horn.

This species is not represented.

MINYOMERUS LANGUIDUS Horn (PSEUDELISSA CINEREA Casey).

El Paso, Texas, July 8; Deming, New Mexico, July 11; Gallup, New Mexico; Peach Springs, Arizona, August 25 (Wickham); Winslow, Arizona (Hubbard and Schwarz, Wickham).

Genus ELISSA Casey.

ELISSA LATICEPS Casey.

El Paso, Texas, July 8 (Wickham); Tucson, Arizona, January 13 (Hubbard and Schwarz).

Genus PANDELETEIUS Schönherr.

PANDELETEIUS CAVIROSTRIS Schaeffer.

Brownsville, Texas, May 10, 29, June 9 (Barber, Schwarz, Townsend).

PANDELETEIUS OVIPENNIS Schaeffer.

Brownsville, Texas, May 24 on *Celtis* (Barber).

PANDELETEIUS ROTUNDICOLLIS Fall.

Chiricahua Mountains, Arizona, June 30 (Hubbard and Schwarz).

PANDELETEIUS SIMPLARIUS Fall.

Fort Grant, Arizona, July 13; Oracle, Arizona, July 9–14 (Hubbard and Schwarz); Prescott, Arizona, June 19 (Barber and Schwarz).

PANDELETEIUS HILARIS Herbst.

Toronto, Ontario (Wickham); Boston, Massachusetts, June 4 (Ormonde); Cambridge, Massachusetts (Hubbard and Schwarz); Staten Island, New York; Buffalo, New York; Pennsylvania (Riley); Washington, District of Columbia, June 27; Pennington Gap,

Virginia; Ross County, Ohio (Hubbard and Schwarz); Heyworth, Illinois, September 2 (Wolcott); Iowa City, Iowa, June 18 (Wickham); Missouri (Riley); Houston, Texas (Wickham); Enterprise, Florida, June 8, 11, 12, 15 (Hubbard and Schwarz).

PANDELETEIUS ROBUSTUS Schaeffer.

Santa Rita Mountains, Arizona, May 27, June 5; Chiricahua Mountains, Arizona, June 2 (Hubbard and Schwarz); Las Vegas Hot Springs, Arizona, August 12; Williams, Arizona, May 31, June 2, 11, July 19 on *Quercus gambelii;* Colorado Springs, Colorado, June 15–30, June 15–30 (Wickham); American Fork Canyon, Utah, June 5 (Hubbard and Schwarz).

PANDELETEIUS CINEREUS Horn.

Dallas, Texas (Boll); New Mexico (J. B. Smith); Arizona (Morrison).

PANDELETEIUS SUBTROPICUS Fall.

Key West, Florida, April 2 (Hubbard and Schwarz).

PANDELETEIUS SUBMETALLICUS Schaeffer.

Chiricahua Mountains, Arizona, July 4 (Hubbard and Schwarz); Walnut, Arizona (Wickham); Bright Angel, Arizona, July 12 (Barber and Schwarz); Los Angeles County, California, July (Coquillett).

Tribe **CYPHINI.**

Genus COMPSUS Schönherr.

COMPSUS AURICEPHALUS Say.

Natchez, Mississippi (Wickham); Arkansas; Brownsville, Texas, June 7 (Hubbard and Schwarz, Townsend); Columbus, Texas, July 22; San Diego, Texas, April 3 (Hubbard and Schwarz, Schwarz); Uvalde, Texas, June 18; New Braunfels, Texas, July 25; Cameron County, Texas, August (Wickham).

Genus CYPHUS Germar.

CYPHUS LAUTUS LeConte.

This species varies considerably in color, but I can find no other differences. Specimens with bluish hue are from New Mexico (Snow); Catalina Mountains, Arizona; Santa Rita Mountains, Arizona (Soltau). Specimens with a purplish hue come from Fort Grant, Arizona, July 20 (Hubbard and Schwarz); Bright Angel, Arizona, July 12 (Barber and Schwarz). Those with brownish hue are from Peach Springs, Arizona (Wickham). Grayish specimens come from Yuma, Arizona, March (H. Brown); Arizona (Morrison). Some yellowish specimens are labeled Arizona (through C. V. Riley). Specimens from the same locality seem to be consistently colored.

CYPHUS PLACIDUS Horn.

Yuma, Arizona (H. Brown).

Genus PSEUDOCYPHUS Schaeffer.

PSEUDOCYPHUS FLEXICAULIS Schaeffer.

Brownsville, Texas (Wickham).

Genus BRACHYSTYLUS Schönherr.

BRACHYSTYLUS ACUTUS Say.

New York; Washington, District of Columbia, May 22; Kentucky; Cadet, Missouri, June 11 on persimmon (J. G. Barlow).

Genus ARTIPUS Schönherr.

ARTIPUS FLORIDANUS Horn.

St. Lucie, Florida, April 20; Jupiter, Florida, April 24; Indian River, Florida; Haulover, Florida, March 17; Lake Worth, Florida, June 4 (Hubbard and Schwarz); Key West, Florida, January 3, 4 (Knab), June 17–July 1 (Wickham); Biscayne, Florida; Dry Tortugas, Florida, June 7 (Wickham); Florida (Ashmead); Palm Beach, Florida (Dyar).

Genus ARAMIGUS Horn.

ARAMIGUS TESSELATUS Say.

Palm Beach, Florida; Texas (Hubbard and Schwarz); Atoka, Oklahoma, June 13 (Wickham); Albuquerque, New Mexico (Wickham); Clay County, Kansas; Gove County, Kansas (Snow); West Point, Nebraska, July (Bruner).

ARAMIGUS FULLERI Horn.

Worcester, Massachusetts, April 11 on *Azalea* and *Cissus* (C. W. Minot); Jersey City Heights, New Jersey, December 26, bad on roses (P. Henderson); Mount Airy, Georgia, September 2 (Hubbard and Schwarz); Iowa City, Iowa, December 22 (Wickham); Pasadena, California, July 21 (Fall); San Diego, California (Hubbard and Schwarz).

Genus PHACEPHOLIS Horn.

PHACEPHOLIS ELEGANS Horn.

This is another variable species in color which apparently can not be divided on a structural basis. *Ph. viridis* Chittenden is the most brilliant green form, (cotypes) San Antonio, Texas, May 21, on fruit trees (Hunter). Other green forms are from Onaga, Kansas, June 27 (Crevecoeur); Lavaca County, Texas, June 21 (Hubbard and Schwarz); San Diego, Texas, May 5 (Schwarz). Forms varying from gray to brown are from Corpus Christi, Texas, May 12; San Diego, Texas,

May 9 (Schwarz); Brownsville, Texas, April 12 (Townsend); Beeville, Texas, April 30 (Marlatt).

PHACEPHOLIS OBSCURUS Horn.

Kansas; Fort Collins, Colorado, April 24 (Soltau).

PHACEPHOLIS CANDIDA Horn.

West Kansas (Popenoe); Pueblo, Colorado (Hubbard and Schwarz).

Genus ACHRASTENUS Horn.

ACHRASTENUS GRISEUS Horn.

Houston, Texas, March 29.

Genus APHRASTUS Schönherr.

APHRASTUS TÆNIATUS Gyllenhal.

Fitchburg, Massachusetts, June (Hubbard and Schwarz); Marion, Massachusetts, July (Wickham); Lawrence, Massachusetts (King); New York; New Jersey; Washington, District of Columbia, June 27 (Hubbard and Schwarz); Pennington Gap, Virginia, July 2 (Hubbard and Schwarz); Heyworth, Illinois, June 14 (Wolcott).

APHRASTUS UNICOLOR Horn.

Laredo, Texas, May 28; San Diego, Texas, May 31.

Tribe **EVOTINI**.

Genus LACHNOPUS Schönherr.

LACHNOPUS FLORIDANUS Horn.

Key West, Florida, April (Hubbard and Schwarz), June 17 (Wickham).

Genus OMILEUS Horn.

OMILEUS EPICÆROIDES Horn.

Columbus, Texas, June 17; Jacksonville, Texas, April 9.

Genus EVOTUS LeConte.

EVOTUS NASO LeConte.

Dakota; Kalispell, Montana, June 13; Priest River, Idaho, June 21 (Wickham); Washington (Morrison); Easton, Washington; Oregon (Koebele); Hood River, Oregon, May 20 (Hubbard and Schwarz).

Tribe **PHYLLOBIINI**.

Genus PHYLLOBIUS Germar.

PHYLLOBIUS GLAUCUS Scopoli (CALCARATUS Fabricius).

This is not represented from North America.

Genus STROPHOSOMUS Stephens.

STROPHOSOMUS CORYLI Fabricius.

Montreal, Canada, August 10.

Genus SCIAPHILUS Stephens.

SCIAPHILUS MURICATUS Fabricius.

Bangor, Maine (Hubbard and Schwarz); Brattleboro, Vermont; Hanover, New Hampshire (Weed); West Roxbury, Massachusetts, June 17.

Genus POLYDROSUS Germar (CYPHOMIMUS Horn).

POLYDROSUS AMERICANUS Gyllenhal (CYPHOMIMUS DORSALIS Horn).

Toronto, Ontario (R. J. Crew); Otsego County, New York; Buffalo, New York (Hubbard and Schwarz); Fort Pendleton, West Virginia, July 10; Oakland, Maryland, July 11; Cincinnati, Ohio; Ann Arbor, Michigan; Grand Ledge, Michigan, July 11 (Hubbard and Schwarz); Onaga, Kansas (Crevecoeur).

POLYDROSUS OCHREUS Fall (CYPHOMIMUS).

This species is not represented.

POLYDROSUS DELICATULUS Horn (SCYTHROPUS).

Cotypes, San José del Cabo, Lower California.

POLYDROSUS PENINSULARIS Horn.

This species is not represented.

POLYDROSUS IMPRESSIFRONS Gyllenhal.

Geneva, New York, June 18 (W. J. Schoene).
Apparently accidentally introduced from Europe.

Genus SCYTHROPUS Schönherr.

SCYTHROPUS CALIFORNICUS Horn.

Sacramento County, California, February (Koebele); Placer County, California, April (Van Dyke); Contra Costa County, California (Coquillett).

SCYTHROPUS FERRUGINEUS Casey.

Los Gatos, California (Hubbard and Schwarz); Humboldt County, California, June 13; Eureka, California (H. S. Barber); Oregon (Koebele).

SCYTHROPUS CRASSICORNIS Casey.

This species is not represented.

SCYTHROPUS LATERALIS Casey.

This species is not represented.

SCYTHROPUS ELEGANS Couper.

Lawrence, Massachusetts; Charlemont, Massachusetts, April; Durham, New Hampshire (Weed and Fiske); Trenton, Ontario (Evans); Canada (Pettit); Helena, Montana, April 26 (Hubbard and Schwarz); Tenino, Washington; Banff Springs, Alberta, June 10 (Hubbard and Schwarz).

SCYTHROPUS CINEREUS Casey.

This species is not represented.

SCYTHROPUS ALBIDUS Fall.

Portland, Oregon; Beaver Canyon, Idaho; Humboldt County, California, June 19; Eureka, California, June 4 (H. S. Barber).

SCYTHROPUS MISCIX Fall.

Cotype, Sacramento County, California; Easton, Washington (Koebele); Helena, Montana, May 5 (Hubbard and Schwarz).

Genus MITOSTYLUS Horn.

MITOSTYLUS TENUIS Horn.

Dallas, Texas; Wades, Texas, May 22; San Diego, Texas, June 13 (Hubbard and Schwarz); Beeville, Texas, April 30 (Marlatt), April 22 (Schwarz).

MITOSTYLUS GRACILIS Horn.

Cotypes, San Jose del Cabo, Lower California.

Tribe PROMECOPINI.

Genus COLEOCERUS Schönherr.

COLEOCERUS DISPAR LeConte.

Tucson, Arizona, July 21 (Hubbard and Schwarz, Wickham).

COLEOCERUS MARMORATUS Horn.

Dallas; San Diego; New Braunfels, June 16; Beeville; San Antonio; Brownsville; Uvalde, June 18; Point Isabel; and Sharpsburg, Texas.

Genus ARACANTHUS Schönherr.

ARACANTHUS PALLIDUS Say.

Illinois (Wickham); Louisville, Kentucky, July 17; Memphis, Tennessee, March 12 (Soltau); St. Louis, Missouri (Schuster).

Genus EUDIAGOGUS Schönherr.

EUDIAGOGUS PULCHER Fabricius.

Orange County; Enterprise; Green Cove Springs and Crescent City, Florida; Columbus, May 19; Cuero and Brownsville, Texas.

EUDIAGOGUS ROSENSCHŒLDI Fahræus.

Mobile, Alabama; Pascagorda and Natchez, Mississippi; Bayou Sara, Louisiana; Columbus and Houston, Texas.

Genus PROMECOPS Schönherr.

PROMECOPS ARCUATA Fabricius (NUBIFERA Gyllenhal).

This species is not represented.

NOTES ON THE PHILIPPINE POND SNAILS OF THE GENUS VIVIPARA, WITH DESCRIPTIONS OF NEW SPECIES.

By Paul Bartsch,

Assistant Curator, Division of Mollusks, U. S. National Museum.

During the recent expedition of the U. S. Bureau of Fisheries steamer *Albatross* to the Philippine Islands every opportunity was used to make extensive collections of fresh-water as well as land and marine shells. Among the fresh-water forms *Vivipara* proved especially interesting, particularly those of Lake Lanao, Mindanao, where we secured no less than 6 gallons of living shells. It was from this lake that I described *Vivipara lanaonis* Bartsch,[a] with forms *alpha* to *lambda*, of which I now figure a fully adult shell, pl. 34, fig. 1. The greater part of the material collected by me in Lanao falls under this species and will form the basis of a special report to be published later.

We were unable to find *Vivipara polyzonata* Frauenfeld anywhere in the Philippines, which makes it appear as if the species did not occur in the islands.

VIVIPARA BULUANENSIS SOLANA, new subspecies.

Plate 34, fig. 2.

Shell similar to *V. buluanensis* proper, but more depressed, with much less inflated whorls and much narrower umbilicus; base less rounded, with a well-marked angle at edge of the umbilicus; in *V. buluanensis* this is well rounded.

The type and another specimen (Cat. No. 207777, U.S.N.M.) comes from Rio Similao, Mindanao. They were donated to the U. S. National Museum by Father Sola, the director of the Museo Ateneo, Manila, for whom it is named. The type has six whorls and measures: Length, 30 mm.; diameter, 23 mm. Four additional specimens (Cat. No. 207778, U.S.N.M.), also from the Museo Ateneo, were collected at Rio Talisayan, Mindanao. Considerable more material from both of these localities is in the Museo Ateneo.

[a] Proc. U. S. Nat. Mus., vol. 32, 1907, pp. 145–147, figs. 1–10.

VIVIPARA CEBUENSIS, new species.

Plate 34, fig. 3.

Shell broadly conic, exterior dark olive with a brownish tinge, interior purplish, lighter at the edge, peritreme with a black edge. Early nuclear whorls small and smooth, forming a decided mucro; later ones like the succeeding turns. Post-nuclear whorls inflated, roundedly shouldered and appressed at the summit; marked by a slender raised peripheral thread and numerous fine spiral lirations, of which those on the well-rounded base are better developed than those occurring between the sutures. Those of the base are also of more even development and spacing than those of the spire. Base narrowly umbilicated; edge of umbilicus scarcely angulated; aperture very broadly oval, outer lip thin, showing the external sculpture within by transmitted light; columella partly reflected over the umbilicus.

The type (Cat. No. 207782, U.S.N.M.) and a lot of specimens were found living by the writer in a boggy, brush-covered field, which in the wet season must form a rather extensive lake, near Compostela, Cebu.

The type has six whorls and measures: Length, 31.8 mm.; diameter, 24.6 mm.

VIVIPARA MINDANENSIS MAMANUA, new subspecies.

Plate 34, fig. 4.

Shell similar to *V. mindanensis* in outline, but more openly umbilicated. In the present form the malleations are confined to the base, while in *mindanensis* proper they extend over the entire surface. The coarse spiral threads of *mindanensis* are obsolete in *mamanua*, which has the entire surface marked by very fine, closely spaced spiral lirations.

The type and another specimen of *V. m. mamanua* (Cat. No. 207779, U.S.N.M.) were donated to the U. S. National Museum by the Museo Ateneo of Manila, which contains additional material. They come from Lake Mainit, Mindanao.

The type has five whorls remaining, which measure: Length, 30.5 mm.; diameter, 29.5 mm.

VIVIPARA PARTELLOI, new species.

Plate 34, figs. 5, 6.

Shell thin, broadly conic, with a strong peripheral keel made up of triangular segments which give it a stellate appearance; color greenish yellow. Nuclear whorls eroded. Post-nuclear turns rather inflated between the keel and the appressed summit and well rounded on the base. Peripheral keel compressed and smooth on the early whorls; on the last two it is composed of a series of hollow triangular projections, arranged in a cone in cone manner, twelve of which occur upon the last whorl and nine upon the preceding. Sutures well con-

stricted. Entire surface of periphery and base marked by strong lines of growth and exceedingly fine closely spaced spiral striations. Aperture subcircular; posterior angle obtuse; outer lip rendered } shaped by the peripheral keel, thin, columella strongly curved; peritreme continuous, black edged; interior bluish white striated with smoky lines.

The type (Cat. No. 207780, U.S.N.M.) and a good series of specimens were collected by myself in Lake Lanao, Mindanao. The type has five whorls and measures: Length, 39.0 mm.; diameter, 33.8 mm.

It gives me pleasure to name this species for Maj. Joseph M. T. Partello, through whose kindness my trip to Lake Lanao was made possible.

VIVIPARA CLEMENSI, new species.

Plate 34, figs. 7, 8.

Shell very broadly conic, strongly shouldered, marked by many spiral cords; greenish horn-colored externally, streaked with darker varices, dark brown within, excepting the edge, which is whitish. Nuclear whorls small. Post-nuclear whorls very strongly, almost tabulatedly, shouldered at the summit, marked by three strong spiral keels, the first of which is at the periphery and the third at the angle of the shoulder, which is about halfway between the periphery and the summit; the second keel falls a little anterior to the middle of the space between the two. In addition to these strong keels the whorls are marked by two strong cords on the shoulder, while another of equal strength divides the space between the three keels. Base well rounded, marked by many subequal and subequally spaced wavy spiral threads. Entire surface of the shell marked by many fine decidedly retractive lines of growth and numerous very fine spiral striations. Aperture very broadly obovate; outer lip thin, rendered slightly wavy by the spiral keels showing the external sculpture within, the spiral keels and cords appearing as dark brown bands; columella moderately curved; peritreme edged with black.

Two specimens out of a large lot (Cat. No. 207781, U.S.N.M.) are selected and figured as cotypes. They show the range of variation in the strength of sculpture; they have five whorls and measure respectively: Length, 35.0 and 34.3 mm.; diameter, 29.0 and 26.5 mm.

They were collected by Rev. Joseph Clemens, at Camp Keithley, north end of Lake Lanao, Mindanao, and the species is named for him.

EXPLANATION OF PLATE 34.

All figures natural size.

Fig. 1. *Vivipara lanaonis* Bartsch.
2. *Vivipara buluanensis solana* Bartsch.
3. *Vivipara cebuensis* Bartsch.
4. *Vivipara mindanensis mamanua* Bartsch.
5, 6. *Vivipara partelloi* Bartsch.
7, 8. *Vivipara clemensi* Bartsch.

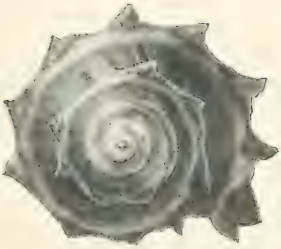
1

2

5

3

4



6

7

8

PHILIPPINE POND SNAILS OF THE GENUS VIVIPARIA.

FOR EXPLANATION OF PLATE SEE PAGE 367.

THE NORTH AMERICAN DRAGONFLIES (ODONATA) OF THE GENUS MACROMIA.

By Edward Bruce Williamson,
Of Bluffton, Indiana.

All the North American dragonflies referred in the past to *Macromia* and *Epophthalmia* are congeneric and should be referred to *Macromia*. *Didymops* is very close to *Macromia*, and adequate venational characters for separating the two genera have not been detected. At the same time *Didymops* seems distinct enough by other characters, and the well-known North American species, *transversa*, is not discussed in this paper. I have seen only males of *Azuma* and *Epophthalmia* and of but one species of each. They are separated at once from *Macromia*, among other characters, by the greatly developed genital hamules in the male and by several venational characters, among which may be mentioned the abrupt apical curving of M_3 and M_4 in both front and hind wings, and the posterior widening of the hind wing from the anal angle to the termination of M_4. (See figs. 1, 2.) Venational differences between *Azuma* and *Epophthalmia* are slight and are mainly to be found in the relations of Cu and A in the front wing proximal to the triangle. The crossed or uncrossed condition of triangles and subtriangles, which has been used in the past in distinguishing *Macromia* and *Epophthalmia* has no value here as a generic character.

The American species of *Macromia* are distributed generally over the United States and southern and eastern Canada. So far as I know, *M. illinoiensis* is the only species frequenting lakes as well as streams. The four species other than *illinoiensis* which I have seen in life prefer the larger streams, along which they course with swift flight at slight elevation, though they not infrequently leave the streams and pass out of sight over the tallest trees. They are most active during bright days, from about 9 or 10 a. m. till 3 or 4 p. m. At Sandusky, Ohio, where *illinoiensis* has been taken in large numbers, many collect toward evening in the cedars on Cedar Point, several individuals frequently choosing the same twig for a resting place. It is probable that during the day these indi-

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viduals seek insect food at a considerable elevation and hence escape observation. Mr. R. A. Muttkowski observed, at Milwaukee, several individuals of a species which he believed was not *illinoiensis* resting in close proximity to each other on a tree branch at a considerable elevation.

The height of the season for the species of *Macromia* seems to lie between the spring and autumn dragonfly seasons, when any possible competition with members of the same order would be at a minimum. Along the Wabash River during a hot day in early August odonate life seems almost suspended. It is on such a day that the collector may hope to find the largest number of individuals of this genus.

Macromias are reported to be eaten by birds. I have never observed examples of this myself. Once a pair in copulation (apparently *pacifica*) was repeatedly attacked by a kingbird, which

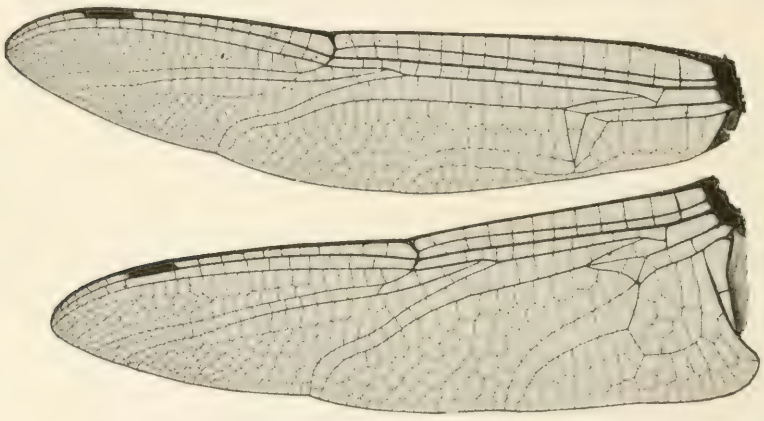

FIG. 1.—WINGS OF MALE AZUMA ELEGANS, FROM MIYAZAKI, JAPAN.

drove the dragonflies back and forth across the Wabash River several times, but the dragonflies eventually came to rest about 30 feet from the ground, clinging to the under side of an oak limb, and escaped without any damage. It is probable that any destruction by birds occurs during the teneral condition of the dragonflies. It is at this period, and only then, so far as I have observed, that kingbirds attempt to capture *Anax junius*. I have seen a yellow-billed cuckoo make repeated and unsuccessful attacks on an adult *Epiaeschna heros*. On the other hand, I once saw a catbird catch an adult *Gomphus*, but the bird pounced on the dragonfly just as it alighted on a clay bank, and did not take it on the wing.

No specimens of *Macromia* have been seen by me which were infested with the red mite which occurs so commonly on many dragonflies. In a large number of specimens examined, only two show abnormal wings which have resulted from apparent mechanical

injury during their development. In these two cases the abnormality is slight and would interfere but little if at all with the normal functions of the insect.

The nymph of *illinoiensis* has been described by Cabot and Needham. I have collected neither nymphs nor exuviæ which have been specifically identified. In Steuben County, Indiana, I collected a few nymphs among tree rootlets in deep pools in a small woodland stream between two lakes, but I was unable to rear these. This paper deals only with imagoes.

Material for this paper has been collected during the past several years. In 1900 Mr. C. C. Deam collected a *Macromia* at Blount Springs, Alabama, which I was unable to identify. Since then I have had a revision of the North American Macromias in mind, and recently I have borrowed specimens from several sources. The result is that I have before me a comparatively large number of

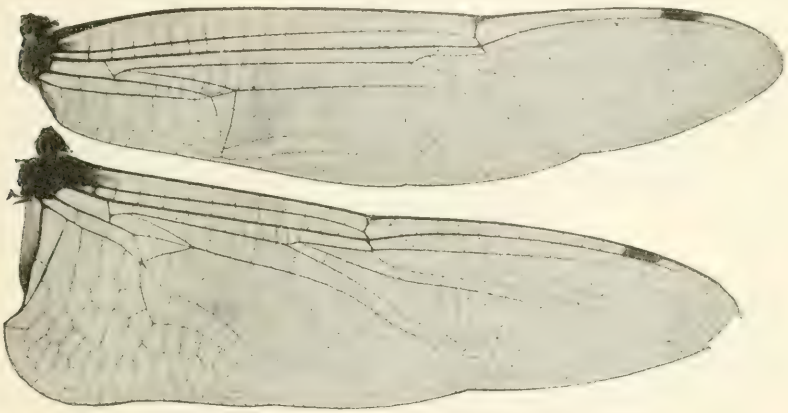

FIG. 2.—WINGS OF MALE EPOPHTHALMIA, SPECIES ? FROM BURMA.

individuals. At the same time, the total number is not large and too few localities are represented. Macromias, with the exception of *illinoiensis*, are rare in collections. This is to be explained by their comparative rarity in nature, by their occurrence during a season when collectors are generally not actively engaged in field work, and by the difficulty of their capture because of their flight over deeper water and their swiftness. In life few insects rival them in beauty, power, and individuality. The few females taken, as compared with the number of males, is also an unfortunate factor which adds to the incompleteness of this paper.

In the following descriptions I have endeavored to indicate especially those characters which will aid in the recognition of the species as far as I am able to do so with the material before me. More formal and detailed descriptions at this time would, it seems to me, serve rather to confuse than emphasize the purpose of this paper. Since

the purpose of this study was the preparation of a means of readily identifying specimens, repeated examination of the individuals before me has been disappointing in its failure to discover striking specific characters, and I have been tempted to return the borrowed material and not publish these notes at all. It is probable, however, that unless some new interest is taken by collectors in the North American Macromias the present difficulties will confront students of North American dragonflies for an indefinite period of time. In the hope of awakening some interest in these beautiful insects I find an excuse for the publication of this incomplete paper.

I am indebted to the following persons for the loan of material: Mr. C. C. Adams, Mr. C. S. Brimley, Dr. Philip P. Calvert (from his collection and the collection of the Academy of Natural Science, Philadelphia), Mr. Rolla P. Currie (collection U. S. National Museum), Mr. Samuel Henshaw (collection Museum of Comparative Zoology), Prof. J. S. Hine (collection Ohio State University), Mr. R. A. Muttkowski (collection Milwaukee Public Museum), and Prof. E. M. Walker. Unless otherwise indicated, specimens are in my collection. The total number of specimens examined in the preparation of this paper is 197—141 males, 56 females. Nearly one-half of this number is *Macromia illinoiensis*. The wings of *Azuma* were photographed by Newton Miller; the other wing photographs were made by Professor Needham.

MACROMIA TÆNIOLATA Rambur.

Length of abdomen: Male, 56–61 mm.; average, 59; female, 57–61 mm.; average, 59.9. Length of front wing: Male, 50.5–56 mm.; average, 54.1; female, 56–61 mm.; average, 58.3. Length of hind wing: Male, 48–53.5 mm.; average, 52.1; female, 53–59 mm.; average, 55.6. Length of first tibia, male, 9 mm.; hind femur, male, 13 mm. Length of tibial keel in length of tibia, male: First tibia, $\frac{3}{4}$; middle tibia, $\frac{1}{4}$ to $\frac{1}{4}$.

Antehumeral stripe present, extending about half or slightly less across the mesepisternum. Latero-ventral metathoracic carina brown, with or without a narrow yellow stripe anteriorly. Yellow ring on abdominal segment 2 narrowly interrupted dorsally (interruption not distinct in one male), not interrupted laterally. Costa dark colored.

Male.—Postclypeus clear greenish, labrum obscure dull yellow; dorsal spots on frons minute to 1 mm. in diameter, lateral spots wanting or indistinct.

Abdominal spots on 3–6 small, rounded, separated dorsally, isolated laterally from any inferior pale areas, about equal in size on all the segments and occupying one-half or less the distance from the transverse carina to the base of the segment; on 7 the large quadrangular spot is separated by a narrow black ring from the base of the segment,

and the yellow is produced very briefly posteriorly across the transverse carina in a small projection on either side of the middorsal line or as a small median squarish continuation; a short subbasal yellow ring on 8, narrowly or broadly interrupted dorsally, not reaching the lower edge of the segment on either side, and bounded posteriorly by the transverse carina (excepting in one male where it is produced dorsally a little beyond the transverse carina); ventrally the pale areas are generally indistinct, most definite on 2.

Wings hyaline, rarely with the faintest yellowish tinges over limited areas, and with the extreme apices faintly fumose; one specimen has the crossveins very narrowly edged with brown; no trace of costal or subcostal basal brown areas; stigma very dark reddish brown or black. (See fig. 3.)

Abdominal appendages[a] distinctly different from *illinoiensis*, about 3.5 mm. long (2.5 in *illinoiensis*), the apex more acute, and in profile more upturned, with the lower edge very slightly convex or straight subapically, and parallel with the upper edge, not converging as in

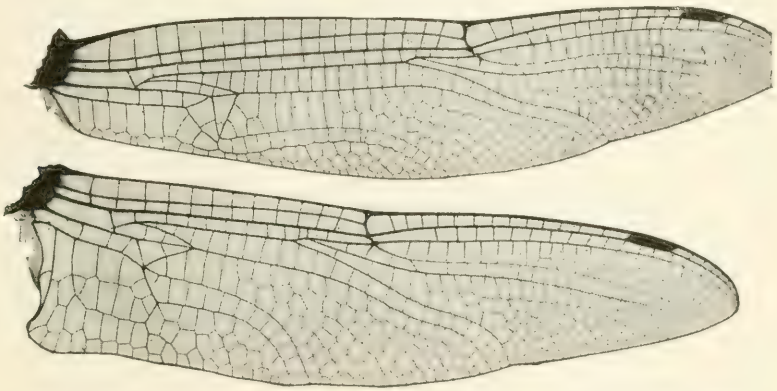

FIG. 3—WINGS OF MALE MACROMIA TÆNIOLATA, BLUFFTON, INDIANA, AUGUST 6, 1905.

illinoiensis; basal lateral external carina always present, but the tooth at its apical termination is always small and may be entirely wanting; a more or less distinct basal external pale area; inferior appendage of usual form, very slightly shorter than the superiors.

Female.—Similar to the male, but lateral spots on frons generally present, though less distinct than dorsal spots.

Abdominal spots similar, but spot on 7 may be divided or not in

[a] Generally in the North American Macromias the appendages lack that strict uniformity of shape which is so marked a specific character in certain groups. The greatest variation in the shape of the superior appendages noticed by me is in the form of the apex. It would seem that this is due to the delicate nature of the appendages, especially probably during teneral life, when they may suffer mechanical injuries, or to post-mortem changes, since not infrequently the superior appendages of an individual are not symmetrical. Corduliinæ generally have the superior appendages weakly chitinized.

the middorsal line (never divided in male), and the basal spots on 8 are reduced to a trace or, more usually, are wanting altogether.

Wings hyaline or tinged with yellowish, most strongly in a teneral specimen; in one or two cases the faintest trace of basal brown areas in the costal spaces; stigma yellow-brown to black, depending on age. The examination of the wings of 7 females shows the following: Triangle of front wing, free 2, crossed 12; subtriangle of front wing and triangle of hind wing, crossed 14.

Vulvar lamina apparently a slight thickening of the median posterior edge of the sternum, with a slight folding into a shallow trough. Abdominal appendages as in *illinoiensis*.

This species can be confused only with the next. Differences are indicated in that description. It is the largest of our Macromias. For living colors see note under next species.

Material examined.—Rosslyn, Virginia, July 30, 1899, female, G. N. Collins (U.S.N.M.). Washington, District of Columbia, July 10, 1902, female, W. C. Weeden (U.S.N.M.). Toledo, Ohio, August 1, 1894, male, J. S. Hine (O. S. U.). Napoleon, Ohio, July 9, 1898, female, J. S. Hine. Elkhart, Indiana, May 31, 1896, teneral female, in thick woods, R. J. Weith (P. P. C.). Fort Wayne, Indiana, July 18, 1901, 5 males, E. B. Williamson (1 U.S.N.M.); August 3, 1902, female, E. B. Williamson. Bluffton, Indiana, August 6, 1905, male; August 8, 1905, male; August 11, 1907, male; August 1, 1908, 2 males, 1 female, E. B. Williamson. Without data, female (O. S. U.). Total, 11 males, 7 females.

MACROMIA WABASHENSIS, new species.

Length of abdomen: Male, 51–57 mm.; average, 54.4. Length of front wing: Male, 47.5–50 mm.; average, 49. Length of hind wing: Male, 46–48 mm.; average, 47.3. Length of first tibia, male, 8 mm.; hind femur, male, 12.6 mm. Length of tibial keel in length of tibia, male: First tibia, $\frac{3}{7}$; middle tibia, $\frac{1}{3}$—to $\frac{1}{3}$.[a]

Very similar to *tæniolata*, but may be recognized by the following characters: Costa (and antenodals and postnodals) yellow or yellowish as far as stigma or tip of wings; labrum less obscured, face paler and brighter colored; lateral spots on frons distinct (indistinct in two specimens); dorsal abdominal spot on 8 similar in shape and extent, relative to the transverse carina, to the spot on 7 (in two specimens a very narrow dorsal basal yellow ring on 9). (The spot on 8, relative to the area of the segment, is really more extensive than on 7, since on 7 there is a wider basal ring of black, though, compared with each other, the spot on 7 is larger than the spot on 8.)

Wings tinged with pale yellowish or hyaline (in about equal numbers), the extreme apex frequently slightly fumose; in 4 specimens a trace of brown spots in basal costal space. (See fig. 4.)

[a] In one specimen, which otherwise seems to belong here, the tibial keel of middle tibia is $\frac{1}{2}$.

Abdominal appendages similar to those of *tæniolata*, but seen in profile the apices of the superiors are less curved and upturned, the apical portion between the median external tooth and the apex less inflated, approaching the form of *illinoiensis;* median lateral external tooth present in every case.

From *pacifica*, which it resembles in color of costa, *wabashensis* is separated at a glance by the shorter antehumeral stripe, the smaller abdominal spots (on 3–6 scarcely one-third as large), and the obscurely colored ventral surface of the apical segments, especially of 8. Differences in the appendages exist, but are scarcely definable.

From *georgina* it is separated at a glance by the obscure and scarcely evident ventral markings on 7 and 9, which are isolated from the dorsal spots.

From both *georgina* and *australensis* it is separated by the brown latero-ventral metathoracic carina, and it lacks the distinct pale ventral basal areas on 8 and 9 of *australensis*.

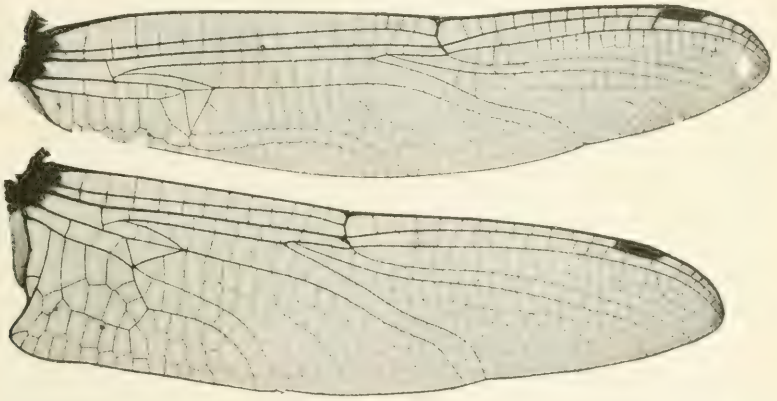

FIG. 4.—WINGS OF MALE MACROMIA WABASHENSIS, BLUFFTON, INDIANA, AUGUST 6, 1905.

Unfortunately I have been unable to take a female of this species. Its habits at Bluffton seem indistinguishable from those of *tæniolata*, with which species and *pacifica* it is associated. The three species are discussed under *pacifica*. On living colors of *tæniolata* and *wabashensis* I have the following note: Eyes, Hooker's green above; below, in front up to vesicle, and behind up to tubercle, dark nile green; yellow markings, chrome yellow; thorax black, with metallic green reflections; abdomen dead black, velvety in appearance.

Type.—A male, in author's collection, taken at Bluffton, Indiana, June 28, 1908.

Material examined.—All collected by E. B. Williamson, Bluffton, Indiana, June 15, 1902, male; August 6, 1905, male; August 8, 1905, 2 males; August 11, 1907, 2 males; June 28, 1908, male; July 10, 1908, male; August 1, 1908, 2 males (1 P. P. C.); total, 10 males.

MACROMIA ALLEGHANIENSIS, new species.

Length of abdomen: Male, 51–54 mm.; average, 52.6; female, 56 mm. Length of front wing: Male, 47.5–48 mm.; average, 47.8; female, 52 mm. Length of hind wing: Male, 45.5–46 mm.; average, 45.8; female, 50 mm. Length of first tibia, male, 8.3 mm.; hind femur, male, 12.1 mm. Length of tibial keel in length of tibia, male: First tibia, $\frac{3}{4}$; middle tibia, $\frac{1}{4}$ to $\frac{1}{5}$.

Without trace of antehumeral thoracic stripe. Latero-ventral metathoracic carina very narrowly yellow posteriorly. Yellow ring on abdominal segment 2 interrupted dorsally, not interrupted at the auricles. Costa dark colored.

Male.—Postclypeus paler than labrum, usually divided by brown into a central and two extremital pale areas; dorsal spots on frons small or wanting.

Abdominal spots similar to *illinoiensis*, with the striking difference that the yellow on 7 encircles the segment, so that segments 7–9 have the inferior basal margin of each segment yellow; small spots are present on 5 in 5 of 7 specimens, and are absent on 6 in 6 of 7 specimens.

Wings hyaline, without trace of color; stigma very dark brown or black.

Abdominal appendages seen in profile similar to *illinoiensis*, but the superiors are constricted ventrally beyond the base and are slightly widened near the apex; in dorsal view the median lateral external tooth is present, but minute in every case.

Female.—Dorsal spots on frons larger than in male, about 1 mm. in diameter; postclypeus slightly paler than labrum, both obscured with dark brown and black.

Abdominal spots present on 3–6, smaller posteriorly and scarcely evident on 6; large spot on 7 not encircling the segment as it does in the male; inferior lateral basal spots on 7–9 indistinct or wanting, excepting on 8 in 1 female, where they are conspicuous; dorsally 8–10 are uniform black.

Wings in 1 specimen hyaline; in the other slightly tinged with brown and with veins brown edged, and with a basal trace of brown in the costal space of front wings and in the costal and subcostal spaces of hind wings; stigma black. Two specimens show: Triangle of front wing free, 1; crossed, 3; subtriangle of front wing free, 1; crossed, 3; triangle of hind wing crossed, 4.

Vulvar lamina similar to that of *illinoiensis* but apparently smaller, shorter, and with the emargination narrower and deeper. Abdominal appendages similar to those of *illinoiensis*.

This species has been confused with *illinoiensis*. The length of the first tibia in the female is about 9, as compared with 7 in *illinoiensis*. The male may be at once recognized by characters of the

tibial keel of middle tibia and abdominal markings mentioned above. I have collected all the specimens I have seen but two. Until this study was begun I confused this species with *illinoiensis*, and I recall nothing striking in its habits in life.

Types.—Male and female in author's collection, taken at Ohiopyle, Pennsylvania, June 24 and June 25, 1900, respectively.

Material examined.—Dunbrooke, Virginia, July 31, 1899, male, R. P. Currie (U.S.N.M.). Ohiopyle, Pennsylvania, June 24, 1900, 2 males, E. B. Williamson. June 25, 1900, 2 males, 1 female, E. B. Williamson (1 male P. P. C.). June 26, 1900, male, E. B. Williamson (U.S.N.M.—Insect Book, pl. 42, fig. 7). September 8, 1901, female, J. L. Graf. Livingston, Kentucky, June 23, 1904, male, E. B. Williamson. A damaged female, collection C. C. Adams, Cleveland, Virginia, August 4, 1899, probably is this species. Total, 7 males, 2 females.

MACROMIA ILLINOIENSIS Walsh.

Length of abdomen: Male, 47–52 mm.; average, 48.8; female, 47–51 mm.; average, 49. Length of front wing: Male, 42–45.5 mm.; average, 44.1; female, 46–50 mm.; average, 48.2. Length of hind wing: Male, 40–45 mm.; average, 42.4; female, 45–49 mm.; average, 47. Length of first tibia, male, 7 mm.; hind femur, male, 10.7 mm. Length of tibial keel in length of tibia, male: First tibia, $\frac{1}{2}$; middle tibia, $\frac{1}{2}-$ to $\frac{1}{2}$.[a]

Without trace of antehumeral thoracic stripe. Latero-ventral metathoracic carina brown. Yellow ring on abdominal segment 2 narrow and interrupted at the auricles and dorsum to form 4 spots. Costa dark.

Male.—Postclypeus distinctly paler, clearer in color than the labrum; dorsal spots on frons variable in size, always small, about 0.5 mm. in diameter, and about half as large as the lateral spots; in one specimen dorsal spots are entirely wanting. (There is considerable variation in the coloring of the labrum, especially in the extent of marginal and central black or dark brown, but this seems independent of locality).

Abdominal spots on 3–6 never meeting in the median line, growing smaller posteriorly, present in only 2 cases on 6, and frequently absent on 4–6; present on 7 as a large dorsal basal spot, posteriorly reaching the transverse carina on either side, produced briefly posteriorly in the mid-dorsal line, not encircling the segment, but limited beneath on the sides by black; segment 8 with a small, narrow, triangular basal spot on either side, the bases of the triangles narrowly separated by the middorsal black line, variable in size and often reduced to mere traces; 8 and 9 (rarely 7) ventrally each with a basal yellowish spot on either side.

[a] Very rarely shorter; I have examined 2 specimens in which it is $\frac{2}{3}$.

Wings hyaline, venation black, in teneral specimens more or less tinged with yellowish; basal costal and subcostal brown spots often present, in their maximum development reaching the first antenodal; wings sometimes fumose beyond the stigma, especially along the anterior margin; stigma yellowish brown to black, apparently depending on age. (See fig. 5.)

Abdominal appendages seen in profile: The upper edge of superiors nearly flat, a slight postero-dorsal elevation at the extreme apex; lower edge beyond the enlarged base nearly parallel to the upper edge, very slightly converging posteriorly, the apex truncate; seen from above the superiors are lyre-shaped, a short basal lateral external carina terminating in a small tooth near the middle of each appendage; this tooth or projection is variable in size, always small, and sometimes not apparent; on the ventral surface distal to this

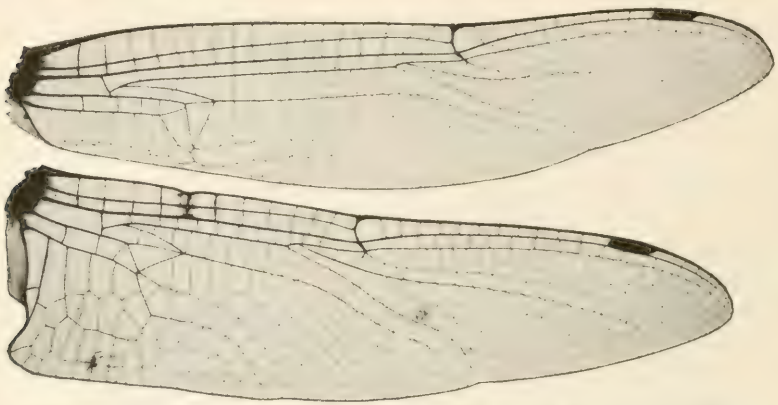

FIG. 5.—WINGS OF MALE MACROMIA ILLINOIENSIS, WATERLOO, IOWA, JUNE 8, 1906.

tooth the appendage is denticulated; inferior appendage triangular, curved, and equaling or slightly exceeding the superiors.

Female.—Postclypeus more obscured than in the male, especially at either extremity; spots on frons larger.

Abdominal spots larger than in male, excepting on 7 and 8; smallest on 5 and 6, where they may be lacking entirely; 7 similar to male; dorsal spots absent on 8, excepting in 2 teneral specimens; inferior lateral basal spots indistinct or absent on 8 and 9.

Wings hyaline, yellowish brown in several teneral specimens, veins black, brown margined in 2 specimens; basal costal and subcostal brown areas reaching beyond the second antenodal as a maximum; apical fumose area sometimes present, variable in extent, in one case extending basally to nodus; as in the male, the darkest winged specimens are teneral; stigma as in male. The wings of 10 females show the following: Triangle of front wing, free 6, crossed 14; subtriangle of front wing, free 4, crossed 16; triangle of hind wing, free 7, crossed 13 (compare with same parts in 10 males as tabulated; in rows of

postrigonal cells, as well as other areas, female Macromias have a larger number of cross-veins than the males). (See fig. 6.)

Vulvar lamina about $\frac{1}{7}$–$\frac{1}{6}$ length of segment 9, deeply and widely emarginate in a semicircle or right angle. Abdominal appendages equal or very slightly shorter than segment 10.

I refer to *illinoiensis* two very similar males, one from Great Falls, Maryland (U.S.N.M.), and the other from Pennsylvania (Acad. Nat. Sci., Phila.). These have abdomen 51 mm. in length and hind wing 46. The Maryland specimen has the tibial keels as usual in *illinoiensis*, but in the Pennsylvania specimen the keels of the first and middle tibiæ are $\frac{1}{3}+$ and $\frac{1}{3}$ in length of the respective tibiæ. The abdominal spots on 3–6 are conspicuous, those on 6 in the Maryland specimen being about 1 mm. in diameter, and in the Pennsylvania specimen about half as large. It is possible that a larger series would reveal that these 2 specimens are specifically distinct.

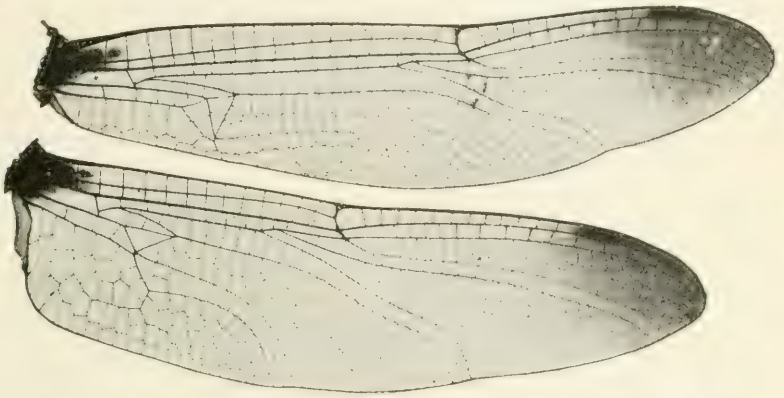

FIG. 6.—WINGS OF FEMALE MACROMIA ILLINOIENSIS, SANDUSKY, OHIO, JULY 12, 1903.

M. illinoiensis is the best known and most widely distributed of the North American Macromias. Professor Walker, who has observed the species carefully, has written me with reference to its habits, and his remarks are quoted in full:

I have taken the species in but two localities, De Grassi Point, Lake Simcoe, and Go Home Bay, Georgian Bay (both Ontario, Canada), but I have also seen it on the wing on the North River, Algonquin Park, where I have also found the exuviæ. At De Grassi Point the nymphs inhabit the most exposed part of the shore, where the clay banks are about 2–5 feet high and are strewn thickly along the water's edge with boulders of various sizes, which are pushed up in the spring by the ice. The water is clear and practically free from vegetation, except microscopic forms, and is subject to considerable wave action. The lake is about 2 miles broad at this point, where it forms part of Cookes Bay, the main body of the lake lying farther to the north.

The nymphs climb up the clay banks, crawling sometimes 20 feet or more from the water's edge, and then climb a tree, sometimes to a height of 7 or 8 feet, before transforming. I have never been at De Grassi Point during the season of transformation, and have never seen the imagoes in the oak grove, but always in the glades and along the roads back in the woods, half a mile or so from the spot where the exuviæ are

found. I have also seen them flying low over the water within 50 yards of the shore, and have once or twice noticed the female flying very close to the water, striking the surface with the tip of the abdomen at intervals of a few yards.

In the glades and wood roads I have taken only the males and have found them most plentiful during July, although they fly till the second or third week of August. The later hours of the afternoon, before sundown, seem to be their favorite time for foraging. They fly very swiftly, in a more or less regular beat up and down a road or opening in a wood, usually about 4 or 5 feet from the ground, but sometimes 15 to 20 feet. They are seldom seen to rest. They disappear before sundown.

At Go Home Bay I have found them in much larger numbers. The shores of this bay are low, well-rounded masses of Laurentian gneiss, exceedingly irregular in contour, and the bay is studded with innumerable rocky islands, more or less sparsely clothed with stunted white pine, red and white oak, aspen, white birch, junipers, Vacciniums of several species, and many other plants, including a great variety of mosses and lichens. The Macromias breed about the rocky shores in all but the most exposed situations. They do not occur in the islands outside the limits of Go Home Bay, i. e., not upon the barren, wind-swept islands of Georgian Bay. The island upon which the biological station is built lies at the mouth of Go Home Bay, and the Macromias were found upon it in considerable numbers, the nymphs transforming most commonly upon the more sheltered parts of the island. The boathouse, which was one of the favorite spots for transformation, is built in a little cove a few yards wide, where the shore is somewhat marshy, a few reeds and pipeworts growing in the water here and there. The nymphs would climb up the sides of the boathouse, usually to the edge of the roof, about 7 feet, but sometimes only 2 or 3 feet. I have also found exuviæ upon the dwelling house, which is built upon a rocky hummock about 12 feet high and 30 feet from the water's edge.

The first imagoes seen in the season of 1907 appeared July 4, but in 1908 they began to transform on June 26, and were coming out in considerable numbers on the 28th and 29th. The usual time for transformation is in the morning between 7 and 8, but we found one individual transforming in the evening of a cloudy day. For the first two weeks or so in July the imagoes are easily taken, as their flight is weak, and they are frequently found hanging from the branches of trees and shrubs, the two sexes in about equal numbers. Later in the season, i. e., during the latter half of July and in August, they became pretty well distributed through the woods and were seen only occasionally about the island. At this time the females are seldom seen. The woods are for the most part sparse, with numerous open, rocky places, and the Macromias fly back and forth in these openings, frequenting especially openings partly surrounded by a thick growth of trees. There are many depressions in the rocks, which are filled with sphagnum and many bog plants. The openings are surrounded by a zone of black spruce, white birch, and scattered red maples, with an undergrowth of mountain holly, *Gaylussacia resinosa*, *Vaccinium canadense*, and a few other plants. The open central parts of these swampy depressions are favorite resorts for *Macromia*, *Epicordulia*, and *Tetragoneuria*.

At Walnut Creek, Putnam County, Indiana, where I took this species along the stream, the flight was very swift, restless, and erratic, though each individual seemed to have a more or less definite range.

Material examined.—Province of Quebec, July 20, 1895, female, Abbe Bégin (P. P. C.). De Grassi Point, Ontario, July 19 and 31, 1901, 2 males, E. M. Walker (E. M. W.); July 25, 1902, male, E. M. Walker (E. M. W.). Go Home Bay, Georgian Bay, Ontario, July 4,

6, and 13, 1907, 2 males, 1 female, E. M. Walker (E. M. W.); June 26, 28, 29, 30, July 3, 8, 9, and 30, 1908, 9 males, 9 females, E. M. Walker (E. M. W.). Ontario, August 3, 1906, male, E. M. Walker (E. M. W.). Orono, Maine, June 16, 17, 18, and 27, and August 7, 1898, 11 males, 3 females, F. L. Harvey (9 males, 1 female, C. C. A.; 1 male, 1 female, P. P. C.; 1 male, 1 female, E. B. W.). Intervale, New Hampshire, June, 1899, teneral male (C. C. A.). Sherborn, Massachusetts, male, A. L. Babcock (P. P. C.). Woods Hole, Massachusetts, August, 1875, male, Hagen (M. C. Z.). Oswego, New York, June 26, 1896, teneral male (U.S.N.M.). Fayette County, Pennsylvania, June 18, 1899, male, E. B. Williamson. Rockwood, Pennsylvania, June 29, 1900, female, E. B. Williamson (U.S.N. M.). Pennsylvania, male (Acad. Nat. Sci., Phila.). Great Falls, Maryland, July 4, 1899, male (U.S.N.M.). Abingdon, Virginia, August 13, 1901, female, C. C. Adams (C. C. A.). Cedar Bluff, Virginia, August 1, 1899, female, C. C. Adams (C. C. A.). Cleveland, Virginia, August 1, 2, and 4, 1899, 8 males, 1 female, C. C. Adams (C. C. A.). Oden, Michigan, August 11, 1907, male, L. A. Williamson. Milwaukee River, Milwaukee, Wisconsin, July 25, 1903, male (Mil. Publ. Mus.). Waterloo, Iowa, June 8, 1906, 3 males, 1 female, Newton Miller. Kappa, Illinois, August 5, 1893, 2 males, C. C. Adams (C. C. A.). Belvidere, Illinois, June 29, 1888, female (P. P. C.). Elkhart, Indiana, June 11 and July 4, 1896, male and female, R. J. Weith (P. P. C.); May 28, 1900, teneral female, R. J. Weith (U.S.N.M.). Fort Wayne, Indiana, July 18, 1901, June 17, 1902, 2 males, 1 female, E. B. Williamson. Bluffton, Indiana, June 20, 1901, male, E. B. Williamson. Walnut Creek, Putnam County, Indiana, June 27, 1908, 6 males, E. B. Williamson. Columbus, Ohio, July 13, 1898, female, J. S. Hine (O.S.U.). Sandusky, Ohio, July 12, 1903, 2 males, 1 female, E. B. Williamson; July, 1896, July 20, 1899, 3 males, J. S. Hine. Livingston, Kentucky, June 23, 1904, male, E. B. Williamson. Knoxville, Tennessee, female, Dr. Josiah Curtis (M. C. Z.). Big Creek, Tennessee, female, C. C. Adams (C. C. A.). Sneedsville, Tennessee, Clinch River, August 16, 1899, female, C. C. Adams (C. C. A.). Without data, 4 males, 1 female (2 males, 1 female, O. S. U.; 1 male, M. C. Z.; 1 male, C. C. A.). Total, 68 males, 29 females.

MACROMIA AUSTRALENSIS, new species.

Length of abdomen: Male, 50–52.5 mm.; average, 51.1; female, 50–52 mm.; average, 50.7. Length of front wing: Male, 44.5–48 mm.; average, 45.7; female, 48–50 mm.; average, 49. Length of hind wing: Male, 43–47 mm.; average, 44.2; female, 46.5–49 mm.; average, 47.5. Length of first tibia, male, 7.25 mm.; hind femur, male, 12 mm. Length of tibial keel in length of tibia, male: First tibia $\frac{3}{4}$ to $\frac{1}{2}-$; middle tibia $\frac{1}{3}-$ to $\frac{3}{8}$.

A very short antehumeral stripe, 1.5–2 mm. long on the mesepisternum. Latero-ventral metathoracic carina yellow. Yellow ring on abdominal segment 2 not interrupted dorsally or laterally. Costa dark colored.

Male.—Postclypeus and labrum similar to *illinoiensis;* dorsal spots on frons rounded, in size from scarcely perceptible to nearly 1 mm. in diameter, and always larger than the lateral spots.

Abdominal spots on 3–6 larger than in *illinoiensis*, growing successively smaller posteriorly, the spot on 3 extended ventrally on either side to meet a longitudinal stripe on the ventral edge of the segment (in *illinoiensis* the dorsal spot is widely separated from the ventral longitudinal stripe); on 3–5 the spots on each segment are separated dorsally by the faintest line of black or the black line may be wanting; in two cases the spots on 6 meet dorsally; the greatest variation in size of spots is on 6, where the spots may be widely separated and about 0.5 mm. long, or joined dorsally and 1.5 mm. in length; spots never wanting on 3–6; 7 similar to *illinoiensis;* spot on 8 $\frac{1}{2}$ to $\frac{3}{4}$ as long as on 7, divided dorsally in only one case, and then by the merest line of black.

One male from Wister, Oklahoma, is very dark and may not belong here; the tibial keels are like *australensis*, but the coloration is more like *illinoiensis*. However, the head is like a very dark *illinoiensis*, while the abdomen has an unusual amount of yellow for *illinoiensis;* the antehumeral stripe seems to be wanting and the yellow ring on 2 is narrowly interrupted dorsally and laterally; well developed spots are present on 6 and 8. In *australensis* 7 may be yellow or not on the ventral basal edge of the segment; in any case the yellow is less distinct than on 8 and 9.

Wings hyaline, without trace of color anywhere even in teneral specimens; stigma black.

Abdominal appendages indistinguishable from *illinoiensis*.

Female.—Head similar to *illinoiensis*, but dorsal spots on frons apparently not larger than in male. Abdomen similar to male, but spots on 3–6 more nearly uniform in size, slightly smaller on 6, 1.5–2 mm. long on 3–5; dorsal spot present on 7; inferior lateral basal spots present on 7–9.

Wings hyaline, short brown basal streaks in the costal or costal and subcostal areas; apex of wings slightly fumose in two specimens; stigma yellowish brown to black. The wings of three females show the following: Triangle of front wing, free 1, crossed 5; subtriangle of front wing, free 1, crossed 5; triangle of hind wing, crossed 6.

I can not be sure of the shape of the vulvar lamina; it seems to be a very short, scarcely emarginate plate; appendages similar to *illinoiensis*.

Types.—Male and female, author's collection taken at Wister, Oklahoma, Poteau River, Frank Collins, August 3, 1907.

Material examined.—Wister, Oklahoma, Poteau River, August 3, 5, and 6, 7 males, 2 females, Frank Collins. Dallas, Texas, male and female, Ball (M. C. Z.). Total, 8 males, 3 females.

Under this name I have included 3 males, which future material and study may reveal are specifically distinct.

Length of abdomen, 50.5–54 mm. Length of front wing, 46.5–48 mm. Length of hind wing, 44–47 mm. Length of first tibia, 7–7.5 mm.; hind femur, 11–12 mm. Length of tibial keel in length of tibia: First tibia, $\frac{1}{2}$–to $\frac{1}{2}$; middle tibia, $\frac{2}{5}$.

The yellow ring on 8 is narrowed laterally, widened dorsally and ventrally, and encircles the segment; in all the other material of *australensis* the dorsal and ventral yellow areas on 8 are separated by black, excepting in one individual where the abdominal spots are very large with the yellow spot on 6 not divided in the median dorsal line by black; in the 3 males under discussion the spots on 6 vary from 0.5–1 mm. in diameter and are distinctly to widely separated in the middorsal line. The stigma is yellow-brown to black.

Material examined.—Hyattsville, Maryland, July 4, 1899, male, J. S. Hine. Gynn's Button Mill, Maryland, September 20, male (M. C. Z.). Blount Springs, Alabama, July 18, 1890, male, Charles C. Deam. Total, 3 males.

MACROMIA GEORGINA de Selys.

Length of abdomen: Male, 50.5–54 mm.; average, 51.8; female, 54 mm. Length of front wing: Male, 47.5–50 mm.; average, 48.8; female, 53 mm. Length of hind wing: Male, 46–48 mm.; average, 47; female, 51 mm. Length of first tibia, male, 8 mm.; hind femur, male, 12 mm. Length of keel in length of tibia, male: First tibia, $\frac{2}{5}$; middle tibia, $\frac{1}{4}$ to $\frac{2}{7}$.

Humeral stripe present, about 3 mm. long on the mesepisternum; otherwise similar to *australensis*.

Male.—Very close to *australensis;* the abdominal spots on 3–6 decreasing in size very slightly posteriorly; spots on 7 and 8 encircling the segments. Abdominal appendages similar to *australensis* and *illinoiensis*, but the superiors have a small, distinct, basal, dorsal yellow area, and the inferior appendage is distinctly paler than the superior appendages.

Female.—Separated from *australensis* by the longer antehumeral thoracic stripe and the larger abdominal spots, especially on 3–5 (1–2 mm. long in *australensis;* 1.5–2.5 in *georgina*). The vulvar lamina is a very short plate with converging sides, broadly and shallowly emarginate.

This is the only species in the material before me to which, I believe, *Epophthalmia georgina* de Selys can be referred. In the female the stigma is yellow-brown, the costa obscure yellowish brown (in the male the costa has the basal median area yellow, but this yellow disappears with the narrowing of the costa which beyond this point

is dull brown). There is nothing in de Selys's description and Martin's recent figure which conflicts with the specimen before me unless it be the form of the vulvar lamina. The triangles of all four wings and the subtriangles of the front wings are all crossed.

To this species I refer a badly faded female in the Museum of Comparative Zoology labeled "Texas," though in this specimen all triangles and subtriangles are free.

Material examined.—Raleigh, North Carolina, July 31 and August 30, 1902, August 9, 1904, June 30, 1905, and September 12, 1907, 4 males, 1 female, C. S. Brimley (C. S. B.); 1 male with last 5 abdominal segments gone. Texas, female (M. C. Z.). Total, 4 males, 2 females.

MACROMIA PACIFICA Hagen.

Length of abdomen: Male, 48.5–53 mm.; average, 50.9; female, 46.5–53.5 mm.; average, 50.6. Length of front wing: Male, 43.5–50 mm.; average, 47.2; female, 46–53 mm.; average, 49.3. Length of hind wing: Male, 41.5–48 mm.; average, 45.3; female, 44.5–49.5 mm.; average, 47.3. Length of first tibia, male, 7.5 mm.; hind femur, male, 11.8 mm. Length of tibial keel in length of tibia, male: First tibia, $\frac{3}{4}$ to $\frac{1}{2}-$; middle tibia, $\frac{1}{3}$ to $\frac{3}{7}$.

Antehumeral thoracic stripe well developed, separated at its upper end from the antealar sinus by about its own width. Latero-ventral metathoracic carina brown or rarely very narrowly yellow. Yellow ring on abdominal segment 2 very wide, narrowly interrupted dorsally by a posteriorly projected middorsal black line which in a few males does not completely traverse the yellow. Costa distinctly yellow to the wing tip.

Male.—Postclypeus green-yellow, labrum dull yellow; dorsal spots on frons occupying the entire surface but the median sulcus, continuous just in front of the antennæ with the lateral spots (rarely separated by brown, the separation narrowest posteriorly); lateral spots are about equal in size or smaller than the dorsal spots.

Abdominal spots large, but on 3–6 divided dorsally by a narrow black line; the spots occupy the area anterior to the transverse carina on each segment but 7 and 8, where they are continued posteriorly, and in length of each segment are about as follows: On 3, $\frac{1}{2}$ to $\frac{1}{2}+$; on 4, $\frac{1}{2}-$to $\frac{1}{2}$; on 5, $\frac{1}{3}+$; on 6, $\frac{1}{3}$; on 7, $\frac{1}{2}$ to $\frac{2}{3}$; on 8, $\frac{2}{5}$ to $\frac{1}{2}$; the dorsal separation is widest on 3 and the spots on this segment are separated from the base of the segment by black about 1 mm. wide; on 4–6 the spots are quadrangular and are separated from the base of each segment by about 0.5 mm.; on 7 and 8 the spots reach the base of each segment; spots on 7 and 8 have a triangular posterior projection on either side of the middorsal line; spots on 3 and 7 are separated from the inferior spots on each segment or are narrowly connected just anterior to the transverse carina; spot on 8 encircles the

segment; 9 usually shows the vestige of a basal spot on either side of the middorsal line; beneath 8 is always spotted basally on either side, 9 usually, and 7 obscurely, if at all.

Wings hyaline to strongly tinged with yellowish, usually slightly tinged; rarely a minute basal brown spot in the costal space; stigma black. (See fig. 7.)

Appendages similar to *illinoiensis* but slightly straighter and longer (2.5 mm. in *illinoiensis;* 3 mm. in *pacifica*); median external tooth small but always present; superiors and inferior about equal in length; the superiors with an external basal yellow spot, variable in size.

Female.—Similar to male; yellow ring on 2 always interrupted dorsally; other spots as in the male bounded posteriorly by the transverse carina, excepting on 7 and 8, and sometimes 6, when they are produced slightly posteriorly; the ventral spots on the posterior segments are plainly present only on 8 and sometimes not there; dorsal and inferior lateral spots on 3, 7, and 8 separated.

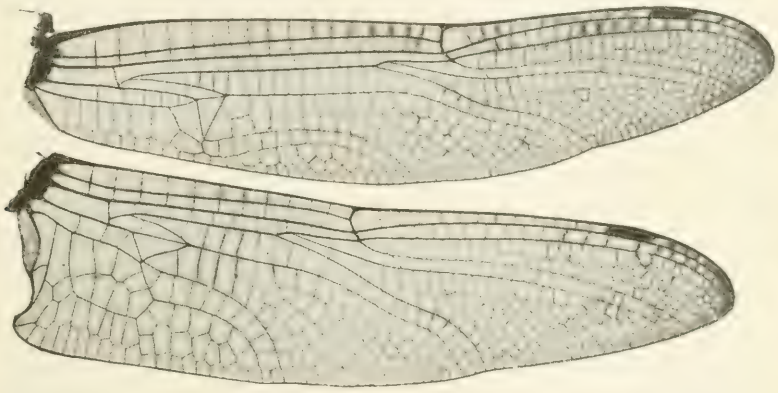

FIG. 7.—WINGS OF MALE MACROMIA PACIFICA, BLUFFTON, INDIANA, AUGUST 19, 1906.

Wings hyaline to deeply yellowish tinged, the color most pronounced distal to the triangles; basal costal spots small, not reaching the first antenodal in any case. The wings of 7 females show the following: Triangle of front wing, free 7, crossed 7; subtriangle of front wing, free 1, crossed 13; triangle of hind wing, free 7, crossed 7. Vulvar lamina not exceeding the eighth segment, developed only as a short, troughlike fold at the apex of the sternum. Abdominal appendages similar to *illinoiensis.*

I have been able to positively identify this species through the kindness of Mr. Henshaw, who loaned me Hagen's type as well as the types of *annulata.* The type of *pacifica* is a collection of fragments (about 20 in number) as stated by Hagen. These are carefully arranged and glued on a piece of cardboard and are sufficient to identify the species.

In *pacifica*, *annulata*, and *magnifica* the dorsal spots on 4–6 occupy all or nearly all the area between the base of each segment and the transverse carina. The only species with which *annulata* and *pacifica* might be confused in length of antehumeral thoracic stripe is *georgina*, which has the abdomen with relatively much more black, the yellow on 4–6 widely separated from the base of each segment. Both *magnifica* and *georgina* have the antehumeral thoracic stripes shorter than in *annulata* and *pacifica*. *Magnifica* is, moreover, distinct by a number of characters (see description of *magnifica*), leaving *annulata* as the only species which might be confused with *pacifica*. In *annulata* and *magnifica* the dorsal stripes on 4–6 are not interrupted with black in the middorsal line, and the latero-ventral metathoracic carina is broadly yellow. For other characters, see descriptions of *annulata* and *magnifica*. There is no doubt that *flavipennis* Walsh is a synonym of *pacifica* and not of *annulata* as Hagen supposed. In Walsh's descriptions of *illinoiensis* and *flavipennis*, each description based on a single female, his descriptions of the vulvar lamina refer to another structure.

M. pacifica is readily recognized at some distance on the wing at Bluffton, where it is associated with *tæniolata* and *wabashensis* (during recent years I have not taken *illinoiensis* here). In flight one gets the impression of an insect largely yellow in color. The yellow is conspicuous on the other 2 species, but to no such extent as on *pacifica*. *M. illinoiensis* gives one the impression of a black insect largely yellow at the apex of the abdomen. The same is undoubtedly true of *alleghaniensis*.

The Wabash River at Bluffton during recent years has been overrun at the ripples by willow herb, so the river in summer is reduced to a succession of pools of greater or less length. On the banks *Hibiscus militaris* has become thoroughly established at the water's edge. These pools seem to be an ideal home for the Macromias. (See pls. 35 and 36.)

The flight of *pacifica* is generally less swift than that of *tæniolata* and *wabashensis* and it ranges less widely, patrolling possibly only one pool, while the others return to the same point only after longer intervals. Individuals of all 3 species follow the same track over and over, crossing the river at a certain point, returning over a certain patch of willow herb, turning out from the shore line at a certain clump of hibiscus, and going and coming over the same or nearly the same course and not following the pools in a circular manner. Moreover, individuals of successive generations have followed the same course as their predecessors, as I have observed at the pools where I have found individuals most numerous and where I have collected for several years. The configuration of vegetation and water is a positive factor in determining the course of flight. Much of my suc-

cess in collecting these dragonflies is due to a recognition of this fact, for the knowledge that one is waiting for the appearance of a dragonfly at the particular point near which that insect will return, even though a great breadth of water and willow herb lies all about, instills in one that patience which is essential in collecting these insects. The use of the word *success* in the above sentence may be questioned; many fruitless days have been spent wading the Wabash.

Males capture the females over the water, sometimes chasing them to great heights. The pairs come to rest in trees or bushes. The females oviposit unattended by the males, following the shore line very closely, ranging back and forth over a short distance, and hovering and striking the abdomen into the water. Fights between males are not rare, though I am not sure that males of the same species fight. In the few cases I have been able to determine certainly 2 species have been involved.

Under certain conditions specimens of *Cordulegaster* have been reported as being very easily taken with an insect net. The few Cordulegasters I have captured in flight have not been such easy prey, and at the present time I can not distinguish Macromias and Cordulegasters on the wing. At the same time I have never taken Macromias at such small streams as I have found Cordulegasters, nor have I taken Cordulegasters at such larger streams (see pls. 35, 36) as Macromias frequent.

Material examined.—Hagen's type, Pacific Railroad survey, lat. 38°, male (M. C. Z.). Waco, Texas, May 25, male and female (M. C. Z.). Milwaukee, Wisconsin, Milwaukee River, cement mills, July 2, 1902, teneral female, V. Fernekes (Mil. Publ. Mus.). Mahomet, Illinois, June 10, 1898, teneral female, C. C. Adams (C. C. A.). Kappa, Illinois, July 13, 1895, male, C. C. Adams (C. C. A.). Bluffton, Indiana, June 15 and August 3, 1902, male, 2 females; August 8 and 13, 1905, 2 males; August 19, 1906, male; August 11, 1907, 4 males; June 28, July 10, and August 1, 1908, 14 males, 2 females. Total, 25 males, 7 females.

MACROMIA ANNULATA Hagen.

Length of abdomen: Male, 52–54 mm.; average, 52.6; female, 52–55 mm. Length of front wing: Male, 45–48.5 mm.; average, 46.5; female, 50–52 mm.; average, 51.3. Length of hind wing: Male, 44–46 mm.; average, 45; female, 48–50 mm.; average, 49. Length of first tibia, male, 7.5; hind femur, male, 12. Length of tibial keel in length of tibia, male: First tibia, $\frac{1}{2}$; middle tibia, $\frac{2}{5}$.

Antehumeral thoracic stripe long, separated above from the antealar sinus by about its own width or slightly more. Latero-ventral metathoracic carina broadly yellow. Yellow ring on abdominal segment 2 very wide, uninterrupted (in one specimen there is a faint, middorsal, longitudinal pale-brown streak); apex of segment 1 laterally

with a yellow streak (the only North American Macromia in which segment 1 is not laterally concolorous). Costa distinctly yellow to the wing tip. Femora pale basally.

Of this species I have seen only Hagen's 6 types, 3 of each sex, kindly loaned me by Mr. Henshaw. It is possible that the color of these specimens may be very different from the colors in life. However, no other basis for description than these specimens is before me.

Male. -General color pale reddish brown, darkest on abdominal segments 3-6. Face very light yellow, nearly white, frons in front and anteclypeus slightly darker; lips and rear of eyes, excepting the dorsal third, the same pale color; a very narrow brown streak in sulcus of frons; the lateral pale areas extensive and extending to postclypeus; vesicle pale (a character it shares only with *magnifica*).

Abdominal spots large, not separated dorsally on 3–8, otherwise similar to *pacifica*, but less distinct (*i. e.*, less sharply defined) and the merest trifle more separated by dark color from the base of each segment; beneath 7–10 are largely pale colored, especially basally; dorsal spot on 3 broadly connected posteriorly with the inferior pale longitudinal area, leaving only a basal ring and a posterior projection from this on either side dark colored; spots on 7 and 8 encircling the segments basally.

Wings hyaline; stigma yellowish brown.

Abdominal appendages distinctly different from those of other species; seen from above the superiors are straighter and much wider beyond the median external tooth than in any other species; in *pacifica*, for example, they taper continually from the tooth to the apex, while in *annulata* they widen from the tooth to before the apex, which is broadly rounded; seen in profile the same is true, and instead of the upper and lower edges converging slightly there is a distinct subapical inferior dilatation; there is an indistinct, pale, dorsal basal area; the inferior appendage is slightly but distinctly shorter than the superiors.

Female.—Similar to the male, but the dorsal spots on 4 are distinctly and on 5 and 6 indistinctly connected just anterior to the transverse carina with extensive but indefinite and suffused inferior lateral longitudinal stripes; there are faint traces of dorsal basal spots on 9 and 10.

Wings hyaline, the faintest trace of basal brown in the costal spaces. Three females show all triangles and subtriangles free.

Vulvar lamina apparently much as in *pacifica*, not distinct, but there seems to be a slight projection posteriorly on either side of the trough. Abdominal appendages similar to *illinoiensis*.

Material examined.—Pecos River, June 26, July 13, August 4, and 1 female without date, 3 males, 3 females, Captain Pope (M. C. Z., all bearing Hagen's red and white card type labels). Total, 3 males, 3 females.

MACROMIA MAGNIFICA McLachlan.

Length of abdomen: Male, 46.5–49 mm.; female, 50–51.5 mm. Length of front wing: Male, 45–46 mm.; female, 48 mm. Length of hind wing: Male, 44 mm.; female, 46 mm. Length of first tibia, male, 7.5; hind femur, male, 12–12.5. Length of tibial keel in length of tibia, male: First tibia, ½; middle tibia, keel wanting.

Antehumeral thoracic stripe long and wide, shorter than in *annulata* and *pacifica*, and separated above by about 2 mm. from the antealar sinus. Latero-ventral metathoracic carina broadly yellow. Yellow ring on abdominal segment 2 wide, interrupted in the middorsal line (in one specimen narrowly continuous over middorsal line at the extreme apex of the ring), interrupted laterally at level of auricles and with little or no pale color ventral to the level of the auricles. Costa distinctly yellow to stigma or wing tip.

Male.—Frons in front, sulcus above, anteclypeus, and base of labrum reddish brown; rear of eyes shining black, as usual in the genus; remainder of head pale, nearly white, including the vesicle; lateral spots on frons about the same size as dorsal spots with which they are continuous.

Thorax rich reddish brown, apparently pruinose; dark area of abdomen darker colored. Dorsal abdominal spots large, excepting basal spots on 9–10, which are small and indistinct; on 3–8 separated from base of segment by little more than a line of black; on 7 and 8 extended posteriorly beyond the transverse carina; not interrupted dorsally on 3–8; dorsal spot connected with inferior lateral stripe only on segment 8 and very narrowly there (segment 3 in *magnifica* is thus very differently patterned from the same segment in *annulata*); distinct ventral basal spots on 8 and 9.

Wings hyaline; stigma very dark brown or black.

Abdominal appendages distinctly different from those of all other American species; the superior appendages seen from above straighter, without trace of median external tooth, the apices less divergent; seen in profile they are heavier just beyond the base than in *illinoiensis* and the upper and lower edges converge continuously to the apex; there is a distinct, pale, basal external area on each superior; the inferior is broad, triangular, and slightly shorter than the superiors.

Female.—Similar to the male; dorsal pale spot on 3 produced posteriorly more or less beyond the transverse carina (the merest hint of this shows in the male; moreover, there is on 4–6 in both sexes a very slight, scarcely distinct, posterior projection of the dorsal spots beyond the transverse carina); dorsal spot on segment 3 narrowly interrupted in the middorsal line; all dorsal spots isolated from inferior lateral pale areas.

Wings hyaline or slightly tinged with faint yellowish at base and anteriorly beyond the nodus; stigma colorless, yellowish brown or

black, depending on age. Three females show all triangles and subtriangles free; and 8 antenodals in 4 hind wings, and 9 in 2.

Vulvar lamina forklike, about one-seventh length of 9; abdominal appendages as in *illinoiensis*.

In its venational and accessory sexual characters, and the absence of a tibial keel on the middle tibia in the male, this species stands the most sharply defined of all North American Macromias.

Material examined.—Fresno, California, June 11 and July 21, 1900, 2 females, E. A. Schwarz (U.S.N.M.). Tucson, Arizona, 2 males (M. C. Z.). Arizona, Cornell Univ. Lot 35, Morrison, female (M. C. Z.). Total, 2 males, 3 females.

VENATIONAL CHARACTERS OF NORTH AMERICAN SPECIES OF MACROMIA (MALES).

The tabulation below is based on the following material:

M. tæniolata, 10 specimens; 1 Toledo, Ohio; 5 Fort Wayne, Indiana; 4 Bluffton, Indiana.

M. wabashensis, 10 specimens; all Bluffton, Indiana.

M. alleghaniensis, 5 specimens; 3 Ohiopyle, Pennsylvania; 1 Dunbrooke, Virginia; 1 Livingston, Kentucky.

M. illinoiensis, 10 specimens; 2 De Grassi Point, Ontario; 1 Orono, Maine; 1 Fayette County, Pennsylvania; 1 Sandusky, Ohio; 1 Fort Wayne, Indiana; 1 Putnam County, Indiana; 1 Livingston, Kentucky, 1 Milwaukee, Wisconsin; 1 Waterloo, Iowa.

M. australensis, 7 specimens; 6 Wister, Oklahoma; 1 Dallas, Texas.

M. australensis?, 3 specimens; 2 Maryland; 1 Alabama.

M. georgina, 4 specimens; Raleigh, North Carolina.

M. pacifica, 10 specimens; 8 Bluffton, Indiana; 1 Waco, Texas; 1 Kappa, Illinois.

M. annulata, 3 specimens; Pecos River.

M. magnifica, 2 specimens; Tucson, Arizona.

Venational characters of North American species of Macromia (males).

Characters.		Species.									
		tæniolata.	*wabashensis.*	*alleghaniensis.*	*illinoiensis.*	*australensis.*	*australensis?.*	*georgina.*	*pacifica.*	*annulata.*	*magnifica.*
1. Antenodals front wing	11..										1= 50%
	12..										1= 50%
	14..				1= 10%	2= 28½%				2=66⅔%	
	15..			2= 40%	3= 30%	3= 42⅞%	1= 33⅓%	1= 25 %	3= 30%	1=33⅓%	
	16..	1= 10%		1= 20%	3= 30%		1= 33⅓%	1= 25 %	2= 20%		
	17..	2= 20%	7= 70%	1= 20%	1= 10%	2= 28½%			2= 20%		
	18..	5= 50%	1= 10%	1= 20%	1= 10%		1= 33⅓%	2= 50 %	2= 20%		
	19..	2= 20%	2= 20%		1= 10%				1= 10%		
2. Postnodals front wing	7..			1= 20%		1= 14⅜%				1=33⅓%	
	8..			2= 40%	1= 10%		1= 33⅓%			1=33⅓%	2=100%
	9..	2= 20%			3= 30%	4= 57⅛%		2= 50 %	3= 30%	1=33⅓%	
	10..	5= 50%	6= 60%	2= 40%	5= 50%	1= 14⅜%	1= 33⅓%	1= 25 %	5= 50%		
	11..	2= 20%	3= 30%		1= 10%	1= 14⅜%	1= 33⅓%	1= 25 %	2= 20%		
	12..	1= 10%	1= 10%								
3. Antenodals hind wing	8..										2=100%
	9..					1= 14⅜%				2=66⅔%	
	10..	1= 10%		1= 20%	3= 30%	3= 42⅞%			2= 20%	1=33⅓%	
	11..	1= 10%	4= 40%	4= 80%	5= 50%	2= 28½%	2= 66⅔%	3= 75 %	4= 40%		
	12..	5= 50%	4= 40%		2= 20%	1= 14⅜%	1= 33⅓%	1= 25 %	3= 30%		
	13..	3= 30%	1= 10%						1= 10%		
	14..		1= 10%								
4. Postnodals hind wing	8..									1=33⅓%	2=100%
	9..			1= 20%						1=33⅓%	
	10..	2= 20%		3= 60%	2= 20%	4= 57⅛%	1= 33⅓%	2= 50 %	3= 30%	1=33⅓%	
	11..	2= 20%	2= 20%		4= 40%		2= 66⅔%		5= 50%		
	12..	3= 30%	3= 30%	1= 20%	4= 40%	2= 28½%		2= 50 %	2= 20%		
	13..	3= 30%	1= 10%			1= 14⅜%					
	14..		3= 30%								
	15..		1= 10%								
5. Average distance from nodus to stigma in wing length, front wing		.280	.271	.281	.275	.271	.270	.263	.279	.287	.286
6. Average distance from nodus to stigma in wing length, hind wing		.357	.355	.372	.361	.360	.352	.351	.359	.356	.364
7. Triangle front wing	Crossed..	15= 75%	7= 35%		2= 10%			2= 25 %	3= 15%		
	Free....	5= 25%	13= 65%	10=100%	18= 90%	14=100 %	6=100 %	6= 75 %	17= 85%	6=100 %	4=100%
8. Subtriangle front wing	Crossed..	18= 90%	11= 55%	1= 10%				2= 25 %	5= 25%		
	Free....	2= 10%	9= 45%	9= 90%	20=100%	14=100 %	6=100 %	6= 75 %	15= 75%	6=100 %	4=100%
9. Triangle hind wing	Crossed..	15= 75%	9= 45%		2= 10%			1= 12½%	3= 15%		
	Free....	5= 25%	11= 55%	10=100%	18= 90%	14=100 %	6=100 %	7= 87½%	17= 85%	6=100 %	4=100%
10. Number antesubtrigonal cells front wing, counting postanal cell, which is always single	2..	2= 10%	1= 5%	10=100%	14= 70%	11=78⅝ %	5= 83⅓%	5= 62½%	6= 30%	6=100 %	4=100%
	3..	18= 90%	19= 95%		6= 30%	3= 21⅜%	1= 16⅔%	3= 37½%	14= 70%		

Venational characters of North American species of Macromia (males)—Continued.

Characters.		Species.									
		taeniolata.	*wabashensis.*	*alleghaniensis.*	*illinoiensis.*	*australensis.*	*australensis?.*	*georgina.*	*pacifica.*	*annulata.*	*magnifica.*
11. Number cubito-anal crossveins front wing	3					2= 14⅔%				5= 83⅓%	4=100 %
	4	10= 50%	4= 20%	6= 60%	9= 45%	8= 57⅛%	2= 33⅓%	3= 37½%	13= 65%	1= 16⅔%	
	5	9= 45%	15= 75%	4= 40%	10= 50%	4= 28⅝%	4= 66⅔%	5= 62½%	7= 35%		
	6	1= 5%	1= 5%		1= 5%						
	7				1= 5%						
12. Number cubito-anal crossveins hind wing	3	20=100%	20=100%	10=100%	19= 95%	11=100 %	6=100 %	8=100 %	20=100 %	6=100 %	4=100 %
13. Last cubito-anal crossvein front wing	Meeting Cu	3= 15%	1= 5%			5= 35⅞%					
	Meeting triangle at upper inner angle	16= 80%	19= 95%	10=100%	9= 45%	8= 57⅛%	6=100 %	7= 87½%	17= 85%	4= 66⅔%	3= 75 %
	Meeting proximal side of triangle	1= 5%			11= 55%	1= 7⅛%		1= 12½%	3= 15%	2= 33⅓%	1= 25 %
14. First cubito-anal crossvein hind wing	Midway between A_3 and A_2		1= 5%	1= 10%	6= 30%	11= 78⅝%	1= 16⅔%	1= 12½%		2= 33⅓%	3= 75 %
	Proximal A_2	7= 35%	7= 35%	5= 50%	8= 40%	3= 21⅞%	4= 66⅔%	5= 62½%	7= 35%	4= 66⅔%	1= 25 %
	Opposite A_2	13= 65%	9= 45%	4= 40%	6= 30%		1= 16⅔%	2= 25 %	11= 55%		
	Distal A_2		3= 15%						2= 10%		
15. Number supratriangular crossveins front wing	1				2= 10 %	2= 14⅜%			2= 10%	3= 50 %	4=100 %
	2	6= 30%	9= 45%	6= 60%	8= 40%	5= 35⅞%	2= 33⅓%	2= 25 %	7= 35%	3= 50 %	
	3	13= 65%	11= 55%	4= 40%	10= 50%	6= 42⅞%	4= 66⅔%	6= 75 %	11= 55%		
	4	1= 5%				1= 7⅛%					
16. Number supratriangular crossveins hind wing	1		9= 45%	6= 60%	17= 85%	13= 92⅞%	4= 66⅔%	7= 87½%	14= 70%	6=100 %	4=100 %
	2	20=100%	11= 55%	4= 40%	3= 15%	1= 7⅛%	2= 33⅓%	1= 12½%	6= 30%		
17. Number crossveins over bridge front wing	1			1= 10%							
	2	5= 25%	2= 10%	4= 40%	3= 15%	6= 42⅞%		2= 25 %	9= 45%	4= 66⅔%	4=100 %
	3	15= 75%	16= 80%	5= 50%	12= 60%	7= 50 %	6=100 %	6= 75 %	10= 50%	2= 33⅓%	
	4		2= 10%		5= 25%				1= 5%		
	6					1= 7⅛%					
18. Number crossveins over bridge hind wing	1										1= 25 %
	2	7= 35%	7= 35%	5= 50%	1= 5%	4= 28⅝%			3= 15%	4= 66⅔%	2= 50 %
	3	10= 50%	11= 55%	5= 50%	11= 55%	9= 64⅜%	4= 66⅔%	7= 87½%	13= 65%	2= 33⅓%	1= 25 %
	4	3= 15%	2= 10%		8= 40%	1= 7⅛%	2= 33⅓%	1= 12½%	4= 20%		
19. Oblique vein front wing	Proximal first crossvein between M_1 and M_2	4= 20%	6= 30%	5= 50%	5= 25%	2= 14⅜%	1= 16⅔%	2= 25 %	4= 20%	3= 50 %	4=100 %
	Opposite first crossvein between M_1 and M_2	2= 10%	6= 30%	1= 10%	3= 15%	1= 7⅛%	1= 16⅔%		10= 50%	2= 33⅓%	
	Distal first crossvein between M_1 and M_2	2= 10%		2= 20%	5= 25%	4= 28⅝%	2= 33⅓%	2= 25 %	3= 15%		
	Between first and second crossveins between M_1 and M_2	7= 35%	4= 20%	2= 20%	1= 5%	4= 28⅝%	2= 33⅓%	3= 37½%	3= 15%	1= 16⅔%	
	Proximal second crossvein between M_1 and M_2	1= 5%	2= 10%		1= 5%	1= 7⅛%		1= 12½%			
	Opposite second crossvein between M_1 and M_2	2= 10%	1= 5%		1= 5%	2= 14⅜%					
	Distal second crossvein between M_1 and M_2	1= 5%			3= 15%						
	Between second and third crossveins between M_1 and M_2	1= 5%	1= 5%		1= 5%						

20. Oblique vein hind wing	Proximal first crossvein between M_1 and M_2	4= 20%	7= 35%	5=50%	7= 35%	.....	1=16⅔%	1= 12½%	5= 25%	3= 50 %	4=100 %
	Opposite first crossvein between M_1 and M_2	6= 30%	9= 45%	2=20%	4= 20%	7= 50 %	2=33⅓%	1= 12½%	7= 35%	2= 33⅓%	.....
	Distal first crossvein between M_1 and M_2	7= 35%	1= 5%	1=10%	6= 30%	.....	2=33⅓%	1= 12½%	1= 5%	.....	.....
	Between first and second crossveins between M_1 and M_2	2= 10%	2= 10%	2=20%	1= 5%	4= 28⅔%	1=16⅔%	.....	4= 20%	1= 16⅔%	.....
	Proximal second crossvein between M_1 and M_2	.....	1= 5%	.....	1= 5%	1= 7⅐%	.....	.....	2= 10%	.....	.....
	Opposite second crossvein between M_1 and M_2	1= 5%	.....	.....	1= 5%	2= 14⅔%	.....	4= 50 %	.....	.....	.....
	Distal second crossvein between M_1 and M_2	.....	.....	.....	.....	.....	.....	1= 12½%	.....	.....	.....
	Between second and third crossveins between M_1 and M_2	.....	.....	.....	.....	.....	.....	.....	1= 5%	.....	.....
21. First postnodal second series front wing	Proximal first crossvein between M_1 and M_2	.....	.....	.....	.....	1 7⅐%	.....	.....	.....	.....	.....
	Distal first crossvein between M_1 and M_2	.....	.....	.....	.....	1= 7⅐%	.....	.....	.....	.....	.....
	Between first and second crossveins between M_1 and M_2	.....	.....	.....	1= %	.....	.....	1= 12½%	.....	2= 33⅓%	.....
	Proximal second crossvein between M_1 and M_2	.....	.....	.....	1= 5%	2= 14⅔%	.....	2= 25 %	.....	.....	1= 16⅔%
	Opposite second crossvein between M_1 and M_2	.....	2= 10%	.....	2= 10%	2= 14⅔%	.....	.....	3= 15%	1= 16⅔%	.....
	Distal second crossvein between M_1 and M_2	.....	.....	8=80%	3= 15%	2= 14⅔%	1=16⅔%	.....	2= 10%	.....	.....
	Between second and third crossveins between M_1 and M_2	4= 20%	6= 30 %	2=20%	6= 30%	3= 21⅔%	4=66⅔%	4= 50 %	10= 50%	2= 33⅓%	3= 83⅓%
	Proximal third crossvein between M_1 and M_2	4= 20%	2= 10%	.....	4= 20%	2= 14⅔%	1=16⅔%	.....	1= 5%	.....	.....
	Opposite third crossvein between M_1 and M_2	7= 35%	4= 20%	.....	2= 10%	1= 7⅐%	.....	1= 12½%	4= 20%	1= 16⅔%	.....
	Distal third crossvein between M_1 and M_2	4= 20%	5= 25%	.....	.....	.....	.....	.....	.....	.....	.....
	Between third and fourth crossveins between M_1 and M_2	1= 5%	1= 5%	.....	.....	.....	.....	.....	.....	.....	.....
	Proximal fourth crossvein between M_1 and M_2	.....	.....	.....	1= 5%	.....	.....	.....	.....	.....	.....

Venational characters of North American species of Macromia (males)—Continued.

Characters.		Species.									
		taeniolata.	*wabash-ensis.*	*alleghan-iensis.*	*illinoien-sis.*	*austra-lensis.*	*austra-lensis?.*	*georgina.*	*pacifica.*	*annulata.*	*magnifica.*
22. First postnodal second series hind wing	Opposite first crossvein between M_1 and M_2					1=7½%					
	Between first and second crossveins between M_1 and M_2				1=5%						
	Opposite second crossvein between M_1 and M_2			1=10%	1=5%			1=12½%			
	Distal second crossvein between M_1 and M_2		1=5%	6=60%	1=5%	4=28½%	1=16⅔%	2=25%	4=20%	1=16⅔%	4=100%
	Between second and third crossveins between M_1 and M_2	3=15%	3=15%	3=30%	6=30%	5=35⅞%	2=33⅓%	3=37½%	8=40%	2=33⅓%	
	Proximal third crossvein between M_1 and M_2	4=20%	2=1 0%		1=5%	3=21⅞%	2=33⅓%	1=12½%	1=5%	1=16⅔%	
	Opposite third crossvein between M_1 and M_2	4=20%	2=10%		5=25%		1=16⅔%	1=12½%	4=20%	1=16⅔%	
	Distal third crossvein between M_1 and M_2	5=25%	4=20%		2=10%	1=7½%			3=15%	1=16⅔%	
	Between third and fourth crossveins between M_1 and M_2	2=10%	6=30%		3=15%						
	Proximal fourth crossvein between M_1 and M_2	2=10%									
	Opposite fourth crossvein between M_1 and M_2		2=10%								
23. Number uncrossed posttrigonal cells between M_4 and Cu_1 front wing	0		5=25%		5=25%				10=50%	3=50%	
	1	3=15%	7=35%		2=10%				4=20%	3=50%	
	2	2=10%	4=20%		1=5%				6=30%		1=25%
	3	3=15%	3=15%	3=30%	4=20%						1=25%
	4	3=15%	1=5%	3=30%	3=15%	2=14⅜%	1=16⅔%				2=50%
	5	6=30%		1=10%	3=15%	5=35⅞%	1=16⅔%				
	6	3=15%		1=10%	2=10%	5=35⅞%	4=66⅔%	3=37½%			
	7			1=10%		1=7½%		5=62½%			
	8			1=10%		1=7½%					
24. Number uncrossed posttrigonal cells between M_4 and Cu_1 hind wing	1								1=5%		
	2	3=15%	11=55%	4=40%	5=25%				9=45%	2=33⅓%	1=25%
	3	16=80%	8=40%	4=40%	12=60%	7=50%	4=66⅔%	3=37½%	9=45%	3=50%	2=50%
	4	1=5%	1=5%	1=10%	2=10%	4=28½%	2=33⅓%	4=50%	1=5%	1=16⅔%	1=25%
	5			1=10%	1=5%	3=21⅜%		1=12½%			
25. Arculus front wing	Between first and second antenodals				1=5%				2=10%	2=33⅓%	
	Proximal second antenodal	19=95%	20=100%	8=80%	18=90%	14=100%	3=50%	6=75%	17=85%	4=66⅔%	4=100%
	Opposite second antenodal	1=5%		2=20%	1=5%		3=50%	2=25%	1=5%		

26. Arculus hind wing	Between first and second antenodals		1= 5 %								2=33⅓%	
	Proximal second antenodal	13=65 %	18=90 %	7=70%	19=95 %	8= 57⅛ %	3=50 %	5=62½%	14=70%	4=66⅔%		4=100%
	Opposite second antenodal	7=35 %	1= 5 %	3=30%	1= 5 %	6= 42⅞ %	3=50 %	3=37½%	6=30%			
27. Arculus front wing	Proximal second cubito-anal crossvein	13=65 %	9=45 %	7=70%	13=65 %	4= 30 13/13%	4=66⅔%	5=62½%	9=45%	4=66⅔%		1= 25%
	Opposite second cubito-anal crossvein	6=30 %	8=40 %	3=30%	7=35 %	9= 69 3/13%	2=33⅓%	3=37½%	11=55%	2=33⅓%		3= 75%
	Proximal third cubito-anal crossvein	1= 5 %	3=15 %									
28. Arculus hind wing	Proximal second cubito-anal crossvein					1= 7⅛ %			1= 5%			
	Opposite second cubito-anal crossvein	11=55 %	10=50 %	4=40%	19=95 %	9= 64⅜ %	2=33⅓%	3=37½%	7=35%	3=50 %		
	Distal second cubito-anal crossvein	9=45 %	10=50 %	6=60%	1= 5 %	4= 28⅝ %	4=66⅔%	5=62½%	12=60%	3=50 %		4=100%
29. Number of rows of cells behind Cu_2 front wing	1–2											4=100%
	2		1= 5 %	9=90%	16=80 %	13= 92⅞ %	3=50 %	7=87½%	2=10%	4=66⅔%		
	2–3	4=21 14/19%	1= 5 %	1=10%	4=20 %	1= 7⅛ %	2=33⅓%	1=12½%	1= 5%			
	3	15=78 18/19%	18=90 %				1=16⅔%		14=70%	2=33⅓%		
	3–4								3=15%			
30. Number of marginal cells between Cu_2 and A_1, hind wing	4											1= 25%
	5											1= 25%
	6			1=10%	1= 5 %	1= 7⅛ %						1= 25%
	7			3=30%	1= 5 %	4= 30 10/13%	3=50 %	3=37½%	3=15%			1= 25%
	8	1= 5 5/19%	1= 5 %	4=40%	7=35 %	7= 53 13/13%	1=16⅔%	2=25 %	6=30%	3=50 %		
	9	5=26 15/19%	5=25 %	2=20%	9=45 %	1= 7 13/13%	2=33⅓%	3=37½%	7=35%	2=33⅓%		
	10	6=31 11/19%	7=35 %		2=10 %				2=10%	1=16⅔%		
	11	2=10 10/19%	6=30 %						2=10%			
	12	4=21 1/19%	1= 5 %									
	13	1= 5 5/19%										
31. Number rows of cells between Cu_1 and Cu_2, hind wing	7											3= 75%
	8			2=20%	1= 5%	3= 21⅜ %		1=12½%				1= 25%
	9			2=20%	5=25 %	9= 64⅜ %	3=50 %	5=62½%	3=15%			
	10	2=10 18/19%	4=20 %	4=40%	14=70 %	2= 14⅜ %	3=50 %	2=2 5%	9=45%	3=50 %		
	11	10=52 12/19%	8=40 %	2=20%					4=20%	3=50 %		
	12	6=31 11/19%	8=40 %						3=15%			
	13	1= 5 5/19%							1= 5%			
32. Number of rows divided cells at wing margin between M_3 and M_4, front wing, counted along M_3	0		1= 5⅓%	4=40%	3=15 %	3= 23 1/13%				3=50 %		2= 50%
	1	5=25 %	3=15 15/19%	6=60%	9=45 %	2= 15 2/13%	3=40 %	3=37½%		1=16⅔%		2= 50%
	2	11=55 %	10=52 12/19%		5=25 %	4= 30 10/13%	2=40 %	2=25 %	7=35%	2=33⅓%		
	3	4=20 %	3=15 15/19%		1= 5 %	3= 23 1/13%		3=37½%	7=35%			
	4		1= 5 5/19%		1= 5 %	1= 7 13/13%			3=15%			
	5		1= 5 1/19%		1= 5 %				3=15%			
33. Number of rows of divided cells at wing margin between M_3 and M_4, hind wing, counted along M_3	0			2=20%								1= 25%
	1	5=26 6/19%	1= 5 %	7=70%	4=21 1/19%	1= 8⅛ %	2=33⅓%	3=37½%	1= 5%	3=50 %		3= 75%
	2	4=21 1/19%	5=25 %	1=10%	6=31 11/19%	3= 25 %	3=50 %	1=12½%	2=10%	1=16⅔%		
	3	7=36 14/19%	6=30 %		5=26 6/19%	5= 41⅜ %	1=16⅔%	2=25 %	5=25%			
	4	3=15 15/19%	7=35 %		3=15 15/19%	2= 16⅝ %		2=25 %	10=50%	1=16⅔%		
	5		1= 5 %		1= 5 1/19%	1= 8⅛ %			1= 5%	1=16⅔%		
	6								1= 5%			

NOTES.—The variation in the number of cubito-anal cross-veins in the front wing is in the region distal to the level of the arculus in every case but 1 wing of *tæniolata* and 3 wings of *wabashensis*.

The curving of the first cubito-anal cross-veins with the convex side distal is constant and is most marked in the hind wing.

In one front wing of *tæniolata* there is a basal antenodal of the second series.

Every specimen studied has 3 cubito-anal cross-veins in the hind wings, excepting one wing of *illinoiensis*, which is evidently a freak.

EXPLANATION OF PLATES.

PLATE 35.

View looking up the Wabash River, 3 miles above Bluffton, Indiana. Six-Mile Creek empties into the river just above the patch of willow herb (*Epilobium angustifolium*) in which man is standing. A short, narrow channel through the willow herb, which grows out from the river bank on either side, is shown. This channel connects two long pools, the lower of which is about 300 yards long, the upper about 150 yards. These pools are closed at their lower and upper ends, respectively, with dense and extensive growths of willow herb, through which the river flows in each case in a narrow tortuous channel. The flow of water through the channels is, as compared with the flow in the pools, relatively swift, and brooklike, and it is along the longer, narrower, and swifter channels that *Hetærina americana* occurs in greatest abundance, though it ranges over the entire river course.

The pools are margined at the water's edge with military hibiscus, lizard tail, and willows, with frequent patches of willow herb, the last extending in some cases nearly to mid stream. All of these plants have become conspicuous in recent years. Willow herb was formerly confined to small areas along the banks and at ripples, and fifteen years ago the hibiscus was unknown here. Now it is next to the willow herb in conspicuousness along the river. These two plants, finding a congenial habitat through profound changes in the river, due apparently to a lowered water level, have themselves profoundly modified and are continuing to modify the nature of the stream. Lizard tail is less abundant.

The bottom of the river where washed clean is limestone, and the depth of the pools is 3 to 3½ feet. The willow herbs break the current and form frequent mud flats over the river bed.

The two pools are favorite Macromia haunts and the four species, *tæniolata*, *wabashensis*, *illinoiensis*, and *pacifica*, have been taken here, *illinoiensis*, however, only once. The rare gomphine, *Dromogomphus spoliatus*, also finds these pools congenial and seems to be increasing in numbers. Associated with the Macromias and *Dromogomphus spoliatus* as imagoes are *Argia putrida*, very abundant, *Argia apicalis* and *tibialis* and *Enallagma exsulans*, less numerous, and occasionally *Libellula pulchella*, and still more rarely *Plathemis lydia*.[a] But the agrionines and libellulines are cosmopolitan in their habitats and occur also at the channels with *Hetærina americana*.

Photograph taken on July 11, 1909, about 9 a. m., cloudy, slight breeze. Newton Miller and E. B. Williamson.

PLATE 36.

Camera placed where man stands in willow herbs in plate 35. View of the length of the lower pool, looking downstream.

[a] The above plants and dragonflies are not offered as a complete list. Only the more numerous and conspicuous species are named. In this connection possibly *Perithemis domitia* and worn belated individuals of *Gomphus graslinellus* as well as the very rare *Stylurus spiniceps* should be mentioned.

SUPPLEMENTARY NOTES.

Since the foregoing manuscript was prepared more collecting has been done at Bluffton, Indiana, and the following material has been taken along the Wabash River:

Macromia tæniolata. August 1, 1909, 1 male.

Macromia wabashensis. July 25, August 1 and 5, 1909, 10 males, 1 female.

Macromia illinoiensis. July 30, 1909, 1 male.

Macromia pacifica. July 25 and 30, August 1, 5, and 8, 1909, 18 males, 1 female.

The association of the four above-named species along the Wabash River at Bluffton during 1909 is thus established.

Macromia wabashensis. Female.

Length of abdomen, 58 mm.; hind wing, 52 mm.

Lateral and dorsal spots on frons distinct, all about equal, rounded, 1 mm. in diameter. Dorsal thoracic stripes extending about two-thirds across the mesepisternum. Latero-ventral metathoracic carina with a narrow, interrupted, and obscured yellow line.

Yellow ring on abdominal segment 2 narrowly interrupted dorsally, the interruption widest anteriorly. Dorsal spots present on 3–8, each spot divided longitudinally in the median line to form 2 spots, excepting on segment 7. As compared with the female of *tæniolata* the following differences may be noted: In segment 3, in *wabashensis*, the spots extend anteriorly from the transverse carina more than one-half the distance to the base of the segment; in *tæniolata* scarcely more than one-third. In segment 4, in *wabashensis*, the spots are about 4 mm. long and extend to within 1 mm. of base of segment; in *tæniolata* the spots are about one-half as long, and extend scarcely one-half the distance from transverse carina to base of segment. Segments 5 and 6 in *wabashensis* have spots relatively as large as on segment 4; *tæniolata*, in the same way, has the spots on these segments relatively the same size as on segment 4 of *tæniolata*. Segment 7 in *wabashensis* not divided medianly, produced posteriorly beyond the transverse carina as a small triangle on either side of the median line; in *tæniolata* the spot is divided longitudinally in the median line and is not produced posteriorly beyond the transverse carina. On 8 in *wabashensis* there is a distinct subbasal spot, divided in the middorsal line, consisting on either side of 2 smaller spots, each about 1 mm. in its greatest diameter; the anterior and lateral one of these is the homologue of the spots on the other segments, the posterior and more dorsal one is the homologue of the projection posteriorly beyond the transverse carina of the spot on 7; in fully adult *tæniolata* there seems to be no trace of this spot on 8.

Wings hyaline, with indistinct, indefinite and scattered fumose areas; scarcely a trace of faint basal brown. Costa yellow to the stigma; stigma black. Antenodals of front wing 18–19, hind wing 12; postnodals of front wing 10; hind wing 11; triangle of front wing free, of hind wing crossed on one side, free on the other; subtriangle of front wing crossed.

Vulver lamina a short median thickening of the posterior edge of the sternum, slightly folded into a trough; on either side of the median line at the posterior end of the sternum is a small, rounded, triangular projection about 0.25 mm. long and twice as wide at its base, pale, slightly chitinized. These two projections very narrowly continuous basally in the median line.

Described from a recently killed specimen taken along the Wabash River, just above the mouth of Six Mile Creek, Bluffton, August 1, 1909. The spots on segment 8 have faded to black in drying. This type female is in the author's collection.

A Favorite Haunt of Macromias.

For explanation of plate see page 396

A Favorite Haunt of Macromias.

A NEW SPECIES OF CERITHIOPSIS FROM ALASKA.

By Paul Bartsch,
Assistant Curator, Division of Mollusks, U. S. National Museum.

Among a lot of shells recently received for determination from Mrs. Kate Stephens, of San Diego, California, collected by her in Alaska, are several new forms of Pyramidellids and a *Cerithiopsis*.

The Pyramidellids have been described in the monograph upon this family now going through the press and the *Cerithiopsis* is characterized below. All the types were kindly donated to the U. S. National Museum.

CERITHIOPSIS STEPHENSI, new species.

Shell elongate conic, chocolate brown. (Nuclear whorls decollated in all the specimens seen.) Post-nuclear whorls well rounded, ornamented spirally by four keels between the sutures, of which the posterior three are strong and tuberculate, the fourth smooth and slender. Axially the whorls are marked by irregular ribs, the junctions of which with the spiral keels form tubercles. The posterior row of tubercles is at the summit and is the weakest, the individuals appearing as rounded knobs. The second is on the middle of the whorl. This and the first, which is immediately above the peripheral sulcus, have their tubercles of about equal strength. On these two keels the tubercles slope gently anteriorly and very abruptly posteriorly. The peripheral sulcus and the other two sulci are equally strong and wide. All are crossed by the ribs, which, however, do not extend over the base. Both spiral cords and ribs are crossed by strong incremental lines. Sutures constricted. Periphery of the last whorl marked by a deep channel. Base well rounded, rather short, marked by strong incremental lines and a few very fine spiral striations. The summit of the succeeding whorl drops a little below the peripheral sulcus in all the whorls of the spire and allows a narrow margin of the smooth base to appear as a cord in the suture. Aperture ovate, with a strong anterior sinus, outer lip thin, showing the external sculpture

CERITHIOPSIS STEPHENSI.

within; columella stout, twisted and curved, having a weak basal fascioles at its insertion.

Type.—Cat. No. 204008, U.S.N.M. It has 12 post-nuclear whorls and measures: Length 9 mm., diameter 2.1 mm. It and two additional specimens in Mrs. Kate Stephens's collection were collected by her at Bear Bay, Peril Strait, Baranoff Island, Alaska. Four more were collected by her at Mole Harbor, Alaska, one of which is in the collection of the U. S. National Museum (Cat. No. 204009). Another in her collection comes from the head of Port Frederick, Chichagoff Island, Alaska.

Named for Mrs. Kate Stephens.

FRESH-WATER SPONGES IN THE COLLECTION OF THE UNITED STATES NATIONAL MUSEUM.—PART II. SPECIMENS FROM NORTH AND SOUTH AMERICA.

By Nelson Annandale,
Superintendent of the Indian Museum, Calcutta.

With the possible exception of specimens from Peru which are unfortunately indeterminable, the American specimens in the collection do not include examples of any undescribed species. Several of them, however, are noteworthy in affording proof of the identity of certain Indian forms with species long known from North America, on account of their locality, or for other reasons, and others have enabled me to carry out a little piece of work much more interesting than the description of new species.

Before proceeding to comment on the American specimens I would like to supplement a statement made in my description of *Spongilla clementis*[a] which, on reading the paper in print, I do not think quite clear. The membrane referred to as sending "branches or hollow root-like processes downward at intervals" is at the base of the sponge, and the root-like processes must have been in intimate contact with the object to which it was attached.

Genus SPONGILLA Wierzejski.

Subgenus EUSPONGILLA Vejdovsky.

SPONGILLA LACUSTRIS of authors.

There are in the collection specimens from Alaska of what appears to be the typical form of this species, but devoid of gemmules. They are labeled "McDonald Lake, Alaska. About 3 feet deep. Very abundant. Color bright green. J. S. Burcham. Sept. 11, 1905. Bureau of Fisheries. Acc. No. 46416."

The Indian form of *S. lacustris*, of which I have now examined specimens from Bombay, Eastern and Lower Bengal, Orissa, and Madras, is distinguished from that of the Holarctic Region by the

[a] Proc. U. S. Nat. Mus., vol. 36, p. 631.

extreme tenuity of its skeleton fibers and by the fact that the branches are never cylindrical but always compressed. When well developed they anastomose. For this form, which I think should be regarded as a subspecies, the name *reticulata* [a] is available. Young specimens are, however, difficult to distinguish from some European and North American forms of *S. lacustris*. *S. proliferens*, another common Indian species closely allied to *S. lacustris*, is easily distinguished by the tubular character of the aperture of the gemmules.

In the collection sent me for examination from the U. S. National Museum there is a bottle of specimens labeled "Lake Titicaca, Peru. R. E. Coker (506). VII.31.08. From Peruvian Government. Acc. No. 49549." Unfortunately, the sponges in the bottle are devoid of gemmules, and as there is nothing distinctive about their slender, smooth, amphioxous skeleton spicules, it is impossible to identify the species. There are no free microscleres. Probably this sponge belongs to the subgenus *Euspongilla*.

Subgenus SPONGILLA Wierzejski.

SPONGILLA FRAGILIS Leidy.

Spongilla fragilis Leidy, Proc. Acad. Nat. Sci., Philadelphia, 1851, p. 278.—Potts, Proc. Acad. Nat. Sci., Philadelphia ("Monograph"), 1887, p. 197, pl. 5, fig. 2; pl. 8, figs. 1–4.

Spongilla decipiens Weber, Zool. Ergebn. Niederland. Ost. Ind., vol. 1, p. 40, pl. 4.

There are specimens in the collection from the mouth of Echo River, Mammoth Cave, Kentucky (W. P. Hay), as well as from other North American localities. I have recently recorded this species from Japan;[b] it also occurs in Calcutta, whence the large series of specimens now in the Indian Museum seems to afford a complete transition between *S. fragilis* and Weber's *S. decipiens*, which must therefore be regarded as a synonym. My *S. crassissima*, of which *S. crassior* is no more than a variety, is distinguished from *S. fragilis* mainly by its extremely hard and compact skeleton. It is sometimes found in the same pond as Leidy's species.

Genus EPHYDATIA Lamouroux.

EPHYDATIA CRATERIFORMIS (Potts).

Meyenia crateriformis Potts, Monogr., p. 228, pl. 9, fig. 6; pl. 10, fig. 5.

Ephydatia indica Annandale, Journ. Asiat. Soc. Bengal, 1907, p. 20; Rec. Ind Mus., vol. 1, p. 272.

This species, which is well represented in the U. S. National Museum collection, is interesting for two reasons: (*a*) its peculiar distribution, and (*b*) the fact that its varieties and phases afford an almost complete bridge between the genera *Spongilla* and *Ephydatia*.

[a] Annandale, Rec. Ind. Mus., vol. 1, p. 387, pl. 14, fig. 1.

[b] Annot. Zool. Jap., vol. 2, p. 106, pl. 2, fig. 1.

As regards its distribution, it has long been known from the United States and was recorded doubtfully by Hanitsch [a] from Ireland some years ago. There is no doubt left in my mind, however, after examining American specimens, that my *E. indica* is identical with *E. crateriformis*. In India it appears to be an extremely variable species and its skeleton spicules are sometimes quite blunt at the tips.

As regards the different forms assumed by the gemmule spicules, the variation appears to be to some extent a seasonal one, but examples from different localities and even individual sponges taken in the same pond at the same time often differ very much from one another. The extreme limit of variation in the direction of *Spongilla* is well illustrated by the accompanying cut (fig. 1), which is the reproduction of a camera lucida sketch of some spicules of a specimen taken in Calcutta in June, 1907. This figure may be contrasted with that published by Potts on plate 10 of his monograph, but every gradation is to be found between the two forms of gemmule spicules. My figure in the Journal of the Asiatic Society of Bengal was badly reproduced and is not satisfactory. I have obtained *E. crateriformis* from the following Indian localities: Calcutta; Moulmein (Lower Burma); Madras, and Igatpuri, Western Ghats, Bombay Presidency.

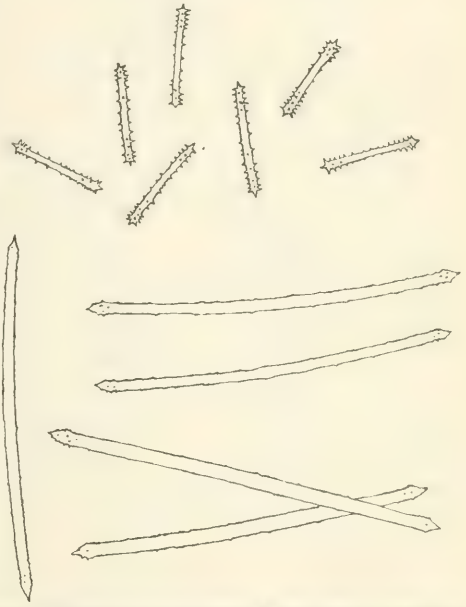

Fig. 1.—Skeleton and gemmule spicules of Spongilla-like form of Ephydatia crateriformis, × 240.

Genus TUBELLA Carter.

TUBELLA PENNSYLVANICA Potts.

Tubella pennsylvanica Potts, Monogr., p. 251, pl. 6, fig. 2; pl. 12, figs. 1, 2, 3.—Annandale, Rec. Ind. Mus., vol. 3, p. 102.

As I have said in the paper previously cited, this species occurs in Travancore near the west coast of southern India. It appears, wherever it occurs, to be averse to light and to be found as a rule under stones or roots. It has probably escaped observation for this reason in many places in which it occurs. (See fig. 2.)

[a] Nature, vol. 51, p. 511.

Genus TROCHOSPONGILLA Vejdovsky.

TROCHOSPONGILLA LEIDYI (Bowerbank).

Spongilla leidyi Bowerbank, Proc. Zool. Soc. London, 1863, p. 445.
Meyenia leidyi Potts, Monogr., p. 212, pl. 5, fig. 3; pl. 10, fig. 1.

In a recent note[a] I referred my *Trochospongilla phillottiana* to the synonymy of this species, being of the opinion that I had found intermediate forms. I have now no doubt, however, that in this belief I was wrong, and that both the Indian species of *Trochospongilla* (*T. latouchiana* and *T. phillottiana*) are in reality distinct both from *T. leidyi* and from one another. They often grow in close association, and microscopic preparations of the one are therefore liable to contain spicules of the other. Were it possible to unite them, it would be necessary to include *T. leidyi* also.

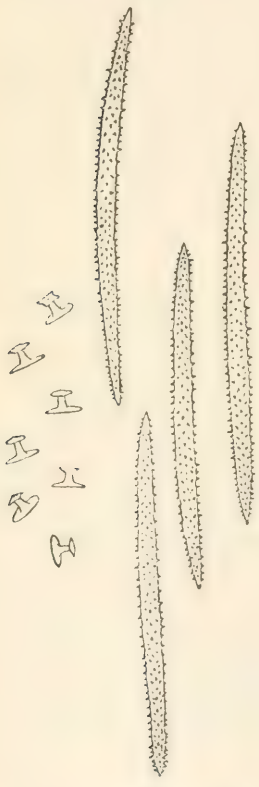

Fig. 2.—Skeleton and gemmule spicules of Tubella pennsylvanica from S. India, × 240.

Genus HETEROMEYENIA Potts.

The species of the "genus" *Carterius* should, in my opinion, be distributed between this genus and *Ephydatia*. To *Heteromeyenia* I would assign Mills' *Carterius tubisperma* and *C. stepanowii* (Dybowski), while Potts' *C. latitenta* and *C. tenosperma* should, if my views are correct, be relegated to *Ephydatia*. The one distinctive character of *Carterius* is the fact that the aperture of the gemmule is provided with highly developed filaments or processes, which, however, differ greatly in the different species. This is undoubtedly a specific character of importance, but it would be more convenient to base the generic diagnoses of the Spongillinæ (the genera of which, it must be admitted in view of the connecting links that occur, are largely artificial) on the nature of the gemmule spicules—a course to which the only objection that can be urged is that in some forms the gemmules are unknown. There can be little doubt, however, that in many such cases gemmules will be found when specimens in the fully mature condition are examined; while the right of certain other forms (as for instance, those genera characteristic of Lake Baikal) to occupy a position in the subfamily is more than doubtful.

[a] Records of the Indian Museum, vol. 3, p. 103.

HETEROMEYENIA PLUMOSA Weltner (Potts MS.).

Heteromeyenia plumosa WELTNER, Archiv für Naturgesch., 1895, part 1, p. 127.

Specimens from the U. S. National Museum are labeled "These are fragments of a single specimen 3 inches in diameter." Weltner, who examined similar specimens, gives a short comparative description, noting those characters in which the form differs from *H. radiospiculata* Mills. As Mr. Potts apparently no longer intends to describe *H. plumosa* it may be as well to give a fuller description.

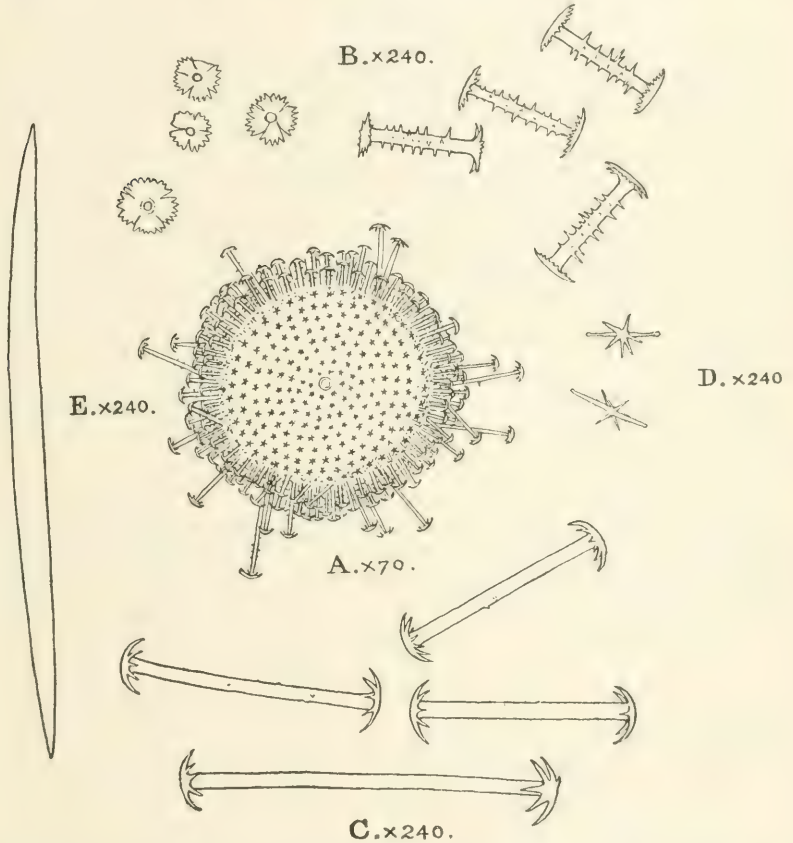

FIG. 3.—GEMMULE AND SPICULES OF HETEROMEYENIA PLUMOSA. A. GEMMULE, × 70, SHOWING APERTURE IN CENTER. B. SHORT BIROTULATES, × 240. C. LONG BIROTULATES, × 240. D. FREE MICROSCLERES, × 240. E. SKELETON SPICULE, × 240.

The sponge appears to have been rather massive, although very brittle and friable. The radiating fibers, which have an oblique course, and some of the transverse ones, are easily visible to the naked eye. The color (dry) is a sooty black in the external parts, but becomes paler toward the base.

A vertical section examined under the microscope shows that the radiating fibers, although not very slender, are loosely compacted. Apparently little if any spongin is present.

The skeleton spicules are slender, smooth, sharply pointed at either end, and nearly straight. They measure on an average 0.384 mm. in length and 0.016 mm. in greatest transverse diameter.

The long gemmule spicules (birotulates) are much longer than the short ones and have slender, straight, almost smooth shafts with only an occasional spine. Their rotulæ consist of a circle of curved hooks joined together at their base. The short birotulates have stouter shafts, which are profusely, irregularly, and somewhat strongly spined. Their rotulæ are not so markedly convex when viewed in profile as those of the long birotulates; they are somewhat irregularly but narrowly and deeply serrated, the incisions being often arranged in groups. The long birotulates measure on an average 0.188 mm. in length, their rotulæ being 0.028 mm. in diameter. The corresponding measurements of the short birotulates are 0.06 and 0.028 mm.; but spicules of intermediate lengths occur.

Free spicules resembling those of *Ephydatia plumosa* are fairly abundant. They consist of a variable number of straight and irregularly roughened shafts meeting at a common center. The shafts are slender and often very numerous; their tips are either pointed or blunt, sometimes minutely globular; often one axis is stouter than the others.

The gemmules are large and spherical. Each has a single very small aperture, which is provided with a short, straight, foraminal tubule.

Habitat.—Pinto Creek, Kinney County, Texas (Albert Turpe coll.).

The free spicules of this species are as characteristic as those of *Ephydatia plumosa*, which they resemble in some respects. In both species they are very minute.

DIAGNOSES OF NEW CEPHALOPODS FROM THE HAWAIIAN ISLANDS.

By S. Stillman Berry,
Of Stanford University, California.

Prior to the publication of a final report on the cephalopods collected by the U. S. Bureau of Fisheries steamer *Albatross* in the Hawaiian Islands it was deemed best to issue the present paper to contain preliminary diagnoses of such forms as are believed to be new, leaving more detailed and completely illustrated descriptions until the appearance of the main report. It is hoped, however, that the following observations will, in the meanwhile, prove useful to other students of the group and sufficient for the ready recognition of the species.

The illustrations for this paper are from drawings by Mr. Henry V. Poor, excepting fig. 1, which is from a photograph by Mr. John H. Paine, of Stanford University.

Genus POLYPUS Schneider, 1784.

POLYPUS HOYLEI, new species.

Body rounded, depressed above and below, about as long as broad, covered with a loose skin of a rather gelatinous consistency; an obscure longitudinal groove in the median ventral region. Mantle-opening small and lunate, extending but little beyond the funnel on either side.

Head broad; neck slightly constricted; eyes very large, with small openings, above which on either side are two prominent, nipple-like tubercles or cirri, each with a pore-like depression in its center. Near these are one or two fainter and smaller papillæ, and a few others, equally or more obscure, are scattered over the dorsal surface of the body.

Surface, except for the above-mentioned tubercles and papillæ, smooth, very finely reticulated with extremely minute papillæ or wrinkles, and very soft to the touch, which are apparently not due to the action of the preserving fluid.

Siphon of moderate size, bluntly conical, connected above with the basal portion of the umbrella and extending forward for about one-third the length of the latter.

Arms rather short and stout, nearly equal, the third pair the shortest (a character especially noticeable in the male); length about twice that of the head and body taken together; umbrella very wide, extending between all the arms in the adult (male) for nearly half their length; suckers rather large and closely set, in two rows save at the base, where there is but a single row; none of those of the male showing any appreciable enlargement.

Hectocotylization affecting only a small portion of the extremity of the arm of the male, its transverse ridges rendered obscure or obsolete by the gelatinous consistency of the skin.

Color of preserved specimens a brownish-red above, more pinkish below. Chromatophores minute and numerous, especially on the upper surface, where they are quite evenly distributed in veins, the interstices between which appear as pale reticulations upon a darker background.

FIG. 1.—POLYPUS HOYLEI. THIRD ARM OF RIGHT SIDE. (SLIGHTLY MAGNIFIED.)

Length of body 65 mm.; of second arm-pair 161 mm.; width of body 45 mm. The type is a specimen obtained by the *Albatross* expedition, but preserved without any locality label. It is an adult male.

Further specimens are in the collection as follows: station 4110, depth 449 fathoms, 1 young; station 4130, depth 783 fathoms, 1 male; station 4132, depth 257 fathoms, 1 female.

The present species is apparently close to *P. januarii* Steenstrup,[a] from which it is readily distinguishable by the smaller mantle-opening, double cirri above the eyes, order of length of arms, their relative shortness, etc.

Named in honor of Dr. William E. Hoyle, to whom we owe much of our knowledge of this fascinating group of animals, and whose masterly memoirs are among our most important classics in their study.

STEPHANOTEUTHIS, new genus.

Body sepioliform, short, saccular. Medio-dorsal margin of mantle free from head, but articulating therewith by a very rudimentary groove and cartilaginous ridge; ventral margin produced forward below the eyes, completely covering the funnel, with the base of which it articulates on either side by a prominent cartilaginous connective apparatus.

[a] Hoyle, *Challenger* Report, p. 97, pl. 7, figs. 1–4.

Fins very large, semicircular, placed somewhat posteriorly.

Head large and broad. Arms short and stout. Tentacles stout; club not expanded, but armed with a great number of very minute suckers.

Gladius none.

Type of the genus.—The following species:

STEPHANOTEUTHIS HAWAIIENSIS, new species.

Body of moderate size, sepioliform, very firm and solid, divided posteriorly by a short horizontal groove, so that the dorsal portion projects backward over the ventral as though the two halves were slid upon one another.

Mantle thick and fleshy, its anterior margin free all round and only connected with the head in the nuchal region by the merest rudiment of a cartilaginous articulation, comprising a narrow, inconspicuous, longitudinal ridge on the inner surface of the mantle and a corresponding groove or depression on the neck, without thickenings or raised edges; inner ventral surface articulated with the base of the funnel on either side by a long, prominent ridge and a corresponding heavy locking apparatus, consisting of a deep curved groove with thickened edges; anterior ventral margin of mantle produced forward beneath and past the eyes so as to conceal the funnel and the entire ventral surface of the head.

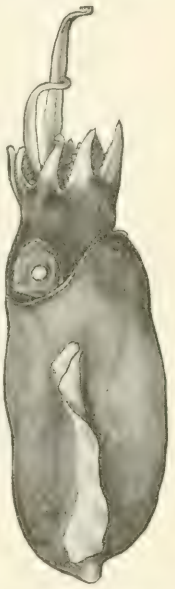

Fig. 2.—Stephanoteuthis hawaiiensis. Lateral aspect. (×1½)

Fins very large in proportion to body; circular; attached somewhat posteriorly and considerably above the median horizontal plane.

Head large, slightly broader than the body, with large prominent eyes. Siphon rather large, obtusely conical; tip rounded, without any downward flexure.

Arms very short, the dorsal pair the longest, the third pair shortest, connected at the base by a short fleshy umbrella, which is lacking between the ventral pair; tips of the four dorsal arms recurved. Suckers small, pedunculated, in two rows, extending nearly to the tips of all the arms save the second pair where they become obsolete for much of the distal portion.

Tentacles stout, slightly tapering, with a flattened inner surface; tentacular club small, of less diameter than the stalk, and of a velvety appearance, owing to the great multitude of very minute suckers with which it is armed.

Surface everywhere smooth. Color of preserved specimens a dirty buff, heavily dotted and reticulated with blackish chromatophores, which are most numerous on the dorsal surface of the head, but are also scattered thickly over the mantle (both above and below), on the ventral surface of the head and siphon, and at the base of all the arms except the third pair.

Gladius apparently wanting.

Total length, excluding tentacles 38 mm.; dorsal length of mantle 22 mm.; ventral length of mantle 27 mm.; width of mantle near middle 14 mm.; width across fins 32.5 mm.

The unique type, a gravid female, was dredged in about 733 fathoms, station 3989, coral sand and rock bottom, in the vicinity of the island of Kauai.

This form can not, I think, be confounded with any other described species of the Sepiolidæ. In the absence of other peculiar characters, the curious shape of the body and the ventral anterior extension of the mantle entirely covering the funnel would by themselves be very distinctive, but, none the less the present form is very closely related to *Heteroteuthis* Gray (*H. dispar* (Rüppell) Gray and *H. weberi* Joubin). The absence of the gladius and the lack of any save the most rudimentary connection between the mantle and the head would seem to ally *Stephanoteuthis* with *Idiosepius* Steenstrup, and there are other points of resemblance as well. *Idiosepius*, however, is stated to have no dorsal connective cartilages whatever, is of a very different shape and aspect, and with small, more posterior, fins. According to its external characters, therefore, *Stephanoteuthis* seems most easily referred to the Sepiolidæ, but until an anatomical examination is possible, its exact position must be left unsettled.

Genus STOLOTEUTHIS Verrill, 1881.

STOLOTEUTHIS IRIS, new species.

Body small, short, stout, laterally much compressed, rounded posteriorly; dorsal width and length about equal and much less than the depth. Mantle smooth, broadly continuous above with the head, from which it is separated only by a rather prominent cutaneous line or fold; anterior ventral margin produced forward beneath the eyes and far past them to form a broad convex lobe, somewhat as is seen in Verrill's *Nectoteuthis pourtalesii*, which almost entirely conceals the funnel and the ventral surface of the head. An indentation in the free anterior edge of the lobe permits the tip of the funnel to be seen. The central region of the lobe is sharply differentiated from the rest of the mantle surface as a large, slightly raised and flattened, heart-shaped area.

Fins relatively enormous, subcircular, narrowed at the base; attached considerably above the median horizontal plane of the

body, thin, slightly broader and longer than the body; anterior margin rounded and reaching to the eyes; posterior margin obtusely pointed, extending beyond the body.

Head very large, short and wide. Eyes large, situated in the angle of the mantle-margin above the anterior ventral lobe.

Sessile arms short, connected by a well-developed basal web reaching beyond the middle of the dorsal arms, but entirely absent between the ventral pair; order of length 3, 4, 2, 1, the third pair much the stoutest and longest and with the largest suckers; suckers small, pedunculated, in two rows.

Tentacles longer than the body, slightly thickened at the base, very slender and tapering; tentacular club but little, if any, wider than the stalk, armed with numerous rows of very minute suckers.

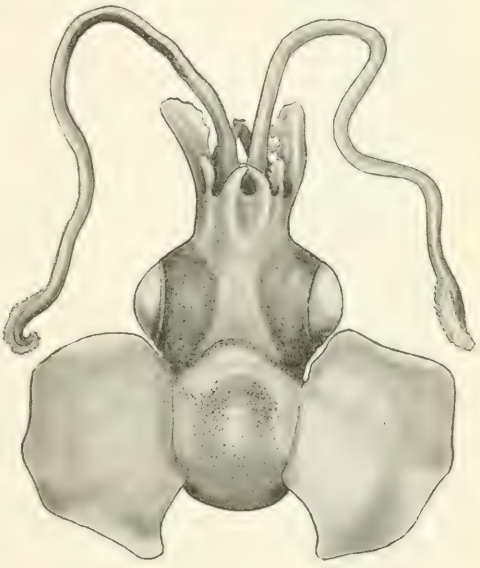

FIG. 3.—STOLOTEUTHIS IRIS. DORSAL ASPECT. (×3)

Gladius not observed; probably absent as in *S. leucoptera.*

Color in alcohol a dirty white; fins unmarked; mantle closely speckled above and below with small brownish chromatophores of two main sizes, which decrease in number laterally and posteriorly; chromatophores evenly and thickly distributed over the ventral heart-shaped area and its immediate vicinity; ventral surface further marked by a dark bluish-gray band bordering the heart-shaped area. Eyes dark gray, pupils white; arms uniformly of a dirty white.

Upon the reverse of the label accompanying the specimen appear the following notes in the handwriting of Dr. W. K. Fisher, as to the color of the animal when taken (colors according to Ridgway's "Nomenclature of Color"):

Tentacles, chromatophores burnt sienna, yellow ochre, and light red. Eye: pupil transparent, iridescent purple, blue, and emerald green; iris reddish burnt sienna. Body (except wings and outer test) iridescent orange, yellow, solferino, green, crimson, purple. Chromatophores of outer test burnt sienna and sepia.

The unique type was taken in 153 fathoms, from a bottom of brown mud and sand, at station 3832, off the south coast of the island of Molokai. Its measurements are: Length of body, excluding tentacles 16 mm.; length of tentacles 21 mm.; width across fins 18 mm.

This is an extremely distinct species, although bearing evident relationship to the *S. leucoptera* of Verrill and the *Nectoteuthis pourtalesii* of the same author, both of which are Atlantic forms. The superficial resemblance which the latter species bears to the Hawaiian form is very great, but the broad dorsal commissure uniting the head and mantle at once distinguishes *S. iris*.

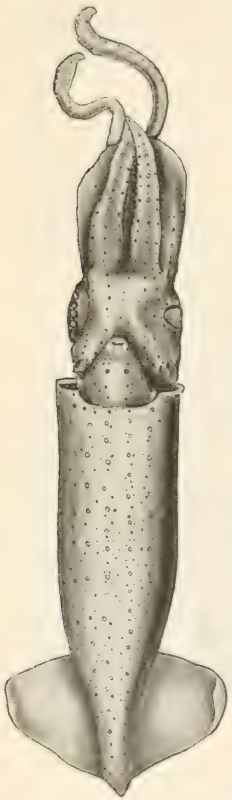

FIG. 4.—ABRALIA ASTROSTICTA. VENTRAL ASPECT. (× 1½.)

Genus ABRALIA Gray, 1849.

ABRALIA ASTROSTICTA, new species.

Mantle firm, fleshy, cylindrical in shape, tapering, at first gradually, then more abruptly, to a bluntish point; anterior edge smooth, emarginate below the funnel. Inner surface of the edge of the mantle articulating with the head in the nuchal region and with the sides of the siphon at the base, as usual in the genus. The dorsal apparatus consists of a simple longitudinal ridge on the mantle and a corresponding plate of cartilage on the neck. The ventral cartilages comprise a slender linear ridge on either side of the inner surface of the mantle, and grooves with thickened edges on the base of the funnel.

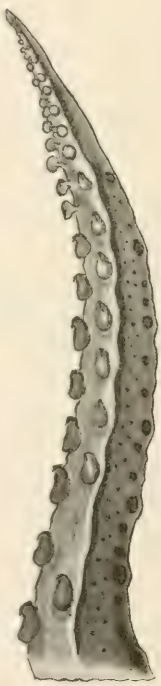

FIG. 5.—ABRALIA ASTROSTICTA. LEFT VENTRAL ARM.

Fins moderately large, subterminal, triangular, each about as broad as long; attached along most of their inner margin.

Head rather large, squarish, flattened above and below; four oblique, fleshy folds behind the eye on either side. Eyes large; orbit with a small rounded sinus in front. Funnel large, subtriangular, its center rounded and protruding ventrally, so that it has a ventrally swollen appearance.

Sessile arms rather short, the second and fourth pairs the longest; first and third pairs about equal in length; outer edge of arms furnished with a membranous or fleshy keel, which reaches its maximum development on the ventral arms. Armature consisting mainly of hooks in two alternating rows; suckers minute, appearing only at the extreme tips of the arms.

Tentacles slender, half as long again as the arms; tentacular club armed with four rows of suckers arranged as follows: (7) two dorsal rows of small suckers, largest at the middle of the club, but extending for its entire length; (2) two ventral rows of similar suckers on the distal portion of the club, replaced proximally by (3) a single row of five or six rather large hooks; (4) at the base of the club, upon the carpus, a fixing apparatus consisting of four or five extremely minute suckers and a few pads.

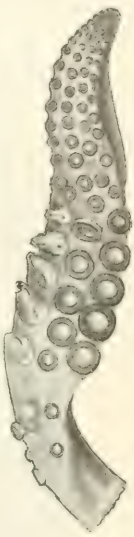

FIG. 6.—ABRALIA ASTROSTICTA. CLUB OF RIGHT TENTACLE.

Buccal membrane seven-pointed, coarsely papillose within; color uniformly pale, with a few slightly darker spots (chromatophores) scattered over the outer surface.

Photophores numerous, quite symmetrically distributed in about ten ill defined longitudinal rows on the ventral surface of the mantle; upon the ventral surface of the head five rows, one of them median; upon the funnel four rows, each comprising a single large organ and several smaller ones; upon each of the ventral arms three rows, two of them upon the body of the arm, the third extending along the marginal keel for over half its length; upon the ventral periphery of the right eyeball a very prominent row of five large, reddish, bead-like organs conspicuously different from the others. (The left eye was so retracted as to render examination impossible without mutilation of the specimen.)

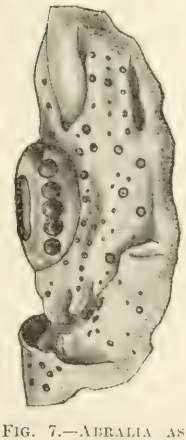

FIG. 7.—ABRALIA ASTROSTICTA. INFERIOR SURFACE OF RIGHT EYE AND SURROUNDING REGION, SHOWING DISTRIBUTION OF LUMINOUS ORGANS.

Color of preserved specimen a dirty buff, the gladius showing through the dorsal integument as a very prominent median dark line; photophores bluish, with whitish centers; chromatophores numerous, especially on the dorsal aspect, but largely replaced ventrally by the photophores.

Length, excluding tentacles 56.5 mm.; length of mantle 34 mm.; maximum width of mantle 10 mm.; width across fins 22 mm.

The type, which was the only specimen obtained, was dredged in about 192 fathoms, coarse coral sand and shell bottom—station 4122, off the southwest coast of the island of Oahu.

This species agrees with Pfeffer's "*hoylei*-group," of the genus *Abralia*, as defined by that author,[a] in that "die Leuchtorgane der Ventralfläche lassen in ihrer Anordnung bilateral-symmetrische Reihenzüge erkennen" and "auf der Ventralfläche des 4. Arm-

[a] Pfeffer, Teuthologische Bemerkungen, p. 289, Hamburg, 1908.

paares drei Reihen von Leuchtorganen, davon eine auf dem Schutzsaum, zwei auf der eigentlichen Armfläche." On the other hand, it differs from the "*hoylei*-group," and agrees with the "*veranyi*-group" (*Asteroteuthis* Pfeffer) in that the tentacular club possesses but one row of hooks and two rows of suckers, and also in that there is no evidence of violet coloration on the buccal membrane, although the lack of this character may be due to the bleaching action of the preserving fluid. Doctor Pfeffer has suggested that the present form may represent a new genus standing midway between *Abralia* and *Asteroteuthis*, but I do not at present feel justified in adopting this view.

FIG. 8.—CHIROTEUTHIS FAMELICA. DORSAL ASPECT. (×2.)

Genus CHIROTEUTHIS d'Orbigny, 1839.

CHIROTEUTHIS FAMELICA, new species.

Mantle cylindrical, extremely long and slender, gradually tapering for a little more than half its length, then becoming suddenly constricted to continue as an extremely slender and delicate rod between the fins, somewhat exceeding them posteriorly, and forming in this region only a thin membrane over the even more slender gladius; anterior margin sinuous, inflated; mantle connectives three in number—a longitudinal cartilage in the nuchal region, and an ear-shaped pit on either side of the base of the funnel, with corresponding cartilaginous ridges on the inner surface of the mantle.

Fins enormous, leaf-like, relatively thick and fleshy, extending for about three-fifths of the length of the mantle; about three times as long as wide; separated only by the posterior spit-like continuation of the mantle except in front, where the attached margin extends well forward on the dorso-lateral surface of the main body.

Head small, slightly narrower than the body. Eyes prominent. Funnel small.

Arms extremely short, except the ventral pair, which are enormously developed, being about three times as long as the rest, and half as long as the body; order of length, 4, 2, 3, 1; umbrella and lateral membrane wanting. Suckers extremely minute, in two rows, rather widely spaced, especially those of the ventral arms; horny rings well-developed, minutely toothed.

Both tentacles unfortunately missing.

Color of the preserved specimen a grayish buff, with a few scattered pale-brown chromatophores; gladius showing as a dark line through the integument.

Length, excluding arms 44 mm.; length of mantle 39 mm.; width across fins 14.5 mm.; length of ventral arms 20 mm.

The single known specimen was taken at station 3989, 733 fathoms depth, from a bottom of coral sand and rock, in the vicinity of the island of Kauai.

C. famelica appears to differ widely from all other known species of the genus in the extreme length and slenderness of the body and the very lanceolate fins, the smallness of the head, and the possession of relatively shorter arms than usual.

Genus CRANCHIA Leach, 1817.

CRANCHIA (LIOCRANCHIA) GLOBULA, new species.

Body subglobular, short and rounded, the diameter almost equal to the length, truncate anteriorly, posteriorly suddenly constricted, thence tapering rapidly to an acute point which forms the basis of attachment of the fins. Mantle smooth, membranous; its anterior margin passing in three even, nearly equal, curves from each point of attachment to the next. These points of attachment are three in number and about equidistant, one being dorsal and median, the other two on either side of the funnel. From the dorsal point of attachment there extends posteriorly on the outer surface of the mantle a narrow cartilaginous ridge composed of a succession of acutely conical tubercles placed close together in a single longitudinal series along the anterior two-thirds of the medio-dorsal line. From each of the ventral points of attachment two similar ridges extend back for about one-third of the length of the mantle, diverging at an angle of somewhat less than 90 degrees; the tubercles minute, of two sizes, irregularly alternating, each line comprising about twenty, arranged in a single series and flanked near the anterior end by parallel rows of two or three smaller tubercles on either side.

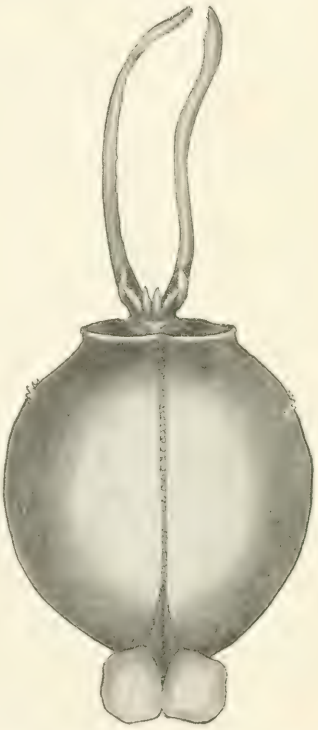

FIG. 9.—LIOCRANCHIA GLOBULA. DORSAL ASPECT. (× 2.)

Head very short and broad, projecting but slightly beyond the mantle. Eyes prominent, with a protruding lens. Funnel short, broad, projecting considerably beyond the mantle, ventrally flexed near the tip.

Sessile arms short, very unequal; order of length, 3, 4, 2, 1; the third pair much the longest, the second and fourth nearly equal; suckers extremely minute, pedunculated, arranged in two series of six (dorsal arms) to thirteen (third pair) each; horny rings apparently smooth; arms webbed, the umbrella extending for about one-half the length of the dorsal arms, but absent between the ventral arms and between these and the third pair.

Tentacles rather stout, much thicker than the sessile arms, almost equal in length to the mantle; club little thickened, tapering to a rather blunt point, furnished with a narrow lateral membrane, and bearing four rows of minute, closely crowded, pedunculate suckers, largest at the center of the club and becoming exceedingly minute toward either end; suckers of two of the rows much reduced proximally and continuing down the stalk for about two-thirds of its length in two widely-spaced alternating rows; aperture of suckers small, with a smooth horny ring.

Gladius not examined.

Color of preserved specimens a semitranslucent grayish white. Chromatophores distributed over the anterior portion of the mantle and extending in two rows along each tentacle, largest and most prominent on the anterior ventral surface of the mantle, where they are grouped in irregular rows to form a rough semicircle.

Length, excluding tentacles 26 mm.; length of mantle 22 mm.; width of mantle 19 mm.; length of tentacles 19 mm.

The type was taken from the plankton at station 3878, south of the island of Lanai, and west of the island of Kahoolawe.

A second smaller specimen was obtained at the same station, and a third, also from the plankton, is from station 4009, between the islands of Kauai and Oahu. These agree in all essentials with the type.

The present form undoubtedly exhibits close relationship to *C. reinhardtii* Steenstrup, but a number of characters above noted, chief of which, perhaps, is the extreme rotundity of the body, serve to distinguish them. Lönnberg[a] has considered rotundity to be merely an immature condition of *C. reinhardtii*, the latter being quite loliginiform when adult. However, the largest *Albatross* specimen is no less spherical than the smallest, and all are vastly more globular than any figures of *C. reinhardtii*, immature or otherwise, which I have seen. Nevertheless it is possible that a larger amount of material and a more extended knowledge of the limits of variation of these rare forms may indicate that the two are but extremes of one species.

[a] Lönnberg, Notes on some rare Cephalopods, p. 611, Stockholm, 1896.

HELICOCRANCHIA Massy, 1907

HELICOCRANCHIA FISHERI, new species.

Body rather barrel-shaped, inflated. Mantle membranous, saccular, thin, colorless; attached firmly at either side of the funnel, and by a cartilaginous semiarticulation in the nuchal region, very much inflated, largest at a point nearly midway between the head and fins, somewhat tapering anteriorly and also posteriorly, where it becomes suddenly constricted and continues to a sharp point, extending as a short, slender, spit-like process between the fins; integument much wrinkled and ventrally contracted, doubtless largely due to the action of the preservative used.

Fins small, thin, circular, almost continuous posteriorly and separated in the median line only by the integument covering the slender gladius.

Head rather large, concave above and below. Funnel moderately large and with a ventral flexion. Eyes very large, globular, sessile; openings of eyelids small.

Arms short, fleshy; order of length, 4, 3, 2, 1; umbrella wanting; lateral membrane or keel well developed, heavy, fleshy, without transverse supports or commissures save on the third pair of arms; third pair of arms differing much from the others, being larger, with larger suckers and a better developed marginal membrane, strengthened by fleshy transverse supports; horny rings well developed, without teeth.

Tentacles larger and heavier than the arms, about half as long as the body; tentacular club large, expanded, tapering to an acute point, with four closely placed rows of minute suckers which extend down on to the stalk, two of them soon becoming obsolete, the remaining two continuing down the arm for about two-thirds of its length, the suckers becoming much reduced in size; suckers of the club extending distally to the extreme tip, largest near the center; club furnished with a well-developed lateral keel, inner margin of tip being supplied with a second wider membrane, parallel to and above the keel.

Gladius not examined.

Color of preserved specimen whitish, semitranslucent. Chromatophores exceedingly minute and few in number.

Ventral length of mantle 46.5 mm.;[a] width of mantle 23 mm.; width across fins 12.5 mm.; length of tentacles 25 mm.

The unique type was dredged in 280 fathoms, ooze bottom, at station 3883, in the Pailolo channel.

Named for Dr. Walter K. Fisher, of Stanford University, to whom the author is much indebted for many helpful suggestions and other kindnesses, and in whose laboratory this work has been carried on.

[a] The dimensions here given are of necessity inaccurate, owing to the extremely wrinkled and contracted condition of the mantle.

It may be well to append herewith a list of all the species of cephalopods at present known to inhabit the waters in the vicinity of the Hawaiian Islands, including as well those obtained by the *Albatross* expedition. Nearly all the latter are entirely new records and it is quite possible that one or two forms, which are merely referred to their genus below, may eventually prove to be new to science, although for the time being it was deemed best to withhold descriptions of them.

LIST OF THE KNOWN SPECIES OF HAWAIIAN CEPHALOPODS.

Cirroteuthis (?), species.
Stations 3898, 3904 (very fragmentary).

Argonauta böttgeri Maltzan.
Station 3927.

Argonauta (*argo* Linnæus?).
Station 3857 (fragment).

Tremoctopus, species (near *quoyanus* d'Orbigny).
Stations 3799, 3878, 3926 3929, 3930, 3931, 4010, 4011, 4086.

Alloposus mollis Verrill.
Station 4095.

Bolitæna, species (young).
Station 4039.

Polypus hawaiiensis Eydoux and Souleyet.
Hawaii (Eydoux and Souleyet).

Polypus hoylei Berry.
Stations 4110, 4130, 4132.

Polypus marmoratus Hoyle.
Honolulu Reef (*Albatross* expedition).

Polypus ornatus Gould.
Station 4002 (young); Honolulu Reef (*Albatross* expedition); Maui (Gould).

Polypus α (young).
Stations 3843, 3921.

Polypus β (young).
Stations 3821, 3837, 3905, 3907, 3911, 3912, 3921, 3926, 3930, 3980, 4011.

Polypus γ (young).
Stations 3849, 3905.

Scævrgus, species.
Stations 3856, 3858, 4103.

Stephanoteuthis hawaiiensis Berry.
Station 3989.

Euprymna morsei Verrill.
Stations 3821, 3829, 3846, 3856, 3857, 3859, 3889, 3896, 3905, 3926, 3931, 3980, 4010, 4071, 4073, 4102, 4103, 4152, 4153; Honolulu Reef (*Albatross* expedition).

Semirossia (?), species.
Stations 3900, 4088 (very fragmentary).

Stoloteuthis iris Berry.
Station 3832.

Sepioteuthis arctipinnis Gould.
Maui (Gould).

Ommastrephes sagittata near *sloanei* Gray.
Stations 3865, 3930, 4082, 4117, 4132, 4353 (hydrographic station); Honolulu (*Albatross* expedition).

Ommastrephid (young).
Stations 3889, 3912, 3926, 3980, 4010, 4152, 4190.
Onychoteuthis banski Leach.
Laysan Island (Schauinsland).
Symplectoteuthis oualaniensis Lesson.
Laysan Island (Schauinsland).
Teleoteuthis appellöfi Pfeffer.
Station 3989.
Abralia astrosticta Berry.
Station 4122.
Abralia, species.
Station 3926 (fragmentary).
Abraliopsis, species.
Station 3926.
Pterygioteuthis giardi Fischer.
Station 4105.
Tracheloteuthis riisei Steenstrup.
Stations 3878, 4190.
Chiroteuthis famelica Berry.
Station 3989.
Cranchia (*Liocranchia*) *globula* Berry.
Stations 3878, 4009.
Cranchiid, species.
Station 4001 (fragmentary).
Xenoteuthis fisheri Berry.
Station 3883.

A REVIEW OF THE SERRANIDÆ OR SEA BASS OF JAPAN.

By David Starr Jordan and Robert Earl Richardson,
Of Stanford University, California.

In this paper is given an account of the species of Serranidæ, the sea bass and related forms, found in the waters of Japan.

The material examined was obtained in Japan by Messrs. Jordan and Snyder in 1900, and belongs to Stanford University and to the U. S. National Museum. The drawings, with one exception, were made by Mr. William S. Atkinson.

Family SERRANIDÆ.

THE SEA BASS.

Body oblong, more or less compressed, covered with adherent scales of moderate or small size, which are usually ctenoid; dorsal and ventral outlines not perfectly corresponding. Mouth moderate or large, not very oblique, the premaxillary protractile and the broad maxillary usually not slipping for its whole length into a sheath formed by the preorbital, which is usually narrow. Supplemental maxillary present or absent. Teeth all conical or pointed, in bands, present on jaws, vomer, and palatines. Gill rakers long or short, usually stiff, armed with teeth. Gills 4, a long slit behind the fourth. Pseudobranchiæ present, large. Lower pharyngeals rather narrow, with pointed teeth, separate (united in *Centrogenys*). Gill membranes separate, free from the isthmus. Branchiostegals normally 7 (occasionally 6). Cheeks and opercles always scaly; preopercle with its margin more less serrate, rarely entire; the opercles usually ending in one or two flat spine-like points. Nostrils double. Lateral line single, not extending on the caudal fin. Skull without cranial spines and usually without well-developed cavernous structure. No suborbital stay. Post-temporal normal. Second suborbital with an internal lamina supporting the globe of the eye; entopterygoid present; all or most of the ribs inserted on the transverse processes when these are developed; anterior vertebræ without transverse processes. Dorsal spines usually stiff, 2 to 15 in number; soft dorsal with 10 to 30 rays; anal fin rather short, its soft rays 7 to 12, its spines, if present, always 3, in certain genera (*Grammistinæ*, *Rypticina*) altogether

wanting. Ventrals thoracic, usually I, 5 (I, 4, in *Pharopterygin*æ), normally developed, without distinct axillary scale. Pectorals well developed, with narrow base. Caudal peduncle stout, the fin variously formed. Vertebræ typically 10+14=24, the number sometimes increased, never more than 35. Air bladder present, usually small, and adherent to the wall of the abdomen. Stomach cæcal, with few or many pyloric appendages; intestines short. Carnivorous fishes, chiefly marine, and found in all warm seas; several found in fresh waters.

ANALYTICAL KEY OF JAPANESE GENERA OF SERRANIDÆ.

a^1. Anal spines 3; well developed.

b^1. Dorsal fins 2, slightly connected at base; dorsal spines 9, 11, or 12 in number, never 10.

c^1. MALAKICHTHYINÆ. First dorsal with 9 spines; scales large, about 45; chin with a bifid tip; maxillary with a supplemental bone.....*Malakichthys*, 1.

c^2. DIPLOPRIONINÆ. First dorsal with 8 spines; scales small; body deep; opercle subentire; maxillary with a large supplemental bone; caudal rounded; no canines; tongue smooth.....*Diploprion*, 2.

c^3. MORONINÆ. First dorsal with 11 or 12 spines; teeth villiform, on jaws, vomer and palatines; scales moderate or rather small; preopercle serrate; ventrals inserted before pectorals.

d^1. Tongue toothless; vertebræ 30 to 35.

e^1. Preopercle without spine; maxillary with supplemental bone; body elongate; scales moderate.....*Lateolabrax*, 3.

e^2. Preopercle with a strong spine at the angle; maxillary without supplemental bone; scales very small.....*Niphon*, 4.

b^2. Dorsal fin single, occasionally deeply divided, sometimes to the base.

f^1. Lateral line single, complete; ventral rays I, 5.

g^1. Maxillary with a distinct supplemental bone.

h^1. Inner teeth of jaws not depressible and hinged.

i^1. Dorsal spines normally 11 or 12; dorsal deeply notched; no distinct canines; tongue toothless.

j^1. SINIPERCINÆ. Scales cycloid; dorsal spines 12.

k^1. Scales large, about 45 in lateral line.....*Bryttosus*, 5.

j^2. POLYPRIONINÆ. Scales small, rough, nearly 100 in lateral line; soft dorsal shorter than spinous part, of 10 to 12 rays.

l^1. Head not armed with spinigerous ridges; preopercle moderately serrate, sometimes becoming entire with age; dorsal fin deeply notched, the last spines much shorter than the middle ones; scales rugose; soft dorsal scaly; forehead broad, flattish; snout, preorbital and jaws naked; caudal subtruncate; preopercle finely serrate, becoming entire with age; gill rakers very strong; pyloric cæca few (about 7); pectoral obtusely pointed; ventral inserted a little before axil of pectoral; vertebræ 26, *Stereolepis*, 6.

i^2. LIOPROPOMINÆ. Dorsal spines less than 10, the spinous part shorter than the soft part, which has 12 rays; preopercle weakly serrate or entire.

m^1. Head rough above; dorsal spines 9; vertebræ 24, *Aulacocephalus*, 7.

m^2. Head smooth above; dorsal spines 8.....*Pikea*, 8.

h^2. EPINEPHELINÆ. Inner teeth of jaws depressible or hinged; canine teeth more or less distinct, in front of each jaw; scales small, firm, the top of head more or less scaly; lateral line running low (except in *Gonioplectrus*, etc.); supraoccipital crest usually more or less encroaching on the top of the skull, so as to leave no distinct smooth area at the vertex (except in *Variola*); temporal crests usually distinct; gill rakers various. Dorsal rays VI to XIV, 12 to 20, the number of spines usually not 10; anal rays III, 7 to III, 12; ventral fins inserted more or less behind axil of pectorals; soft dorsal scaly; scales of lateral line usually triangular and cycloid; vertebræ almost always 10+14=24, rarely 26 or 27.

n^1. Dorsal spines 6 to 8; preopercle with strong recurved teeth below; anal spines weak.....*Plectropomus*, 9.

n^2. Dorsal spines 11 (rarely 10, never 9).

o^1. Parietal crests not produced forward on the frontals; frontals with a process or knob on each side, behind interorbital area; premaxillary processes fitting into a cavity or emargination at the anterior extremity of the frontals; anal rays III, 8, or III, 9. Scales of the lateral line normal, marked by radiating ridges. Cranium narrow above the interorbital space, deeply concave in cross section; occipital crest meeting interorbital region; vertebræ 24.....*Epinephelus*, 10.

o^2. Parietal crests produced forward on the frontals. Frontals without processes on the upper surface; parietal crests extending to between orbits; premaxillary processes not extending to the frontals. Anal fin elongate, its rays III, 10 to III, 12; caudal fin lunate or truncate; spines slender, those of the anal fin graduated; lower jaw strongly projecting; cranium rather broad, transversely concave between the eyes, its lateral crests very strong, nearly parallel with the supraoccipital crest and extending farther forward than the latter, joining the supraocular crest above the eye; scales small, largely cycloid, those of the lateral line simple; pyloric cæca few (12 to 20); dorsal rays XI, 16 to 18.

p^1. Nostrils close together, the posterior scarcely enlarged.....*Trisotropis*, 11.

g^2. Maxillary without supplemental bone; canine teeth, if present, usually developed on the side of the lower jaw as well as in front; depressible teeth few or none; scales mostly ctenoid, including those of the lateral line; tubes of lateral line straight or with an ascending tubule, covering most of the length of scale. Temporal crests on cranium almost obsolete.

q^1. SERRANINÆ. Gill rakers comparatively short and wide apart; lateral line not running very close to the back; dorsal rays X, 11 to 15; anal rays usually III, 7; supraoccipital crest not extending far forward on top of the

skull, a more or less distinct convex smooth area being left on the vertex between the supraoccipital and the interorbital area; no angle in lateral line, vertebræ 24.

r^1. Ventral fins anterior, inserted more or less in advance of axil of pectoral, well separated; preopercle evenly serrate.

s^1. Dorsal fin continuous; a few hinged teeth in upper jaw; caudal lunate, the upper rays produced; snout and jaws naked, *Chelidoperca*, 12.

s^2. Dorsal fin notched to base; teeth all small, none hinged; caudal rounded; snout and jaws scaled..... *Sayonara*, 13.

q^2. ANTHIINÆ. Gill rakers usually very long, slender, and close set; lateral line running close to the back, often angulated; supraoccipital crest high; occiput with a short, convex, smooth area; canines present; no depressible teeth; preorbital narrow; vertebræ usually 26.

t^1. Dorsal spines 10; maxillary scaly.

u^1. Pectoral rays mostly branched; jaws with small canines.

v^1. Entopterygoids with teeth; teeth on the tongue; dorsal rays X, 20; scales small; caudal truncate; pectoral long, unsymmetrical; ventrals inserted below them, *Caprodon*, 14.

v^2. Entopterygoids toothless; few if any teeth on tongue; scales large; dorsal rays less than X, 20.

w^1. Caudal fin lunate, its outer rays produced; ventral fins inserted below pectorals.

x^1. Lateral line with a distinct angle below last rays of soft dorsal; ventral fins long; preopercle strongly serrate.. *Anthias*, 15.

x^2. Lateral line without angle below last rays of soft dorsal; ventral fins not produced, *Pseudanthias*, 16.

u^2. Pectoral rays all simple; canines strong; body elongate; tongue smooth; scales large; caudal lunate..... *Tosana*, 17.

1. Genus MALAKICHTHYS Döderlein.

Malakichthys DÖDERLEIN, in Steindachner and Döderlein, Denkschr. Akad. Wien, vol. 47, 1883, p. 240 (*griseus*).

Satsuma SMITH and POPE, Proc. U. S. Nat. Mus., vol. 31, 1906, p. 472 (*macrops*).

Form oblong, compressed, head pointed; mouth and eye large; a supplemental maxillary present; villiform teeth in bands, in jaws, and on vomer and palatines; tongue smooth; no canines; a double forward-pointing tooth-like projection at symphysis of lower jaw; preopercle thin toward margin, with evident, but rather weak, serratures both above and below the angle; opercle with 2 thin, flat, short spines; gill membranes free; gill rakers long and slender; branchiostegals 7; scales moderate, finely ctenoid, thin, and easily deciduous; opercles, cheeks, and upper portion of head scaly; snout and jaws naked; lateral line complete, high, and about parallel with back; tube occupying middle third of scale; two dorsals, connected at the base, anterior with 9 rather slender spines; anal III, 7. Caudal emarginate; ventrals close together, slightly behind base of pectorals, the spine long; pectorals long and pointed, the upper rays longest.

Known at present only from the shore waters of Japan; one species.

The affinities of this genus are not certainly known. It has a superficial resemblance to *Amia* and to *Ambassis*, but the armature of the opercle is that of the Serranidæ. The genus *Satsuma* was based on a young example of the type of *Malakichthys*.

(*μαλακός*, soft; *ἰχθύς*, fish).

1. MALAKICHTHYS GRISEUS Döderlein.

Malakichthys griseus DÖDERLEIN, in Steindachner and Döderlein, Denkschr. Akad. Wien, vol. 47, 1883, p. 240; fig. 1, in vol. 48, pl. 2, fig. 1. ("Tokyo," probably Sagami Bay).—JORDAN and SNYDER, Proc. U. S. Nat. Mus., vol. 23, 1901, p. 353 (Tokyo).—ISHIKAWA, Prel. Cat., 1897, p. 57 (Kagoshima; Miyakoshima).

Satsuma macrops SMITH and POPE, Proc. U. S. Nat. Mus., vol. 31, 1906, p. 472, fig. 5 (Kagoshima).

Head 2.60 in length; depth 2.65; depth caudal peduncle 3.5 in head; eye 2.6 in head; snout 4; interorbital space 4.3; maxillary 2.1; width of its extremity 2.5 in eye; dorsal IX—I, 10; anal III, 7; scales 4–41–10 or 11; pores 46, the last 6 borne by scales extending on caudal rays. Form oblong, compressed; back moderately elevated, the dorsal and ventral outlines nearly symmetrical; head pointed; the profile slightly angled behind eye; mouth large, very oblique; maxillary short of a vertical from anterior edge of pupil; lower jaw projecting, the symphysis with two closely set, forward-pointing, tooth-like processes. Jaws, vomer, and palatines with bands of villiform teeth; tongue toothless; nostrils subequal; preoperculum rounded, thin toward margin, with rather weak serratures both

above and below the angle; operculum with 2 thin, flat, short spines; gill rakers long and slender, 23 or 24 on lower limb of outer arch, the longest exceeding in length the corresponding filaments. Scales moderate, finely ctenoid, thin, and easily deciduous; entire head scaled, except mandibles and snout. Spinous dorsal inserted almost directly over base of ventrals; dorsal spines slender, sharp, the fourth longest, its length little more than diameter of eye; soft dorsal lower than spinous; caudal deeply emarginate, the middle rays about three-fifths length of outer; first anal spine extremely short, seven or eight times in length of second, which is about seven-eighths of third; ventrals inserted a trace behind pectorals, falling short of vent, 2 in head, the spine long and slender; pectoral long and pointed, about 1.3 in head, reaching past vent, but not to base of anal.

Color in spirits silvery, olivaceous above; in 1 specimen are to be seen on the sides traces of 2 or 3 longitudinal crimson stripes; a

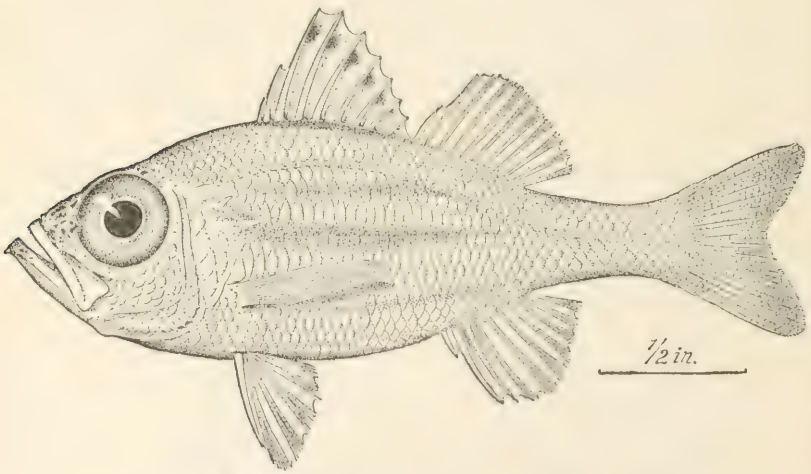

FIG. 1.—MALAKICHTHYS GRISEUS, TYPE OF SATSUMA MACROPS.

small black blotch near margin of each membrane of spinous dorsal back of third spine.

The above description is taken from 5 specimens 6 to 8 inches (to tip of caudal), from different localities on Sagami Bay: Yodomi, Misaki, and Odawara. It lives in rather deep water. It is recorded by Smith and Pope from Kagoshima, in the province of Satsuma.

In spite of certain discrepancies between the descriptions of Smith and Pope and Döderlein in the matter of number of scales, length of dorsal spines, length of pectoral, depth of notch between dorsals, and in the account of the coloration, we do not feel justified in regarding the species *macrops* and *griseus* as distinct. Our specimens show considerable variation both in the length of the pectoral and in the depth of the cleft between the dorsals. In all but a single

specimen all traces of the crimson side stripes have disappeared, and in 1 specimen traces of the blotches in the dorsal membranes are all but obliterated. Thus is probably to be explained Doctor Döderlein's failure to figure any color pattern. As compared with our specimens, the length of the pectorals in the figure of *Malakichthys griseus* Döderlein are about as much too long as those of *Satsuma macrops* Smith and Pope are too short.

(*griseus*, gray.)

2. Genus DIPLOPRION Kuhl and Van Hasselt.

Diploprion KUHL and VAN HASSELT, in Cuvier and Valenciennes, Hist. Nat. Poiss., vol. 2, 1828, p. 137 (*bifasciatum*).

Body short and deep, much compressed, back elevated; mouth large, protractile; maxillary with a large supplemental bone; jaws, vomer, and palatines with bands of villiform teeth, no canines; tongue smooth; upper limb of preopercle without conspicuous serratures; angle obtuse; lower limb with 8 or 10 strong teeth; operculum with 3 strong spines; gill rakers moderate, with knob-like tips; scales very small, ctenoid; lateral line complete; cheeks and opercles scaly; rest of head, jaws, and chin bare; parts of operculum, preoperculum, infraorbital, and suborbital regions rugose; 2 dorsals, connected at the base, anterior with 8 strong spines; anal III, 13; caudal rounded; ventrals below base of pectorals, close together, with a short but strong spine; pectorals rounded.

East Indies, China and Japan; probably but one species. The affinities of this genus are rather obscure, but it is doubtless a member of the family of Serranidæ.

(*διπλόος*, double; *πρίων*, saw.)

2. DIPLOPRION BIFASCIATUS Kuhl and Van Hasselt.

OKIMADO (off-shore window-shutter).

Diploprion bifasciatum KUHL and VAN HASSELT, in Cuvier and Valenciennes, Hist. Nat. Poiss., vol. 2, 1828, p. 137, pl. 21 (Java).—TEMMINCK and SCHLEGEL, Faun. Japon., Pisc., 1842, p. 2, pl. 2 (Nagasaki).—RICHARDSON, Ichthyol. Chin., 1846, p. 221 (Canton, insect boxes).—BLEEKER, Nieuwe Nalez. Japan., 1857, p. 59 (Nagasaki; Simabara Bay).—NYSTRÖM, Svensk. Vet. Akad. Handl., vol. 13, pt. 4, No. 4, 1887, p. 8 (Nagasaki).—ISHIKAWA, Prel. Cat., 1897, p. 56 (Kagoshima).—STEINDACHNER and DÖDERLEIN, Denkschr. Akad. Wien, vol. 47, 1883, p. 234 (Kagoshima).—JORDAN and SEALE, Proc. U. S. Nat. Mus., vol. 29, 1905, p. 521 (Hongkong); Proc. Davenport Acad. Sci., vol. 10, 1905, p. 9 (Hongkong).

Head 3; depth 2.2; depth caudal peduncle 2.2 in head; eye in head 4.3 to 4.4; dorsal VIII, 15; anal III, 13; scales 110 to 115; nose 2.7 to 2.9 in head; maxillary 1.6, equal to pectoral, width of its extremity about equal to diameter of eye; interorbital space arched, equal to eye. Back elevated, its highest point at front of

spinous dorsal; profile steep, slightly angled over eye; mouth large, oblique; lower jaw scarcely projecting. Jaws, vomer, and palatines with bands of villiform teeth; tongue without teeth; posterior nostril enlarged; angle of preoperculum obtuse, its upper limb without conspicuous serratures, lower with about 8 strong teeth; opercular spines moderate, the middle one strongest; middle and upper spines often bluntish or bi- or tri-furcate; gill rakers 21, 2 or 3 rudiments, with knob-like tips. Cheeks scaled; opercles with a few scales posteriorly; much of operculum, preoperculum, infraorbital, and supraorbitral regions bare and rugose. Second dorsal spine longest, 1.6 in head; longest soft ray 1.75; caudal rounded; pectoral broadly

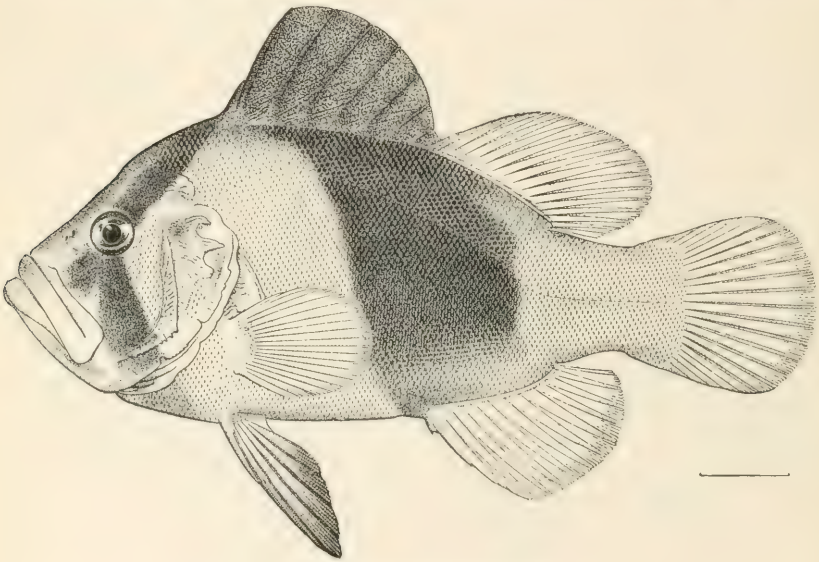

FIG. 2.—DIPLOPRION BIFASCIATUS.

rounded, 1.6 in head; ventrals long, reaching past vent, 1 to 1.2 in head.

Color in spirits yellow, with two broad cross-bands of blackish brown; first cross-band as wide as eye, passing across nape in front of dorsal, through eye, and to lower border of preopercle; second about four times width of eye, originating between sixth dorsal spine and fifth soft ray and passing obliquely downward, striking the ventral line between tips of reflexed pectorals and middle of anal; spinous dorsal blackish, paler forward; ventrals dusky, blackish toward tips; other fins plain yellow.

Here described from specimens as follows: Hakata 1, $8\frac{1}{2}$ inches; Wakanoura 2, 7 to $8\frac{1}{2}$ inches; Nagasaki 2, 6 inches.

This species is occasionally taken on the shores of Kiusiu and Shikoku in southern Japan and southward to China and India. Doctor Döderlein got numbers in Kagoshima.

Specimens from Hongkong have the back slightly less elevated and the depth less and the opercular spines on the average a little longer and more slender. Probably all belong to one species.

(*bis*, two; *fascia*, band.)

3. Genus LATEOLABRAX Bleeker.

Lateolabrax BLEEKER, Nieuwe Nalez., Japan, 1857, p. 53 (*japonicus*).—BOULENGER, Cat. Fishes, vol. 1, 1895, p. 122.

Percalabrax GÜNTHER, Cat. Fishes, vol. 1, 1859, p. 70 (*japonicus*). (After Percalabrax [a] of Temminck and Schlegel.)

Body compressed, elongate; mouth large, protractile; maxillary with supplemental bone; villiform teeth in jaws and on vomer and palatines; tongue smooth; no canines; preopercle serrated behind, its lower border with a few strong antrorse spines; opercle with a single spine; gill rakers long and slender; seven branchiostegals; scales small, ctenoid; head, except jaws and chin, scaled; lateral line complete, the tube straight, extending nearly the length of the scale; two dorsals, connected at the base, anterior with 11 or 12 strong spines; anal III, 8 or 9; caudal emarginate; ventrals behind base of pectorals, close together, with a strong spine; pectorals obtusely pointed. "Posterior processes of premaxillaries not extending to frontals; parietal and supraoccipital bones not extending to between post-frontal processes; supraoccipital and parietal crests strong, not produced on the frontal; vertebræ 35 (17+18)." (Boulenger.)

Coasts of China and Japan; one species. The genus is allied to the bass (*Dicentrarchus*) of Europe, and to the American genera *Morone* and *Roccus*.

3. LATEOLABRAX JAPONICUS (Cuvier and Valenciennes).

SUZUKI.

Labrax japonicus CUVIER and VALENCIENNES, Hist. Nat. Poiss., vol. 2, 1828, p. 85 (Sea of Japan).—BLEEKER, Verh. Batav. Gen., vol. 25, 1853, p. 23 (Japan).—RICHARDSON, Ichthyol. Chin., 1846, p. 222 (Hongkong; Canton).

Perca-labrax japonicus TEMMINCK and SCHLEGEL, Faun. Japon., Pisc., 1842, p. 2, pl. 2, fig. 1 (Nagasaki).

Percalabrax japonicus GÜNTHER, Cat. Fishes, vol. 1, 1859, p. 71 (China; Japan). – STEINDACHNER and DÖDERLEIN, Beitr. Kennt. Fische Japan, vol. 1, 1883, p. 20, pl. 4, fig. 3 (Tokyo).—NYSTRÖM, Svensk. Vet. Akad. Handl., vol. 13,

[a] We follow Gill and Boulenger in retaining for this genus the name *Lateolabrax* instead of the earlier term, *Perca-labrax*, used by Temminck and Schlegel. It is evident that the Fauna Japonica used the name *Perca-labrax japonicus* as the equivalent of *Perca* (*Labrax*) Japonicus suggested by Cuvier and Valenciennes. Temminck and Schlegel use the French name "Bars" as the equivalent of *Perca-labrax*. The "Bars" comprise Cuvier's subgenus *Labrax*, or, as suggested in a footnote, his *Perca* (*Labrax*). Evidently in the Fauna Japonica the hyphen replaces the bracket. As the type of the "Bars" is the European, *Perca labrax*, the name *Perca-labrax* has the same type. If regarded as tenable, *Perca-labrax* might replace *Dicentrarchus* for the species now called *Dicentrarchus labrax*.

pt. 4, No. 4, 1887, p. 5 (Nagasaki).—NAMIYE, Class. Cat., 1881, p. 92 (Tokyo).—ISHIKAWA, Prel. Cat., 1897, p. 57 (Hokkaido).

Lateolabrax japonicus BLEEKER, Nieuwe Nalez., Japan, 1857, p. 53 (Japan).—BOULENGER, Cat. Fishes, vol. 1, 1895, p. 123 (China; Japan; Formosa, etc).—JORDAN and SNYDER, Proc. U. S. Nat. Mus., vol. 23, 1901, p. 353 (Tokyo).—JORDAN and SEALE, Proc. U. S. Nat. Mus., vol. 29, 1905, p. 521 (Shanghai).—JORDAN and STARKS, Proc. U. S. Nat. Mus., vol. 31, 1906, p. 517 (Port Arthur).

Head 3.3; depth 4 to 4.4; depth caudal peduncle 3.3 in head; eye 5.2 to 5.4; nose 3.75; dorsal XII—I or II, 12; anal III, 8; scales 14 to 17—103 to 106—24 to 26; pores 97; maxillary extending nearly to back of eye, 2.2 in head; width of its extremity about three-fifths of eye; interorbital space little elevated, flattish, 1.1 times eye. Form slender, moderately compressed, greatest thickness of body one-half depth; back little elevated, highest under third dorsal spine; profile straight from occiput; muzzle sharp; lower jaw projecting for a distance equal to width of pupil. Jaws, vomer, and palatines with bands of villiform teeth; tongue toothless; nostrils subequal; preoperculum with a salient angle; above the angle 2 or 3 strong points, directed backward and downward; below it 2 or 3 antrorse teeth; operculum ending in a moderate, flattish spine, above which is a second short bluntish point; gill rakers 14 to 16+2 or 3 rudiments. Top of head, cheeks, opercles, and suborbitals scaled; maxillary and lower jaw smooth. Origin of spinous dorsal midway between pectorals and ventrals; longest dorsal spine the fifth, 2 in head; longest soft ray 2.6 in head; caudal emarginate, its corners rounded; pectoral 2 in head; ventral 1.8.

Color in spirits silvery, olive to purplish on upper parts; an interrupted black line or row of spots along each side of base of spinous dorsal; an irregular row of small black spots midway between dorsal and lateral line, and a third irregular row extending along or slightly above lateral line; these spots are faint or absent in many specimens; membranes of spinous dorsal edged with dusky and with two to four longitudinal rows of irregular dark blotches; soft dorsal similarly marked, but with the blotches less diffuse.

Specimens from Port Arthur have the spots on sides larger and plainer than in Japanese specimens.

Here described from specimens as follows: Yokohama, 1 specimen, 12 inches; Tokyo, 14, 3 to 10 inches; same, 2, 8 to 9 inches; Wakanoura, 3, 4 to 11 inches; Kurume, 49, 3 to 6 inches; Chikugo River, Kurume, 1, 11 inches; Matsushima, 3, 6 to 8 inches; Kagoshima, 1, 8 inches. It was also seen at Nagasaki, Hiroshima, Onomichi, Tsuruga, Hakata, and Kobe. It is common along the whole coast of Japan, being one of the most highly valued food fish, like its ally, the striped bass of America. It is known everywhere as Suzuki. The young enter the streams.

4. Genus NIPHON Cuvier and Valenciennes.

Niphon CUVIER and VALENCIENNES, Hist. Nat. Poiss., vol. 2, 1828, p. 131 (*spinosus*).

Body elongate, compressed; mouth large, protractile; maxillary without supplemental bone; villiform teeth in jaws and on vomer and palatines; tongue smooth; no canines; preopercle serrated behind, with a very strong backward pointing spine at the angle; a few short spines on lower border; opercle with three strong spines; gill rakers long and slender; seven branchiostegals; scales very small, ctenoid; head scaly; maxillary bare, except for a narrow median patch of scales; lateral line complete, the tube straight, extending the length of the scale; two dorsals, connected at the base, anterior with 11 strong spines; anal III, 7; caudal emarginate; ventral below base of pectorals, close together, with a strong spine; pectorals rounded, the upper rays longest. "Posterior processes of premaxillaries not extending to frontals, parietal and supraoccipital bones not extending to between postfrontal processes; no parietal crests; supraoccipital crest feeble, not extending to anterior extremity of the bone; vertebræ 31 (14+17)." (Boulenger.)

Coasts of Japan to Philippines; one species. Size large.

(*Nip-hon* or *Nippón*, the name of the Eastern Kingdom, corrupted by early travelers into Japon or Japan.)

4. NIPHON SPINOSUS Cuvier and Valenciennes.

ARA (bass), **ARA-ARA** (rough or violent).

Niphon spinosus CUVIER and VALENCIENNES, Hist. Nat. Poiss., vol. 2, 1828, p. 131, pl. 19 (Sea of Japan).—TEMMINCK and SCHLEGEL, Faun. Japon., Pisc., 1842, p. 1, pl. 1 (Nagasaki).—GÜNTHER, Cat. Fishes, vol. 1, 1859, p. 80 (Japan).—STEINDACHNER and DÖDERLEIN, Denkschr. Akad. Wien., vol. 47, 1883, p. 228 (Tokyo).—BOULENGER, Cat. Fishes, vol. 1, 1895, p. 124 (Yokohama).—NYSTRÖM, Svensk. Vet. Akad. Handl., vol. 13, pt. 4, No. 4, 1887, p. 5 (Nagasaki).—RICHARDSON, Ichthyol. Chin., 1846, p. 222 (Japan).—NAMIYE, Class. Cat., 1881, p. 92 (Tokyo).—ISHIKAWA, Prel. Cat., 1897, p. 57 (Tokyo; Hizen; Boshu).—JORDAN and SNYDER, Proc. U. S. Nat. Mus., vol. 23, 1901, p. 353 (Tokyo); p. 750 (Yokohama).—SMITH and POPE, Proc. U. S. Nat. Mus., vol. 31, 1906, p. 468 (Kochi).

Head 2.8; depth 3.5; depth caudal peduncle 4.1 in head; eye 6.4; dorsal XII—I, 10; anal III, 7; scales 24–163-56; nose 2.75 in head; maxillary 2.25, nearly to middle of eye, width of its extremity five-sixths of eye; interorbital space 4.4 in head, nearly flat, with two slightly raised central ridges. Back moderately elevated, highest under third dorsal spine; profile straight; muzzle long, sharp, lower jaw strongly projecting. Villiform teeth in jaws and on vomer and palatines; nostrils unequal, the posterior much larger, elongated; a single strong sharp backwardly directed spine at the angle of the pre-

operculum, and a number of short points along the margin above it; lower face with 3 strong backwardly directed spines; middle spine of operculum much the longest, longer than the preopercular spine; gill rakers 16. Cheeks, opercles, suborbitals, and occiput scaled. Longest dorsal spine 3.5 in head; longest soft ray 3.4; caudal emarginate; pectoral 2.4 in head; ventral 2.5.

Color in spirits light yellowish brown, paler below; fins dusky toward tips; caudal with a narrow pale edge on lower and upper lobes, the edge broadest on lower lobe. The young have also a longitudinal dark stripe on body, extending forward through eye, and a black blotch on soft dorsal.

Here described from a large specimen, about 28 inches, from Misaki. We have also a young specimen in good color from the Philippines. The species is not common in Japan, but is valued as food. It reaches a large size, and is known as *ara*.

(*spinosus*, spiny.)

5. Genus BRYTTOSUS Jordan and Snyder.

Bryttosus JORDAN and SNYDER, Proc. U. S. Nat. Mus., vol. 23, 1901, p. 354 (*kawamebari*).

Body oblong, compressed; mouth large, protractile; maxillary with a large supplemental bone; jaws, vomer, and palatines with bands of villiform teeth; no true canines; tongue smooth; preopercle serrated; opercle with two flat spines; gill rakers long and slender; branchiostegals 7; scales moderate, thin, flexible, cycloid, not easily deciduous; cheeks and opercles scaled; rest of head naked; lateral line continuous, the tubes straight; dorsal fins confluent, the anterior with 12 spines, its base longer than that of second; anal rays III, 9; caudal rounded; ventrals scarcely behind pectorals, close together, each with a short strong spine; pectorals rounded.

Fresh waters of Japan; one species. This genus in its external characters bears a very close resemblance to the American sunfishes or Centrarchidæ, notably to the genus *Chænobryttus*. This resemblance is heightened by the presence of a small black flap or tip to the opercle, as in *Lepomis* and related genera. The skeleton has not been compared with that of *Lepomis* or *Chænobryttus*, but it would not be strange if *Bryttosus* should prove allied to the ancestral Serranidæ from which the Centrarchidæ are developed. Related to *Bryttosus* are *Siniperca* and *Coreoperca*, fishes of the rivers of China and Korea, not found in Japan. From *Siniperca*, *Bryttosus* differs in its large scales.

(*Βρύττος*, *Bryttus*, a name given by Cuvier and Valenciennes to *Apomotis*, an American sunfish.)

5. BRYTTOSUS KAWAMEBARI (Temminck and Schlegel).

MIDZUKURI (water chestnut burr); **KAWAMEBARU** (river big-eye); **YOTSUME** (four eyes);[a] **OYANIRAMI** (parent scorner).[b]

Serranus kawamebari TEMMINCK and SCHLEGEL, Faun. Japon., Pisc., 1842, p. 5 (Japan).—GÜNTHER, Cat. Fishes, vol. 1, 1859, p. 107 (after Temminck and Schlegel).

Siniperca? kawamebari BOULENGER, Cat. Fishes, vol. 1, 1895, p. 138 (notes on type-specimen in Leyden Museum furnished by Doctor Reuvens).

Bryttosus kawamebari JORDAN and SNYDER, Proc. U. S. Nat. Mus., vol. 23, 1901, p. 354, pl. 12 (Yamagawa, above Bay of Shimabara).

Head 2.5; depth 2.45; depth caudal peduncle 2.5 in head; eye 3.8 to 4.5; dorsal XII, 12; anal III, 9; scales 10–44 to 46–18; nose 3.4 to 3.7; maxillary past eye in largest specimens, slightly short of back of eye in smaller, 1.9 to 2.2 in head; width of extremity of maxillary nearly equal to eye; interorbital space little elevated, slightly convex, equal to eye. Body short, robust, moderately compressed; back moderately elevated, highest under front of spinous dorsal; profile nearly straight; muzzle pointed; lower jaw slightly shorter than upper; villiform teeth in bands in jaws and on vomer and palatines; some of the anterior teeth in both jaws slightly enlarged; no true canines; posterior nostril slightly smaller; preopercle without marked angle, broadly rounded, the upper limb rather finely serrate, lower margin sinuous; opercle with 2 flat spines, the lower longest; the flap emarginate behind; gill rakers short, about half length of corresponding filaments, 7 besides 3 rudiments on lower limb of outer arch; scales moderate, cycloid; opercles and cheeks scaled, rest of head without scales; lateral line complete, the tubes straight. Dorsal origin halfway between gill opening and base of pectoral; longest dorsal spine (fifth) 3 to 3.5 in head; longest soft ray 2.2; caudal broadly rounded; first anal spine less than half of second, second and third more than half longest soft rays; pectorals rounded, 1.9 to 2.1 in head; ventrals rounded, short of vent, 1.75 to 1.9 in head.

Color in spirits dark bluish brown, with traces (plain in very young) of 5 or 6 dusky cross-bands on posterior two-thirds of body and caudal peduncle. Cheeks crossed by 3 wavy lines of dusky radiating from eye; a conspicuous round black blotch on margin of opercular flap between the spines; spinous dorsal, anal, and ventrals dusky; soft dorsal, caudal, and anal paler, with light spots in rows or in mottling; pectorals pale; edges of branchiostegals dusky.

Here described from 11 specimens, 1½ to 4½ inches long, from the following localities: Yama River (Yamagawa) near Funayado, 10;

[a] Referring to the black opercular spot.

[b] From *oya*, parents and *nirami*, to stare offensively. This four-eyed fish is supposed to be guilty of this provoking offense intolerable in Japanese customs.

Yabe River at Funayado on the island of Kiusiu, 1. The species is abundant in clear streams and mountain springs of the Southern Island. It reaches but a small size.

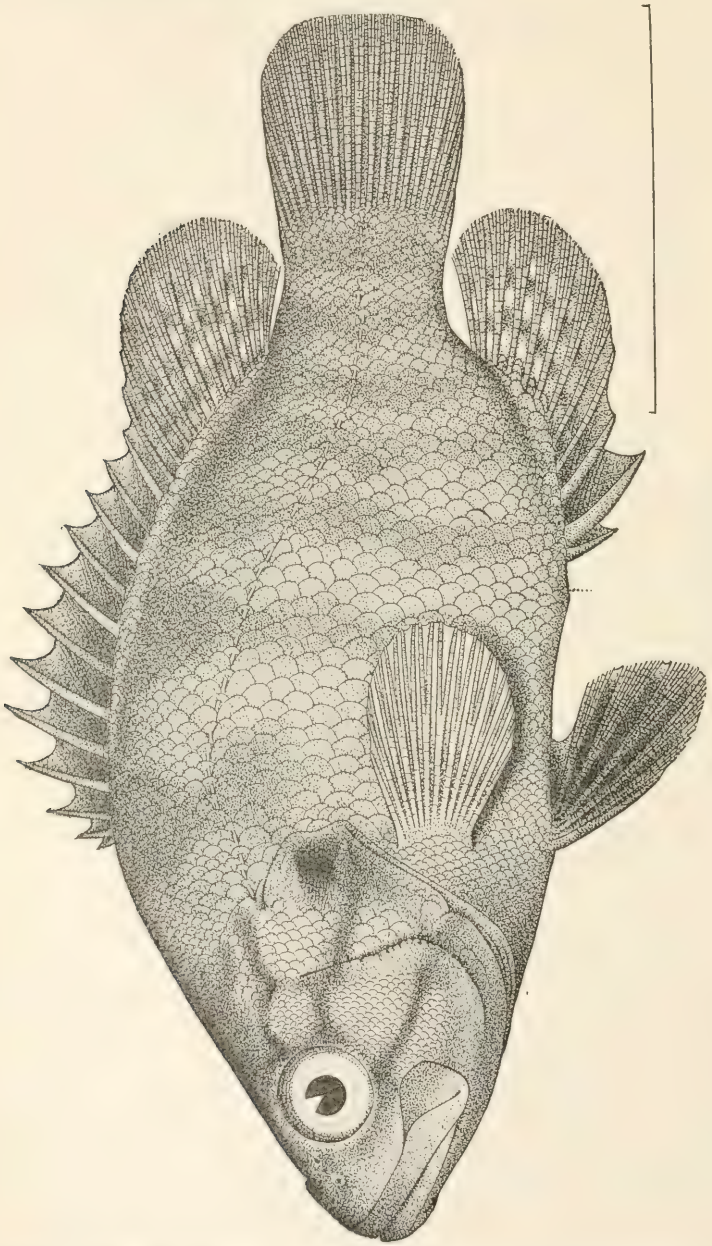

FIG. 3.—BRYTTOSUS KAWAMEBARI.

(*kawa*, river; *mebaru*, pop-eye—a name applied to the green species of *Sebastodes*.)

6. Genus STEREOLEPIS Ayres.

Stereolepis AYRES, Proc. Cal. Acad., vol. 2, 1859, p. 28 (*gigas*).
Megaperca HILGENDORF, Sitzb. Ges. Nat. Freund. Berlin, 1878, p. 155 (*ischinagi*).

Body robust, moderately compressed; mouth rather large, protractile; maxillary with supplemental bone; jaws, vomer, and palatines with bands of villiform teeth; no canines; tongue smooth; preopercle serrated, some antrorse spines on its lower border in young (up to 14 inches; absent in full-grown specimens); opercle with 2 flat spines; gill rakers stoutish, of moderate length; branchiostegals 7; scales small, ctenoid on posterior portion of body; cheeks and opercles scaled; lateral line complete; dorsal fins confluent, with a deep notch between spinous and soft dorsal; anterior dorsal with 11 or 12 spines, its base much longer than that of soft dorsal, which has no spine; anal III, 8; caudal truncate or slightly emarginate; ventrals a little in front of pectorals, close together, with a strong spine; pectorals obtusely pointed.

"Vertebræ 26 (12+14)."

Coasts of California and Japan; two species. Both reach an enormous size, being among the largest of the perch-like fish.

(*στερεός*, thick; *λεπίς*, scale.)

6. STEREOLEPIS ISCHINAGI (Hilgendorf).

ISHINAGI (rock bass); OIWO (huge-fish).

Megaperca ischinagi HILGENDORF, Sitzb. Ges. nat. Freund. Berlin, 1878, p. 156 (Tokyo and Yokohama).—STEINDACHNER and DÖDERLEIN, Denkschr. Akad. Wien, vol. 27, 1883, p. 228, pl. 3, fig. 3 (young) (Tokyo).—JORDAN and SNYDER, Proc. U. S. Nat. Mus., vol. 23, 1901, p. 354 (Tokyo).

Stereolepis gigas (part, not of Ayres) BOULENGER, Cat. Fishes, vol. 1, 1895, p. 153; Proc. Zool. Soc. London, 1897, p. 917, pl. 52, lower figure (from photograph of type of *Megaperca ischinagi*); Ann. and Mag. Nat. Hist., ser. 7, vol. 19, 1907, pp. 489, 491.

Stereolepis ischinagi JORDAN and SNYDER, Proc. U. S. Nat. Mus., vol. 30, 1906, p. 841, fig. 1 (young) (Hakodate; Tokyo; Yokohama; Misaki).

Having had no additional materials, we here reproduce the description of a 14-inch specimen from Hakodate, by Jordan and Snyder:[a]

Head 2.90 in length to base of caudal; depth 2.6; depth of caudal peduncle 8.5; snout 3.4 in head; maxillary 2.25; eye 5; width of interorbital space 4; dorsal XII, 11; anal III, 7; scales 14-87-31. Interorbital space flat; lower jaw projecting; preorbital and suborbital with strong ridges, the suborbital ridges uniting to form a single crest, which extends upward behind the eye; lips thick; maxillary extending to a point below posterior edge of orbit, its upper edge covered anteriorly by the preorbital; supplemental maxillary distinct, its lower edge with a pronounced ridge. Teeth in broad villi-

[a] Proc. U. S. Nat. Mus., vol. 30, 1906, p. 841.

form bands on jaws, vomer, and palatines; tongue smooth; large pseudobranchiæ present; gill-rakers 3+8, large and strong; opercle with 2 spines, the upper short and broad, the lower longer and more pointed; preopercle strongly serrate; subopercle with a few serrations; edge of interopercle rough; throat, snout, and top of head naked; occipital and parietals with a few strong radiating ridges, which show through the naked skin; cheeks and opercles scaly; scales of head and body cycloid, growing slightly ctenoid posteriorly; each scale with a vertical tuberculate ridge, imparting a characteristic roughness to the covering of the body; fins with minute scales; lateral line following the contour of back; first dorsal spine very short, almost entirely concealed; the fifth ray longest, 1.8 in head; membrane of spinous dorsal deeply incised between spines, the attached portion of the membrane extending halfway up anterior edge of spine; longest

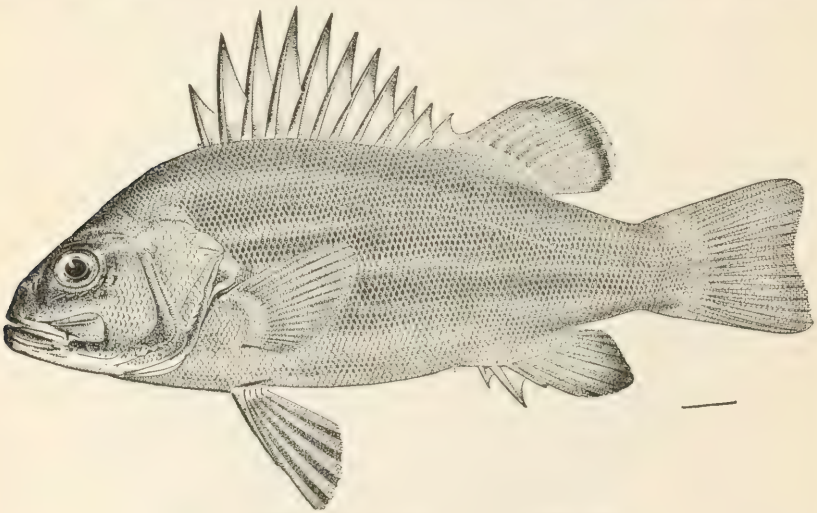

FIG. 4.—STEREOLEPIS ISCHINAGI (YOUNG, FROM MISAKI).

dorsal ray 2.8 in head; edge of fin rounded; origin of anal below base of third dorsal ray; the spines strong and prominent, the second 4.5 in head; margin of fin rather pointed in outline; pectoral unsymmetrical, its upper rays longest, 2.3 in head; ventral 1.6; caudal 6.5, lunate. Body olivaceous, with 6 broad, dusky lateral stripes, the first extending along base of dorsal; the second following lateral line to caudal peduncle, where it joins the third; the fourth passing from base of pectoral to caudal; the fifth and sixth rather indistinct, merging near base of anal; head dusky above; soft dorsal, anal, and pectorals strongly egded with dusky, the soft dorsal narrowly tipped with whitish. Adult nearly plain dark olive.

We have a specimen 14 inches long, and several smaller ones, from Hakodate. Jordan and Snyder saw specimens in 1900 at Hakodate,

Tokyo, Yokohama, and Misaki. Snyder obtained small specimens in 1906 at Otaru in Hokkaido. The species is common about rocks in middle and northern Japan, especially about Hakodate.

Doctor Boulenger is convinced of the identity of this species with the Californian species, *Stereolepis gigas* Ayres. We have not had a large Japanese specimen for comparison with adult specimens from the California coast. Doctor Hilgendorf's type of *Megaperca ischinagi* from Tokyo was over a meter in length, and the drawing from a photograph of it published by Doctor Boulenger [a] shows a fish with larger scales and higher dorsal spines than in *Stereolepis gigas*. We here reproduce a drawing published by Jordan and Snyder of a young specimen 14 inches long of the Japanese fish, *Stereolepis ischinagi*. For comparison with this we present a figure, rather crudely executed but substantially correct, of the American species *Stereolepis gigas*. This is based on a specimen, the only young one ever preserved,

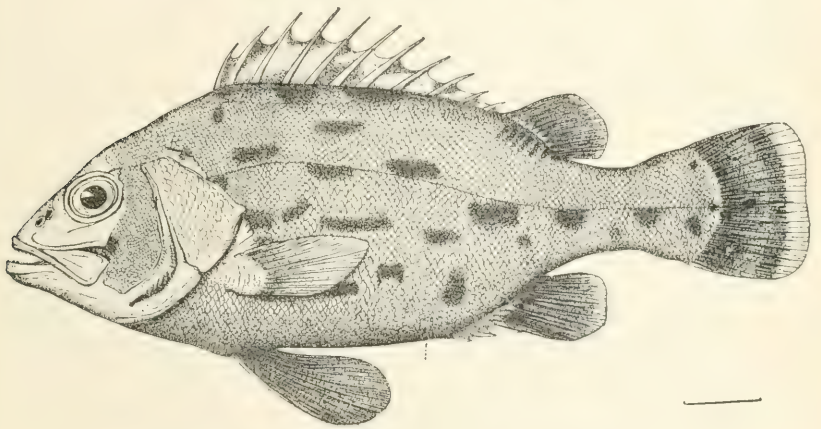

FIG. 5.—STEREOLEPIS GIGAS (YOUNG, FROM SANTA BARBARA).

about 10 inches long, of the American species. The specimen was taken off Santa Barbara in California in 1880, by Jordan and Gilbert. We adhere to the opinion originally expressed by Jordan and Snyder that the two species are distinct although very closely related. The Japanese species is separated by the larger scales, 80 to 90 instead of 100 to 115, and by the form of the dorsal fin, the spines in the first dorsal being much higher in specimens of the same size. In the Japanese species there are 12 dorsal spines, the first being minute. This spine seems to be wanting in *Stereolepis gigas*. The young of *Stereolepis ischinagi* is striped with dark. The young of *Stereolepis gigas* is marked by obscure oblong blotches.

(*ishinagi*, the local name, from *ishi*, rock.)

[a] Proc. Zool. Soc. London, 1897, p. 917, pl. 52, lower figure.

7. Genus AULACOCEPHALUS Temminck and Schlegel.

Aulacocephalus TEMMINCK and SCHLEGEL, Faun. Japon., Pisc., 1842, p. 15.

Body oblong, compressed; mouth large, maxillary with supplemental bone; villiform teeth in jaws and on vomer and palatines; tongue smooth; preopercle serrate; opercle with 3 strong spines; gill-rakers long and slender; branchiostegals 7; scales very small, strongly ciliated, separated by naked skin. Cheeks and opercles scaled; top of head and sides of snout with strong bony rugosities showing through the thin skin; lateral line continuous, the tubes long and straight; dorsal fins confluent, the anterior with 9 spines, its base longer than that of second; anal III, 9; caudal subtruncate; ventrals below pectorals, close together, each with a short, strong spine; pectorals rounded. "Premaxillary processes not extending to frontals; parietals and supraoccipital short, latter with a feeble crest not extending on to cranium; vertebræ 24 (10+14)." (Boulenger.)

Japan to India. One species.

(*αὐλαξ* furrow; *κεφαλή* head.)

7. AULACOCEPHALUS TEMMINCKI Bleeker.

KURIHATA (emerald flag or emerald bass).

Aulacocephalus TEMMINCK and SCHLEGEL, Faun. Japon., Pisc., 1842, p. 15, pl. 5, fig. 2 (Nagasaki).

Aulacocephalus temmincki BLEEKER, Verh. Bat. Gen., vol. 26, 1857, p. 12 (Japan).—BOULENGER, Cat. Fishes, vol. 1, 1895, p. 158 (Siam; Mauritius).

Aulacocephalus schlegeli GÜNTHER, Cat. Fishes, vol. 1, 1859, p. 173 (Isle de France).—STEINDACHNER and DÖDERLEIN, Denkschr. Akad. Wien, vol. 47, 1883, p. 233 (Tokyo).—NAMIYE, Class. Cat., 1881, p. 93 (Tokyo).—ISHIKAWA, Prel. Cat., 1897, p. 56 (Tokyo).

Head 2.6; depth 2.8; depth of caudal peduncle 2.7 in head; eye 5.5; dorsal IX, 12; anal III, 8; scales about 85 in a longitudinal series; pores 70; nose 2.8 in head; maxillary to middle of eye, 2 in head, the width of its extremity eight-tenths diameter of eye; interorbital space very little elevated, flattish, 1.3 in eye. Form oblong, compressed, greatest thickness of body about one-third its depth; back moderately elevated, the profile straight from nape to the rather low, bluntly pointed muzzle; jaws subequal. Jaws, vomer, and palatines with bands of villiform teeth, the outer anterior teeth of upper jaws rather more enlarged than corresponding ones of lower; no canines; tongue smooth; free at end, which is slender and pointed; nostrils small, subequal; preopercular angle obtuse, the margin serrate above and below the angle; opercle with three strong spines, the middle one longest, the others subequal; gill-rakers longer than the filaments, 17 or 18, on lower limb of outer arch. Cheeks and

opercles scaled; rest of head, including jaws and chin, without scales; top of head and suborbital region with strong bony rugosities, showing through the thin skin; lateral line continuous, high, and strongly curved under back of dorsal. Spinous dorsal low, the longest spine (3d or 4th) 2.8 in head; longest soft ray 2.5; caudal subtruncate, slightly rounded; anal spines short, the second and third spines less than half length of first ray; ventrals below pectorals, close together, short of vent, 1.8 to 2 in head; pectorals rounded, 2.2 in head.

Color in spirits purplish brown, somewhat paler below; a yellow mid-dorsal stripe, including lower half of spinous dorsal and base of soft dorsal, extending backward on top of caudal peduncle to its end, and forward, after bifurcating under front of spinous dorsal, on each side of head, through eye, to end of snout; tips of ventral spines and outer half of ventrals blackish; other fins dusky.

Here described from two specimens 6 and 7 inches long, the first from the sea off Okinose (presented by the Imperial University), the second from Misaki, both fishing towns being on Sagami Bay. This handsome fish is rare in Japan, being taken occasionally in the Kuro Shiwo from Tokyo southward.

(Named for C. J. Temminck, of Leyden, the colleague of Professor Schlegel.)

8. Genus PIKEA Steindachner.

Pikea STEINDACHNER, Sitzb. Akad. Wien, vol. 71, 1874, p. 375 (*lunulata*).
Labracopsis DÖDERLEIN, in Steindachner and Döderlein, Denkschr. Akad. Wien, vol. 47, 1883, p. 235 (*japonicus*).

Body elongate, compressed; mouth large, protractile; maxillary with supplemental bone; jaws with broad bands of villiform teeth, some of the inner ones longer and depressible; vomer and palatines with villiform teeth; tongue smooth; preopercle ciliated or denticulated; opercle with three flat points; gill-rakers rather long (*japonica*); branchiostegals 7; scales rather small, ctenoid, striated; head entirely covered with cycloid scales; lateral line complete; dorsal fins confluent, with a broad shallow notch of variable depth; dorsal spines 8; spinous and soft dorsals subequal in length; anal III, 8; caudal emarginate; ventrals a little before base of pectorals, close together, each with a slender spine; pectorals pointed, the upper rays longest; base of dorsal, caudal, and anal scaly.

"Vertebræ 24 (10+14)."

Coasts of Japan, South Seas, and Hawaii; 3 species known. Size small.

The subgenus *Labracopsis* Döderlein (*japonicus*) differs slightly from *Pikea maculata*, *Pikea lunulata* (Mauritius) and *Pikea aurora* Jordan and Evermann (Hawaii) in the finer and more regular dentic-

ulation of the preopercle, and in the lesser depth of the notch between the dorsals. The genus *Liopropoma* Gill (*aberrans*) differs from *Pikea*, according to Poey, in having one more dorsal spine, the preopercular border smooth, and the opercle ending in a single spine.

(Named for Col. Nicholas Pike, United States consul at Mauritius, a naturalist who left many paintings of tropical fishes.)

a^1. PIKEA: Last dorsal spine less than half as long as the longest soft rays; border of preopercle almost entire.....*maculata*, 8.

a^2. LABRACOPSIS: Last dorsal spine at least half as long as the longest soft rays; border of preopercle finely toothed.....*japonica*, 9.

8. PIKEA MACULATA Steindachner and Döderlein.

Pikea maculata STEINDACHNER and DÖDERLEIN, Denkschr. Akad. Wien, vol. 47, 1883, p. 234, pl. 6, fig. 1 (Tokyo).

Liopropoma maculatum BOULENGER, Cat. Fishes, vol. 1, 1895, p. 156.

Head 3 in length; depth 4.25; eye 5 in head; dorsal VIII, 12; anal III, 8; scales 6–70–30; nose longer than eye; maxillary reaching beyond center of eye; interorbital space flattish. Body elongate, back little elevated, profile nearly straight, from front of dorsal; muzzle moderately sharp; cleft of mouth high; top of head flattish; lower jaw projecting; villiform teeth in bands, on jaws, and on vomer and palatines; tongue toothless; border of preopercle rounded;[a] opercle with 3 flat points; gill-rakers not described; head entirely scaled, the scales largely cycloid; lateral line complete. Origin of dorsal slightly behind base of pectoral; longest dorsal spine (third) about 3 in head; longest soft ray 2; caudal weakly emarginate, the lobes rounded; pectoral 1.33 in head; ventrals shorter than pectorals. Color reddish yellow, with roundish brown spots along back and upper part of sides and on basal portion of spinous and soft dorsals and caudal. (Steindachner and Döderlein.)

We have seen no specimens of this species. The type, 25 cm. in length, was obtained by Doctor Döderlein from Tokyo, doubtless from Sagami Bay.

(*maculatus*, spotted.)

[a] In the original description of this species Doctor Döderlein states that the border of the preopercle is "nur mit zarten Cilien besetzt," and in the description of *Pikea* (*Labracopsis*) *japonicus* it is said that the bone is "dicht und zart gesähnt." These statements are used by Boulenger (Cat. Fishes, vol. 1) in the key and descriptions of these species. The original figure of *Pikea maculata* shows a smooth preopercle, that of *Pikea lunulata* shows one rather coarsely denticulated. The original figure of *Labracopsis japonicus* shows what might well be called a very finely and regularly denticulated, or even "ciliated" preopercle. Our specimen from Tokyo agrees well with the figure; and as further evidence that there has been confusion in the description of this character of the two species, we have the statement (in the definition of the new subgenus *Labracopsis*) that *Labracopsis* (*japonicus*) differs from *Pikea* (*maculata* and *lunulata*) "nur durch das Vorkommen zahlreicher, spitzer Zähnchen am Vordeckel." In *Pikea aurora*, the preopercle is very finely denticulate.

9. PIKEA JAPONICA Döderlein.

Pikea (*Labracopsis*) *japonica* DÖDERLEIN, in Steindachner and Döderlein, Denkschr. Akad. Wien, vol. 47, 1883, p. 235, pl. 6, fig. 3 (Tokyo).

Liopropoma japonicum BOULENGER, Cat. Fishes, vol. 1, 1895, p. 156.

Labracopsis japonicus JORDAN and SNYDER, Proc. U. S. Nat. Mus., vol. 23, 1901, p. 354 (Tokyo); p. 751 (Yokohama).

Head, 2.9 in length; depth, 3.4; depth caudal peduncle, 2.4; eye, 4.7 in head; dorsal VIII, 14; anal III, 10; scales, 4–57–23; nose, 3.6 in head; maxillary, 2.1; interorbital space, 1.2 in eye, slightly convex. Form elongate, back little elevated; profile slightly convex behind occiput, thence nearly straight to muzzle; mouth large, maxillary extending nearly to back of orbit; lower jaw slightly projecting; jaws with bands of fine villiform teeth; vomer and palatines toothed; tongue smooth; nostrils subequal; preopercle rounded, without prominent angle, its posterior border finely ciliated; opercle with 3 flat points; gill-rakers 8, with 1 or 2 rudiments, the longest longer than the corresponding filaments. Scales feebly ctenoid, becoming more or less cycloid anteriorly; head entirely covered with cycloid scales; lateral line complete. Longest dorsal spine (third), 3.25 in head; longest soft ray, 2; caudal very feebly emarginate; pectoral, 1.4; ventral, 1.8, short of vent.

Color in spirits uniform straw, tinged with olive; borders of soft dorsal, caudal, and anal whitish. Doctor Steindachner states that the fish is reddish golden, with a dark lateral stripe from the eye to the base of the caudal. In our specimen there are faint traces of this dark stripe on opercle and anterior part of side.

Here described from a specimen 8½ inches long, taken in the Tokyo market by Prof. Keinosuke Otaki. It is doubtless from Sagami Bay. The species must be rare in Japan.

9. Genus PLECTROPOMUS (Cuvier) Oken.

Plectropomus CUVIER, Règne Anim., vol. 2, 1817, p. 277 (*calcarifer; maculatus; cyclostome*).

Plectropomus OKEN, Isis, 1817, p. 1782, misprint for p. 1182 (after Cuvier).

Plectropoma CUVIER and VALENCIENNES, Hist. Nat. Poiss., vol. 2, 1828, p. 387 (*melanoleucus=cyclostomus; maculatus;* restricted to *maculatus*).

Plectropoma GILL, Proc. Acad. Sci. Phila., 1862, p. 236 (name only).

Paracanthistius BLEEKER, Verh. Akad. Amst., vol. 14, 1873, no. 2, p. 13 (*maculatus; Lates calcarifer*, the first species named by Cuvier under "*Plectropomes*," being taken as type of *Plectropoma*).

Body elongate, compressed; scales very small, roughish. Lateral line feebly marked, the tubes very short and straight, the scales ciliated. Mouth large, protractile; maxillary exposed, with supplemental bone; teeth in jaws in several series, the inner movable, depressible, hinged at the base; very strong canine teeth in front of both jaws and on the side of the mandible; teeth on vomer and

palatines; tongue smooth. Head partly scaled, snout naked; preopercle entire or finely serrate behind, with antrorse spines on the lower border; opercle with three spines. Gill membranes separate; pseudobranchiæ present; gill-rakers moderate. Dorsal fin single, with VI or VIII, 11–12 rays, the spinous portion nearly as long as the soft. Anal short, with III, 8 rays, the spines very feeble, flexible. Caudal truncate or emarginate. Pectorals symmetrical, rounded, with 16 to 18 rays. Ventrals below the pectorals, close together, with a feeble, flexible spine. Posterior processes of premaxillaries extending nearly to between the frontals; parietal and supraoccipital bones extending to between postfrontal processes, with short, feeble crests. Vertebræ 24 (10+14).

This genus is abundant in the South Seas and tropical Pacific. It is close to *Epinephelus*, from which it differs in the presence of but 6 to 8 dorsal spines and in the recurved hooks on the lower part of the preorbital. This character appears in several other genera, some of them not closely related to *Plectropomus*.

The genus as originally formed included two species, the one the type of *Lates*, the other chosen by subsequent writers as type of *Plectropoma*. As *calcarifer* is the species first mentioned by Cuvier, Bleeker has chosen it as type, framing the new name *Paracanthistius* for the present group. Earlier usage has, however, chosen *maculatus* as the type of the group. The earliest spelling in Latin form is *Plectropomus*, not *Plectropoma*.

(*πλῆκτρον*, spur; *πῶμα*, opercle).

10. PLECTROPOMUS MACULATUS (Bloch).

Bodianus maculatus Bloch, Ichthy., vol. 4, 1790, p. 48, pl. 228 ("Japan," probably Isle de France).

Plectropoma maculatum Cuvier and Valenciennes, Hist. Nat. Poiss., vol. 2, 1828, p. 393 (Isle de France, based on the *Bodianus maculatus* of Bloch).—Günther, Cat., vol. 1, 1859, p. 156 (Red Sea).—Boulenger, Cat. Fishes, vol. 1, 1895, p. 160 (Indian and Western Pacific oceans to Cape York and Mauritius).

Paracanthistius maculatus Jordan and Seale, Fishes Samoa, 1906, p. 256 (Samoa, Faté).

Holocentrus leopardus Lacépède, Poiss., vol. 4, 1802, pp. 332, 367 (Indian Ocean).

Plectropoma leopardinum Cuvier and Valenciennes, Hist. Nat. Poiss., vol. 2, 1828, p. 392, pl. 36 (Indian Ocean, based on the *Holocentrus leopardus* of Lacépède).—Temminck and Schlegel, Faun. Japon., Pisc., 1842, p. 12 (Nagasaki).—and of authors.

Labrus lævis Lacépède, *Bodianus cyclostomus* and *melanoleucus* Lacépède, *Plectropoma punctatum* Quoy and Gainard, *melanoleucum* Cuvier and Valenciennes, *areolatum* Rüppell, *cyanostigma* Bleeker, *P. leopardus* Richardson, *Paracanthistius leopardinus* Bleeker, *Paracanthistius maculatus* Bleeker, etc.

D. VII or VIII, 11–12. A. III, 8. Scales 16 to 20–120 to 145–60 to 80; scales in lateral line 80 to 106. Depth of body equal to or

a little less than length of head, 3¼ to 4 times in total length to base of caudal. Snout 1½ (young) to 3 times (adult) diameter of eye, which is 5 to 7½ times in length of head; interorbital width 4½ to 6½ times in length of head; lower jaw projecting; maxillary extending to below center or posterior border of eye, the width of its distal extremity at least two-thirds diameter of eye; preopercle rounded, with 3 or 4 strong antrorse spines on its lower border (less distinct in old specimens); opercle with 3 spines, median nearer lower than upper; cheeks and opercles covered with small scales. Gill-rakers moderately long, 9 or 10 (and some rudiments) on lower part of anterior arch. Dorsal spines rather slender, increasing in length to the third or fourth, which is nearly one-third length of head and shorter than longest (anterior) soft rays. Pectoral one-half to three-fifths length of head, as long as or slightly longer than ventrals. First anal spine rudimentary, often indistinct, third longest, bound to first soft ray. Caudal truncate or feebly emarginate, sometimes slightly produced at the angles. Coloration very variable; several varieties are distinguished, which, however, completely pass into one another.

This species is abundant in the tropical Pacific. Our description is taken from Boulenger, as there is one record from Japan, that from Nagasaki of Temminck and Schlegel, but no specimens have been taken there since. This specimen is said to have been brown with numerous small blue spots. It corresponds to variety B of Boulenger = *Holocentrus leopardus* Lacépède = *Plectropoma leopardinum* Cuvier and Valenciennes. We have the same form from Samoa. It is apparently only a variant with smaller spots.

(*maculatus*, spotted.)

10. Genus EPINEPHELUS Bloch.

Epinephelus Bloch, Ichthyologia, vol. 7, 1793, p. 14 (*marginalis*).
Cynichthys Swainson, Nat. Hist. Classn. Fishes, vol. 2, 1839, p. 201 (*flavopurpuratus*).
Cerna Bonaparte, Icon. Fauna Italica, vol. 3., 1841 (*gigas-guaza*).
Hyporthodus Gill, Proc. Acad. Nat. Sci. Phila., 1861, p. 98 (*flavicauda-niveatus*).
Schistorus Gill, Proc. Acad. Nat. Sci. Phila., 1862, p. 237 (*mystacinus*).
Labroperca Gill, Proc. Acad Nat. Sci. Phila., 1863, p. 80 (*labriformis*).
Merus Poey, Ann. Lyc. Nat. Hist. N. Y.,. vol. 10, 1871, p. 39 (*gigas*).
Priacanthichthys Day, Proc. Zool. Soc. London, 1868, p. 193 (*madcraspatensis*).
Cerna Doderlein, Revista delle Specia del genere Epiniphelus o Cerna, 1873 (*gigas*).
Homalogrystes Alleyne and Macleay, Proc. Linn. Soc. New South Wales, vol. 1, 1876, p. 268, pl. 6, fig. 3 (*güntheri*).
Hyposerranus Klunziger, Fische des Rothen Meeres, 1884, p. 3 (*morrhua*).

Body stout, compressed, covered with small, ctenoid scales, which are often somewhat embedded in the skin; scales of the lateral line triangular, cycloid; soft parts of the vertical fins generally more or

less scaly. Cranium narrow above. Parietal crests not produced on frontals, which are without transverse ridge posteriorly; frontals with a process or knob on each side behind interorbital area; premaxillary processes fitting into a notch or cavity on the anterior end of the frontals. Preopercle moderately serrate behind, its lower limb entire, without distinct antrorse spine; opercle with 2 strong spines. Nostrils well separated. Mouth large; maxillary large, with a well-developed supplemental bone, its surface usually with small scales. Canine teeth few, large in the front of the jaws; enlarged teeth of the inner series of each jaw depressable. Gill rakers short and rather few. Dorsal spines usually 11, rarely 10, not filamentous, the last ones somewhat shorter than the middle ones. Anal spines 3, the second usually the larger; the number of soft rays 7 to 9. Caudal fin rounded or lunate. Pyloric cœca few (usually 10–20). Pectorals rounded, shortish, nearly symmetrical, of 15 to 20 rays. Ventrals moderate, inserted below pectorals, close together, each with a strong spine. Species very numerous, most of them of large size, abounding in all the tropical seas, where they are valuable food fishes. This is the largest and most important genus of the Serranidæ, and its species are most widely distributed. Although numerous species are found in Japan, they are relatively few in individuals and form an insignificant part of the food supply.

(ἐπινέφελος, clouded over, in allusion to the membrane supposed to cover the eye in the typical species.)

ANALYTICAL KEY OF JAPANESE SPECIES OF EPINEPHELUS.

a^1. Dorsal fin with 11 spines and 14 to 18 soft rays; anal with 8 or 9 soft rays.
  b^1. Teeth in sides of mandibles in 2 rows.
    c^1. Caudal fin subtruncate or slightly emarginate.
      d^1. Caudal fin subtruncate, slightly concave when stretched, or very broadly rounded with squarish corners; dorsal XI, 17 or 18; scales 14–110–40; body and fins covered everywhere with very numerous roundish or hexagonal brownish spots, less than size of pupil in adults, separated by very narrow line-like intervals of the paler ground color.....*chlorostigma*, 11.
      d^2. Caudal distinctly though not strongly emarginate; dorsal XI, 16 or 17; scales 15–114–44; color in spirits brown; head, body, and fins alike marked with roundish or hexagonal darker areas not much smaller than eye and separated by narrow paler interspaces; caudal with a conspicuous white edge.....*craspedurus*, 12.
    c^2. Tail rounded.
      e^1. Nostrils subequal.
        f^1. Pectorals noticeably longer than head behind eye; dorsal XI, 16 or 17; scales 13–98–42; eye unusually large, 2 in maxillary; nose short, 4.5 in head; body with large unequal polygonal brown spots, about 10 or 12 in a row from gill-opening to base of caudal; pectorals, ventrals, and anal dark toward ends; other fins marked as body.....*megachir*, 13.
        f^2. Pectorals noticeably shorter than head behind eye.
          g^1. Body without stripes or crossbars.

h^1. Body and vertical fins brown, with round bright red spots (pale in spirits); a single large blackish blotch under last dorsal spines; dorsal XI, 15 or 16; scales 16–103–40.....*akaara*, 14.

h^2. Body and vertical fins brown, with round dark spots; a large blackish blotch at base of last dorsal spines, one or two along base of soft dorsal, and one on top of caudal peduncle; dorsal XI, 16 or 17; scales 13–98–40.....*fario*, 15.

g^2. Body with stripes, rows of spots, or crossbars.

i^1. Sides with oblique longitudinal stripes or rows of spots.

j^1. Rays of soft dorsal 12 or 13; color brown, on each side three narrow black longitudinal stripes (rows of spots in young), originating behind eye; upper stripe ending under back of spinous dorsal, middle one under middle of soft dorsal, lower stripe ending on base of caudal peduncle, slightly above its middle; soft dorsal and caudal spotted with black; scales 10 to 12–100 to 115–35 to 42 (after Boulenger).*latifasciatus*, 16.

j^2. Rays of soft dorsal 14 or 15.

k^1. Brown, each side with three rows of round black spots, beginning behind eye, first row ending under middle of dorsal; median row (of larger spots) ending on base of caudal, lower row coursing lower portion of side toward caudal peduncle to a point over middle of back of anal; a row of about 10 small round black spots on back along base of dorsal; membranes of soft dorsal, caudal, and anal with many small round black spots; dorsal XI, 14 or 15; scales 13–108 to 119–44.....*epistictus*, 17.

k^2. Body with a large dark blotch on occiput, and with several obliquish bands downward and forward from mid-dorsal line to opercle; sides of head with 3 or 4 dark streaks; fins unspotted; dorsal, XI, 14; scales 17–108–48..*morrhua*, 18.

i^2. Sides with transverse or obliquish crossbars (may be broken up more or less in *E. moara*).

l^1. Body reddish brown, crossed by 6 broad obliquish bars of darker, the bars usually broken up more or less, so as to produce the effect of a marbled pattern; dorsal XI, 14 or 15; scales 12–105–40.....*moara*, 19.

l^2. Body gray with yellow spots on head and body, and with fins broadly edged with yellow; preserved specimens showing on each side 5 obliquely transverse bars of dark color; dorsal XI, 15 or 16; scales 18–94–38; point of opercular flap nearer lateral line than base of pectoral. *awoara*, 20.

e^2. Posterior nostrils conspicuously larger than anterior; inferior margin of preopercle with one or two downwardly directed points, set at some distance from the teeth of the angle; interorbital bridge more elevated than in other Japanese species of *Epinephelus*, sides with 7 or 8 vertical cross bands, the last one (on caudal peduncle) very dark above; a dark mustache-like streak under back of maxillary; dorsal XI, 14 or 15; scales 18–110–44. Pyloric cæca in increased number (*Schistorus* Gill). *septemfasciatus*, 21.

b^2. Teeth in sides of mandibles in 3 rows; color red (straw in spirits), each side with 4 or 5 indistinct dark red vertical bands, and with 2 longitudinal rows of elongate whitish or silvery blotches (each blotch within the corresponding transverse band); each of the membranes of spinous dorsal tipped with a conspicuous triangular patch of black; dorsal XI, 15 or 16; scales 14–108–38.*tsirimenara*, 22.

11. EPINEPHELUS CHLOROSTIGMA (Cuvier and Valenciennes).

Serranus chlorostigma CUVIER and VALENCIENNES, Hist. Nat. Poiss., vol. 2, 1828, p. 352 (Seychelles).—GÜNTHER, Cat. Fishes, vol. 1, 1859, p. 151 (after Cuvier and Valenciennes).

Epinephelus chlorostigma BOULENGER, Cat. Fishes, vol. 1, 1895, p. 203 (Red Sea, Indian Ocean, China Sea).—SAUVAGE, Poiss. Madagascar, 1891, p. 73 (Madagascar).

Serranus waandersii BLEEKER, Nat. Tijd. Ned. Ind., vol. 17, 1858, p. 152 (Bali); Atl. Ichth., vol. 7, 1876, p. 47, pl. 281, fig. 1.

Serranus areolatus KLUNZINGER, Synop. Fisch. Roth. Meer., 1870, p. 675 (Red Sea) (not *S. areolatus* Klunzinger, 1884).

Serranus geoffroyi KLUNZINGER, Fisch. Roth. Meer., 1884, p. 3 (Red Sea).

Serranus celebicus var. *multipunctatus* KOSSMANN and RAUBER, Fisch. Roth. Meer., p. 6 (Red Sea).

Epinephelus chlorostigma JORDAN and RICHARDSON Mem. Carnegie Museum, vol. 4, 1909, p. 183 (Takao, Keerun, Formosa).

(East Indian fauna; north to southern Japan.)

Head 2.5; depth 3.25; eye 7.3 in head, 3.25 in maxillary; dorsal XI, 17 or 18; anal III, 8; scales 14–110–40; nose 4.2 in head; maxil-

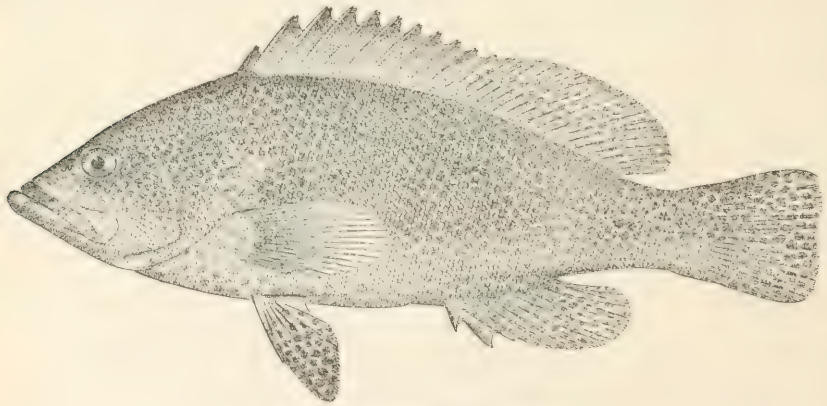

FIG. 6.—EPINEPHELUS CHLOROSTIGMA.

lary a little short of back of eye, 2.3 in head, 1.16 in pectoral; interorbital space strongly convex, about 1.3 times diameter of eye in specimen 15 inches long; 1.2 in eye in one 5 inches. Back moderately elevated, the dorsal and ventral outlines not greatly dissimilar; profile straight, muzzle sharp, lower jaw projecting. Teeth in sides of lower jaw in 2 rows; canines moderate; nostrils unequal; preopercle with a salient angle, with 6 to 8 enlarged points; margin of lower preopercular limb without serratures; free edge of upper portion of posterior limb finely serrated; opercular spines about equidistant; opercular flap pointed, the point directed straight backward; gill-rakers 13+4 or 5 rudiments. Cheeks and opercles covered with small scales; occiput with fine imbedded scales; maxillary and lower jaw with numerous extremely fine scales, those on the maxillary more

or less confined to a patch about its middle; scales on body rather weakly ctenoid. Spinous dorsal beginning over insertion of pectoral; longest dorsal spine 2.5 in head; longest ray of soft dorsal 1.8 in base of the fin; caudal subtruncate; pectoral 1.8 in head; ventral 2.

Color in spirits reddish brown, head, body and fins, except pectorals, everywhere covered with small roundish or irregularly polygonal dark spots, separated by narrow line-like paler areas, giving the effect of a reticulated pattern; pectorals more faintly marked, but in same way; in a specimen 15 inches long the dark areas are about one-half diameter of the pupil; in a young specimen 5.5 inches, the largest spots exceed the diameter of the pupil.

Of this species we have three specimens: one 15.5 inches long, from Misaki; one 14 inches, from Nagasaki; one 5.5 inches, from Wakanoura. There is no other record from Japan, but it is relatively common in the East Indies.

(*χλορός*, green; *στίγμα*, spot.)

12. **EPINEPHELUS CRASPEDURUS** Jordan and Richardson, new species.

Serranus angularis STEINDACHNER and DÖDERLEIN, Denkschr. Akad. Wien., vol. 47, 1883, p. 232 (Oshima and Kagoshima, Japan). (Not of Cuvier and Valenciennes or of Bleeker, =*S. celebicus* Bleeker.)

Epinephelus areolatus SMITH and POPE, Proc. U. S. Nat. Mus., vol. 31, 1906, p.468 (Susaki and Yamagawa, Japan). (Not *Perca areolata* of Forskål.)

(Coasts of southern Japan; not common.)

Head 2.85; depth 3.25; eye in head 4.8, in maxillary 2.50; dorsal XI, 16 or 17; anal III, 8; scales 15–114–44. Nose 3.40; maxillary slightly short of back of orbit, 2 in head, 1.3 in pectoral; interorbital space 1.2 in eye, moderately convex. Back moderately elevated; profile gently arched, no angle at nape; muzzle moderately sharp; lower jaw projecting less than width of lip. Teeth in sides of lower jaw in 2 rows; canines moderate; nostrils subequal; angle of preopercle moderately salient, with 3 or 4 stronger points; opercular spines equidistant; point of opercular flap directed backward, midway between lateral line and base of pectoral; gill-rakers 12+2. Top of head, cheeks and opercles with small scales; chin and lower jaws smooth or nearly so. Dorsal fin beginning slightly in front of pectorals; longest dorsal spine (4th) 2.4 in head; longest soft ray 1.4 in base of fin; caudal evidently emarginate when closed, nearly square when stretched; pectoral 1.5 in head; ventral 1.6.

Color in spirits palish brown, the darker color on body, head and fins in the form of irregular shaped roundish or hexagonal spots, in size somewhat smaller or nearly as large as eye, and separated from each other by narrow, line-like pale interspaces, whose width is about one-fifth to one-fourth the diameter of the dark areas; caudal with a conspicuous white edge, as wide as one-half pupil on middle of mar-

gin; soft dorsal with a very narrow edging of white; pectoral spots and interspaces paler than those of other fins.

Of this species we have six specimens, 6 to 7 inches long, from Kagoshima, collected by Prof. John O. Snyder. The type is No. 64154 U.S.N.M. A co-type is No. 21180 Stanford University. This species is distinguished from specimens of *Epinephelus angularis* (Bleeker) from Sumatra by having the dark areas on body and fins separated by much narrower "linear" intervals; and by having the fins, including soft dorsal, marked as body, the soft dorsal of the specimen from Sumatra having a black longitudinal bar on outer fourth of soft dorsal. A specimen from Keerun, Formosa (*Epinephelus areolatus*?) differs from both Japanese and Sumatran specimens in having its caudal slightly *rounded* (stretched or closed) and in lacking the white border on caudal, while it has all fins spotted like body, as in the

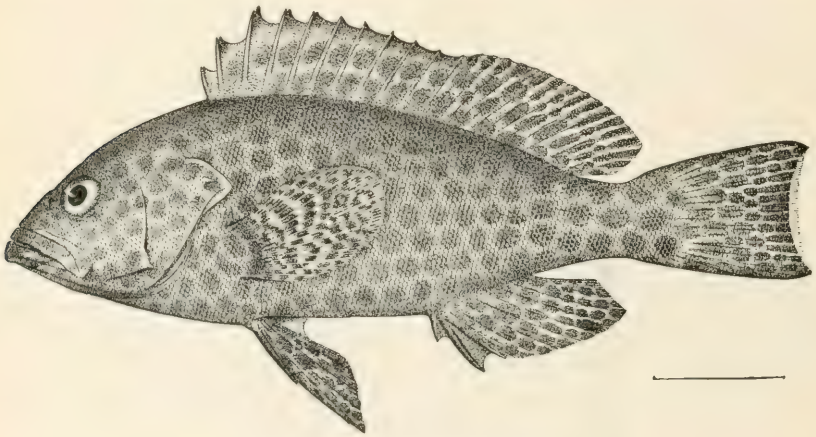

FIG. 7.—EPINEPHELUS CRASPEDURUS.

Japanese species, and has the dark areas separated by wide pale intervals as in *Epinephelus angularis* from Sumatra. The *Perca areolata* of Forskål, of which *S. angularis* Cuvier and Valenciennes and *E. celebicus* Bleeker are made synonyms by Doctor Boulenger is apparently best regarded as a distinct species (=*S. areolatus* of Cuvier and Valenciennes, Günther and Day=*E. areolatus* Sauvage=*S. areolatus* Klunzinger 1884 (not 1870)=*S. celebicus* Klunzinger 1870). This species (*Epinephelus areolatus*) has not been found in Japan.

(*κράσπεδων*, border; *οὐρά*, tail.)

13. EPINEPHELUS MEGACHIR (Richardson).

Serranus areolatus japonicus TEMMINCK and SCHLEGEL, Faun. Japan., Pisc., 1842, p. 8 (Japan). (Not *Epinephelus japonicus* Krusenstern.)

Serranus megachir RICHARDSON, Ichth. China, 1846, p. 230 (Canton, China).

Serranus merra (not Bloch) DAY, Fish. India, 1875, p. 13, pl. 2, fig. 2 (Andamans). (Though so stated by Day, this is certainly not the *Epinephelus*

merra of Bloch, which has dorsal XI, 15, and pectorals shorter than head and spotted like caudal.)

Serranus hexagonatus STEINDACHNER and DÖDERLEIN, Beitr. Japan, vol. 1, 1883, p. 232 (Tokyo Bay). (Not *Perca hexagonata* of Forster, which is *Serranus stellans* of Richardson.)

(Coasts of China and southern Japan.)

Head 2.60; depth 3; eye noticeably large, in head 4.40, in maxillary 2; dorsal XI, 17; anal III, 8; scales 13–98–42. Nose very short, 4.52 in head; maxillary to back of orbit, 2.1 in head, 1.65 in pectoral. Interorbital space slightly convex, 1.8 in eye. Back low; profile nearly straight to occiput, thence slightly steeper to muzzle; muzzle short and blunt; lower jaw scarcely projecting. Teeth in sides of lower jaws in 2 rows; canines moderate; posterior nostril slightly the larger; preopercular angle scarcely produced, armed with 3 or 4 moderately strong serratures; opercular spines

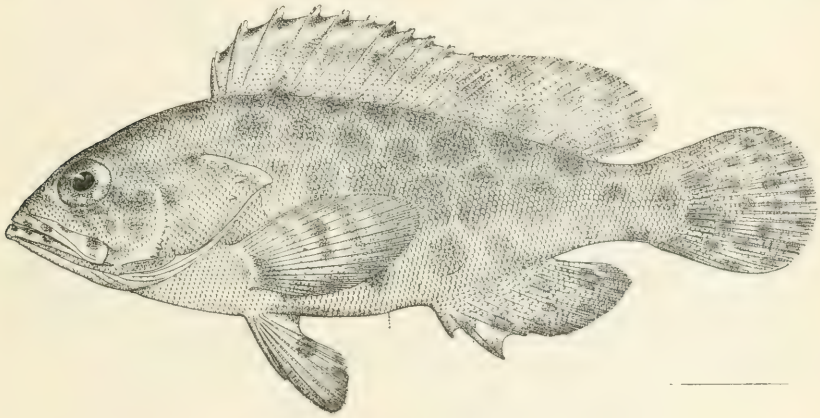

FIG. 8.—EPINEPHELUS MEGACHIR.

equidistant; point of flap directed a little upward, nearer lateral line than pectoral; gill-rakers 10+4 or 5 rudiments. Top of head, cheeks, opercles, and chin covered with small scales; maxillary smooth. Dorsal origin slightly behind pectorals; longest dorsal spine (3d) 2.45 in head; longest soft ray 1.5 in base of fin; caudal rounded; pectoral unusually large and long, 1.2 in head, much exceeding length of portion of head behind eye; ventral 1.75.

Color in spirits brown, with large darker hexagonal or roundish spots, or unequal size, separated by narrow, almost linear, paler intervals; largest of the dark spots nearly as large as eye, the number in a row between gill opening and base of caudal 11 or 12; dorsal, anal, and caudal fins marked as body; pectorals dusky, darkest behind, the upper-anterior two-thirds with scattering small pale spots; chin and lower jaw with 4 or 5 narrow dusky cross-bars; breast with 3 somewhat wider bars.

This species is here described from a specimen 6 inches long from Keerun, Formosa. We have no specimens from Japan, where the species is apparently rare. It may be known from other spotted species by the long pectorals. It is widely diffused in the South Seas and East Indies.

(*μέγας*, large, *χείρ*, hand.)

14. EPINEPHELUS AKAARA (Temminck and Schlegel).

AKAARA (red bass); ADSUKIHATA (red-pea-bass).[a]

Serranus akaara Temminck and Schlegel, Faun. Japon., Pisc., 1842, p. 9, pl. 3, fig. 1 (Nagasaki).—Richardson, Ichth. China, 1846, p. 231.—Günther, Cat. Fishes, vol. 1, 1859, p. 140 (Japan, India[b]).—Namiye, Class. Cat., 1881, p. 93 (Tokyo).—Ishikawa, Prel. Cat., 1897, p. 56 (Tokyo).

Epinephelus akaara Jordan and Snyder, Proc. U. S. Nat. Mus., vol. 23, 1901, p. 354 (Tokyo).—Boulenger, Cat. Fishes, vol. 1, 1895, p. 216 (Japan, China,? India).

Serranus shihpan Richardson, Ichth. China, 1846, p. 231 (Hongkong).

Serranus variegatus Richardson, Ichth. China, 1846, p. 231 (Hongkong).

Serranus awoara Steindachner and Döderlein, Beitr. Japan, vol. 1, 1883, p. 23 (Tokyo; China Sea). (Not *Serranus awoara* Temminck and Schlegel.)

(Coasts of China and Japan, common north to Tokyo.)

Head 2.6; depth 3 to 3.15; eye 5.2 in head, 2.5 in maxillary; dorsal XI, 15 or 16; anal III, 8; scales 16-103-40; nose 3.7; maxillary extending fully to back of orbit or a little beyond, 2.1 in head, 1.3 in pectoral; interorbital space slightly convex, 1.3 in eye. Dorsal outline more arched than ventral, the highest point under the second or third dorsal spine; profile even, slightly convex, tapering gradually to a sharp muzzle; lower jaw projecting less than width of lip. Teeth in sides of lower jaw in 2 rows; canines moderate; posterior nostril slightly the larger; preopercular angle very little salient, the angle with conspicuously enlarged points; opercular spines nearly equidistant, the lower spine slightly nearer middle than the upper; flap bluntly pointed; gill-rakers 12 or 13+4 or 5 rudiments. Top of head, cheeks, opercles, and suborbitals covered with small scales; maxillary and premaxillary smooth; lower jaw with fine embedded scales. Dorsal beginning over origin of pectoral; longest dorsal spine 2.75 in head; height of longest soft ray 1.5 in length of fin's base; caudal rounded, with slightly squarish corners in a few specimens; pectoral 1.5 in head; ventral 2.

Color in spirits light brownish, both head and body of typical specimens covered thickly with roundish pale spots (bright scarlet in life) a little larger than the pupil; these spots as a rule extend on dorsal and anal; caudal and pectoral more faintly spotted; a large dark blotch, larger than eye, on the back, under last rays of

[a] *Adsuki*, a small red pea, from the scarlet spots. *Hata* and *ara* are general names for fishes of this group.

[b] Locality questioned by Boulenger.

spinous dorsal, and extending on its membranes. Specimens from Kobe, Onomichi, and one from Nagasaki have the light spots faint or absent and have the ventrals and anal dusky to blackish.

Of this species we have fifteen specimens, two 9.5 inches long from Nagasaki; nine 5 to 9 inches, from Onomichi; one 8.5 inches, from Kobe; two 7 to 8 inches, from Wakanoura; two 6 inches, from Hiroshima; one 7.5 inches, from Shimonoseki. It was recorded also from Tsuruga and Hakata.

It is the most abundant Japanese species of *Epinephelus*, being found almost every day in the markets from Tokyo southward.

(*aka*, red; *ara*, bass.)

15. EPINEPHELUS FARIO (Thunberg).

Perca fario THUNBERG, Nya Handl., vol. 14, 1792, p. 296, pl. 9 (Nagasaki).—BLOCH and SCHNEIDER, Syst. Ichth., 1801, p. 323.

Epinephelus japonicus ("Epinephelus du Japon") KRUSENSTERN, Reise, 1810, pl. 64, fig. 2 (Japan).

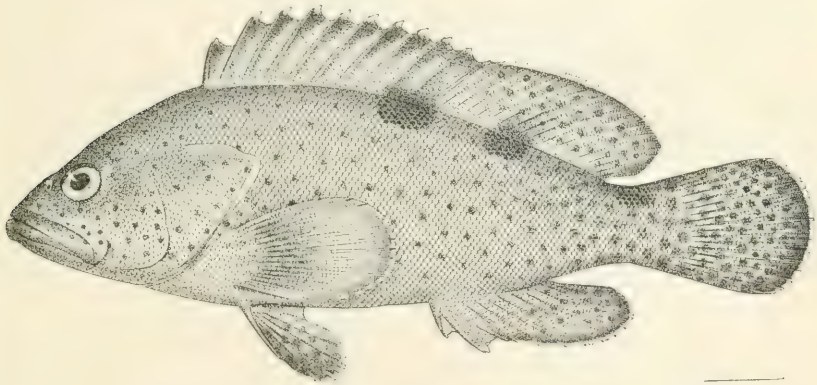

FIG. 9.—EPINEPHELUS FARIO.

Serranus trimaculatus CUVIER and VALENCIENNES, Hist. Nat. Poiss., vol. 2, 1828, p. 331 (after Krusenstern).—TEMMINCK and SCHLEGEL, Faun. Japon., Pisc., 1842, p. 8 (Japan).—RICHARDSON, Ichth. China, 1846, p. 232 (Japan, from Bürger).—PETERS, Monatsber. Akad. Berlin, 1865, p. 110 (synonymical note based on examination of type-specimen).—KNER, Novara, Fische, vol. 1, 1865, p. 18 (Hongkong and Java).—BLEEKER, Bijdr, Japan, vol. 4, p. 8.—GÜNTHER, Cat. Fishes, vol. 1, 1859, p. 109 (part) (China and Japan).

Epinephelus trimaculatus BOULENGER, Cat. Fishes, vol. 1, 1895, p. 221 (China).—JORDAN and SNYDER, Proc. U. S. Nat. Mus., vol. 23, 1901, p. 354 (Tokyo).

Serranus fasciatomaculosus PETERS, Monatsber. Akad. Berlin, 1865, p. 111 (Japan, based on Bleeker's *S. trimaculatus*, Bijdr, Japan, vol. 4, p. 8).

Serranus ura CUVIER and VALENCIENNES, Hist. Nat. Poiss., vol. 2, 1828, p. 332 (Nagasaki). (*ura*, misspelling of *ara*, according to Peters, 1865.)

Serranus ara TEMMINCK and SCHLEGEL, Faun. Japon., Pisc., 1842, p. 8 (Nagasaki).

(Coasts of China and southern Japan.)

Head 2.6; depth 2.8; eye 5.8 in head, 1.37 in pectoral; dorsal XI, 16 or 17; anal III, 8; scales 13–98–40; nose 4.25 in head; maxillary

reaching a pupil's width behind orbit, 2.2 in head, 1.37 in pectoral; interorbital space flattish, 1.2 in eye. Dorsal outline symmetrical, more curved than ventral, highest point of back between first and fourth dorsal spines; profile nearly straight, scarcely convex; muzzle sharp, but less so and more upturned than in *E. akaara:* lower jaw projecting less than width of lip. Teeth in sides of lower jaw in 2 rows; canines moderate; posterior nostril scarcely enlarged; preopercular angle scarcely salient, with no conspicuous points at angle; opercular spines equidistant; opercular flap bluntly pointed; gill-rakers 11 or 12+3 or 4 rudiments. Cheeks and opercles covered with small scales; top of head, suborbitals, and lower jaws with small embedded scales; maxillary and premaxillary smooth. Dorsal origin slightly in front of insertion of pectorals; longest dorsal spine 2.8 in head; height of longest soft dorsal ray 1.75 to 2 in length of base of fin; caudal rounded; pectoral 1.6 in head; ventral 2.

Color in spirits reddish brown, both body and head with numerous small blackish spots, less than half diameter of pupil; back with three saddle-like black blotches, extending into the fin membranes, the first blotch at the back of the spinous dorsal, the second midway of length of soft dorsal, and the third crossing the top of the caudal peduncle; soft dorsal, caudal, and anal with small black spots as body; all fins except spinous dorsal narrowly edged with white.

Of this species we have three specimens, two 9 to 10 inches, from Wakanoura; one 8.5 inches, from Nagasaki. It is generally common in southern Japan, not reaching a large size.

(*fario,* trout, in low Latin.)

16. EPINEPHELUS LATIFASCIATUS (Temminck and Schlegel).

Serranus latifasciatus TEMMINCK and SCHLEGEL, Faun. Japon., Pisc., 1842, p. 6 (Nagasaki).—GÜNTHER, Cat. Fishes, vol. 1, 1859, p. 154 (after Temminck and Schlegel).—DAY, Fish. India, Suppl., 1888, p. 780, figs. (Madras). (D. XI, 12.)

Serranus grammicus DAY, Proc. Zool. Soc., 1867, p. 700 (Madras); Fish. India, 1875, p. 281, pl. 5, fig. 4 (Madras). (D. XI, 12.)

Priacanthichthys maderaspatensis DAY, Proc. Zool. Soc., 1868, p. 193 (Madras). (D. XI, 12.)

Epinephelus latifasciatus BOULENGER, Cat. Fishes, vol. 1, 1895, p. 206 (Shanghai, Madras, Bombay, Muscat). (D. XI, 12–13.)

(East Indian fauna, north to Japan.)

This fish seems to differ from *E. cpistictus* in having fewer dorsal rays (12 or 13 instead of 15, as in *E. cpistictus*) and in details of coloration; lacking row of spots on side below median row and row of spots along base of dorsal fin. (Boulenger.)

We have no specimens of this species, which may prove identical with *Epinephelus cpistictus.* The exact agreement between the color

pattern in Schlegel's account with Day's description of *Serranus grammicus* leaves little doubt of the identity of their specimens.

(*latus*, broad; *fascia*, band.)

17. EPINEPHELUS EPISTICTUS (Temminck and Schlegel).

Serranus epistictus TEMMINCK and SCHLEGEL, Faun. Japon., Pisc., 1842, p. 8 (Nagasaki).—BLEEKER, Verh. Batav. Gen., vol. 26, no. 4, 1855, p. 60, pl. 2, fig. 1.

Serranus epistictus BLEEKER, Nieuwe Nalez. Japan, 1857, p. 60 (Nagasaki). (D. XI, 14 or 15.)

Epinephelus epistictus SMITH and POPE, Proc. U. S. Nat. Mus., vol. 31, 1906, p. 468 (Kochi).

(Coasts of southern Japan.)

Head 2.6; depth 3.2; eye 4 in head, 2.2 in maxillary; dorsal XI, 15; anal III, 8; scales 13–108 to 120–44; nose 4 in head; maxillary scarcely to back of orbit, 1.95 in head, 1.2 in pectoral; interorbital

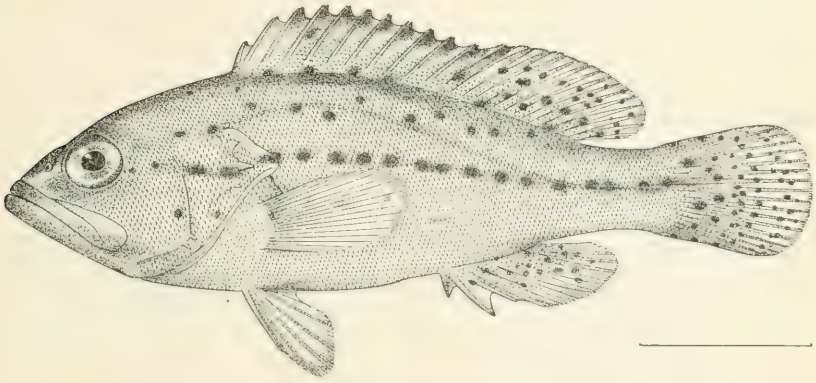

FIG. 10.—EPINEPHELUS EPISTICTUS.

space nearly flat, slightly convex, 1.25 in eye. Back moderately elevated, profile convex, a slight depression over eye; snout moderately pointed; lower jaw scarcely projecting. Teeth in sides of lower jaw in two rows; canines moderate; posterior nostril not enlarged; angle of preoperculum moderately salient, armed with two conspicuous points, directed backward and downward (=half width of pupil in specimen 4½ inches long); opercular spines nearly equidistant, upper spine noticeably shorter and blunter than lower; gill-rakers 10+4 rudiments. Top of head, cheeks, opercles, and suborbitals covered with fine scales. Dorsal beginning over origin of pectoral; longest dorsal spine 3 in head; longest soft ray 1.4 in base of soft fin; caudal rounded; pectorals 1.6 in head; ventrals 2.

Color in spirits purplish brown, each side with three rows of black spots; a median row which consists of spots broader than those in upper and lower rows, extending from lower edge of orbit across

opercle and along middle of side to a point slightly above middle of base of caudal; an upper row, more or less irregular, originating at the upper angle of the gill-opening and extending across lateral line toward middle of soft dorsal; a lower row crossing cheek and opercle below eye and extending along lower part of side to a point over or back of anal fin; membranes of spinous dorsal with a median row of small elongate black spots, continued for some distance on soft dorsal; a row of about 10 or 12 distinct roundish black spots along base of dorsal spines and rays (in a specimen 6 inches long there are 6 under spinous dorsal and 4 under soft dorsal); upper half of soft dorsal with numerous small round spots; caudal and anal marked as soft dorsal; pectorals plain, except for a small spot or two about base; ventrals plain, tinged behind with dusky.

This fish is apparently distinguished from *Epinephelus latifasciatus* of Temminck and Schlegel, Boulenger, and Day by having 15 soft dorsal rays instead of 12 or 13, and by its color pattern.

Of this species we have two specimens, one 4.5 inches long, from Nagasaki; one 6 inches, from Kagoshima.

It may prove identical with *Epinephilus latifasciatus*, the latter being the earlier name.

(*ἐπί*, above; *στικτός*, spotted.)

18. EPINEPHELUS MORRHUA (Cuvier and Valenciennes).

IYAGOBATA (iyago-bass).

Serranus morrhua CUVIER and VALENCIENNES, Hist. Nat. Poiss., vol. 9, 1833, p. 434 (Île de France).—GÜNTHER, Cat. Fishes, vol. 1, 1859, p. 254 (after Cuvier and Valenciennes).—DAY, Fish. India, vol. 1, 1875, p. 21, pl. 5, fig. 1 (Madras).—KLUNZINGER, Fisch. Roth. Meer, 1884, p. 3, pl. 1, fig. 2 (Red Sea).

Epinephelus morrhua BOULENGER, Cat. Fishes, vol. 1, 1895, p. 208 (part only?) (Red Sea, Muscat, Mauritius).

Serranus pœcilonotus TEMMINCK and SCHLEGEL, Faun. Japon., Pisc., 1842, p. 6, pl. 4A, fig. 1 (Nagasaki).—BLEEKER, Nieuwe Nalez. Japan, 1857, p. 61 (Nagasaki).

Serranus brunneus STEINDACHNER and DODERLEIN, Beitr. Japan, vol. 1, 1883, p. 230, pl. 5, figs. 1 and 2 (Japan). (Not *Epinephelus brunneus* Bloch).—NYSTRÖM, Svensk. Vet. Akad., vol. 13, Afd. 4, no. 4, 1887, p. 6 (Nagasaki).

Epinephelus latifasciatus JORDAN and SNYDER, Proc. U. S. Nat. Mus., vol. 23, 1901, p. 354 (Yokohama). (Not *Serranus latifasciatus* Temminck and Schlegel).

(East Indian fauna, north to southern Japan.)

Head 2.2; depth 2.8; eye 5.3 in head, 2.66 in maxillary; dorsal XI, 14; anal III, 8; scales 17–108–48; nose 4 in head; maxillary 2.2 in head, 1.12 in pectoral, extending past back of orbit a distance equal to width of nostril; interorbital space nearly flat, 1.1 in eye. Body rather thin, back elevated; profile convex, muzzle pointed; lower jaw strongly projecting. Teeth in sides of lower jaw in two rows; canines moderate; posterior nostril but little enlarged; pre-

opercular angle little salient, armed with 4 or 5 moderate points, directed backwards and downwards; opercular spines nearly equidistant; gill-rakers 11+3 or 4 rudiments. Cheeks, opercles, top of head, suborbitals, lower jaws, and chin covered with fine scales; maxillary smooth Dorsal origin in front of insertion of pectoral a distance equal to two-thirds diameter of eye; longest dorsal spine 2.9 in head; longest soft ray 1.25 in length of soft dorsal; caudal rounded; pectorals 1.8 in head; ventrals 2.15.

Color in spirits light reddish brown; body marked by 5 or 6 obliquish-longitudinal broken band or blotches of darker color; a V-shaped band on occiput with the limbs of the V directed forward, one to each eye; a saddle-like blotch before dorsal, as wide as eye, extending forward on each side from gill-opening to eye as a narrower band; a wide band originating between fifth and eighth dorsal spines and tapering obliquely forward to flap of opercle; two narrower

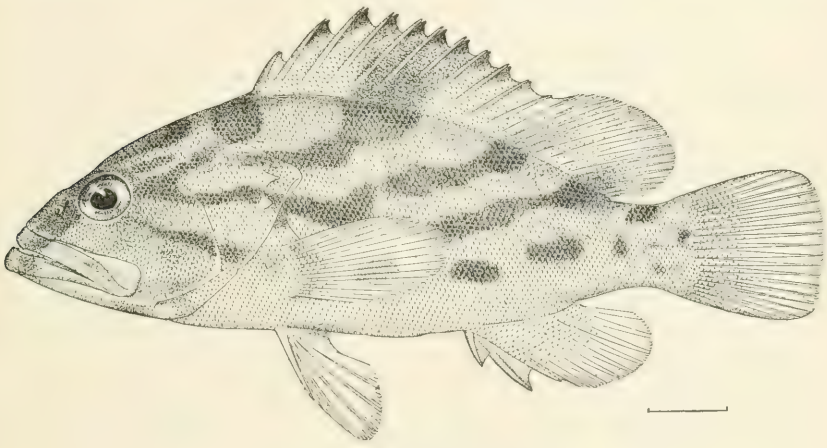

FIG. 11.—EPINEPHELUS MORRHUA.

bands beginning at front and back of soft dorsal and converging forward to meet under the seventh dorsal spine whence a single narrow stripe is continued forward across the opercle to the eye; a narrow broken stripe (or row of spots) extending from caudal peduncle forward across side on level of pectoral to a point below eye; a faint band across lower part of opercle; bands that abut on dorsal fins extending more or less into the fin-membranes; caudal, anal, ventrals, and pectorals plain.

Of this species we have one specimen, 9.5 inches long, from off Tokyo, collected by Professor Otaki. It is evidently the *pacilonotus* of Temminck and Schlegel, but we can not separate the Japanese form from the Indian species called *Epinephelus morrhua*. Should the latter form prove different the present species will stand as *Epinephelus pœcilonotus*.

(*morrhua*, the cod-fish.)

19. EPINEPHELUS MOARA (Temminck and Schlegel).

MOARA (kelp-bass).

Serranus moara TEMMINCK and SCHLEGEL, Faun. Japon., Pisc., 1842, p. 10, pl. 4, fig. 2 (Nagasaki).—GÜNTHER, Cat. Fishes, vol. 1, 1859, p. 133 (after Temminck and Schlegel).—NAMIYE, Class. Cat., 1881, p. 93 (Tokyo).

Epinephelus moara JORDAN and SEALE, Proc. Davenport Acad., vol. 10, 1905, p. 9, pl. 5 (Hongkong).—JORDAN and RICHARDSON, Mem. Carnegie Museum, vol. 4, 1909, p. 183 (Takao, Formosa).

Epinephelus nebulosus (part) BOULENGER, Cat. Fishes, vol. 1, 1895, p. 240 (Japan). (Not *Serranus nebulosus* of Cuvier and Valenciennes or of Bleeker.)

(Coasts of southern Japan and China.)

Head 2.25; depth 3.5; eye 6.8 in head, 3.4 in maxillary; dorsal XI, 14 or 15; anal III, 8; scales 12–100 to 105–40; nose 4.2 in head; maxillary extending more than half width of eye behind orbit, 2.12 in head, 1 in pectoral; interorbital space nearly flat, very slightly convex, 1.4 in eye. Form slender, back little elevated, width of body 2 in its greatest depth; profile long, straightish, muzzle sharp; lower jaw projecting width of lip. Teeth in sides of lower jaws in two rows; canines moderate; posterior nostril scarcely enlarged; preopercle with the angle strongly salient, furnished with several obscure points in specimens 14 to 20 inches, with 2 or 3 conspicuous points in young individuals; lower opercular spine a little nearer middle than is upper; gill-rakers 10+4 or 5 rudiments. Top of head, suborbitals, maxillary, and lower jaw with small embedded scales; scales on cheeks and opercles larger. Dorsal originating slightly in front of origin of pectoral; longest dorsal spine 3.3 in head; height of longest soft ray 1.5 in length of base of soft fin; caudal rounded; pectoral 2.15 in head; ventral 2.

Color in spirits reddish brown; back and sides crossed by 6 broad obliquely transverse bars of dusky, the first one crossing in front of spinous dorsal, the second to fifth bars abutting on dorsal fin and thence extending obliquely downward and forward, the sixth bar crossing the caudal peduncle; each bar about 2½ times width of eye; one or more, sometimes all, bars may be broken up by lighter areas within them, or bars may present irregular branchings below the lateral line, giving the fish a marbled appearance; the four middle bars may extend into the dorsal fin for about half its height; several narrow bars crossing opercle and cheek, converging toward eye; soft dorsal, caudal, and anal narrowly but plainly white-edged; ventrals dusky, with obscure white edges; pectorals plain, with some dusky toward base.

We have ten specimens of this species, one 20 inches long, from Nagasaki; one 13 inches, and two 6 to 8 inches, from Wakanoura; three 2 to 3 inches and three 8 to 12 inches, from Misaki. It was also seen at Hakata. It is not one of the common species.

(*mo*, a sea-weed or kelp; *ara*, bass.)

20. EPINEPHELUS AWOARA (Temminck and Schlegel).

AOARA (green bass).

Serranus awoara TEMMINCK and SCHLEGEL, Faun. Japon., Pisc., 1842, p. 9, pl. 3, fig. 2 (Nagasaki).—RICHARDSON, Ichth. China, 1846, p. 231 (Nagasaki, specimen of Bürger, British Museum).—GÜNTHER, Cat. Fishes, vol. 1, 1859, p. 150 (China).—NYSTRÖM[a] Svensk. Vet. Akad. Handl., vol. 13, Afd. 4, No. 4, 1887, p. 6 (Nagasaki).—NAMIYE, Class. Cat., 1881, p. 93 (Tokyo market).—ISHIKAWA, Prel. Cat., 1897, p. 56 (Tokyo).—KNER, Novara Fische, vol. 1, 1865, p. 26 (Singapore).

Epinephelus awoara BOULENGER, Cat. Fishes, vol. 1, 1895, p. 230 (China).—BLEEKER, Atlas, vol. 7, 1876, p. 59 (after Kner, above).—JORDAN and RICHARDSON, Mem. Carnegie Museum, vol. 4, 1909, p. 183 (Takao, Formosa).

Serranus diacanthus STEINDACHNER and DODERLEIN, Beitr. Japan, vol. 1, 1883, p. 231 (Tokyo, Nagasaki, Hongkong). (Not *Serranus diacanthus* Cuvier and Valenciennes.) D XI, 15; "hintere Rand der Caudal und obere Rand der Gliederstrahlen der Dorsale breit hell gesäumt, und ähnlich gefärbte (hell blaugraue?) runde Flecken liegen an den Seiten des Kopfes." –5 oblique transversal bands on body; teeth not described. (Steindacher.)

(Coasts of southern Japan and China, not common.)

Head 2.60; depth 3.30; eye in head 4.40, in maxillary 2.30; dorsal XI, 16; anal III, 8; scales 18–94–38. Nose 3.9 in head; maxillary slightly short of back of orbit, 2 in head, 1.25 in pectoral; interorbital space 1.37 in eye, convex. Back low; profile broadly convex as far as forehead, whence the descent becomes steeper; a slight depression over nostrils; muzzle rather blunt; lower jaw projecting width of lip. Teeth in sides of lower jaws in two rows; canines moderate; posterior nostril slightly the larger; preopercular angle scarcely produced, furnished with 2 or 3 moderately strong points; point of opercular flap directed upward, much nearer lateral line than base of pectoral; gill-rakers 12+3. Cheeks, opercles, lower jaw, and chin scaled with fine scales; maxillary smooth. Dorsal originating over pectoral; longest dorsal spine (3rd) 2.8 in head; longest soft ray 1.9 in base; caudal rounded; pectoral 1.65 in head; ventral 1.75.

Color in spirits purplish brown, each side crossed with 5 broad blackish stripes; first stripe descending vertically from between second and fifth dorsal spines; second originating between sixth and tenth spines and descending obliquely backward to middle of side and then swinging obliquely forward, broader than the other stripes and tending to spread apart as a double stripe on lower half of side; third band originating between eleventh spine and middle of soft dorsal and descending in a slightly obliquely backward direction; fourth band beginning behind middle of soft dorsal and descending obliquely backward, becoming broader below; fifth band

[a] Made a synonym of *Epinephelus sexfasciatus* Cuvier and Valenciennes, by Doctor Boulenger.

covering posterior half of caudal peduncle; all bands extending some distance into dorsal membranes; dorsal and caudal indistinctly barred or mottled, with broad paler margins; anal, ventrals, and pectorals blackish.

This species is here described from two specimens 8½ inches long, and one 15 inches, from Takao, Formosa. We have no specimens from Japan, where it is apparently rare.

The specimens from Takao, Formosa, which are here called *Epinephelus awoara*, are well distinguished from specimens of *Epinephelus sexfasciatus* from Sumatra by the different coloration of the dorsal and caudal. Cross bands are said by Temminck and Schlegel to be present on the body of *S. awoara* after death. Faint light spots are apparent on head and parts of body of our largest specimen from Formosa (15 inches). Dr. Hans Sauter, the collector, states that the color in life is "light brown, under parts suffused

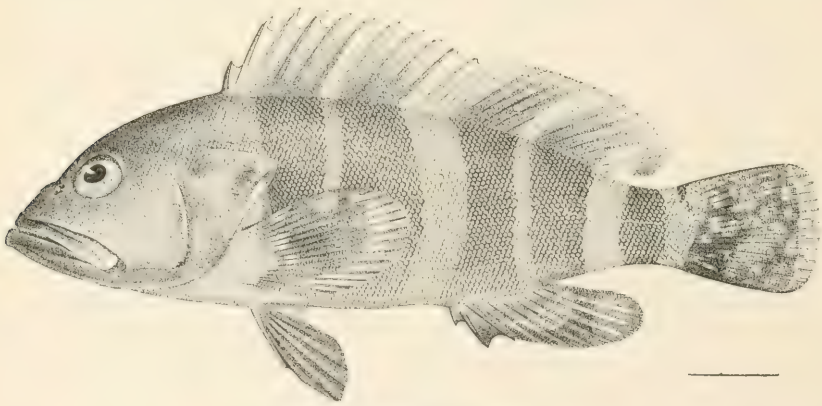

FIG. 12.—EPINEPHELUS AWOARA.

with yellow; fins gray, with yellow borders." We have seen no specimens from Japan or elsewhere which seem to correspond with the *Epinephelus awoara* of Boulenger (skin 38 cm. long, from China) (? *S. awoara* of Kner, specimens from Singapore), a species with the fins yellow edged and with *3 rows* of teeth in sides of lower jaws. Body bands are not said by either Kner or Boulenger to be present in the specimens.

(*ao*, blue-green; *ara*, bass.)

21. EPINEPHELUS SEPTEMFASCIATUS (Thunberg).

HAKAMA[a] ARA (coat-skirt bass).

Perca septemfasciata THUNBERG, Vet. Acad. Handl. Stockholm, vol. 14, 1793, p. 56, pl. 1 (Nagasaki).

Plectropoma susuki CUVIER and VALENCIENNES, Hist. Nat. Poiss., vol. 2, 1828, p. 404 (Japan). - TEMMINCK and SCHLEGEL, Faun. Japon., Pisc., 1842, p. 11, pl.

[a] Hakama is the skirt of a garment like a coat, worn by men in Japan.

4, fig. 1 (Nagasaki).—RICHARDSON, Ichth. China, 1846, p. 230 (Coasts of China, authority of Mr. Reeves).—GÜNTHER, Cat. Fishes, vol. 1, 1859, p. 160 (after Temminck and Schlegel).—?GÜNTHER, Proc. Zool. Soc., 1867, p. 100 (Sydney, Australia).—NYSTRÖM, Svensk. Vet. Akad. Handl., vol. 13, Afd. 4, no. 4, 1887, p. 5 (Nagasaki).—?MACLEAY, Proc. Linn. Soc. N. S. W., vol. 5, 1880–81, p. 323 (Port Jackson, probably an error).

Serranus octocinctus TEMMINCK and SCHLEGEL, Faun. Japon., Pisc., p. 7, pl. 4 A., fig. 2, 1842 (Nagasaki).—BLEEKER, Nieuwe Nalez. Japan, 1857, p. 62 (Nagasaki).—GÜNTHER, Shore Fish. Challenger, 1880, p. 63 (Yokohama).

Serranus susuki STEINDACHNER and DÖDERLEIN, Beitr. Japan, vol. 1, 1883, p. 230 (Kagoshima, Tokyo, Nagasaki).

Serranus mystacinus (not of Poey) NAMIYE, Class. Cat., 1881, p. 93 (Tokyo markets).—ISHIKAWA, Prel. Cat., 1897, p. 56 (Tokyo).

Epinephelus septemfasciatus JORDAN and SNYDER, Proc. U. S. Nat. Mus., vol. 23, 1901, p. 354 (Tokyo); p. 751 (Sasuna, Tsushima).—BOULENGER, Cat. Fishes, vol. 1, 1895, p. 226 (part only) (Yokohama).

(Coasts of southern Japan, generally common.)

Head 2.5; depth 3; eye 5.4 in head, 2.66 in maxillary; dorsal XI, 14 or 15; anal II, 9; scales 18–110–44; nose 3.8 in head; maxillary extending barely to or scarcely past back of orbit, 2.16 in head, 1.16 in pectoral; interorbital space elevated, strongly convex, the top of the eye a pupil's width below level of the bridge; width of bridge 1 to 1.25 times eye. Body comparatively thin and deep; dorsal outline more arched than ventral; profile broadly convex, the descent over eye rather steep. Teeth in sides of lower jaw in two rows; canines moderate; posterior nostril about twice size of anterior; angle of preopercle moderately produced, with several moderate points, some of these often bicuspid; lower face of preopercle with one or two downwardly or antrorsely directed points, set at some distance anterior to the teeth of the angle; upper opercular spine much farther from middle spine than is lower; gill-rakers 12+2 or 3 rudiments. Cheeks, opercles, top of head, lower jaws, and chin with fine scales; a small patch of very fine scales near tip of maxillary. Origin of dorsal midway between gill-opening and insertion of pectoral; longest dorsal spine 2.75 in head; longest soft ray 1.4 in length of base of soft dorsal; caudal rounded; pectorals 1.75 in head; ventrals 1.9 to 2.1.

Color in spirits light reddish brown, the body crossed by seven transverse bands of darker color, the width of the bands greater than diameter of orbit; the sixth band (counting backward) presents the appearance of a double or split band, and extends from middle of soft dorsal to middle of anal; the seventh band is broader and darker than the others (twice eye), and covers the top of the caudal peduncle nearly to the caudal fin, and extends a short distance on the membranes of the soft dorsal; all body bands in front of caudal peduncle may extend a short distance into dorsal membranes; soft dorsal, caudal, and anal with narrow pale edges; remainder of anal and

ventrals dusky; pectorals pale; a black mustache-like streak along along lower face of suborbital, partly covered by the folded maxillary.

Of this common species we have 25 specimens—eight, 6 to 11 inches long, from Tokyo; one, 6 inches, from Nagasaki; fourteen, 2 inches, from Misaki; one, 6 inches, from Kobe; one, 3 inches, from Tsuruga. It stands next to *E. akaara* in abundance in Japan.

This species is very close to *Epinephelus mystacinus* of the West Indies.

(*septem*, seven; *fasciatus*, banded.)

22. **EPINEPHELUS TSIRIMENARA** (Temminck and Schlegel).

AKAHATA (red bass) (red flag); **TSIRIMENARA** (crape bass).

Serranus tsirimenara Temminck and Schlegel, Faun. Japon., Pisc., 1842, p. 7, pl. 4 A, fig. 3 (Japan).—Günther, Cat. Fishes, 1859, p. 144 (after Bleeker).—Bleeker, Nieuwe Nalez., Japan, 1857, p. 62 (Nagasaki).—Steindachner and Döderlein, Beitr. Japan, vol. 1, 1883, p. 24 (Tokyo, Kochi).—Nyström, Svensk. Vet. Akad. Handl., vol. 13, Afd. 4, No. 4, p. 6 (Nagasaki).—Namiye, Class. Cat., 1881, p. 93 (Tokyo).—Ishikawa, Prel. Cat., 1897, p. 56 (Tokyo).

Serranus marginalis Richardson, Ichth. China, 1846, p. 233 (China, Japan, etc.) (Not *S. marginalis* of Cuvier and Valenciennes, a closely related species in the East Indies=*Epinephelus fasciatus* Forskål).

Epinephelus fasciatus Jordan and Snyder, Proc. U. S. Nat. Mus., vol. 23, 1901, p. 354 (Tokyo). (Not=*Perca fasciata* Forskål, a species of the East Indian fauna.)

Epinephelus tsirimenara Smith and Pope, Proc. U. S. Nat. Mus., vol. 31, 1906, p. 468 (Kochi).

(Coasts of southern Japan; rather common in open waters.)

Head 2.4; depth 3.2; eye 5.7 in head, 2.6 in maxillary; dorsal XI, 15 or 16; anal III, 8; scales 14–108–38; nose 4.1 in head; maxillary extending well past back of orbit, 2.27 in head, 1.25 in pectoral; interorbital space flattish, scarcely elevated above rim of orbit, 1.16 in eye. Dorsal and ventral outlines unsymmetrical; greatest elevation of back in front of first dorsal spine; profile uneven, the depression over eye marked; snout moderately pointed; lower jaw projecting width of lip. Teeth in sides of lower jaw in two rows; canines in upper jaw stoutish; nostrils subequal; preopercular angle little prominent, furnished with 5 or 6 short serratures; opercular spines equidistant; flap bluntly pointed, directed rather downward; gill-rakers 12 + 3 rudiments. Top of head, cheeks, opercles, and lower jaws covered with very fine scales; maxillary and premaxillary smooth or with extremely fine embedded scales. Dorsal fin originating above base of pectoral; longest dorsal spine 3.25 in head; longest soft ray 1.4 in length of base of fin; caudal rounded, with slightly squarish angles; pectoral 1.75 in head; ventral 2.25.

Color in life bright rose-red, in spirits straw to light brownish, the head and nape inclined to dusky; an irregular blackish rim encircling lower half of orbit; a short black streak on forward edge of cheek; each side with two longitudinal rows of elongate white blotches (4 or

5 in a row); and with as many faint transverse bands of dusky, including within them the white spots, as there are of the latter; membranes of spinous dorsal each with a triangular black blotch, tipping fin; along each side of base of spinous dorsal a row of smaller blackish streaks; caudal, anal, ventrals, and pectorals uniform, yellowish.

Of this abundant species we have thirteen specimens—one, 13.5 inches long, from Nagasaki; three, 2 inches, from Tokyo; nine, 4 to 8 inches, from Wakanoura. It is found in rather deep clear water in the southern bays. It has been identified by most recent writers with *Epinephelus fasciatus* of the South Seas.

As compared with a specimen of *E. fasciatus* 12 inches long from Lord Howe Island, our Japanese specimens differ in having the depth slightly less, the maxillary a very little shorter, gill-rakers fewer (by two rudiments), and in having the anterior triangular

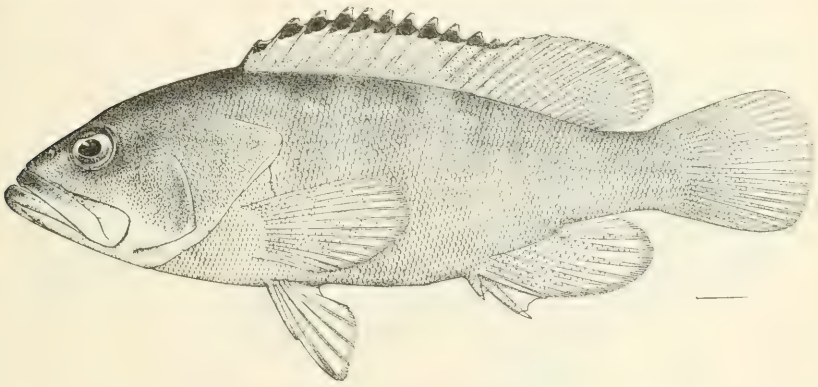

FIG. 13.—EPINEPHELUS TSIRIMENARA.

dorsal blotches as deep as long (the Lord Howe specimen having all the blotches longer than deep). Specimens from Queensland are said by Mr. J. Douglas Ogilby to have the body deeper (2.45–2.90), head longer (2.35–2.60), maxillary longer (beyond eye), and gill-rakers in greater number (18) than specimens from the tropical Pacific.

(*tsirimen*, crape, which may be red; *ara*, bass).

11. Genus TRISOTROPIS Gill.

Trisotropis GILL, Proc. Acad. Nat. Sci. Phila., 1865, p. 104 (*guttatus=venenosus*).
Parepinephelus BLEEKER, Systema Percarum Revisum, 1875, p. 257 (*acutirostris*).
Archoperca JORDAN and EVERMANN, Fish. North Middle America, vol. 1, 1898, p. 1169 (*boulengeri*).

Cranium broad and transversely concave between the eyes, its lateral crests very strong, nearly parallel with the supraoccipital crest and extending much farther forward than the latter, joining

the supraocular crest above the eye, the supraoccipital crest not extending on the frontals; premaxillaries not extending backward to the frontals; lower jaw strongly projecting; anal fin elongate, with 10 to 12 soft rays; caudal lunate or rounded; spines of fins slender, none of them much elevated; scales small, mostly cycloid, those on the lateral line simple; pyloric cæca few; gill-rakers various; nostrils small, well separated, subequal. Otherwise essentially as in *Epinephelus*, from which genus *Trisotropis* is well separated by the structure of the skull, and superficially by the longer anal, larger mouth, and more slender fin rays. Food fishes of the Tropics, mostly American.

We here separate *Trisotropis* as a genus distinct from *Mycteroperca*, with which it agrees in general characters, but the posterior nostril in *Mycteroperca* is much larger than the anterior, while in *Trisotropis* the nostrils are essentially as in *Epinephelus*. The single Japanese species belongs to the subgenus, *Archoperca*, defined by the deep,

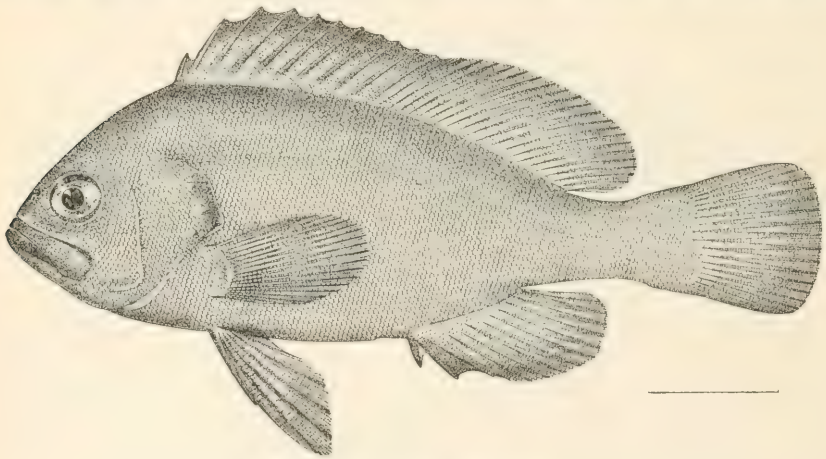

FIG. 14.—TRISOTROPIS DERMOPTERUS.

compressed body and the relatively short and high anal fin. The gill-rakers are few, as in the subgenus *Trisotropis* and in *Epinephelus*. In *Parepinephelus* the gill-rakers are numerous and long.

(τρεις, three; ἴσος, equal; τρόπις, keel, from the three parallel keels on the top of the skull, a character which distinguishes *Trisotropis* from *Epinephelus*.)

23. TRISOTROPIS DERMOPTERUS (Temminck and Schlegel).

Serranus dermopterus TEMMINCK and SCHLEGEL, Faun. Japon., Pisc., 1842, p. 10 (Nagasaki).—GÜNTHER, Cat. Fishes, vol. 1, 1859, p. 154 (after Temminck and Schlegel).—STEINDACHNER and DÖDERLEIN, Denkschr. Akad. Wien, vol. 59, 1892, p. 359, pl. 2, fig. 1.

Epinephelus dermopterus BOULENGER, Cat. Fishes, vol. 1, 1895, p. 269 (China).

Head 3.3 in length; depth 2.65; eye 4 in head, 1.7 in maxillary; dorsal XI, 21; anal III, 10; scales 27–140–66; pores 70; nose 4 in

head; maxillary reaching vertical from back of pupil, 2.25 in head, 1.66 in pectoral; interorbital space strongly convex, 1.2 times diameter of eye. Body strongly compressed; back elevated, highest under first dorsal spine; profile convex; nape prominent; lower jaw longest. Teeth in two series in sides of lower jaw; canines rather small; preopercle with fine serræ on posterior margin, the angle nearly a right angle, with 3 or 4 enlarged points; lower margin without serratures; middle spine of opercle longest, nearer lower spine than upper; opercular flap pointed, the point nearer axil of pectoral than lateral line; gill-rakers 16 to 17. Cheeks and opercles and top of head scaled, those on opercle rather larger than scales on body; lower jaw with some very fine embedded scales; scales ciliated. Spinous dorsal originating far forward, the first spine inserted nearly over upper corner of gill-opening; longest dorsal spine (the fourth) 2.3 in head; fourth spine and those behind it subequal; height of soft dorsal 1.6 in head; caudal subtruncate; anal not angulated; pectoral 1.25 in head; ventral 1.16, barely reaching vent.

Color, in spirits, uniform dark purplish brown; fins blackish, the caudal, anal and pectorals with a faint narrow pale edge.

Of this species we have three specimens from Wakanoura, the largest 6.25 inches in total length. Doctor Boulenger states that it grows to more than 1 foot in length. This species is quite unlike the other Japanese *Epinephelinæ*, being closely related to *Trisotropis* (*Archoperca*) *boulengeri* of the west coast of Mexico.

(*δέρμα*, skin; *πτερόν*, fin.)

12. Genus CHELIDOPERCA Boulenger.

Chelidoperca BOULENGER, Cat. Fishes, vol. 1, 1895, p. 304 (*hirundinacea*).

Body elongate, moderately compressed; mouth large, protractile; maxillary without evident supplemental bone; jaws with broad bands of villiform teeth, some of the inner ones in middle of upper jaw depressible; teeth on vomer and palatines; tongue smooth; preopercle serrate; opercle with two spines; gill-rakers moderate; branchiostegals seven; scales moderate, thin, irregularly ciliate; head partly scaled, the tip of snout, maxillaries, and front of chin naked; lateral line complete; dorsal fins confluent; dorsal spines 10; spinous and soft dorsal subequal in length; anal III, 6; caudal lunate; ventrals anterior to pectorals, close together, with a moderate spine; pectorals pointed.

"Posterior processes of premaxillaries not extending to the frontals; supraoccipital and parietal crests short, smooth area of cranium extending posteriorly to a line connecting the preopercular borders." (Boulenger.)

Western Pacific and Indian oceans; two species.

(*χελιδών*, swallow; *πέρκη*, perch.)

24. CHELIDOPERCA HIRUNDINACEA (Cuvier and Valenciennes).

HIMEKODAI:[a] (Princess-perch).

Centropristis hirundinaceus CUVIER and VALENCIENNES, vol. 7, 1831, p. 450 (Japan).—TEMMINCK and SCHLEGEL, Faun. Japon., Pisc., 1842, p. 14, pl. 5, fig. 1 (Nagasaki).—GÜNTHER, Cat. Fishes, vol. 1, 1859, p. 87.—BLEEKER, Acta Soc. Ind Neerl., vol. 8, 1860, p. 75 (Japan).—STEINDACHNER and DÖDERLEIN, Denkschr. Akad. Wien, vol. 47, 1883, p. 233 (Tokyo).—NYSTRÖM, Svensk. Vet. Akad. Handl., vol. 13, pt. 4, no. 4, 1887, p. 7 (Nagasaki).—NAMIYE, Class. Cat., 1881, p. 93 (Tokyo).—ISHIKAWA, Prel. Cat., 1897, p. 57 (Tokyo).

Chelidoperca hirundinacea BOULENGER, Cat. Fishes, vol. 1, 1895, p. 305.—JORDAN and SNYDER, Proc. U. S. Nat. Mus., vol. 23, 1901, p. 751 (Yokohama).—SMITH and POPE, Proc. U. S. Nat. Mus., vol. 31, 1906, p. 468 (Kochi; Urado).

Centropristes pleurospilus GÜNTHER, Shore Fish, Challenger, 1880, p. 37, pl. 16, fig. 2 (Arafura Sea).

(Coast of southern Japan and southward.)

Head 3; depth 3.75; depth caudal peduncle 2.8 in head; eye 3.5; snout 3.75; interorbital space flat, 2.5 in eye; maxillary 1.9 in head, width of its extremity 2 in eye; dorsal X, 10; anal III, 6; scales 4–47–12. Form elongate, moderately compressed, back little elevated; profile slightly convex; muzzle pointed; mouth large, low, little oblique; maxillary not reaching to opposite back of orbit; lower jaw prominently projecting, the anterior teeth not entirely covered when mouth is closed. Jaws with bands of villiform teeth; tongue smooth; nostrils subequal, the anterior with conspicuous flaps; preopercle rounded, with small sharp, evenly placed serratures behind and below; opercle with two sharp spines; gill-rakers 12, including rudiments, the longest about equal to the corresponding filaments. Scales unevenly ciliate, thin and somewhat deciduous; cheeks and opercles, parietal frontal region and most of chin scaled; nose and maxillaries naked. Spinous dorsal inserted a very little behind base of pectoral; dorsal spines slender and flexible, the fourth or fifth longest, 2.65 in head; caudal emarginate, the upper rays somewhat produced; anal spines feeble, the third little more than half length of first soft ray; ventrals inserted in front of pectorals, their length 1.4 in head, nearly reaching vent (specimen 6 inches); pectorals pointed, 1.3 in head, reaching to vent.

Color in spirits light olive, with tinge of purplish; in life rosy, with a yellow lateral stripe; young specimens are said to have a series of four or five oblong black spots along the side of the body; spinous and soft dorsal spotted.

Of this species we have two specimens, one 6 inches long, from Suruga Bay, and one 5 inches, from Yokohama market, doubtless from Sagami Bay. The species is rather rare in the Kuro Shiwo.

(*hirundinaceus*, like a swallow.)

[a] *Hime*, daughter of a daimio.

13. Genus SAYONARA Jordan and Seale.

Sayonara JORDAN and SEALE, Proc. U. S. Nat. Mus., vol. 30, 1906, p. 145 (*satsumæ*).

Body robust, moderately elongate; mouth large, protractile; maxillary without supplemental bone; minute teeth in jaws and on vomer and palatines; upper jaw with a few enlarged teeth; tongue and pterygoids toothless; preopercle finely and evenly serrated; opercle with three flat points; gill-rakers moderate; branchiostegals seven; scales rather large, ciliate; entire head scaly; lateral line complete, high, its tubes simple, not angulated at base of caudal peduncle; dorsal deeply notched, its spines 10, all low, first and last short; spinous and soft portions subequal in length, without filamentous rays; anal III, 7; caudal convex; ventrals short, anterior to pectorals, close together, with a rather weak spine; pectorals subsymmetrical, blunted pointed. This genus is evidently allied to *Serranus*, but it differs from other genera of its type by the divided dorsal and the scaly jaws.

(*sayonara*, "if it must be"—the common good-by salutation of the Japanese.)

25. SAYONARA SATSUMÆ Jordan and Seale.

Sayonara satsumæ JORDAN and SEALE, Proc. U. S. Nat. Mus., vol. 30, 1906, p. 145 with figure (Yamagawa, near Kagoshima).

Sayonara mitsukurii SMITH and POPE, Proc. U. S. Nat. Mus., vol. 31, 1906, p. 469 with figure (Kagoshima).

Head 2.3 in length; depth 2.8; depth caudal peduncle 2.8 in head; eye 4.8; snout 4; interorbital space nearly flat, 1.65 in eye; maxillary 1.8 in head, width of its extremity 1.5 in eye; dorsal X, 15; anal III, 7; scales 2–33–12. Body rather short, not greatly compressed; profile convex; mouth large, oblique; maxillary extending to vertical from back of orbit; jaws subequal; minute teeth in bands in both jaws; upper jaw with two of the outer teeth on either side of symphysis enlarged; preopercle and lower margin of interopercle and preopercle finely and evenly serrated, no plectroid spines on preopercle; opercle with three short flat spines; gill-rakers rather short, 11 or 12 on lower limb of outer arch, the 5 lowermost rudimentary, the longest of the others somewhat shorter than the filaments. Scales large, ciliate; head scaly, including snout, maxillaries, and lower jaw; lateral line complete, running high, without angle under last dorsal rays; tubules of first 20 scales short, simple, occupying anterior half of scale only, those of scales farther back longer; soft dorsal scaly at base. Spinous dorsal inserted in advance of pectorals; third to sixth spine longest, third 3.75 in head; remaining spines gradually shorter to the tenth, which is as short as the first; soft dorsal higher, longest

ray 2.1 in head; longest anal ray 2.3 in head; second anal spine 3.3 in head; caudal convex; ventrals inserted in advance of upper axil of pectorals their length 1.7 in head, nearly reaching vent; pectoral long, subsymmetrical, its lower rays reaching to middle of anal.

Color bright red in life. In spirits yellowish white, with about three very indistinct whitish longitudinal streaks on side; fins pale, unmarked.

Known from the type, a specimen 6.25 inches long, taken at Yamagawa, near Kagoshima, above described. A second specimen, apparently of the same species, from the same locality has been named *Sayonara mitsukurii*. The differences seem to us to be due in part to the small size of the specimen of Smith and Pope and in part to errors in the figure of the typical species.

The nominal species, *Sayonara mitsukurii*, is said by the authors to differ from *Sayonara satsuma*, as figured and described, in its

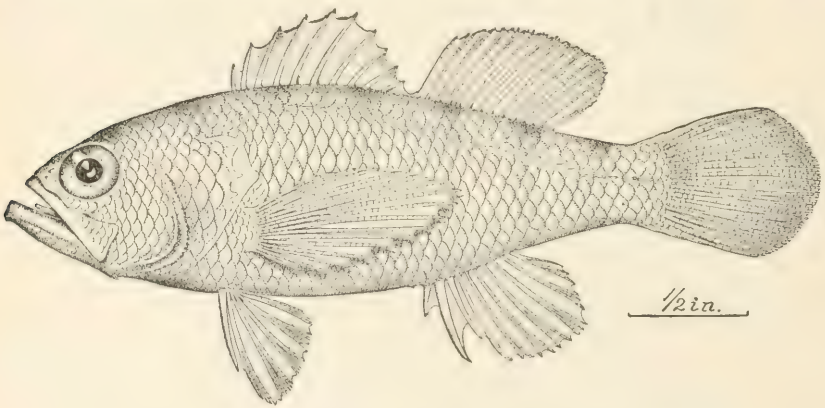

FIG. 15.—SAYONARA SATSUMÆ (TYPE OF SAYONARA MITSUKURII).

larger eye, longer tubules in lateral line, long and slender gill-rakers, higher dorsal fins, unbranched pectoral rays and color. We note that the youth and small size (2⅞ inches) of Smith and Pope's specimen may explain its slightly larger eye, higher dorsal fins, unbranched pectoral rays, and traces of dark cross bands. The type of *Sayonara satsuma* has some of the pectoral rays not at all branched and the others branched only very far out toward their ends. The drawing of *Sayonara satsuma* incorrectly represents the length of the tubules of the scales in the posterior half of the lateral line; shows the opercular spines rather too much concealed; and represents somewhat too small the scales on suborbitals and maxillaries. The statement in the description of *S. satsuma* that the gill-rakers are "short" is hardly accurate, the longest being nearly equal to the corresponding filaments. Only a careful comparison of the types of the two species will show whether they are really distinct, but the probabilities are in favor of their identity.

(*Satsuma*, a province of southern Japan famous in Japanese history; its chief port is Kagoshima.)

14. Genus CAPRODON Temminck and Schlegel.

Caprodon TEMMINCK and SCHLEGEL, Fauna Japonica Pisces, 1842, p. 64 (type afterwards named *schlegeli*).

Neoanthias CASTELNAU, Proc. Linn. Soc. N. S. W., vol. 3, 1878, p. 367 (*güntheri*= *longimanus*).

Body strongly compressed covered with moderate, rough scales; lateral line complete, running high, the tube bifurcate; mouth rather large; canines small; teeth on entopterygoids and tongue; head entirely scaly. Preopercle denticulate; opercle with 3 spines; 7 branchiostegals. Dorsal continuous, scaly at base, the rays X, 20, the spinous and soft parts about equal. Anal short, III, 8 or 9. Ventrals below pectorals. Colors brilliant. Tropical Pacific.

(*κάπρος*, boar; *ὀδούς* tooth.)

26. CAPRODON SCHLEGELII (Günther).

AKASAGI (red heron = red bass).

Caprodon TEMMINCK and SCHLEGEL, Faun. Japon., Pisc. 1842, p. 64, pl. 30 (Nagasaki).

Anthias schlegelii GÜNTHER, Cat. Fishes, vol. 1, 1859, p. 93 (after Temminck and Schlegel).—ISHIKAWA, Prel. Cat., 1897, p. 57 (Izu).

Anthias (*Caprodon*) *schlegelii* STEINDACHNER and DÖDERLEIN, Denkschr. Akal Wien, vol. 47, 1883, p. 225 (Tokyo).

Caprodon schlegelii BOULENGER, Cat. Fishes, vol. 1, 1895, p. 314.—JORDAN and SNYDER, Proc. U. S. Nat. Mus., vol. 23, 1901, p. 354 (Tokyo); Bull. U. S. Bur. Fish., vol. 26, 1906, p. 211, pl. 12, fig. 1 (Honolulu).—REGAN, Ann. Mag. Nat. Hist., 7th ser., vol. 15, 1905, p. 18 (Inland Sea of Japan).

Head 3.3; depth 2.75; depth caudal peduncle 3 in head; eye 3.6; snout 3.8, a little shorter than eye; interorbital space convex 3.2; maxillary 2.2 in head, width of its extremity 1.75 in eye; dorsal X, 19 or 20; anal III, 8 or 9; scales 6 or 8–60 to 65–20 to 23. Form oblong, compressed; back evenly curved and moderately elevated; profile convex; mouth moderate, oblique; maxillary reaching past front of pupil; lower jaw projecting; anterior teeth exposed when mouth is closed; villiform teeth in jaws, and on vomer, palatines, entopterygoids, and tongue; a pair of small anteriorly directed canines in both upper and lower jaw at symphysis; on each side of lower jaw, opposite symphysial valve, a short row of backwardly pointed canines; posterior nostril larger than anterior; angle of preopercle rounded, its posterior and lower border finely denticulated; opercle with but two evident spines; gill-rakers 22 or 23, the longest about 1.2 in length of corresponding filaments. Scales rough, ciliate, adherent; head entirely scaled, including mandibles and maxillaries; small scales on bases of fins, extending far out on membranes, those of spinous dorsal forming a distinct sheath whose height is more than

half that of the spines. Spinous dorsal inserted slightly in advance of pectoral; dorsal spines strong, the fourth to seventh longest, 2.8 in head; caudal weakly emarginate or truncate; second and third anal spines subequal, very strong, 3.5 in head; ventrals inserted behind pectorals, 1.6 in head; pectorals longer than head, unsymmetrical, the upper rays shortened, the eighth to thirteenth conspicuously elongated, the tip of reflexed pectoral reaching nearly or quite to base of anal.

Our Japanese specimens are plain straw color in spirits, without traces of the original color pattern. The types from Japan were pink, with a yellow stripe above eye, a double yellow stripe through it to tip of snout, and two faint oblique yellow streaks across opercle; upper half of body with numerous round greenish blotches, only slightly darker than the ground color; anal with round yellow spots; back of spinous dorsal with a few irregular blackish blotches; all fins yellow outwardly. A specimen taken by Doctor Jordan at Honolulu in 1905,[a] and figured in color, does not differ in any essential respect from this description.

Of this species we have specimens as follows: Four from Misaki, 10 inches, two 8 inches, and one 6 inches, and one from Awa, 8 inches. A specimen from Honolulu figured in color by Jordan and Snyder agrees with the Japanese fish. The species is rare, and lives in rather deep water.

(Named for Prof. H. Schlegel of Leyden, the accomplished author of a large part of the Fauna Japonica.)

15. Genus ANTHIAS Bloch.

Anthias Bloch, Ausländische Fische, vol. 6, 1792, p. 97 (*anthias*).

Aylopon Rafinesque, Carattere di Alcuni Nuovi Generi, 1810, p. 52 (*anthias*); the generic name *Anthias* regarded as preoccupied by *Anthia*, a genus of beetles (1801).

Sacura Jordan and Richardson, new subgenus (*margaritaceus*).

Body oblong, strongly compressed; scales moderate or rather large, ciliate; lateral line complete, angulate below last rays of dorsal, the tubes straight or with an ascending tubule, and extending along nearly the entire scale; jaws and front scaly; mouth large; maxillary surface scaly; jaws with villiform teeth, intermixed with curved canines; a small group of teeth on the vomer and a narrow series on each palatine; tongue smooth or with a few teeth; head entirely scaled; preopercle serrate, the teeth near the angle enlarged, without antrorse teeth on the lower border; opercle with 2 or 3 spines; 7 branchiostegals; gill-rakers very long and slender; dorsal fin not notched, with X, 12 to 18 rays, the spinous portion about equal to the soft; third dorsal spine produced; anal short, III, 6 to 8;

[a] Jordan and Snyder, Bull. U. S. Bur. Fish., vol. 26, 1906, pl. 12, fig. 1.

caudal lunate, with filamentous lobes; pectoral obtuse-pointed, subsymmetrical, rays 17 or 18; ventrals below pectorals, close together, each with a strong spine, the soft rays much produced in the typical species; posterior processes of premaxillaries extending to between the frontals; frontals very convex, with a transverse ridge behind, between the posterior borders of the orbits and in front of the very strong supraoccipital crest; parietal crests feeble; vertebræ 10+15 or 16 =25 or 26. Tropical seas; the typical species (*Anthias anthias*, Linnæus) a well-known inhabitant of the Mediterranean. The Japanese species differs from the type of the genus in having the ventrals not produced in a ribbon-like expansion; in the slender caudal peduncle and more elevated nape and in the production of the second soft ray of the dorsal. It may be regarded as forming a distinct subgenus, *Sacura*, from the Japanese name, *Sakuradai*, *Sakura* being the Japanese cherry.

(*anthias*, ancient name of some large fish, perhaps the Albacore, apparently from *ἄνθος*, a flower.)

27. ANTHIAS MARGARITACEUS Hilgendorf.

SAKURADAI (cherry-porgy).

Anthias margaritaceous Hilgendorf, Sitzb. Ges. Naturf. Fr., 1879, p. 78 (Japan, probably Sagami Bay).—Steindachner and Döderlein, Denkschr. Akad. Wien, vol. 47, 1883, p. 225, pl. 3, fig. 1 (Tokyo, exact locality not given, probably Sagami Bay).—Nyström, Svensk. Vet. Akad. Handl., vol. 13, pt. 4, No. 4, 1887, p. 5 (Nagasaki).—Ishikawa, Prel. Cat., 1897, p. 57 (Tokyo, Boshu).—Boulenger, Cat. Fishes, vol. 1, 1895, p. 327 (Tokyo).

(Coasts of Japan, in rather deep water.)

"Dorsal X, 17 or 18; anal III, 7 or 8; scales 4–42 to 45–15; lateral line 27 to 30. Depth of body 2½ times in total length; length of head 2⅘ to 3 times. Snout scaly, slightly convex, shorter than diameter of eye, which is 3 to 3½ times in length of head, and equals interorbital width; lower jaw projecting, partly scaled; maxillary scaly, extending to below center of eye, or slightly beyond, the width of its distal extremity three-fifths to two-thirds diameter of eye; two or three strong spines at angle of preopercle; three opercular spines; 23 gill-rakers on lower part of anterior arch. Dorsal originating above post-temporal; first and second spines shortest, third longest in the adult, nearly twice as long as the fourth and ending in a filament; no notch between spinous and soft portions; soft dorsal not deeper than spinous; third ray produced in a long filament. Pectoral nearly as long as head. Ventral as long as or a little shorter than pectoral, reaching anal. Anal spines strong, first shortest, second longest and strongest; anterior soft rays longest. Caudal deeply emarginate, crescentic, with the outer rays much produced and ending in long filaments. Lateral line forming an angle below the last dorsal rays. Color red, with two longitudinal series of mother-of-pearl spots on each side, and a streak

of the same color from below the eye to the base of the pectoral; base of dorsal brown or blackish; a black blotch may be present between the last four dorsal spines." (Boulenger.)

We have no specimens of this beautiful species. It is said to reach a length of 14 to 21 cm.

(*margaritaceus*, pearly.)

16. Genus PSEUDANTHIAS Bleeker.

Pseudanthias BLEEKER, Poissons Réunion et Madagascar, Ned. Tijds. Dierk., vol. 4, 1872, p. 156 (*pleurotænia*).

Zalanthias JORDAN and RICHARDSON, new subgenus (*kelloggi*).

Body oblong, moderately compressed; mouth large; canines moderate; tongue toothless; snout and maxillary scaly; preopercle serrate, the angle rounded, the teeth at angle enlarged in typical species, obsolete in the Japanese species; scales large ctenoid, lateral line passing gradually to the tail, not forming a sharp angle under the last rays of the dorsal; gill-rakers numerous, slender; third dorsal spine highest, dorsal fin with a slight notch, if any; caudal lunate, or subtruncate with produced lobes; anal short, with three spines; ventral fin not produced, inserted below pectorals; third dorsal spine, first or second soft ray and one or both lobes of caudal sometimes produced in filaments.

This genus differs from *Anthias* chiefly in the lack of distinct angle in the lateral line, and in the short ventral fin. The Japanese species, with the Hawaiian *Pseudanthias kelloggi*, differ from the East Indian species of *Pseudanthias* in having the angle of the preopercle rounded and entire, and in having the dorsal fin notched, the last spine of the dorsal being much shorter than the first ray. They may constitute a distinct subgenus, *Zalanthias*, of which *Pseudanthias kelloggi* may be taken as type.

(ψευδής, false; Anthias.)

28. PSEUDANTHIAS AZUMANUS Jordan and Richardson, new name.

AKAHATA (red flag).

Anthias japonicus DÖDERLEIN, in Steindachner and Döderlein, Denkschr. Akad. Wien, vol. 47, 1883, p. 227, pl. 3, fig. 2 (Tokyo, doubtless Sagami Bay).—NYSTRÖM, Svensk. Vet. Akad. Handl., vol. 13, pt. 4, No. 4, 1887, p. 5 (Nagasaki).—BOULENGER, Cat. Fishes, vol. 1, 1895, p. 328 (Bay of Tokyo). (Name preoccupied by *Anthias japonicus* Bloch, which is *Scolopsis japonica*).

Pseudanthias japonicus JORDAN and EVERMANN, Bull. U. S. Fish Comm., vol. 23, 1903, p. 227 (Sagami Bay).

(Coast of Southern Japan.)

Head 2.6; depth 2.5 to 2.6; depth of caudal peduncle 3 in head; eye 3.4; snout 3.6; interorbital space 1.5 in eye, scarcely convex; maxillary 2 in head; width of its extremity 1.6 in eye; dorsal X, 15; anal III, 7; scales 2 or 3–37 to 38–12. Oblong, compressed; back considerably

elevated; profile convex; snout pointed; mouth large, oblique; maxillary reaching vertical from back of pupil; lower jaw slightly projecting; a pair of small canines in upper and lower jaw at symphysis; a strong backwardly directed canine in each side of lower jaw anterior to its middle; tongue and entopterygoids toothless; nostrils subequal; border of preopercle rounded, finely denticulated; opercle with 3 flat points; gill-rakers 14, the longest about equal to the corresponding filaments. Scales ciliate, adherent; head entirely scaled, including mandibles, chin, and maxillaries; scaled encroaching on bases of soft fins but not of spinous dorsal; lateral line normally curved, not forming an angle under last dorsal rays. Dorsal originating very slightly in front of pectoral; dorsal spines strong, the fourth longest, 2 in head, the spines shortening backward, the last being only about half the height of the soft rays, the second of which is elongated and filamentous; caudal weakly emarginate, the upper rays produced, filamentous; anal spines strong, the second longest, 2.1 in head; ventrals inserted under pectorals, 1.5 in head; pectorals subsymmetrical, pointed, as long as head, reaching past base of anal. Color yellowish red, probably scarlet in life.

Of this species we have four specimens, 3 to 4 inches long, dredged in Sagami Bay. It lives in rather deep water.

(*Azuma*, a poetical name for Japan.)

17. Genus TOSANA Smith and Pope.

Tosana Smith and Pope, Proc. U. S. Nat. Mus., vol. 31, 1906, p. 470 (*niwæ*).

Body elongate, moderately compressed, with short, blunt head; dorsal single, without notch, the third spine much the longest, no rays filamentous; caudal crescentic, the lobes produced, upper lobe the longer; anal with the third spine longest; pectoral rays all undivided; scales large and strongly toothed, covering all parts of body and head; lateral line high, its tubes simple; no angle at base of caudal peduncle; preopercle with vertical limb evenly serrate, its lower margin entire; opercle with 3 flat spines; jaws with large, prominent, projecting canines; outer row of teeth in upper jaw canine-like, inner ones fine and villiform; teeth in lower jaw canine-like, in a single row; vomer and palatines with villiform teeth; tongue smooth; no supplemental maxillary; gill-rakers very long and slender; gill-membranes free from the narrow carinate isthmus. (Smith and Pope.)

This genus is said by the authors to differ from *Pseudanthias* Bleeker mainly in the unbranched pectoral rays and larger scales, and from *Pronotogrammus* Gill in the more posterior insertion of the ventrals, the closely scaled top of head, absence of preopercular spines, and dentition. It seems to be well separated from both, as also from *Dactylanthias*, which has likewise simple pectoral rays.

(*Tosa*, "brave youth," a province of Japan on the island of Shikoku, which includes Kochi and Urado.)

29. TOSANA NIWÆ Smith and Pope.

Tosana niwæ SMITH and POPE, Proc. U. S. Nat. Mus., vol. 31, 1906, p. 470, fig. 4 (Urado Bay, Province of Tosa).

(Coast of southern Japan.)

Head 3.65 in length; depth 3.62; eye 3 in head; snout 5; interorbital 3.5; dorsal X, 15; anal III, 7; scales in lateral line 35. Body elongate, compressed, its greatest depth about equal to length of head; dorsal outline but gently arched, the ventral nearly straight; peduncle compressed, its least depth 2 in head; snout short and blunt, its length equal to 0.66 diameter of eye; mouth oblique; maxillary reaching to below middle of pupil, the width of its distal end more than half diameter of eye; mandible projecting; teeth in upper jaw in two series, the outer canine-like, the inner in a villiform band;

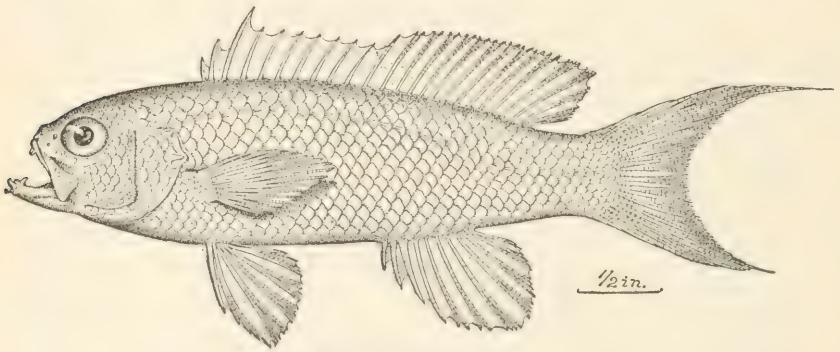

FIG. 16.—TOSANA NIWÆ.

on each side of the tip of the upper jaw one pair of long canines directed downward and another pair directed inward and backward; teeth in lower jaw a single row of canines, with 2 pairs of enlarged canines on each side of tip; a narrow band of small teeth on palatines, and a small patch on vomer; tongue smooth, pointed; preopercle with rounded angle, the upper limb serrate, the lower smooth; opercle with 3 flat spines, the middle longest; gill-rakers long and slender, 23 on lower limb of first arch; scales large, strongly toothed, fully covering body and head, about 6 rows on cheeks; lateral line high, concurrent with back, the tubules straight simple, and forming an obtuse angle under posterior end of dorsal fin; dorsal fin continuous, the third spine much the longest, half in head and nearly twice length of second, fourth to tenth subequal; soft rays of nearly equal length except last two, the longest considerably longer than third spine; anal shorter and deeper than soft dorsal; caudal deeply and evenly concave, the outer rays much produced, upper lobe longer;

pectorals and ventrals shorter than head. Color in alcohol rosy pink, lighter below; all fins yellowish. (Smith and Pope.)

At present known only from the type, a specimen 110 mm. long, collected in Urado Bay, in Tosa, in 1903.

(Named for H. Niwa, director of the Fishery Experiment Station at Kochi.)

SUMMARY.

Family SERRANIDÆ.

1. *Malakichthys* Döderlein, 1883.

1. *griseus* Döderlein, 1883; Sagami Bay.

2. *Diploprion* Kuhl and Van Hasselt, 1828.

2. *bifasciatus* Kuhl and Van Hasselt, 1828; Hakata, Wakanoura, Nagasaki.

3. *Lateolabrax* Bleeker, 1857.

3. *japonicus* (Cuvier and Valenciennes) 1828; Same, Matsushima, Tokyo, Yokohama, Chikugo River, Kagoshima, Nagasaki, Kobe, Hiroshima, Onomichi, Hakata, Tsuruga, Port Arthur.

4. *Niphon* Cuvier and Valenciennes, 1828.

4. *spinosus* Cuvier and Valenciennes, 1828; Misaki, Tokyo.

5. *Bryttosus* Jordan and Snyder, 1901.

5. *kawamebari* (Temminck and Schlegel), 1842; Yamagawa River, Funayado, Yobe R., Funayado.

6. *Stereolepis* Ayres, 1859.

6. *ischinagi* (Hilgendorf), 1878; Otaru, Hakodate, Tokyo, Yokohama, Misaki.

7. *Aulacocephalus* Temminck and Schlegel, 1842.

7. *temminckii* Blecker, 1857; Okinose, Misaki.

8. *Pikea* Steindachner, 1874.
§ *Pikea.*

8. *maculata* Steindachner and Döderlein, 1883.

§ *Labracopsis* Döderlein, 1883.

9. *japonica* Döderlein, 1883; Sagami Bay.

9. *Plectropomus* (Cuvier), Oken, 1817.

10. *maculatus* (Bloch), 1790.

10. *Epinephelus* Bloch, 1793.

11. *chlorostigma* (Cuvier and Valenciennes), 1828; Misaki, Wakanoura, Nagasaki.

12. *craspedurus* Jordan and Richardson, 1909; Kagoshima.

13. *megachir* (Richardson), 1846.

14. *akaara* (Temminck and Schlegel), 1842; Tsuruga, Hakata, Shimonoseki, Wakanoura, Hiroshima, Kobe, Onomichi, Nagasaki.

15. *fario* (Thunberg), 1792; Wakanoura, Nagasaki.

16. *latifasciatus* (Temminck and Schlegel), 1842.

17. *epistictus* (Temminck and Schlegel), 1842; Kagoshima, Nagasaki.
18. *morrhua* (Cuvier and Valenciennes), 1833; Tokyo.
19. *moara* (Temminck and Schlegel), 1842; Misaki, Wakanoura, Hakata, Nagasaki.
20. *awoara* (Temminck and Schlegel), 1842.
21. *septemfasciatus* (Thunberg), 1793; Misaki, Tokyo, Kobe, Tsuruga, Nagasaki.
22. *tsirimenara* (Temminck and Schlegel), 1842; Tokyo, Wakanoura, Nagasaki.

11. *Trisotropis* Gill, 1865.
§ *Archoperca* Jordan and Evermann, 1898.

23. *dermopterus* (Temminck and Schlegel) 1842; Wakanoura.

12. *Chelidoperca* Boulenger, 1895.

24. *hirundinacea* (Cuvier and Valenciennes), 1831; Suruga Bay, Sagami Bay.

13. *Sayonara* Jordan and Seale, 1906.

25. *satsumæ* Jordan and Seale, 1906; Kagoshima.

14. *Caprodon* Temminck and Schlegel, 1842.

26. *schlegelii* Günther, 1859; Misaki, Awa.

15. *Anthias* Bloch, 1792.
§ *Sacura* Jordan and Richardson, 1909.

27. *margaritaceus* Hilgendorf, 1879.

16. *Pseudanthias* Bleeker, 1872.
§ *Zalanthias* Jordan and Richardson, 1909.

28. *azumanus* Jordan and Richardson, 1909; Sagami Bay.

17. *Tosana* Smith and Pope, 1906.

29. *niwæ* Smith and Pope, 1906.

ON OLIVINE-DIABASE FROM DAVIDSON COUNTY, NORTH CAROLINA.[a]

By Joseph E. Pogue,

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Introduction.—The terms "basalt" and "diabase" have been employed with varying significance in this country and abroad. By diabase, as used herein, is meant a basic igneous rock, composed predominantly of plagioclase and augite, having ophitic texture, and occurring in dikes or intrusive sheets. Where olivine is present as an essential constituent the rock is termed an olivine-diabase.

Olivine-diabase, though by no means a rare rock, has not the wide distribution of the olivine-free members of the diabase family. In the United States it has been described, in more or less detail, as occurring at St. George (5),[b] Kennebunkport (12), Addison Point and Vinalhaven (18), Maine; in the Lake Champlain region (13); at Deerfield (7) and Cape Ann (22), Massachusetts; among the Thousand Islands, in the St. Lawrence River (24); in the Palisades of the Hudson, in New Jersey (16, 17); in Culpeper (1), Floyd (27), and Pittsylvania (28) counties, and near Harrisonburg (4), Virginia; in Rowan (14) and Davidson (21) counties, North Carolina; in Lee County, near Gold Hill, Alabama (2); in the Diablo and Van Horn mountains of Texas (19); near Pilot Knob and Iron Mountain, Missouri (10); in Minnehaha County, South Dakota (3); at Pigeon Point, Cook County, Minnesota (6), and a number of localities near Brule River and Duluth (26); in the Marquette iron-bearing district of Michigan (25) and the Penokee series of Michigan and Wisconsin (11); in California, near San Luis (8) and in the San Francisco peninsula (15); in Kittitas County, Washington (23); and in Alaska near

[a] The data for the present paper are taken largely from a report, by the writer, on the Cid mining district of Davidson County, North Carolina, which is now in press and will appear as Bulletin No. 21 of the North Carolina Geological Survey. For this privilege the author is indebted to the courtesy of Dr. Joseph Hyde Pratt, the state geologist.

[b] The numbers in parentheses refer to the bibliography at the end of the article.

Stepovak Bay (20).[a] The majority of these descriptions are very brief; some include petrographic details, but very few contain such important essentials as chemical or mineralogical composition. Most of the occurrences, too, represent rocks more or less changed by alteration.

In view of the above considerations, a detailed quantitative description of an olivine-diabase of exceptional freshness and unusual richness in olivine is herein given. The material is represented in the U. S. National Museum collections by deposit No. 77422.

Field occurrence.—Olivine-diabase occurs in Davidson County, North Carolina, in the form of dikes which cut a series of ancient volcanic rocks. This series includes slate, acid tuffs and breccias, rhyolite, dacite, andesitic tuffs and breccias, andesite, and dikes of gabbro and diabase, and is a part of a broad band of volcano-sedimentary rocks, called the "Carolina slate belt," which crosses the State in a northeast-southwest direction, forming an important part of the Piedmont Plateau. The dikes are uniformly, though not abundantly, distributed, and show upon the surface as narrow lines of rounded, yellowish bowlders, locally called "nigger-heads." They vary in size from a few feet in width and a few yards in length to a hundred feet in width and over a mile in length. The majority conform to the former rather than to the latter dimensions. In trend they also vary, but the more common directions are included between N. 30° E. and N. 30° W.

The olivine-diabase is doubtless of Triassic age, for dike rocks of similar character have a widespread occurrence throughout the Piedmont Plateau, and in many places may be traced into areas of Triassic sandstone.

Megascopic description.—The olivine-diabase is a massive, fine-grained, dark-blue rock, with a faint purplish tinge and a more or less waxy luster. To the unaided eye it appears a closely knit aggregate of dark-colored minerals, showing numerous small crystal faces. With the hand lens it is possible to recognize occasional striated feldspars, and to distinguish from these the darker-colored ferromagnesian constituents. The augite and olivine, however, can not be differentiated; this is notable in view of the fact that the latter mineral comprises nearly one-fifth of the rock.

Microscopic description.—The microscope reveals the following minerals, named in the probable order of their formation: Iron ore, olivine, plagioclase, and augite. (See pl. 37.)

[a] Many of the rocks along the Atlantic coast formerly described as "trap," under present usage would be termed olivine-diabase; but an attempt to differentiate these would involve too long a discussion for the present purpose.

The feldspar is basic labradorite, possibly running into bytownite, and makes up about 45 per cent of the rock. It occurs in long, slender laths of subhedral habit. The albite twinning is universal, in combination with which is occasionally found a Carlsbad twin. Zonary structure is not pronounced. Inclusions consist of small particles of iron ore and rare shreds of biotite. The alteration of the feldspars is insignificant.

Augite, the most common ferromagnesian constituent, forming about 35 per cent of the rock, is pale green in color and nonpleochroic. It rarely shows crystal outline, but surrounds and incloses the feldspars, forming a matrix in which they are arranged at random. Iron ore occurs as inclusions, and the alteration product, of which there is little, is a pale green, scaly mineral, probably antigorite.

Olivine is present to the extent of about 17 per cent, and forms rounded crystals or grains of a very pale color. It includes particles of iron ore, and is partly changed to talc instead of serpentine, the more common alteration product of olivine. This mode of decomposition differs from the more usual form in that the change is not confined to the cracks of the mineral, but proceeds independently of these, often beginning within the crystal, and is not necessarily accompanied by the segregation of iron ores. The formation of talc from olivine is very unusual in an olivine-diabase, though among the Appalachian peridotites this mode of alteration, termed "steatitization," is stated to be comparable to serpentinization.[a]

The iron ores are abundantly scattered through the rock, but prefer the company of the ferromagnesian minerals, particularly olivine. They occur in both grains and specks, and rarely show good crystal outline.

Texture.—The diabase forms an excellent example of the ophitic texture; that is, the feldspars are long, slender laths, arranged at random, and around these the augite is molded. The olivine mostly holds its own form against that of the plagioclase, but in some cases it includes, or partly includes, a feldspar lath. Thus it appears that the olivine in part crystallized previous to the feldspars, and in part the crystallization was simultaneous.

Mineral composition or mode.—The percentage of the actual mineral components was determined according to the Rosiwal method,[b] by measuring with a micrometer the diameters of each crystal in lines across the thin section. The feldspar, augite, olivine,

[a] J. H. Pratt and J. V. Lewis, Corundum and the peridotites of western North Carolina, N. C. Geol. Survey, vol. 1, 1905, pp. 121–123.

[b] Rosiwal, Verh. Wien Geol. Reichs-Anst., vol. 32, 1898, p. 143 ff. See Cross, Iddings, Pirsson, Washington, The quantitative classification of igneous rocks, 1903, p. 204.

and magnetite could be accurately determined. No allowance was made for the small amount of alteration products present, for the magnetite being in part ilmenite, nor for a slight proportion of orthoclase doubtless associated with the plagioclase. The error arising from these sources was not considered sufficient to materially affect the result. The average size of grain was found to be 0.17 mm. and a total distance of 32.30 mm. was traversed, with the results given in the table:

Mineral composition or mode of olivine-diabase.

Ratio of volumes.	Specific gravity.	Ratio of weights.	Mode.
1,655×	2.72	=4,502	=45.6 per cent plagioclase.
1,025×	3.4	=3,485	=35.3 per cent augite.
515×	3.34	=1,720	=17.4 per cent olivine.
35×	5	= 175	=1.8 per cent magnetite.

By giving definite values to the mineral components, the chemical composition may be calculated from the mode. The plagioclase was estimated to be Ab_1An_3; to the augite was assigned the composition obtained for this mineral in an olivine-hypersthene diabase from Culpeper County, Virginia;[a] for olivine, an analysis of this mineral from Montarville,[b] Montreal, Canada, was taken. Magnetite was given its theoretical value. The results are shown in the following table:

Chemical composition of olivine-diabase calculated from its mode.

	Feldspar.	Augite.	Olivine.	Magnetite.	Total.
SiO_2	22.5	17.4	6.5	.....	46.4
Al_2O_3	14.9	3.2	.....	.....	18.1
Fe_2O_3	.....	.1	.....	1.2	1.3
FeO	.....	3.2	3.9	.6	7.7
MgO	.....	5.2	6.9	.....	12.1
CaO	7.0	5.8	.....	.....	12.8
Na_2O	1.3	.2	.....	.....	1.5
K_2O	.....	.1	.....	.....	.1
Total	45.7	35.2	17.3	1.8	100.0

Chemical composition.—The chemical analysis of the olivine-diabase is given in column I of the following table. Columns II and III include the average compositions of olivine-diabase and normal diabase as obtained from a large number of reliable analyses: In parentheses accompanying these two columns are shown the limits for each component. The analyses of two related rocks are added for comparison in columns IV and V.

[a] Bull. Geol. Soc. Am., vol. 2, 1891, p. 344.

[b] Amer. Jour. Sci., vol. 29, 1860, p. 283.

Analyses of olivine-diabase and related rocks.

	I.	II.		III.		IV.	V.
		Average.	Extremes.	Average.	Extremes.		
SiO_2	47.66	50.14	(52.7–39.64)	51.34	(58.28–46.52)	46.63	45.73
Al_2O_3	19.24	14.35	(18.86–10.62)	15.53	(21.79–10.60)	14.40	13.48
Fe_2O_3	1.83	5.60	(10.43– 1.11)	4.12	(12.36– .15)	2.85	11.60
FeO	8.67	5.66	(9.66– 2.85)	7.20	(13.62– 2.71)	8.06	not det.
MgO	10.79	7.56	(13.05– 5.09)	6.13	(12.73– 1.30)	7.25	15.40
CaO	9.91	10.83	(11.94– 9.68)	8.98	(14.70– 2.86)	9.28	9.92
Na_2O	1.14	2.93	(5.95– 1.17)	2.87	(4.74– .97)	2.47	3.24
K_2O	.26	.93	(3.09– .23)	1.09	(3.75– .04)	.70	.47
H_2O	.06	1.14	(2.56– .14)	1.46	(5.58– .00)	etc.	.94
Total	99.56						100.78

I. Chemical analysis of olivine-diabase from near Fairmont, Davidson County, North Carolina. A. S. Wheeler, analyst.

II. Average and extreme values of 9 analyses of olivine-diabase appearing in Washington's Tables. Includes all analyses of olivine-diabase marked "superior." From Chemical analyses of igneous rocks published from 1884 to 1900, U. S. Geol. Survey, Prof. Paper No. 14, 1903; and The superior analyses of igneous rocks from Roth's Tabellen, 1869 to 1884, U. S. Geol. Survey, Prof. Paper No. 28, 1904.

III. Average and extreme values of 62 analyses of diabase appearing in Washington's Tables. Includes all "superior" analyses of normal diabase.

IV. Chemical analysis of diabase (auvergnose), Mount Ascutney, Vermont. W. E. Hillebrand, analyst. From U. S. Geol. Survey, Bull. No. 148, 1897, p. 70.

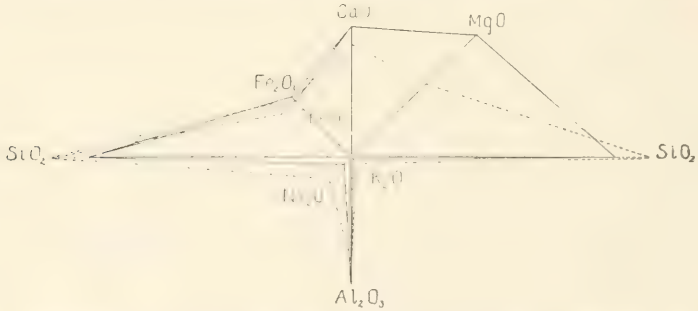
V. Chemical analysis of olivine-diabase from Pittsylvania County, Virginia. T. L. Watson, analyst. From Amer. Geol., vol. 22, 1898, p. 87.

Discussion of the chemical composition. Comparing first column I of the above table with the results obtained in the preceding table, it will be seen that the composition as derived by microscopic determination is in pretty fair accord with the more exact results of the chemical analysis. The chief points of difference lie in the rather high amounts of magnesia and lime present in the former. This discrepancy must be attributed chiefly to the values assumed for the variable components, augite and olivine; that the first was too calcic and the second too high in magnesia. The microscopic analysis is sufficiently accurate to be of value in classifying the rock, inasmuch as its position in the quantitative system is the same, whether calculated from the chemical or microscopic analysis.

Turning now to a comparison of the chemical analysis of the rock described (I) with the average composition of olivine-diabase (II) and normal diabase (III), the following features appear regarding the Davidson County olivine-diabase: Low in silica; high in alumina; ferric iron low; ferrous iron fairly high; magnesia high; lime a little high; alkalies a bit low. The rock is consequently extremely basic, due chiefly to the large amount of olivine present. The high percentage of alumina indicates a very aluminous augite, low in calcium. The olivine is judged to be fairly high in ferrous iron. By a comparison with the extreme values for each component given in parentheses the relations of the rock under discussion are still more accurately brought out, particularly in regard to those components, i. e., alumina and magnesia, which approach most closely the extremes.

The accompanying figure represents graphically the relationships brought out by columns I and III of the preceding table.

A few words may be added in regard to the method here used of comparing the composition of a described rock with composite analyses. Usually it is customary, in quoting an analysis, to include for comparison several analyses of related rocks. The analyses selected are apt to be those which correspond most closely with the rock described. Occasionally, however, a dissimilar analysis may be inserted, or a series of analyses ranging from a close approximation to an extreme of the same type; but in any case the chief feature brought out is whether the individual occurrence is like or unlike other individual occurrences, and unless one has a sufficient working knowledge of analyses to visualize an average the exact quantitative relation of a member of a type to that type does not completely



GRAPHIC REPRESENTATION OF THE CONSTITUENTS OF THE OLIVINE-DIABASE DESCRIBED (SOLID LINES) AND THE AVERAGE NORMAL DIABASE (DASH LINES).

appear. Now that Washington's admirable collections of rock analyses are available, and in these the reliable analyses are grouped, it is a matter of little difficulty to determine, by averaging, the composition of any rock type desired, and in doing this to note the extreme values, both low and high, for each component. A column thus obtained, including the average and extreme values for each component, serves well in determining the significance of each constituent, and the analysis as a whole, of any rock under discussion. The use of extreme values must be made with caution, however, as such values are more likely than normal values to be the result of some error in analysis.

Certain differences between a composite olivine-diabase and a composite normal diabase may be observed in columns II and III, but a discussion of these does not come within the province of the present paper.

Classification in the quantitative system.[a]—From the chemical analysis of the rock previously given, its position in the quantitative system may be determined by calculation of the norm, as follows:

Calculation of the norm of kedabekase (olivine-diabase).

	Analysis.	Molecular ratio.	Or.	Ab.	An.	Mg.	Di.	Ol.	Hy.
SiO_2	47.66	0.794	18	108	334	.....	20	55	259
Al_2O_3	19.24	.188	3	18	167	.....	.....	.....	.....
Fe_2O_3	1.83	.011	.....	.....	.....	11	.....	.....	.....
FeO	8.67	.121	.....	.....	.....	11	3	32	75
MgO	10.79	.269	.....	.....	.....	.....	7	78	184
CaO	9.91	.177	.....	.....	167	.....	10	.....	.....
Na_2O	1.14	.018	.....	18	.....	.....	.....	.....	.....
K_2O	.26	.003	3	.....	.....	.....	.....	.....	.....
H_2O	.06	.....	.....	.....	.....	.....	.....	.....	.....

Or	1.67	
Ab	9.43	57.53
An	46.43	
Di	2.26	
Hy	28.30	41.89
Ol	8.78	
Mg	2.55	
H_2O	.06	
	99.48	

Class, $\frac{Sal}{Fem}=\frac{57.53}{41.89}=1.3=$III, salfemane.

Order, $\frac{Q}{F}=\frac{0}{57.53}=0=$perfelic=5, gallare.

Rang, $\frac{K_2O+Na_2O}{CaO}=\frac{21}{167}=.12=$percalcic=5, kedabekase.

Subrang, not needed.

Weathering.—The olivine-diabase is not very susceptible to superficial alteration. Where cut by joint planes, however, it forms concentrically weathered bowlders with a yellow or rust-colored exterior. This coating of clay-like material stained with iron oxide is only a very small fraction of an inch in thickness, and beneath is revealed the fresh rock. The soil resulting from the complete decomposition of these bowlders is a rust-colored clay with very little grit.

LITERATURE ON OLIVINE-DIABASE OCCURRING IN THE UNITED STATES.[b]

1. CAMPBELL, H. D., and BROWN, W. G. Composition of certain igneous rocks of Virginia.

Bull. Geol. Soc. Am., vol. 2, 1891, pp. 339–347.

Gives the chemical composition of an olivine-hypersthene diabase from Culpeper County, Virginia.

[a] As proposed by Cross, Iddings, Pirsson, and Washington in 1903. For explanation of this method of classification the reader is referred to their book, The Quantitative Classification of Igneous Rocks.

[b] This bibliography is not intended to be exhaustive. It contains, however, the most important articles, in which are included petrographic or chemical descriptions of olivine-diabase. There are references to no less than several hundred articles on "trap rock" in the so-called Newark series alone (see I. C. Russell, The Newark System, Bull. No. 85, U. S. Geol. Survey, 1892), and many of these are what would now be termed olivine-diabases.

2. CLEMENTS, J. M. Notes on the microscopic character of certain rocks from northeast Alabama.
Ala. Geol. Survey, Bull. No. 5, 1896, pp. 133–176.
Gives a brief description of an olivine-diabase from Gold Hill in Lee County.

3. CULVER, G. E., and HOBBS, W. H. On a new occurrence of olivine-diabase in Minnehaha County, South Dakota.
Trans. Wisc. Acad., vol. 8, 1892, p. 206.
Describes briefly a somewhat altered olivine-diabase.

4. DARTON, N. H., and DILLER, J. S. Occurrence of basalt dikes in the upper Paleozoic of Appalachian Virginia.
Amer. Jour. Sci., vol. 39, 1890, p. 269.
Mentions the occurrence of an olivine-diabase near Harrisonburg.

5. DICKERMAN, Q. E., and WADSWORTH, M. E. An olivine-bearing diabase from St. George, Maine.
Boston Soc. Nat. Hist., vol. 23, p. 28.
Very brief description.

6. DILLER, J. S. The educational series of rock specimens collected and distributed by the United States Geological Survey.
U. S. Geol. Survey, Bull. No. 150, 1898, pp. 274–278.
Includes a description, with chemical analysis, of an olivine-diabase, formerly described as an olivine-gabbro, from Pigeon Point, Cook County, Minnesota. Contains about 10 per cent olivine.

7. EMERSON, B. K. The Deerfield dyke and its minerals.
Amer. Jour. Sci., vol. 24, 1882, pp. 195–202; 270–278; 349–359.
Olivine is uniformly present.

8. FAIRBANKS, H. W. San Luis Folio, California.
U. S. Geol. Survey, Geol. Atlas of U. S., folio No. 101, 1904, p. 7.
Describes diabase exceptionally rich in olivine; this is often the most important constituent. Rock is generally much decomposed.

9. HAWES, G. W. On a group of dissimilar eruptive rocks in Campton, New Hampshire.
Amer. Jour. Sci., vol. 17, 1879, pp. 147–151.
Includes brief description of an "olivine-diabase." This rock is now regarded (Rosenbusch) as a camptonite.

10. HAWORTH, E. A contribution to the Archæan geology of Missouri.
Amer. Geol., vol. 1, 1886, pp. 280–363.
Dikes of olivine-diabase of Archæan age occur in the vicinity of Pilot Knob and Iron Mountain. Rock is very fresh.

11. IRVING, R. D., and VAN HISE, C. R. The Penokee Iron-bearing series of Michigan and Wisconsin.
U. S. Geol. Survey, Mon. 19, 1892, pp. 350–354.
Olivine is present in comparatively few of the diabases. In one case is very abundant.

12. KEMP, J. F. Trap dikes near Kennebunkport, Maine.
Amer. Geol., vol. 5, 1890, p. 129.
Describes briefly an olivine-diabase.

13. KEMP, J. F., and MARSTERS, V. F. The trap dikes of the Lake Champlain region.
U. S. Geol. Survey, Bull. No. 107, 1893, pp. 28–29.
Olivine occurs in a few dikes, and what may be an alteration product of it is present in others.

14. LANEY, F. B. The Gold Hill Mining District of North Carolina.
Bull. N. C. Geol. Survey (in press).
Describes olivine-diabase from Rowan County.

15. LAWSON, A. C. Sketch of the geology of the San Francisco peninsula.
U. S. Geol. Survey, 15th Ann. Rept., 1895, pp. 405–476.
Describes briefly typical olivine-diabase which probably represents small dikes.

16. LEWIS, J. V. Petrography of the Newark igneous rocks of New Jersey.
Ann. Rept. Geol. Sur. N. J., 1907, pp. 97–167.
Includes a detailed description of olivine-diabase from the Palisades in New Jersey, with analyses, diagrams, photomicrographs, etc.

17. ——— The Palisade diabase of New Jersey.
Amer. Jour. Sci., vol. 26, 1908, pp. 155–162.
Olivine-diabase containing 15 to 20 per cent olivine occurs in a ledge 10 to 20 feet thick, which extends along the Palisades northward from Jersey City for 20 miles.

18. MERRILL, G. P. On the collection of Maine building stones in the U. S. National Museum.
Proc. U. S. Nat. Mus., vol. 6, 1883, pp. 176–177.
Brief description of olivine-diabase quarried at Addison Point and Vinalhaven. Olivine frequently much altered to serpentine.

19. OSANN, A. Report on the rocks of Trans-Pecos, Texas.
Tex. Geol. Survey, 4th Ann. Rept., 1893, pp. 123–138.
Petrographic characters of an olivine-diabase from the Diablo Mountains. Olivine is very fresh. Similar rock occurs in the Van Horn mountains.

20. PALACHE, C. Geology about Chichagof Cove, Stepovak Bay, with notes on Popof and Unga islands.
Harriman Alaska Exp., vol. 4, 1904, pp. 69–88.
Mentions a few "olivine-diabase" dikes. No olivine present, but serpentine resulting from it.

21. POGUE, J. E. Geology and structure of the ancient volcanic rocks of Davidson County, North Carolina.
Amer. Jour. Sci., vol. 28, 1909, pp. 229–230.
Includes brief account of the olivine-diabase here described in detail.

22. SHALER, N. S. Geology of Cape Ann.
U. S. Geol. Survey, 9th Ann. Rept., p. 609.
Olivine present in one dike.

23. SMITH, G. O. (*In* Analyses of rocks).
U. S. Geol. Survey, Bull. No. 168, 1900, p. 225.
Chemical analyses of olivine-diabase from Kittitas County, Washington.

24. SMYTH, C. H., Jr. A group of diabase dikes among the Thousand Islands, St. Lawrence River.
Trans. N. Y. Acad. Sci., vol. 13, 1894, pp. 209–214.
"Olivine is an important constituent of a part of the dikes, is present in small amount in others, and is absent in about half."

25. VAN HISE, C. R., and BAYLEY, W. S. The Marquette iron-bearing district of Michigan.
U. S. Geol. Survey, Mon. 28, 1897.
Mentions the occurrence of fresh olivine-diabase. No petrographic description.

26. WADSWORTH, M. E. Peridotytes, gabbros, diabases, and andesites of Minnesota.
Minn. Geol. Survey, Bull. No. 2.
Describes briefly many olivine-diabases in which the olivine is more or less altered.

27. WATSON, T. L. The occurrence of nickel in Virginia.
Am. Inst. Min. Eng., Bull. No. 17, 1907, pp. 829–843.
Very brief description of dikes of olivine-diabase in Floyd County.

28. ——— Weathering of diabase near Chatham, Virginia.
Am. Geol., vol. 22, 1898, p. 87.
Gives analyses of three olivine-diabases, two of which are not fresh.

29. ——— Mineral resources of Virginia, pp. 36–37.
Includes summary of articles on olivine-diabase in Virginia.

EXPLANATION OF PLATE 37.

UPPER FIGURE. Olivine-diabase from Davidson County, North Carolina. A photomicrograph in ordinary light, magnified about 20 diameters. Section shows plagioclase laths, augite, and olivine; the last altering to talc. The ophitic texture is well illustrated.

LOWER FIGURE. Olivine-diabase from Davidson County, North Carolina. A photomicrograph in polarized light, with crossed nicols, magnified about 20 diameters. Shows twinned plagioclase, augite, and grains of olivine.

PHOTOMICROGRAPHS OF SECTIONS OF OLIVINE-DIABASE.

FOR EXPLANATION OF PLATE SEE PAGE 484.

THE SNAPPING SHRIMPS (ALPHEIDÆ) OF THE DRY TORTUGAS, FLORIDA.

By Henri Coutière,

Of the École Supérieure de Pharmacie, Paris, France.

The Alpheidæ collected by Dr. J. F. McClendon at the Tortugas, Florida, in the course of his study of the habits of crustaceans during the summer of 1908, are referable to eight different forms, including one new species and one new subspecies. They are as follows:

ALPHEUS FORMOSUS Gibbes.

ALPHEUS CRISTULIFRONS Rathbun.

ALPHEUS ARMILLATUS H. Milne Edwards.

This species, one of the most abundant and the most widely distributed on the American coast, very often accompanies *A. heterochælis*. It has nearly always been confused with that species, perhaps by Say himself. So far as I know, the types of *A. heterochælis* no longer exist, but those of *A. armillatus* H. Milne Edwards are in the museum at Paris and permit the differentiation of the two forms almost with certainty.

A. heterochælis has a rostrum with rounded borders, and the rostro-orbital depressions are not definitely limited behind, but gradually join the carapace. Furthermore, the small claw of the male is armed with longitudinal crests furnished with hairs on the movable finger. The claw suggests the beak of *Balæniceps* (the Whale-headed Stork of Africa), following the comparison of Hilgendorf.

In *A. armillatus* the rostrum has the form of a sharp crest which widens abruptly into a triangular space. The concave borders of this triangle very distinctly limit the rostro-orbital depressions behind and even slightly overhang them in the adult specimens. Lastly the small claw of the male is never comparable to the beak of *Balæniceps*. The specimen collected by Doctor McClendon is a young male in which the typical form of the rostrum is little marked. The hooks terminating the third, fourth, and fifth feet are also longer than in the adult.

?ALPHEUS CANDEI Guérin.

Guérin's type was from Cuba. The figure and description which he gives, although insufficient, apply to the specimens from Tortugas with singular accuracy. The form of the frontal border, sinuous between the spinous orbital arches and the rostrum, the proportion of the articles of the antennule, the stylocerite, the spine of the basicerite, the relative proportions of the two pairs of antennæ, of the carpocerite and of the scaphocerite; all these details agree with the figure and the description of *A. candei*. The stylocerite is, however, a little shorter in the specimens from Tortugas. In the drawing by Guérin the scale of the scaphocerite is not distinct, but this inaccuracy may be explained by the long slender form of the scale, the internal border of which is in the prolongation of the strong lateral spine.

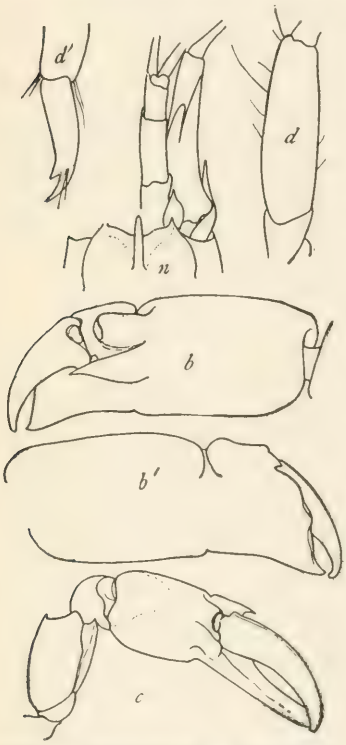


FIG. 1. ALPHEUS CANDEI. *b*. INFERO-EXTERNAL SURFACE OF LARGE CHELA. *b'*. SUPERO-INTERNAL SURFACE OF LARGE CHELA. *c*. SMALL CHELA. *d*. MEROPODITE OF THIRD FOOT. *d'*. DACTYL OF FIFTH FOOT. *n*. ANTERIOR REGION.

The large chela has its lower border scarcely interrupted by constriction and the inferior margin of the article may be called almost straight as in Guérin's description. Also the meropodites of the third pair are unarmed. Unfortunately the single specimen collected by Doctor McClendon has only one member intact, a foot of the fifth pair, showing the bifid dactyl. The third pair is represented on but one side and there only by the meropodite. It is therefore impossible to ascertain whether the second pair is, as Guérin says, much longer than the following. But that is a common character in the "*megacheles*" group of species. Consequently, I am strongly inclined to believe that Doctor McClendon has found Guérin's species in Florida.

SYNALPHEUS MINUS (Say).

SYNALPHEUS TOWNSENDI SCAPHOCERIS, new subspecies.

I consider this form a new subspecies of *S. townsendi* Coutière which differs from the type form in the following points: The carpocerite surpasses the antennule by half its distal article. The scaphocerite has a very broad scale, only 3.8 times as long as wide, this proportion reaching 6 in *S. townsendi*, 5 in the form *brevispinis*. The stylocerite

reaches the extremity of the median antennular article. The anterior palmar border of the large chela is unarmed. Lastly the posterior border of the telson is very convex, and the spines at the angles are shorter than in typical *S. townsendi*. These last three characters connect the new form with *S. townsendi brevispinis* from Lower California.

Type-specimen.—Cat. No. 40019, U.S.N.M., from the Dry Tortugas, Florida, collected by J. F. McClendon.

FIG. 2.—SYNALPHEUS TOWNSENDI SCAPHOCERIS. *a*. CARPOCERITE. *n*. ANTERIOR REGION. *t*. TELSON.

SYNALPHEUS BROOKSI Coutière.

Lives in the loggerhead sponge and nowhere else, according to Doctor McClendon.

SYNALPHEUS MCCLENDONI, new species.

This species is very like *S. sanctithomæ* Coutière, from which it is distinguished by the following characters: The stylocerite reaches the extremity of the basal antennular article. The spine of the scaphocerite is very stout, wider than the scale, and slightly overreaches the antennule. The scale does not exceed the middle antennular article. The carpocerite is at least 5 times as long as wide. The large claw is more slender and the fingers more elongated than in *S. sanctithomæ*. The thickness of the palm is scarcely greater than the length of the fingers, while the proportion is equal to 1.28 in the species cited. Furthermore, the fingers are curved inward, and flattened, crossing at their extremities. The upper border of the palm is terminated by a sharp and regularly conical spine. The telson is wide at its extremity; its posterior border is contained only 2.8 times in its length, instead of 4.7 times in *S. sanctithomæ*.

FIG. 3.—SYNALPHEUS MCCLENDONI. *a*. CARPOCERITE. *b*. LARGE CHELA. *c*. SMALL CHELA. *d*. THIRD FOOT. *n*. ANTERIOR REGION.

This species belongs very near the form which I described as *S. longicarpus approxima*, but it differs from it in the shape of the large chela, in the meropodite, the supero-external border of which is unarmed and regularly rounded, and in the telson, which is broader at the extremity.

Type-specimen.—Cat. No. 40018, U.S.N.M., from the Dry Tortugas, Florida, collected by J. F. McClendon.

SOME BEES OF THE GENUS AUGOCHLORA FROM THE WEST INDIES.

By T. D. A. Cockerell,
Of the University of Colorado, Boulder.

The most recent catalogues of West Indian bees are those by Friese, in Zeitschrift für Hymenopterologie und Dipterologie, 1902, and in the Zoologische Jahrbücher for 1908. The 1902 list covers the Greater Antilles, and includes six species of *Augochlora*, of which one (*A. parva* Cresson) has been transferred by Baker to the *Chloralictus* section of *Halictus*. The number six is nevertheless maintained, as I have added a species (1909) from Jamaica, *A. jamaicana*. The 1908 list includes the species of the Lesser Antilles, and cites five species of *Augochlora*, the information being derived from Ashmead's paper in the Transactions of the Entomological Society of London, 1900. By some accident *A. alcyone* Smith, from Santo Domingo, is omitted from Friese's 1902 list. Following Ashmead, three of the species of the Greater Antilles are said to extend to St. Vincent. The whole West Indian list, with type-localities, stands as follows:

A. decorata (Smith). Jamaica (female).
A. præclara Cresson. Cuba (female).
A. regina Smith. Jamaica (female).
A. elegans Cresson. Cuba (male).
A. jamaicana Cockerell. Jamaica (female).
A. magnifica Cresson. Cuba (male).
A. alcyone Smith. Santo Domingo (female).
A. cyaneoviridis Ashmead. St. Vincent (female, male).
A. claviventris Ashmead. St. Vincent (male).

A. nigromarginata (Spinola), the *graminea* of authors, is reported by Friese from Trinidad, but this island has a South American fauna.

I have examined Smith's types at the British Museum, and ascertained that all three belong to the group with the hind spur of the hind tibia simple, or appearing so under an ordinary lens. The same is true of *A. jamaicana*. Having some doubts about Ashmead's determination of the St. Vincent species, I asked Mr. S. A. Rohwer

to examine them. This he kindly did, and, finding my doubts apparently confirmed, sent them on, with other West Indian material, for investigation. The present paper presents the results, all the species described being in the U. S. National Museum.

1. Group VIBRISSATI.

This group, so abundantly represented on the mainland, seems to be wholly absent in the West Indies.

2. Group SERICEI.

A single species, very close to the abundant South American *A. nigromarginata*.

AUGOCHLORA PISCATORIA, new species.

Brilliant blue-green, the abdomen in the male becoming a pure purple-blue; smaller than *A. nigromarginata*, the length of the anterior wing about 6¾ mm. (in *nigromarginata* 8 to 9½); hind spur with four stout spines (six in *nigromarginata*, according to a specimen in the British Museum, but four on one side and five on the other in a Brazilian specimen from Smith's collection); male with last antennal joint hooked, and large fish-tail process, covered with white pubescence, arising from beneath margin of third ventral abdominal segment. The female, compared with *A. nigromarginata* from Brazil, is much bluer, with much shorter and scantier hair on the head and thorax, and the abdomen is very shiny and feebly punctured, this being especially noticeable on the first segment, although in the male this is strongly punctured. The wings in both sexes are very dusky and strongly reddish; the first recurrent nervure enters the base of the third submarginal cell, or joins the second transverso-cubital a little on the outer side. The more ample wings of *A. nigromarginata* are by no means so dark. The short hair of the head (except the cheeks) and dorsum of thorax is nearly all black or dark fuscous in both sexes; in *A. nigromarginata* it is much less so. The tegulæ are considerably darker than in *A. nigromarginata*. The hind margins of the abdominal segments, as in *nigromarginata*, are black. One of the males is unusually large and blue, but evidently conspecific.

Habitat.—St. Vincent, West Indies (*H. H. Smith*); 11 females, 7 males. This is evidently an insular representative of *A. nigromarginata*, sufficiently differentiated to be considered a distinct species. It is, I suppose, the insect reported by Ashmead as *A. regina*.

According to Vachal, the Mexican *A. binghami* Cockerell (male) is the same as *A. nigromarginata*. It is certainly very closely allied, but it differs from both *nigromarginata* and *piscatoria* by having the mandibles dark, and only the upper half of the labrum pallid. The male flagellum of *binghami* is obscurely reddish beneath; in *nigro-*

marginata it is fulvous; but in *piscatoria* it is black. The tarsi of *binghami* are black, of *nigromarginata* (male) more or less testaceous, as also in *piscatoria*. The fish-tail structure of *binghami* is covered with dark brown hair.

Type-specimen.—Cat. No. 12868, U.S.N.M.

3. Group OXYSTOGLOSSI.

In this group the hind spurs appear simple under a lens; with a compound microscope they are seen, in the species before me, to be minutely serrate. This is the dominant and characteristic group of the West Indies.

AUGOCHLORA VINCENTANA, new species.

Female.—Length about 5½ to 6 mm., brilliant bluish-green, varying to almost entirely blue; head and thorax minutely and densely punctured, with short but rather abundant pubescence, white on cheeks and pleura, pale yellowish dorsally; sides of face with hoary white pubescence, contrasting with the convex little-hairy supraclypeal region, which also is yellowish-green, the adjacent parts on each side being bluish-green; head rather large; eyes very deeply emarginate; antennæ dark, or flagellum dull red beneath; lateral ocelli tilted, so that seen from above they appear oval; clypeus rather densely punctured, its lower margin broadly blackened; mandibles ferruginous, blackened at apex and base, and with a small inner tooth; metathorax shining, the basal area with extremely fine longitudinal striæ, bordered behind by a shining rim; with a compound microscope it can be seen that these striæ are vermiform and irregular except laterally, that the shining rim has an extremely delicate reticulation, and that the much bluer posterior part of metathorax is quite closely punctured, the punctures of very different sizes; scutellum densely punctured like the mesothorax; tegulæ shining rufopiceous, pallid exteriorly in front; wings reddish-hyaline, stigma and nervures dark brown; second submarginal cell not especially narrow, receiving the first recurrent nervure very near its apex; knees, tibiæ, and tarsi clear ferruginous, with yellowish-white hair; femora variable from nearly all black or fuscous to nearly all ferruginous; hind coxæ blue-green; hind spur microscopically serrate, the teeth pale; abdomen shining, very feebly sculptured, the hind margins of the segments very narrowly blackish; no vibrissæ; at extreme base of second segment there is a minute fringe of white cilia; venter piceous, the hind margins of the segments narrowly testaceous.

Male.—Similar in most respects to the female; face very greatly narrowed below; antennæ long, flagellum crenulate, pale reddish beneath; lower edge of clypeus narrowly, and labrum, pale yellowish

or cream-color; mandibles pale ferruginous; mesothorax rather less closely sculptured; tegulæ variable, pale reddish or darker; femora and tibiæ red, anterior femora metallic green behind; tarsi yellowish-white at base, redder beyond; venter of abdomen normal.

Habitat.—St. Vincent, West Indies (*H. H. Smith*); 5 females, 4 males. A variable little species, but I can not divide it into two. This is what Ashmead reported as *A. decora* Smith (error for *decorata*). It differs from *A. decorata* in the dark nervures, broader second submarginal cell, and in having the thorax and abdomen of the same color. In the color of the legs, it resembles the Mexican *A. cordiæfloris* Cockerell, but that has lighter wings, a differently colored abdomen, and a smaller, rounder head. The type female of *A. vincentana* is labeled as coming from an altitude of 500 feet. One of the males is from Kingstown.

Type-specimen.—Cat. No. 12869, U.S.N.M.

AUGOCHLORA CYANEOVIRIDIS Ashmead.

I have before me two females of the original lot, from St. Vincent. The hind spur is microscopically serrate, with dark teeth; there are no vibrissæ. The second submarginal cell is very narrow. Easily known from *A. vincentana* by its larger size and dark legs. Compared with *A. antillana*, it is smaller, and the area of the metathorax has fine longitudinal striæ, quite different from the transverse curved striæ of *antillana*.

The three following are superficially much alike, and might be taken for the same species without close examination. They may be separated as follows:

Area of metathorax with transverse curved striæ ..... *antillana*
Area of metathorax with longitudinal striæ 1
1. Longitudinal striæ extending to, or almost to, the margin of the area; wings very dark ..... *buscki*
Longitudinal striæ in the middle extending less than halfway to margin of area; wings not dark ..... *cubana*

AUGOCHLORA ANTILLANA, new species.

Female.—Length nearly 9 mm., rather robust, deep blue-green, the abdomen shining with purple reflections, and even some magenta patches on the middle of the first two segments; head and thorax granular-punctate, the vertex and mesothorax dullish, the latter under the compound microscope appears as if densely, deeply, and confluently malleate; head rather large, oblong, the face evidently longer than in *A. piscatoria;* clypeus purple-tinted, with scattered very strong punctures, the anterior margin somewhat depressed and very narrowly black; *labrum black, shining, with two low bosses,* its lower part striato-punctate; *mandibles very broad, swollen below,*

strongly dentate, obscurely reddish; scape black; flagellum more or less dull reddish beneath; eyes deeply emarginate; keel between antennæ strong; hair of head and thorax short and inconspicuous, scanty and white on cheeks and pleura, short and black on face, vertex, mesothorax, and scutellum; tubercles conspicuously fringed with short white hair; *area of metathorax with peculiar sculpture, consisting of semicircular grooves on each side, giving way to short oblique striæ posteriorly;* scutellum minutely rugosopunctate like mesothorax; tegulæ rufopiceous, green basally; wings strongly dusky, reddish, nervures and stigma dark brown; first recurrent nervure joining second transverso-cubital, but toward the inner side; legs piceous; the coxæ and anterior femora blue-green; hind spur microscopically serrate, the teeth light; abdomen broad, without vibrissæ, hind margins of segments very narrowly blackened; venter piceous, with pale hair.

Habitat.—St. Vincent, West Indies (*H. H. Smith*). The label bears the number 2.

Type-specimen.—Cat. No. 12870, U.S.N.M.

AUGOCHLORA BUSCKI, new species.

Female.—Length about 10 mm.; head and thorax brilliant blue-green; abdomen yellowish-green, with purple tints laterally, the hind margins of the segments being very broadly black, the black largely suffused with purple; head and thorax very densely and quite strongly punctured, the punctures of the mesothorax separately visible under a lens; pubescence scanty, and poorly preserved in the specimen, but evidently short and black or mainly so on face and head and thorax above, pallid on ventral surface; head ordinary, not elongate, *cheeks broad, and with a small but evident tubercle beneath;* eyes deeply emarginate; clypeus shining, with scattered punctures, its disk purple-tinted, but its upper margin narrowly golden-green; mandibles black, with a blue spot at base; antennæ dark; *scutellum closely and minutely punctured, bigibbous, with a median sulcus; area of metathorax with numerous strong longitudinal striæ,* which curve outwards a little just before reaching its outer edge; posterior face of metathorax dullish, without any sharp rim; tegulæ piceous with a rufous spot, the anterior base metallic; *wings very dark reddish;* stigma and nervures dark red-brown; first recurrent nervure joining second transverso-cubital, but toward outer side; legs brown-black, anterior femora blue-green behind; hind spur microscopically serrate, the teeth dark; abdomen only moderately shining; venter with long hair, partly black and partly dull white. The claw-joints are ferruginous.

Habitat.—Aguadilla, Porto Rico, Jan., 1899 (*Aug. Busck*). A distinct species, easily known by the characters italicized.

Type-specimen.—Cat. No. 12871, U.S.N.M.

AUGOCHLORA CUBANA, new species.

Female.—Length about 10 mm.; brilliant shining blue-green, with strong purple tints, especially on head and abdomen; head and thorax densely punctured, the punctures on mesothorax strong; pubescence short and thin, white on pleura, cheeks, and face (a little black on supraclypeal area), black on vertex, mesathorax, and scutellum, white on metathorax; head rather long, the clypeus prominent, with large well-separated punctures, its apical margin depressed in middle; mandibles black, strongly dentate, and with a blue basal spot; labrum roughened, obscurely bituberculate; antennæ dark, scape not metallic; mesothorax a yellower green than the rest of the insect, very brilliant; scutellum finely and closely punctured, not bigibbous; *area of metathorax with strong longitudinal striæ, but these are complete only laterally; in the median area they extend less than halfway to the posterior edge*, the nonstriate part being minutely roughened; posterior face of metathorax shining; tegulæ with the anterior half strongly metallic, the posterior rufopiceous; wings hyaline, slightly dusky, but not dark, stigma dark ferruginous, nervures dark fuscous; second submarginal cell large; first recurrent nervure joining second transverso-cubital, but toward the inner side, or just entering second submarginal; all the femora metallic, but the tibiæ and tarsi black; claws ferruginous; hind spur microscopically serrate as in *A. buscki;* abdomen broad, little hairy above, *hind margins of segments not black*, or at most a linear hardly noticeable edge; ventral surface with long yellowish-white hair, not mixed with black.

Habitat.—Baracoa, Cuba, Aug., 1902 (*Aug. Busck*). The following table separates the species of *Augochlora* known from Cuba:—

Area of metathorax with the median third striate only at base: tibiæ and tarsi not metallic; insect with strong purple tints.....*cubana* Cockerell
Area of metathorax striate practically all over 1
1. Tibiæ and tarsi not metallic; their pubescence black.....*regina* Smith
Tibiæ metallic, with pale or hoary pubescence 2
2. Abdominal segments "beautifully margined with violaceous," the margins also depressed and impunctate (male).....*magnifica* Cresson
Abdomen ordinary 3
3. Scape purplish-blue; head golden-green (female).....*præclara* Cresson
Scape black (male) .....*elegans* Cresson

I have never seen *A. magnifica* or *præclara*. *A. elegans* I have examined in the British Museum, the specimen being from Santo Domingo.

I have not seen *A. claviventris* Ashmead, from St. Vincent; Mr. Rohwer tells me that it is not represented in the U. S. National Museum. It will be readily known from the other West Indian species by the claviform piceous-black abdomen of the male.

Type-specimen.—Cat. No. 12872, U.S.N.M.

DESCRIPTION OF A NEW TERRESTRIAL ISOPOD FROM GUATEMALA.

By Harriet Richardson,
Collaborator, Division of Marine Invertebrates, U. S. National Museum.

The isopod to be described resembles in general appearance and in its spiny armature the form described by Kinahan, from Jamaica, as *Acanthoniscus spiniger*. Notwithstanding the striking superficial similarity of the two species, they can not be referred to the same genus.

Family ARMADILLIDIDÆ.

GLOBARMADILLO, new genus.

Body covered with long spines. Head wider than long; eyes distinct.

Second pair of antennæ with a flagellum composed of two articles, the first being very short.

Thorax with no epimera distinctly separated from the segments either above or on the under side.

Abdomen with the terminal segment triangular, ending posteriorly in an acute apical point.

Uropoda with the basal article or peduncle wider than long, situated somewhat obliquely; the inner branch is inserted at the inner post-lateral angle of the basal article; the outer branch is short, hidden in a dorsal view, and does not reach the tip of the terminal abdominal segment.

The type of the genus is *Globarmadillo armatus*, new species.

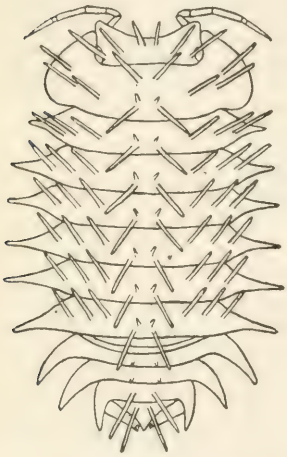
GLOBARMADILLO ARMATUS, new species.

Body contractile, capable of being rolled up into a ball. Surface covered with long spines.

Head broader than long, with the front slightly excavate and the antero-lateral angles acutely produced. There are six long spines on the head, two just back of the anterior margin, close together, one on either side of the median line, and four on the posterior half of the head between the eyes, two on either side of the median line,

the two middle ones being farther apart and longer than those on the anterior portion of the head. The eyes are small, composite, and situated close to the lateral margin. The first pair of antennæ is inconspicuous and rudimentary. The second pair has the first article of the peduncle short; the second is much longer; the third is not so long as the second; the fourth is twice as long as the third; the fifth is a little longer than the fourth; the flagellum consists of two articles, the first of which is minute, the second long and tapering and furnished with a long spine at the tip.

The first segment of the thorax is furnished with ten long spines and two small ones. There are two long spines close together on the anterior portion, one on either side of the median line, six long spines on the middle portion, three on either side of the median line, and two long ones on the posterior portion, close together, one on either side of the median line. There are two short spines just anterior to the two long spines on the posterior portion. The lateral parts of the first segment are produced anteriorly and posteriorly into a wide plate on either side. The second segment is furnished with eight long spines and two short ones. Six of these long ones are arranged in a transverse row about the middle, three on either side of the median line, and two are placed near the posterior margin, close together, one on either side of the median line. The two small spines are placed just in front of the two long ones near the posterior margin. In the following five segments the spines are the same in number and arranged in the same manner as in the second segment. The lateral parts of all six segments are produced into long narrow spine-like processes. Epimera are not distinct on any of the segments either on the dorsal or ventral side.



GLOBARMADILLO ARMATUS (DIAGRAMMATIC).

The first two segments of the abdomen are short and unarmed; their lateral parts are covered by the last thoracic segment; the following three segments are furnished each with two spines close together, one on either side of the median line, those on the third and fourth segments being short and those on the fifth segment long. The lateral parts of the third, fourth, and fifth segments are produced in long, narrow tapering processes. The sixth or terminal segment is triangular, broad at the base and with the posterior margin acutely produced in the middle. The basal portion of the segment

is furnished with two long spines. The uropoda occupy all the space between the lateral parts of the fifth segment and the apical part of the sixth segment.

The peduncle is large, somewhat obliquely placed, and has the outer branch inserted along the inner margin. The inner branch does not extend beyond the tip of the abdomen and is concealed by it. The outer branch is also short and does not extend beyond the apical process of the last abdominal segment.

There are seven pairs of ambulatory legs.

Only two specimens of this species were collected by Dr. O. F. Cook at Trece Aquas, Guatemala.

Type-specimen.—Cat. No. 40082, U.S.N.M.

The two specimens are very small and so completely rolled up that only a diagrammatic drawing could be made.

THE TYPE-SPECIES OF THE NORTH AMERICAN GENERA OF DIPTERA.

By D. W. Coquillett,
Custodian of Diptera, U. S. National Museum.

The great importance of knowing definitely what species is the type of any given genus is now recognized by practically every worker in the field of biology. For several years past the writer has been engaged in ascertaining the types of the genera of Diptera reported as occurring in North and Middle America, and the present paper gives the results of these labors. The rules adopted by the International Zoological Congress, as amended at the 1907 (Boston) meeting and the later decisions, published in Science for October 29, 1909, have been followed in all cases.

The following rules or articles more especially concern us in the present work:

Article 2. "The scientific designation of animals is uninominal for subgenera and all higher groups." A genus or subgenus, to which no species was originally referred by name, dates from its earliest published description or figure.

Article 3 specifies that the scientific names of animals must be in Latin or, at least, must be latinized. This excludes certain works where only French or other vernacular names are employed, such as Duméril's Exposition d'une Méthode Naturelle, published in 1801; his Considérations Générales, 1823; Schinz's Das Thierreich, 1823, and Latreille's Familles Naturelles du Règne Animal, 1825.

Article 19. "The original orthography of a name is to be preserved unless an error of transcription, a *lapsus calami*, or a typographical error is evident." The so-called emended names are to be regarded only as misspelled names, and as such have no permanent place in the nomenclature.

Article 25. The well known law of priority. This article holds, among other things, that a new generic name unaccompanied by either a description or a figure is valid if the name of one or more described species is mentioned as pertaining to it.

Article 26. Zoological nomenclature began with the year 1758.

Article 27. "The law of priority obtains, and consequently the oldest available name is to be retained." It further asserts that a name, whether generic, subgeneric, or specific, founded on any part of an animal, or of any of its early stages, is valid.

Article 30. The type of any polytypical genus is that one of the original species first designated as such type. An exception occurs in those cases where the genus originally contained only two species, neither of which had been designated the type by the founder of the genus, nor by any subsequent writer, and an author later takes one of these species as the type of a second genus, he thereby definitely makes the remaining species the type of the old genus.

Article 34. "A generic name is to be rejected as a homonym when it has previously been used for some other genus of animals." Unless the two names are identical, letter for letter, they are not homonyms.

The following list contains all of the genera of Diptera known to the writer as having been reported from North and Middle America up to January 1, 1909, together with their type-species and synonymy. A few genera, such as those to which no species has ever been assigned, and some others, founded on foreign species, are omitted in this list; but as nearly all in this class are synonyms of older generic names their omission in no way affects the status of the valid names adopted in the present list.

In the cases of those neglected, polytypical genera whose types have not heretofore been designated, and which contain among their original species one belonging to an older genus, such a species has been selected as the type, thus, as far as possible, sinking this class of names into the synonymy. In this way, fewer changes have resulted among the current names than would have been the case had the opposite course been pursued. In selecting the types of polytypical genera now in current use, it has been my constant aim to select such a species as would result in the maintenance of the present status of the genus. The recommendations appended to Article 30 of the International Code, as amended at the 1907 (Boston) meeting of the International Zoological Congress, have been essentially followed.

The synonymy of the European species and, in most cases, the limits of the genera, are those given in the monumental Katalog der Paläarktischen Dipteren, by Kertesz, Bezzi, Stein, and Becker, a most admirable work, in four octavo volumes. Some idea of the magnitude of the labors of its authors in unraveling and recording the greatly involved synonymy may be gleaned from a few facts relating to a single species, *Tachina vulgaris* Fallen. This species has been redescribed and renamed no less than *two-hundred and fifty-seven times!* On this one species alone Robineau-Desvoidy established the

almost incredible number of two-hundred and forty-five new species (so-called), which he distributed into five (imaginary) new genera! And this is only one sample from among the many cases.[a]

In one instance I have differed with the authors of the Katalog in the generic assignment of one species, *Tipula culiciformis* De Geer, which these authors place in the genus *Corethra*, but which there is every reason for believing belongs to the preceding genus, *Mochlonyx*. The breeding of this and related species by Meinert, his reference of the present species to *Mochlonyx*, and the confirmation of such reference by von Röder are set forth in my article in the Canadian Entomologist for July, 1903. I recently wrote to Dr. J. C. H. de Meijere, the leading dipterologist of Holland, for an expression of his opinion on the subject, and under date of September 28, 1908, he wrote me, entirely corroborating this reference, saying, "As to *Corethra culiciformis* De Geer, it is my opinion that Meinert has demonstrated with certainty that this gnat is a *Mochlonyx*." The reference of this species in the Katalog is therefore clearly erroneous.

In most cases subgeneric names have been thrown into the synonymy.

In the accompanying list, the writer has personally examined the original references with the exception of a small number, the data of which were obtained at second hand, such genera being indicated by an asterisk (*). The references in regard to the genera founded by Clark in his Essay on Bots (1815) were kindly communicated to me by Mr. E. E. Austen, of the British Museum, while those from Berthold's Natürliche Familien des Thierreichs (1827) were furnished to me by Mr. E. T. Cresson, jr., of the Academy of Natural Sciences of Philadelphia, and to both of these gentlemen my thanks are due.

Names of genera which are considered valid by the best authorities are printed in **black-face** type, but several of those so indicated are to be considered as such only from want of authoritative knowledge on the subject. Synonyms and homonyms are printed in *italics*.[b]

Although the preparation of this paper has extended over many years, and every opportunity has been taken to ascertain the earliest founding of each genus and the first designation of a type-species for the polytypical genera, still it is possible, or even probable, that some earlier records have been overlooked, and the writer will be under obligations to anybody informing him of such previous records.

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[a] The Katalog appears to be very complete, except that it omits most of the genera of the Anthomyiidæ and Acalypteræ founded by Lioy in the Atti Instituto Veneto, ser. 3, vol. 9, 1863 and 1864. The greater number of the genera founded by Meigen in his Nouvelle Classification des Mouches à deux ailes (Diptera L.), 1800, are also omitted; there is a reprint of this paper, with comments and synonymy, by Mr. Friedrich Hendel in the Verh. k. k. Zool.-Bot. Ges. Wien, vol. 58, pages 43 to 69, 1908, which I have made use of in the present paper.

[b] The generic names are arranged alphabetically, for easy reference. An index to the species is appended to this paper.

Ablabesmyia JOHANNSEN, Bull. 86, N. Y. State Mus., p. 125, 1905. 24 species. Type, *Tipula monilis* LINNÆUS, the sixth species, by present designation.

Ablautus LOEW, Berliner Ent. Zeitschr., vol. 10, p. 37, 1866. 1 species. Type, *Ablautus trifarius* LOEW.

Acanthina WIEDEMANN, Auss. Zweifl. Ins., vol. 2, p. 50, 1830. 3 species. Type, *Clitellaria elongata* WIEDEMANN, the third species, by designation of BRAUER, Denkschr. Kais. Akad. Wiss. Wien, vol. 44, 1882, p. 86. Not *Acanthina* FISCHER, 1806. Equals **Artemita** WALKER, 1854.

Acanthinomyia HUNTER, Trans. Amer. Ent. Soc., vol. 27, p. 129, 1900. Change of name for *Acanthina* WIEDEMANN, 1830, not of FISCHER, 1806. Type, *Clitellaria elongata* WIEDEMANN. Equals **Artemita** WALKER, 1854.

Acanthocnema BECKER, Berliner Ent. Zeitschr., vol. 39, p. 136, 1894. 3 species. Type, *Cordilura nigrimana* ZETTERSTEDT, by original designation.

Acanthomera WIEDEMANN, Dipt. Exot., p. 60, 1821. 1 species. Type, *Acanthomera picta* WIEDEMANN. Equals **Pantophthalmus** THUNBERG, 1819.

Acaulona WULP, Biol. Centr.-Amer., Dipt., vol. 2, p. 4, April, 1888. 1 species. Type, *Acaulona costata* WULP. Syn., *Euacaulona* TOWNSEND, 1908; *Euomogenia* TOWNSEND, 1908.

Acemya DESVOIDY, Essai Myod., p. 202, 1830. 1 species (as 3). Type, *Tachina acuticornis* MEIGEN. Syn., *Agculocera* MACQUART, 1855.

Achætomus COQUILLETT, Can. Ent., vol. 39, p. 75, March, 1907. 1 species. Type, *Achætomus pilosus* COQUILLETT.

Achætoneura BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 58, p. 333, 1891. 5 species. Type *Masicera frenchii* WILLISTON, the first species (as *hesperus*, new species), by present designation. Equals **Frontina** MEIGEN, 1838.

Achalcus LOEW, Neue Beitr., vol. 5, p. 30, 1857. 2 species. Type, *Porphyrops flavicollis* MEIGEN, the first species, by present designation.

Acicephala COQUILLETT, Journ. N. Y. Ent. Soc., vol. 6, p. 163, 1898. 2 species. Type, *Acicephala polita* COQUILLETT, the first species, by original designation.

Acidia DESVOIDY, Essai Myod., p. 720, 1830. 2 species. Type, *Tephritis cognata* WIEDEMANN, the second species, by designation of RONDANI, Bull. Soc. Ent. Ital., vol. 2, 1870, p. 10. Syn., *Euleia* WALKER, 1836; *Epidesmia* RONDANI, 1856; *Myoleja* RONDANI, 1856; *Prionimera* RONDANI, 1861; *Philophylla* RONDANI, 1870.

Acidigona LOEW, Monogr. Dipt. N. Amer., vol. 3, p. 285, 1873. 1 species. Type, *Trypeta melanura* LOEW.

Aciura DESVOIDY, Essai Myod., p. 773, 1830. 2 species. Type, *Aciura femoralis* DESVOIDY, the first species, by designation of RONDANI, Dipt. Ital. Prodr., vol. 1, 1856, p. 113.

Acnemia WINNERTZ, Verh. Zool.-Bot. Ges. Wien, vol. 13, p. 798, 1863. 3 species. Type, *Leia nitidicollis* MEIGEN, the first species, by designation of JOHANNSEN in Wytsman's Gen. Ins., Dipt., Mycet., 1909, p. 63.

Acontistoptera BRUES, Amer. Nat., vol. 36, p. 373, May, 1902. 1 species. Type, *Acontistoptera melanderi* BRUES.

Acreotrichus MACQUART, Dipt. Exot., Suppl. 4, p. 121, 1850. 2 species. Type, *Acreotrichus gibbicornis* MACQUART, the first species, by present designation.

Acrocera MEIGEN, Illiger's Mag., vol. 2, p. 266, 1803. 1 species. Type, *Syrphus globulus* PANZER. Syn., *Paracrocera* MIK, 1886.

Acrochæta WIEDEMANN, Auss. Zweifl. Ins., vol. 2, p. 42, 1830. 1 species. Type, *Acrochæta fasciata* WIEDEMANN.

Acrocholidia KOLENATI, Wien. Ent. Monatschr., vol. 1, p. 62, 1857. 2 species. Type, *Acrocholidia hehsteinii* KOLENATI, the first species, by present designation. Equals **Nycteribia** LATREILLE, 1796.

Acrochordonodes BIGOT, Bull. Soc. Ent. France for 1878, p. 97, 1878. 1 species. Type, *Acrochordonodes vittatus* BIGOT. Equals **Senogaster** MACQUART, 1834.

Acroglossa WILLISTON, in Scudder's Butt. N. Engl., vol. 3, p. 1916, 1889. 1 species. Type, *Acroglossa hesperidarum* WILLISTON. Equals **Spallanzania** DESVOIDY, 1830.

Acrometopia SCHINER, Wien. Ent. Monatschr., vol. 6, p. 434, 1862. Change of name for *Oxyrhina* MEIGEN as erroneously identified by ZETTERSTEDT. 2 species. Type, *Oxyrhina wahlbergi* ZETTERSTEDT, the first species, by original designation of ZETTERSTEDT.

Acrometopia LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 1088, 1864. 1 species. Type, *Sepsis cornuta* MEIGEN. Equals **Sepsis** FALLEN, 1810.

Acromyia LATREILLE, Gen. Crust. et Ins., vol. 4, p. 305, 1809. 1 species. Type, *Asilus muscarius* FABRICIUS (as *Acromyia asiliformis*. In the article entitled "Hybos," in the Nouv. Dict. Hist. Nat., 2d ed., 1818, Latreille wrote that he had received from Bonelli a specimen of this genus under the generic name of *Acromya*). Syn., *Syneches* WALKER, 1852; *Pterospilus* RONDANI, 1856.

Acronacantha WULP, Biol. Centr.-Amer., Dipt., vol. 2, p. 243, 1891. 1 species. Type, *Acronacantha nubilipennis* WULP.

Acronarista TOWNSEND, Smiths. Misc. Coll., vol. 51, p. 85, 1908. 1 species. Type, *Acronarista mirabilis* TOWNSEND.

Acrosticta LOEW, Berliner Ent. Zeitschr., vol. 11, p. 293, 1868. 2 species. Type, *Acrosticta scrobiculata* LOEW, the first species, by present designation.

Acrotænia LOEW, Monogr. Dipt. N. Amer., vol. 3, p. 274, 1873. 2 species. Type, *Trypeta testudinea* LOEW, the first species, by present designation.

Acrotoxa LOEW, Monogr. Dipt. N. Amer., vol. 3, p. 227, 1873. 11 species. Type, *Dacus fraterculus* WIEDEMANN, the second species, by designation of BEZZI, Boll. Lab. Zool. Portici, vol. 3, p. 280, 1909. Equals **Anastrepha** SCHINER, 1868.

Actia DESVOIDY, Essai Myod., p. 85, 1830. 1 species (as two new ones). Type, *Actia cingulata* DESVOIDY. Syn., *Osmæa* DESVOIDY, 1830; *Thryptocera* MACQUART, 1834; *Elfia* DESVOIDY, 1850; *Herbstia* DESVOIDY, 1851; *Peribæa* DESVOIDY, 1863; *Gymnophtalma* LIOY, 1864; *Gymnoparcia* BRAUER and BERGENSTAMM, 1889.

Actina MEIGEN, Klass. Beschr. Zweifl. Ins., p. 116, 1804. 3 species. Type, *Actina chalybea* MEIGEN (as *Beris nitens* MEIGEN), the first species, by designation of RONDANI, Arch. Zool., vol. 3, 1864, p. 87.

Actinoptera RONDANI, Bull. Soc. Ent. Ital., vol. 3, p. 164, 1871. 3 species. Type, *Trypeta æstiva* MEIGEN, the second species, by present designation. Equals **Trupanea** SCHRANK, 1795.

Actora MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 5, p. 403, 1826. 1 species. Type, *Actora æstuum* MEIGEN. Equals **Helcomyza** CURTIS, 1825.

Adelinia COSTA, Il Giamb. Vico, vol. 2, p. 447, 1857.* 1 species. Type, *Adelinia italica* COSTA. Equals **Asindulum** LATREILLE, 1805.

Adenia DESVOIDY, Hist. Nat. Dipt., vol. 1, p. 1041, 1863. 1 species (as 10). Type, *Tachina simulans* MEIGEN. Equals **Exorista** MEIGEN, 1803.

Adia DESVOIDY, Essai Myod., p. 558, 1830. 1 species. Type, *Adia oralis* DESVOIDY. Equals **Pegomya** DESVOIDY, 1830.

Adiplosis FELT, 23d Rep. State Ent. N. Y., p. 405, 1908. 1 species. Type, *Cecidomyia toxicodendri* FELT.

Admontia BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 56, p. 104, 1889. 1 species. Type, *Degeeria amica* MEIGEN (as *podomyia*, new species). Equals **Hyperecteina** SCHINER, 1861.

Adoxomyia KERTESZ, Ann. Mus. Nat. Hungarica, vol. 5, p. 499, 1907. New name for *Clitellaria* SCHINER, not of Meigen. 2 species. Type, *Clitellaria dahlii* MEIGEN, the first species, by designation of BEZZI, Wien. Ent. Zeit., vol. 17, p. 75, 1908.

Æcothea HALIDAY, Ann. Nat. Hist., vol. 2, p. 187, November, 1838. 1 species. Type, *Helcomyza fenestralis* FALLEN.

Aëdeomyia THEOBALD, Journ. Trop. Med., vol. 4, p. 235, July 15, 1901. No species. In Monogr. Culic., vol. 2, p. 219, Nov. 23, 1901, 1 species. Type, *Aëdes squamipennis* ARRIBALZAGA.

Aëdes WIEDEMANN, in Meigen's Syst. Beschr. Zweifl. Ins., vol. 1, p. 13, 1818. 1 species. Type, *Aëdes cinereus* WIEDEMANN.

Ænigmatias MEINERT, Ent. Medd., vol. 2, p. 213, 1890. 1 species. Type, *Ænigmatias blattoides* MEINERT.

Agatachys MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 6, p. 343, 1830. 1 species. Type, *Tachydromia celeripes* MEIGEN. Syn., *Stilpon* LOEW, 1859.

Agathomyia VERRALL, Brit. Flies, vol. 8, p. 30, 1901. 2 species. Type, *Callomyza antennata* ZETTERSTEDT, the first species, by present designation.

Agathon RÖDER, Wien. Ent. Zeit., vol. 9, p. 230, 1890. 1 species. Type, *Agathon elegantula* RÖDER. Equals **Bibiocephala** OSTEN SACKEN, 1874.

Aguloccra MACQUART, Ann. Soc. Ent. France for 1855, p. 24, 1855. 1 species. Type, *Tachina acuticornis* MEIGEN (as *nigra*, new species). Equals **Acemya** DESVOIDY, 1830.

Agelanius RONDANI, Arch. Zool., vol. 3, p. 79, 1864. 2 species. Type, *Agelanius meridianus* RONDANI, the first species, by present designation. Equals **Tabanus** LINNÆUS, 1758.

Agnotomyia WILLISTON, Ent. Amer., vol. 2, p. 106, 1886. 1 species. Type, *Stygia elongata* SAY. Equals **Dialysis** WALKER, 1850.

Agria DESVOIDY, Essai Myod., p. 376, 1830. 1 species (as 6). Type, *Musca affinis* FALLEN. Equals **Sarcophaga** MEIGEN, 1826.

Agrobia LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 1313, 1864. 1 species. Type, *Agromyza pectinata* MEIGEN. Equals **Agromyza** FALLEN, 1810.

Agromyza FALLEN, Spec. Ent. Meth. Exh., p. 21, 1810. No species. In his Agromyzides Sveciæ, pp. 3 to 7, 1823, 14 species (1 as a variety). Type, *Agromyza ambigua* FALLEN (described as a variety of the first species), by designation of WESTWOOD, Intr., vol. 2, Synops., p. 151, 1840 (as *nigripes* MEIGEN). Syn., *Phytobia* LIOY, 1864; *Phyllophila* LIOY, 1864; *Agrobia* LIOY, 1864; *Redia* LIOY, 1864; *Agrophila* LIOY, 1864; *Anisoneura* LIOY, 1864.

Agrophila LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 1314, 1864. 4 species. Type, *Agromyza exilis* MEIGEN, the first species, by present designation. Equals **Agromyza** FALLEN, 1810.

Akronia HINE, Ohio Nat., vol. 1, p. 113, 1901. 1 species. Type, *Akronia frontosa* HINE.

Alasion RONDANI, Dipt. Ital. Prodr., vol. 2, p. 14, 1857. Change of name for *Apogon* RONDANI, 1856, preoccupied. Type, *Ceratopogon flavipes* MEIGEN. Equals **Helea** MEIGEN, 1800.

Albinia DESVOIDY, Essai Myod., p. 209, 1830. 1 species. Type, *Albinia buccalis* DESVOIDY. Equals **Macquartia** DESVOIDY, 1830.

Alcephagus GIMMERTHAL, Ent. Zeit. Stettin, vol. 6, p. 152, 1845. Change of name for *Ornithobia* MEIGEN, 1830, on the ground that the latter name is not appropriate. Type, *Pediculus cervi* LINNÆUS. Equals **Lipoptena** NITZSCH, 1818.

Aldrichia COQUILLETT, Trans. Amer. Ent. Soc., vol. 21, p. 93, 1894. 1 species. Type, *Aldrichia ehrmanni* COQUILLETT.

Alina DESVOIDY, Hist. Nat. Dipt., vol. 2, p. 639, 1863. 3 species (as 4). Type, *Alina pratensis* DESVOIDY, the second species, by present designation. Equals **Morellia** DESVOIDY, 1830.

Allocotus LOEW, Berliner Ent. Zeitschr., vol. 16, p. 258, 1872. 1 species. Type, *Allocotus edwardsii* LOEW. Not *Allocotus* MAYR, 1864. Equals **Paracosmus** OSTEN SACKEN, 1877.

Allodia WINNERTZ, Verh. Zool.-Bot. Ges. Wien, vol. 13, p. 826, 1863. 5 species. Type, *Mycetophila lugens* WIEDEMANN, the fourth species, by designation of JOHANNSEN in Wytsman's Gen. Ins., Dipt., Mycet., 1909, p. 104. Syn. *Brachycampta* WINNERTZ, 1863.

Allœoneurus MIK, Jahresb. k. k. Akad. Gymnas., p. 8, 1878. 1 species. Type, *Musca lacustris* SCOPOLI. Equals **Orthoceratium** SCOPOLI, 1803.

Allognosta OSTEN SACKEN, Berliner Ent. Zeitschr., vol. 27, p. 297, 1883. Change of name for *Metoponia* LOEW, not of MACQUART. 3 species. Type, *Beris fuscitarsis* SAY, the third species, by present designation.

Allograpta OSTEN SACKEN, Bull. Buffalo Soc. Nat. Hist., vol. 3, p. 49, 1876. 1 species. Type, *Scæva obliqua* SAY.

Alloneura RONDANI, Dipt. Ital. Prodr., vol. 1, p. 140, 1856. 1 species. Type, *Pipunculus minimus* BECKER (as *flavipes* MEIGEN). Equals **Dorilas** MEIGEN, 1800.

Allophorocera HENDEL, Verh. Zool.-Bot. Ges. Wien, vol. 51, p. 203, 1901. 1 species. Type, *Dexodes auripila* BRAUER and BERGENSTAMM. Equals **Lydella** DESVOIDY, 1830.

Allophyla LOEW, Zeitschr. Ent. Breslau, vol. 13, p. 43, 1862. 1 species. Type, *Heleomyza atricornis* MEIGEN.

Allotrichoma BECKER, Berliner Ent. Zeitschr., vol. 41, p. 121, 1896. 4 species. Type, *Hecamede lateralis* LOEW, the first species, by original designation.

Alophora DESVOIDY, Essai Myod., p. 293, 1830. 1 species (as 4). Type, *Syrphus hemipterus* FABRICIUS. Equals **Phasia** LATREILLE, 1805.

Alticomerus RONDANI, Dipt. Ital. Prodr., vol. 1, p. 121, 1856. 1 species. Type, *Milichia maculata* MEIGEN (as *trinotatus*, new species). Equals **Odinia** DESVOIDY, 1830.

Amalopis HALIDAY, in Walker's Ins. Britt., Dipt., vol. 3, p. xv, 1856. 1 species. Type, *Limnobia occulta* MEIGEN. Equals **Tricyphona** ZETTERSTEDT, 1837.

Amedea DESVOIDY, Essai Myod., p. 207, 1830. 1 species. Type, *Amedea scutellaris* DESVOIDY. Equals **Macquartia** DESVOIDY, 1830.

Amedoria BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 56, p. 106, 1889. 1 species. Type, *Tachina luctuosa* MEIGEN (as *medorina* SCHINER). Equals **Medina** DESVOIDY, 1830.

Amesia DESVOIDY, Hist. Nat. Dipt., vol. 2, p. 363, 1863. 1 species. Type, *Tachina disjuncta* WIEDEMANN (as *variabilis*, new species). Equals **Microphthalma** MACQUART, 1843.

Amina DESVOIDY, Essai Myod., p. 626, 1830. 1 species. Type, *Amina parisiensis* DESVOIDY. Equals **Scopeuma** MEIGEN, 1800.

Aminta DESVOIDY, Essai Myod., p. 569, 1830. 5 species. Type, *Aminta ludibunda* DESVOIDY, the first species, by present designation. Equals **Fannia** DESVOIDY, 1830.

Amiota LOEW, Berliner Ent. Zeitschr., vol. 6, p. 229, May, 1862. 2 species. Type, *Amiota leucostoma* LOEW, the second species, by present designation. Syn., *Phortica* SCHINER, Dec., 1862.

Ammobates STANNIUS, Isis von Oken for 1831, p. 33, 1831. 3 species. Type, *Ammobates notatus* STANNIUS, the second species, designated by RONDANI, Dipt. Ital. Prodr., vol. 1, 1856, p. 143. Not *Ammobates* LATREILLE, 1809. Equals **Tachytrechus** HALIDAY, 1851.

Amobia DESVOIDY, Essai Myod., p. 96, 1830. 1 species. Type, *Amobia conica* DESVOIDY. Syn., *Macronichia* RONDANI, 1859; *Moschusa* DESVOIDY, 1863; *Thaoa* DESVOIDY, 1863; *Trixoclista* TOWNSEND, 1892.

Amphicnephes LOEW, Monogr. Dipt. N. Amer., vol. 3, p. 83, 1873. 1 species. Type, *Trypeta pulla* WIEDEMANN (as *pertusus*, new species).

Amphicosmus COQUILLETT, West Amer. Sci., vol. 7, p. 219, 1891. 1 species. Type, *Amphicosmus elegans* COQUILLETT.

Amphinome MEIGEN, Nouv. Class. Mouch., p. 15, 1800.* No species. *Limonia* MEIGEN, 1803, is a change of name. Type, *Tipula tripunctata* FABRICIUS. Syn., *Limonia* MEIGEN, 1803; *Limnobia* MEIGEN, 1818; *Unomyia* MEIGEN, 1818; *Limnomyza* RONDANI, 1856.

Ampycophora WAHLBERG, Öfv. Kongl. Vet. Akad. Förh., vol. 4, p. 261, 1847. 1 species. Type, *Aulacigaster rufitarsis* MACQUART (as *tarsata*, new species). Equals **Aulacigaster** MACQUART, 1835.

Ampyx WALKER, List Dipt. Ins. Brit. Mus., vol. 7, p. 564, 1855. 1 species. Type, *Asilus distendens* WIEDEMANN (as *varipennis*, new species). Syn., *Doryclus* JÆNNICKE, 1867.

Amsteinia AM STEIN, Jahresb. Nat. Ges. Graubünden., ser. 2, vol. 3, p. 99, 1858. 1 species. Type, *Crameria æstroidea* DESVOIDY (as *punctipennis*, new species). Equals **Trixa** MEIGEN, 1824.

Amyclæa DESVOIDY, Hist. Nat. Dipt., vol. 2, p. 404, 1863. 1 species. Type, *Amyclæa serva* DESVOIDY. Equals **Phorostoma** DESVOIDY, 1830.

Anacampta LOEW, Zeitsch. Ges. Naturwiss., vol. 32, p. 7, 1868. 4 species. Type, *Musca urticæ* LINNÆUS, the first species, by designation of LOEW, Monogr. Dipt. N. Amer., vol. 3, 1873, p. 58. Equals **Ceroxys** MACQUART, 1835.

Anaclinia WINNERTZ, Verh. Zool.-Bot. Ges. Wien, vol. 13, p. 770, 1863. 1 species. Type, *Mycetophila nemoralis* MEIGEN.

Analcocerus LOEW, Verh. Zool.-Bot. Ges. Wien, vol. 5, p. 140, 1855. 1 species. Type, *Analcocerus atriceps* LOEW.

Anarmostus LOEW, Dipt.-Fauna Südafrika, p. 142, 1860. 1 species. Type, *Asilus iopterus* WIEDEMANN.

Anasimyia SCHINER, Cat. Dipt. Europæ, p. 108, 1864. 2 species. Type, *Musca transfuga* LINNÆUS, the first species, by present designation. Equals **Helophilus** MEIGEN, 1822.

Anastœchus OSTEN SACKEN, West. Dipt., p. 251, 1877. 1 species. Type, *Bombylius nitidulus* FABRICIUS (as *barbatus*, new species).

Anastrepha SCHINER, Reise *Novara*, Zool., vol. 2, Dipt., p. 263, 1868. 6 species. Type *Dacus serpentinus* WIEDEMANN, the first species, by original designation. Syn., *Acrotoxa* LOEW, 1873.

Anatopynia JOHANNSEN, Bull. 86, N. Y. State Mus., p. 135, 1905. 1 species. Type, *Tanypus plumipes* FRIES.

Ancylogaster BIGOT, Bull. Soc. Ent. France for 1884, p. 69, 1884. 1 species. Type, *Hemyda aurata* DESVOIDY (as *armatus*, new species). Equals **Hemyda** DESVOIDY, 1830.

Andrenomya RONDANI, Nuovi Ann. Sci. Nat. (Bologna), ser. 3, vol. 2, p. 189, 1850. 1 species. Type, *Rhynchocephalus caucasicus* FISCHER (as *Nemestrina albofasciata* WIEDEMANN). Equals **Rhynchocephalus** FISCHER, 1806.

Andrenosoma RONDANI, Dipt. Ital. Prodr., vol. 1, p. 160, 1856. 1 species. Type, *Asilus ater* LINNÆUS. Syn., *Elæotoma* COSTA, 1863.

Anepsiomyia BEZZI, Zeitsch. Hym. Dipt., vol. 2, p. 192, 1902. Change of name for *Anepsius* LOEW, 1857, not of LECONTE, 1852. Type, *Porphyrops flaviventris* MEIGEN. Syn., *Anepsius* LOEW, preoccupied.

Anepsius LOEW, Neue Beitr., vol. 5, p. 45, 1857. 1 species. Type, *Porphyrops flaviventris* MEIGEN. Not *Anepsius* LECONTE, 1852. Equals **Anepsiomyia** BEZZI, 1902.

Anetia DESVOIDY, Hist. Nat. Dipt., vol. 1, p. 868, 1863. 1 species. Type, *Tachina nigripes* FALLEN (as *occlusa*, new species). Equals **Lydella** DESVOIDY, 1830.

Anevrina LIOY, Atti Inst. Veneto, 3d ser., vol. 10, p. 77, 1864. 2 species. Type, *Phora caliginosa* MEIGEN, the first species, by present designation. (Equals *Phora* of authors, not of LATREILLE.)

Angiorhina BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 56, p. 163, 1889. 1 species. Type, *Tachina crudelis* WIEDEMANN.

Anglearia CARLIER, Ann. Soc. Ent. France for 1835, p. 659, 1835. 1 species. Type, *Anglearia antennata* CARLIER. Equals **Perithinus** HALIDAY, 1831.

Anicia DESVOIDY, Hist. Nat. Dipt., vol. 2, p. 99, 1863. 1 species (as 4). Type, *Anicia sabulosa* DESVOIDY. Equals **Metopia** MEIGEN, 1803.

Anisia WULP, Biol. Centr.-Amer., Dipt., vol. 2, p. 186, August, 1890. 41 species. Type, *Anisia inflexa* WULP, the first species, by present designation.

Anisomera WIEDEMANN, in Meigen's Syst. Beschr. Zweifl. Ins., vol. 1, p. 210, 1818. 1 species. Type, *Anisomera obscura* WIEDEMANN. Equals **Hexatoma** LATREILLE, 1809.

Anisonevra LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 1314, 1864. 1 species. Type, *Agromyza lacteipennis* FALLEN? Equals **Agromyza** FALLEN, 1810.

Anisopogon LOEW, Berliner Ent. Zeitschr., vol 18, p. 377, 1874. Change of name for *Heteropogon* LOEW, 1847, previously used for a genus of plants. Type, *Dasypogon manicatus* MEIGEN. Equals **Heteropogon** LOEW, 1847.

Anisopus MEIGEN, Illiger's Mag., vol. 2, p. 264, 1803. No species. In his Klass. Beschr. Zweifl. Ins., p. 103, 1804, 2 species. Type, *Tipula fuscata* FABRICIUS (as *fuscus*, new species), the first species, by present designation. Equals **Sylvicolæ** HARRIS, 1776.

Anisotamia MACQUART, Dipt. Exot., vol. 2, pt. 1, p. 81, 1840. 2 species. Type, *Anisotamia ruficornis* MACQUART, the first species, by present designation.

Anomaloptera LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 218, 1864. 1 species. Type, *Tipula nigra* LINNÆUS. Equals **Tipula** LINNÆUS, 1758.

Anopheles MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 1, p. 10, 1818. 2 species. Type, *Culex bifurcatus* LINNÆUS, the first species, by designation of CURTIS, Brit. Ent., 1828, p. 210. Syn., *Cœlodiazesis* DYAR and KNAB, April 15, 1906; *Myzorhynchella* THEOBALD, Jan., 1907.

Anoplomerus RONDANI, Dipt. Ital. Prodr., vol. 1, p. 141, 1856. 1 species. Type, *Musca notata* FABRICIUS. Not *Anoplomerus* LATREILLE, 1844. Equals **Scellus** LOEW, 1857.

Anoplopus RONDANI, Dipt. Ital. Prodr., vol. 2, p. 14, 1857. Change of name for *Anoplomerus* RONDANI, 1856, not LATREILLE, 1844. Type, *Musca notata* FABRICIUS. Equals **Scellus** LOEW, 1857.

Anorostoma LOEW, Zeitschr. Ent. Breslau, vol. 13, p. 47, 1862. No species. In the Berliner Ent. Zeitschr., vol. 6, 1862, p. 223, 1 species. Type, *Anorostoma marginata* LOEW.

Anorthus LOEW, Ent. Zeit. Stettin, vol. 11, p. 117, 1850. 1 species. Type, *Hydrophorus jaculus* FALLEN. Equals **Medetera** FISCHER, 1819.

Anoxycampta BIGOT, Bull. Soc. Ent. France for 1880, p. 150; 1880. 1 species. Type, *Anoxycampta hirta* BIGOT. Equals **Phryxe** DESVOIDY, 1830.

Anthalia ZETTERSTEDT, Ins. Lapp., p. 538, 1838. 3 species. Type, *Anthalia gyllenhali* ZETTERSTEDT, the first species, by designation of COQUILLETT, Proc. Ent. Soc. Washington, vol. 5, 1903, p. 246. Equals **Euthyneura** MACQUART, 1836.

Anthoica RONDANI, Dipt. Ital. Prodr., vol. 4, p. 8, 1861. Change of name for *Myobia* DESVOIDY, 1830, preoccupied. Type, *Tachina inanis* FALLEN. Equals **Leskia** DESVOIDY, 1830.

Anthomyia MEIGEN, Illiger's Mag., vol. 2, p. 281, 1803. 2 species. Type, *Musca pluvialis* LINNÆUS, the second species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 143.

Anthomyza FALLEN, Spec. Ent. Meth. Exh., p. 20, 1810. No species. In his Agromyzides Sveciæ, pp. 7 and 8, 1823, 4 species. Type, *Anthomyza gracilis* FALLEN, the third species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 152. Syn., *Leptomyza* MACQUART, 1835; *Anthophilina* ZETTERSTEDT, 1837; *Psilosoma* LIOY, 1864.

Anthophilina ZETTERSTEDT, Isis von Oken for 1837, p. 55, 1837. 1 species (and 3 manuscript names). Type, *Anthomyza gracilis* FALLEN. Equals **Anthomyza** FALLEN, 1810.

Anthracomya RONDANI, Dipt. Ital. Prodr., vol. 1, p. 87, 1856. 1 species. Type, *Musca melanoptera* FALLEN (as *geneji*, new species). Equals **Morinia** DESVOIDY, 1830.

Anthracophaga LOEW, Zeitschr. Ent. Breslau, vol. 15, p. 15, 1866.* 3 species. Type, *Musca strigula* FABRICIUS, the first species, by present designation.

Anthrax SCOPOLI, Ent. Carn., p. 358, 1763. 1 species. Type, *Musca anthrax* SCHRANK (as *morio* LINNÆUS). Syn., *Spogostylum* MACQUART, 1840; *Argyramœba* SCHINER, 1860; *Coquillettia* WILLISTON, 1896. (*Anthrax* of authors equals *Villa* LIOY.)

Anticheta HALIDAY, Ann. Nat. Hist., vol. 2, p. 187, November, 1838. 1 species. Type, *Sciomyza analis* MEIGEN (as *Tetanocera vittata* HALIDAY).

Antiopa MEIGEN, Nouv. Class. Mouch., p. 32, 1800.* No species. *Chrysotoxum* MEIGEN, 1803, was a change of name. Type, *Musca bicincta* LINNÆUS. Syn., *Chrysotoxum* MEIGEN, 1803.

Antlemon LOEW, Syst. Beschr. Zweifl. Ins., vol. 2, p. 30, 1871. 1 species. Type, *Asindulum halidayi* LOEW. Equals **Asindulum** LATREILLE, 1805.

Antocha OSTEN SACKEN, Proc. Acad. Nat. Sci. Phila. for 1859, p. 219, 1860. 1 species (as 2). Type, *Antocha saxicola* OSTEN SACKEN. Syn., *Orimargula* MIK, 1883.

Anypenus PHILIPPI, Verh. Zool.-Bot. Ges. Wien, vol. 15, p. 702, 1865. 2 species. Type, *Anypenus obscurus* PHILIPPI, the second species, by present designation. Equals **Apiocera** WESTWOOD, 1835.

Aochletus OSTEN SACKEN, Biol. Centr.-Amer., Dipt., vol. 1, p. 38, 1886. 1 species. Type, *Aochletus cinctus* OSTEN SACKEN.

Apachemyia TOWNSEND, Smiths. Misc. Coll., vol. 51, p. 75, 1908. 1 species. Type, *Demoticus pallidus* COQUILLETT. Equals **Demoticus** Macquart, 1854.

Apatolestes WILLISTON, Ent. Amer., vol. 1, p. 12, 1885. 1 species. Type, *Apatolestes comaster* WILLISTON.

Apeilesis MACQUART, Dipt. Exot., Suppl. 1, p. 8, 1846. 1 species. Type, *Apeilesis cinerea* MACQUART. Equals **Dolichopeza** CURTIS, 1825.

Apelleia BELLARDI, Saggio Ditt. Mess., Append., p. 17, 1862. 1 species. Type, *Apelleia vittata* BELLARDI.

Aphantotimus WHEELER, Psyche, vol. 5, p. 375, 1890. 2 species. Type, *Aphantotimus williston* WHEELER, the first species, by present designation. Equals **Thrypticus** GERSTÆCKER, 1864.

Aphestia SCHINER, Verh. Zool.-Bot. Ges. Wien, vol. 16, p. 673, 1866. 1 species. Type, *Aphestia brasiliensis* SCHINER.

Aphiochæta BRUES, Trans. Amer. Ent. Soc., vol. 29, p. 337, 1903. 24 species. Type, *Phora nigriceps* LOEW, the tenth species, by designation of BRUES, Gen. Ins., Dipt., Phoridæ, 1906, p. 9. Equals **Megaselia** RONDANI, 1856.

Aphœbantus LOEW, Berliner Ent. Zeitschr., vol. 16, p. 253, 1872. 1 species. Type, *Aphœbantus cervinus* LOEW. Syn., *Triodites* OSTEN SACKEN, 1877.

Aphria DESVOIDY, Essai Myod., p. 89, 1830. 1 species (as 2). Type, *Tachina longirostris* MEIGEN. Syn., *Olivieria* MEIGEN, 1838; *Rhynchosia* MACQUART, 1848.

Aphritis LATREILLE, Hist. Nat. Crust et Ins., vol. 14, p. 358, 1805. 1 species. Type, *Musca mutabilis* LINNÆUS (as *auropubescens*, new species). Equals **Microdon** MEIGEN, 1803.

Aphrosylus HALIDAY, in Walker's Ins. Britt., vol. 1, p. 220, 1851. 2 species. Type, *Aphrosylus raptor* HALIDAY, the first species, by present designation.

Aphrozeta PERRIS, Mem. Acad. Roy. Sci. Lyon, vol. 2, p. 491, 1847. 2 species. Type, *Medetera viridis* MEIGEN (as *semiglauca*, new species), the first species, by present designation. Syn., *Parhydrophorus* WHEELER, 1896.

Apinops COQUILLETT, Rev. Tach. Amer., p. 67, 1897. 1 species. Type, *Apinops atra* COQUILLETT.

Apiocera WESTWOOD, Lond. Edinb. Philos. Mag., vol. 6, p. 448, 1835. 2 species. Type, *Apiocera fuscicollis* WESTWOOD, the second species, by present designation. Syn., *Tapinocera* MACQUART, 1838; *Pomacera* MACQUART, 1847; *Anypenus* PHILIPPI, 1865.

Apivora MEIGEN, Nouv. Class. Mouch., p. 37, 1800.* No species. Equals **Volucella** GEOFFROY, 1762. Type, *Musca pellucens* LINNÆUS.

Aplomya DESVOIDY, Essai Myod., p. 184, 1830. 2 species. Type, *Tachina confinis* FALLEN (as *zonata*, new species), the second species, by designation of DESVOIDY, Hist. Nat. Dipt., vol. 1, 1863, p. 459. Syn., *Hubneria* DESVOIDY, 1847; *Cynisca* DESVOIDY, 1863; *Ethilla* DESVOIDY, 1863.

Apocephalus COQUILLETT, Proc. Ent. Soc. Washington, vol. 4, p. 501, 1901. 1 species. Type, *Apocephalus pergandei* COQUILLETT.

Apogon RONDANI, Dipt. Ital. Prodr., vol. 1, p. 175, 1856. 1 species. Type, *Ceratopogon flavipes* MEIGEN (as *hortulanus* MEIGEN). Equals **Helea** MEIGEN, 1800.

Apomidas COQUILLETT, Can. Ent., vol. 24, p. 315, 1892. 1 species. Type, *Apomidas trochilus* COQUILLETT.

Aporomya RONDANI, Dipt. Ital. Prodr., vol. 3, p. 90, 1859. 1 species. Type, *Tachina dubia* FALLEN. Equals **Lypha** DESVOIDY, 1830.

Aporosa MACQUART, Dipt. Exot., vol. 1, pt. 1, p. 62, 1838. 2 species. Type, *Geranomyia canariensis* BERGROTH (as *maculipennis*, new species), the first species, by present designation. Equals **Geranomyia** HALIDAY, 1833.

Aporotachina MEADE, Ent. Monthly Mag., ser. 2, vol. 5, p. 109, 1894. 5 species. Type, *Tachina angelinæ* MEIGEN, the first species, by present designation. Equals **Lydella** DESVOIDY, 1830.

Apostrophus LOEW, Schr. Ges. Freunde Nat. Moscow for 1870, p. 58, 1870.* 1 species. Type, *Tachina melanura* MEIGEN (as *suspecta*, new species). Equals **Besseria** DESVOIDY, 1830.

Apotomella DUFOUR, Ann. Soc. Ent. France for 1846, p. 455, 1846. 1 species. Type, *Aulacigaster rufitarsis* MACQUART. Equals **Aulacigaster** MACQUART, 1835.

Aptilotus MIK, Wien. Ent. Zeit., vol. 17, p. 206, 1898. 1 species. Type, *Aptilotus paradoxus* MIK.

Aptorthus ALDRICH, Kansas Univ. Quart., vol. 2, p. 48, 1893. 4 species. Type, *Aptorthus albiciliatus* ALDRICH, the first species, by present designation. Equals **Mesorhaga** SCHINER, 1868.

Araba DESVOIDY, Essai Myod., p. 127, 1830. 3 species (as 10). Type, *Musca leucocephala* ROSSI (equals species 2 to 9), by designation of DESVOIDY, Hist. Nat. Dipt., vol. 2, 1863, p. 83. Equals **Metopia** MEIGEN, 1803.

Arabella DESVOIDY, Hist. Nat. Dipt., vol. 2, p. 88, 1863. 1 species (as 8). Type, *Musca leucocephala* ROSSI. Equals **Metopia** MEIGEN, 1803.

Archilestes SCHINER, Verh. Zool.-Bot. Ges. Wien, vol. 16, p. 672, 1866. 2 species. Type, *Dasypogon capnopterus* WIEDEMANN, the first species, by designation of SCHINER, Reise *Novara*, Zool., vol. 2, Dipt., 1868, p. 168. Not *Archilestes* SELYS, 1862. Equals **Archilestris** LOEW, 1874.

Archilestris LOEW, Berliner Ent. Zeitschr., vol. 18, p. 377, 1874. Change of name for *Archilestes* SCHINER, 1866, not of SELYS, 1862. Type, *Dasypogon capnopterus* WIEDEMANN. Syn., *Archilestes* SCHINER, 1866, preoccupied.

Archytas JÆNNICKE, Neue Exot. Dipt., p. 392, 1867. 1 species. Type, *Musca diaphana* FABRICIUS (as *bicolor*, new species). Syn., *Nemochæta* WULP, 1888; *Tachinodes* BRAUER and BERGENSTAMM, 1889; *Parafabricia* BRAUER and BERGENSTAMM, 1894.

Arctobiella COQUILLETT, Journ. N. Y. Ent. Soc., vol. 10, p. 188, 1902. 1 species. Type, *Arctobiella obscura* COQUILLETT.

Arctophila SCHINER, Wien. Ent. Monatschr., vol. 4, p. 215, 1860. 2 species. Type, *Syrphus bombiformis* FALLEN, by designation of WILLISTON, Synops. N. Amer. Syrph., 1886, p. 158.

Ardoptera MACQUART, Ins. Dipt. Nord France, separata, p. 105, 1827. 1 species. Type, *Tachydromia irrorata* FALLEN. Equals **Dolichocephala** MACQUART, 1823.

Argyra MACQUART, Hist. Nat., Dipt., vol. 1, p. 456, 1834. 7 species. Type, *Musca diaphana* FABRICIUS, the first species, by designation of RONDANI, Dipt. Ital. Prodr., vol. 1, 1856, p. 141. Equals **Porphyrops** MEIGEN, 1824.

Argyrella DESVOIDY, Hist. Nat. Dipt., vol. 2, p. 87, 1863. 1 species (as 2). Type, *Musca leucocephala* ROSSI. Equals **Metopia** MEIGEN, 1803.

Argyria DESVOIDY, Hist. Nat. Dipt., vol. 2, p. 82, 1863. 2 species (as 6). Type, *Musca leucocephala* ROSSI, the first species, by original designation. Equals **Metopia** MEIGEN, 1803.

Argyromœba SCHINER, Wien. Ent. Monatschr., vol. 4, p. 51, 1860. 3 species. Type, *Anthrax tripunctata* WIEDEMANN, the first species, by present designation. Equals **Anthrax** SCOPOLI, 1763.

Argyrophylax BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 56, p. 163, 1889. 1 species. Type, *Tachina albincisa* WIEDEMANN. Equals **Sturmia** DESVOIDY, 1830.

Argyrospyla RONDANI, Dipt. Ital. Prodr., vol. 1, p. 162, 1856. 1 species. Type, *Anthrax jacchus* FABRICIUS. Equals **Mima** MEIGEN, 1820.

Aricia DESVOIDY, Essai Myod., p. 486, 1830. 9 supposed species. Type, *Musca impuncta* FALLEN, the first 5 supposed species, by designation of COQUILLETT, Journ. N. Y. Ent. Soc., vol. 9, 1901, p. 135. Equals **Mydæa** DESVOIDY, 1830.

Arina DESVOIDY, Essai Myod., p. 696, 1830. 1 species. Type, *Arina obscura* DESVOIDY. Equals **Chetocera** DESVOIDY, 1830.

Arisbæa DESVOIDY, Hist. Nat. Dipt., vol. 2, p. 290, 1863. 1 species. Type, *Arisbæa lateralis* DESVOIDY. Equals **Eliozeta** RONDANI, 1856.

Arnoldia KIEFFER, Wien. Ent. Zeit., vol. 14, p. 7, 1895. 2 species. Type, *Cecidomyia quercus* BINNEY, the second species, by present designation.

Arpagita LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 1327, 1864. 1 species. Type, *Stomoxys dorsalis* FABRICIUS. Equals **Dalmannia** DESVOIDY, 1830.

Arrenopus BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 58, p. 360, 1891. 2 species. Type, *Sphixapata piligena* RONDANI, the second species, by designation of BRAUER and BERGENSTAMM, Verh. Zool.-Bot. Ges. Wien, vol. 43, 1893, p. 504. Equals **Senotainia** MACQUART, 1846.

Arrhenica OSTEN SACKEN, Proc. Acad. Nat. Sci. Phila. for 1859, p. 243, 1860. 2 species. Type, *Arrhenica spinosa* OSTEN SACKEN, the first species, by present designation. Equals **Caloptera** GUERIN, 1829.

Arribalzagia THEOBALD, Monogr. Culic., vol. 3, p. 81, 1903. 1 species. Type, *Arribalzagia maculipes* THEOBALD. Equals **Cellia** THEOBALD, 1902.

Artemita WALKER, List Dipt. Brit. Mus., vol. 5, Suppl. 1, p. 61, 1854. 2 species. Type, *Clitellaria amenides* WALKER, the second species, by designation of BRAUER, Denkschr. Kais. Akad. Wiss. Wien, vol. 44, 1882, p. 86. Syn., *Acanthina* WIEDEMANN, 1830, preoccupied; *Acanthinomyia* HUNTER, 1900.

Arthria KIRBY, Fauna Bor. Amer., Ins., p. 311, 1837. 1 species. Type, *Arthria analis* KIRBY. Equals **Aspistes** MEIGEN, 1818.

Arthroceras WILLISTON, Ent. Amer., vol. 2, p. 107, 1886. 2 species. Type, *Arthroceras pollinosus* WILLISTON, the second species, by present designation.

Arthrochæta BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 56, p. 134, 1889. 1 species. Type, *Arthrochæta demoticoides* BRAUER and BERGENSTAMM. Syn., *Microtrichomma* GIGLIO-TOS, 1893.

Arthrocnodax RÜBSAAMEN, Wien. Ent. Zeit., vol. 14, p. 189, 1895. 3 species. Type, *Arthrocnodax vitis* RÜBSAAMEN, the first species, by present designation.

Arthropeas LOEW, Ent. Zeit. Stettin, vol. 11, p. 304, 1850. 1 species. Type, *Arthropeas sibirica* LOEW.

Arthrostylum WILLISTON, Kansas Univ. Quart., vol. 4, p. 108, 1895. 1 species. Type, *Pheneus tibialis* WALKER (as *fascipennis*, new species). Equals **Pheneus** WALKER, 1851.

Ascia MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 3, p. 185, 1822. 5 species (as 9). Type, *Syrphus podagricus* FABRICUS, the first species, by designation of WESTWOOD, Intr., vol. 2, 1840, Synops., p. 136. Not *Ascia* SCOPOLI, 1777. Equals **Neoascia** WILLISTON, 1886.

Asemosyrphus BIGOT, Bull. Soc. Ent. France for 1882, p. 128, 1882. 2 species (as 4). Type, *Helophilus mexicanus* MACQUART (equals the first 3 species), by present designation.

Asilus LINNÆUS, Syst. Nat., 10th ed., p. 605, 1758. 12 species. Type, *Asilus crabroniformis* LINNÆUS, the third species, by designation of LATREILLE, Consid. General., 1810, p. 443.

Asindulum LATREILLE, Hist. Nat. Crust. et Ins., vol. 14, p. 290, 1805. 1 species. Type, *Asindulum nigrum* LATREILLE. Syn., *Macrorrhyncha* WINNERTZ, 1846; *Adelinia* COSTA, 1857; *Antlemon* LOEW, 1871.

Asphondylia LOEW, Dipt. Beitr., vol. 4, pp. 20, 21, 1850. 1 species. Type, *Cecidomyia sarothamni* LOEW. Syn., *Phyllophaga* RONDANI, 1856.

Aspidoptera COQUILLETT, Can. Ent., vol. 31, p. 334, 1899. 1 species. Type, *Aspidoptera busckii* COQUILLETT. Syn., *Lepopteryx* SPEISER, 1900.

Aspilia RONDANI, Atti Soc. Ital. Sci. Nat., vol. 9, p. 3, 1866. 6 species. Type, *Anthomyia allotalla* MEIGEN, the sixth species, by original designation. Equals **Mydæa** DESVOIDY, 1830.

Aspilota LOEW, Monogr. Dipt. N. Amer., vol. 3, p. 286, 1873. 2 species. Type, *Trypeta alba* LOEW, the first species, by present designation. Not *Aspilota* FOERSTER, 1862. Equals **Neaspilota** OSTEN SACKEN, 1878.

Aspistes MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 1, p. 319, 1818. 1 species. Type *Aspistes berolinensis* MEIGEN. Syn., *Arthria* KIRBY, 1837.

Asteia MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 6, p. 88, 1830. 2 species. Type, *Asteia amœna* MEIGEN, the first species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 152.

Asthenia WESTWOOD, Mag. Zool., ser. 2, vol. 4, Ins., pl. 94, 1842. 1 species. Type, *Asthenia fasciata* WESTWOOD. Not *Asthenia* HÜBNER, 1816. Equals **Blephariceria** MACQUART, 1843.

Astoma LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 762, 1864. 1 species. Type, *Nemotelus niger* DE GEER. Equals **Omphrale** MEIGEN, 1800.

Astrophanes OSTEN SACKEN, Biol. Centr.-Amer., Dipt., vol. 1, p. 106, 1886. 1 species. Type, *Astrophanes adonis* OSTEN SACKEN.

Asynapta LOEW, Dipt. Beitr., vol. 4, pp. 20, 21, 1850. 5 species. Type, *Cecidomyia longicollis* LOEW, the first species, by present designation.

Asyndetus LOEW, Berliner Ent. Zeitschr., vol. 13, p. 35, 1869. 2 species. Type, *Asyndetus ammophilus* LOEW, the first species, by present designation.

Atacta SCHINER, Reise *Novara*, Zool., vol. 2, Dipt., p. 328, 1868. 1 species. Type, *Atacta brasiliensis* SCHINER.

Atalanta MEIGEN, Nouv. Class. Mouch., p. 31, 1800.* No species. *Clinocera* MEIGEN, 1803, is a change of name. Type, *Clinocera nigra* MEIGEN. Syn., *Clinocera* MEIGEN, 1803; *Paramesia* MACQUART, 1835.

Atarba OSTEN SACKEN, Monogr. Dipt. N. Amer., vol. 4, p. 127, 1869. 1 species. Type, *Atarba picticornis* OSTEN SACKEN.

Atelenevra MACQUART, Rec. Soc. Sci. Lille for 1834, p. 356, 1834. 1 species. Type, *Pipunculus holosericeus* MEIGEN. Equals **Chalarus** WALKER, 1834.

Atelestus WALKER, Ent. Mag., vol. 4, p. 229, 1837. 1 species. Type, *Empis pulicaria* FALLEN (as *sylvicola*, new species). Syn., *Platycnema* ZETTERSTEDT, 1838.

Ateloglossa COQUILLETT, Journ. N. Y. Ent. Soc., vol. 7, p. 219, 1899. 1 species. Type, *Ateloglossa cinerea* COQUILLETT.

Atemnocera BIGOT, Bull. Soc. Ent. France for 1882, p. 114, 1882. 1 species. Type, *Volucella scutellata* MACQUART. Equals **Volucella** GEOFFROY, 1762.

Ateria DESVOIDY, Hist. Nat. Dipt., vol, 1, p. 809, 1863. 1 species. Type, *Ateria nitida* DESVOIDY. Equals **Wagneria** DESVOIDY, 1830.

Atherix MEIGEN, Illiger's Mag., vol. 2, p. 271, 1803. 2 species. Type, *Sylvicola melanchola* HARRIS (as *Rhagio diadema* FABRICIUS), the first species, by designation of

LATREILLE, Consider Général., 1810, p. 443. Syn., *Nodutis* MEIGEN, 1820; *Ibisia* RONDANI, 1856.

Athrycia DESVOIDY, Essai Myod., p. 111, 1830. 2 species. Type, *Athrycia erythrocera* DESVOIDY, the first species, by designation of DESVOIDY, Hist. Nat. Dipt., vol. 1, 1863, p. 830. Equals **Voria** DESVOIDY, 1830.

Athyroglossa LOEW, Neue Beitr., vol. 7, p. 12, 1860. 1 species. Type, *Notiphila glabra* MEIGEN.

Atilia DESVOIDY, Hist. Nat. Dipt., vol. 1, p. 475, 1863. 1 species (as 5). Type, *Musca libatrix* PANZER. Equals **Zenilla** DESVOIDY, 1830.

Atomaria BIGOT, Ann. Soc. Ent. France for 1854, p. 482, 1854. 1 species. Type, *Tipula atomaria* DE GEER. Not *Atomaria* STEPHENS, 1830. Equals **Epidapus** HALIDAY, 1856.

Atomogaster MACQUART, Hist. Nat., Dipt., vol. 2, p. 329, 1835. 6 species. Type, *Atomogaster macquarti* STÆGER (as *Anthomyia triquetra* MEIGEN), the first species, by original designation. Equals **Azelia** DESVOIDY, 1830.

Atomosia MACQUART, Dipt. Exot., vol. 1, pt. 2, p. 73, 1838. 6 species. Type, *Laphria puella* WIEDEMANN (as *incisuralis*, new species), the fourth species, by present designation.

Atonia WILLISTON, Psyche, vol. 5, p. 257, 1889. 2 species. Type, *Atomosia mikii* WILLISTON, the second species, by designation of WILLISTON, Biol. Centr.-Amer., Dipt., vol. 1, 1901, p. 316.

Atractia MACQUART, Dipt. Exot., vol. 1, pt. 2, p. 151, 1838. 1 species. Type, *Asilus psilogaster* WIEDEMANN.

Atractocera MEIGEN, Illiger's Mag., vol. 2, p. 263, 1803. 1 species. Type, *Simulium ornatum* MEIGEN (as *Tipula regelationis* LINNÆUS). Equals **Molusina** MEIGEN, 1800.

Atrichia SCHRANK, Fauna Boica, vol. 3, p. 54, 1803.* 1 species (as 3). Type, *Musca fenestralis* LINNÆUS. Equals **Omphrale** MEIGEN, 1800.

Atrichia LOEW, Berliner Ent. Zeitschr., vol. 10, p. 42, 1866. 1 species. Type, *Atrichia longurio* LOEW. Not *Atrichia* SCHRANK, 1803. Equals **Pseudatrichia** OSTEN SACKEN, 1877.

Atrichopogon KIEFFER, Gen. Ins., Dipt., Chir., p. 53, 1906. 3 species. Type, *Ceratopogon exilis* COQUILLETT, the first species, by present designation. Equals **Helea** MEIGEN, 1800.

Atropharista TOWNSEND, Trans. Amer. Ent. Soc., vol. 19, p. 92, 1892. 1 species. Type, *Tachina insolita* WALKER (as *jurinoides*, new species). Equals **Melanophrys** WILLISTON, 1886.

Atrophopalpus TOWNSEND, Ent. News, vol. 3, p. 130, 1892. 1 species. Type, *Atrophopalpus angusticornis* TOWNSEND.

Atrophopoda TOWNSEND, Trans. Amer. Ent. Soc., vol. 18, p. 373, 1891. 1 species. Type, *Atrophopoda singularis* TOWNSEND. Equals **Paradidyma** BRAUER and BERGENSTAMM, 1891.

Atylotus OSTEN SACKEN, Mem. Boston Soc. Nat. Hist., vol. 2, p. 426, 1876. 4 species. Type, *Tabanus bicolor* WIEDEMANN, the first species, by present designation. Equals **Tabanus** LINNÆUS, 1758.

Aulacigaster MACQUART, Hist. Nat., Dipt , vol. 2, p. 579, 1835. 1 species. Type, *Aulacigaster rufitarsis* MACQUART. Syn., *Apotomella* DUFOUR, 1846; *Ampycophora* WAHLBERG, 1847.

Automola LOEW, Monogr. Dipt. N. Amer., vol. 3, p. 118, 1873. 2 species. Type, *Ortalis atomaria* WIEDEMANN, the first species, by present designation.

Avihospita HENDEL, Wien. Ent. Zeit., vol. 20, p. 29, 1901. 1 species. Type, *Musca azurea* FALLEN. Equals **Protocalliphora** HOUGH, 1899.

Azelia DESVOIDY, Essai Myod., p. 592, 1830. 9 supposed species. Type, *Anthomyia triquetra* WIEDEMANN (equals the first and fourth supposed species), by designation of RONDANI, Atti Soc. Ital. Sci. Nat., vol. 9, 1866, p. 72. Syn., *Atomogaster* MACQUART, 1835.

Baccha FABRICIUS, Syst. Antliatorum, p. 199, 1805. 6 species. Type, *Syrphus elongatus* FABRICIUS, the last species, by designation of CURTIS, Brit. Ent., p. 737, 1839.

Bacchis DESVOIDY, Essai Myod., p. 803, 1830. 5 species. Type, *Bacchis cellarum* DESVOIDY, the first species, by present designation. Equals Leptocera OLIVIER, 1813.

Bactria MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 2, p. 307, 1820. 1 species. Type, *Asilus pictus* MEIGEN. Syn., *Trupanea* MACQUART, 1838; *Promachus* LOEW, 1848; *Telejoneura* RONDANI, 1864.

Baldratia KIEFFER, Meine Antwort Rübsaamen, p. 6, 1897.* 1 species. Type, *Baldratia salicorniæ* KIEFFER.

Balioptera LOEW, Berliner Ent. Zeitschr., vol. 8, p. 347, 1865. 6 species. Type, *Musca combinata* LINNÆUS, the first species, by present designation. Equals Geomyza FALLEN, 1810.

Barpleygma WULP, Biol. Centr.-Amer., Dipt., vol. 2, p. 416, 1899. 1 species. Type, *Baryplegma gilva* WULP.

Bathydexia WULP, Biol. Centr.-Amer., Dipt., vol. 2, p. 222, 1891. 2 species. Type, *Phorostoma appendiculata* BIGOT, the first species, by present designation.

Baumhaueria MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 7, p. 251, 1838. 1 species. Type, *Tachina goniæformis* MEIGEN. Syn., *Pachycephala* LIOY, 1864.

Bebricia DESVOIDY, Hist. Nat. Dipt., vol. 1, p. 1112, 1863. 2 species. Type, *Macquartia micracera* DESVOIDY, the first species, by original designation. Equals, **Macquartia** DESVOIDY, 1830.

Beggiatia LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 1088, 1864. 1 species. Type, *Sepsis barbipes* MEIGEN. Equals **Sepsis** FALLEN, 1810.

Belida DESVOIDY, Hist. Nat. Dipt., vol. 2, p. 45, 1863. 1 species. Type, *Belida flavipalpis* DESVOIDY. Equals **Sturmia** DESVOIDY, 1830.

Bellardia DESVOIDY, Hist. Nat. Dipt., vol. 2, p. 548, 1863. 1 species. Type, *Tachina obsoleta* MEIGEN (as *vernalis*, new species). Equals **Onesia** DESVOIDY, 1830.

Bellieria DESVOIDY, Hist. Nat. Dipt., vol. 2, p. 432, 1863. 1 species (as 2). Type, *Sarcophaga melanura* MEIGEN. Equals **Sarcophaga** MEIGEN, 1826.

Belvosia DESVOIDY, Essai Myod., p. 103, 1830. 1 species. Type, *Musca bifasciata* FABRICIUS (as *bicincta*, new species). Syn., *Latreillia* DESVOIDY, 1830; *Latreillimyia* TOWNSEND, 1908.

Bercœa DESVOIDY, Hist. Nat. Dipt., vol. 2, p. 549, 1863. 8 species (as 13). Type, *Musca hæmorrhoidalis* FALLEN, the sixth species, by original designation. Equals **Sarcophaga** MEIGEN, 1826.

Beris LATREILLE, Hist. Nat. Crust. et Ins., vol. 3, p. 447, 1802. 1 species. Type, *Musca chalybeata* FORSTER (as *Stratiomys serdentata* FABRICIUS). Syn., *Hexacantha* MEIGEN, 1803; *Oplachantha* RONDANI, 1864; *Hexacantha* LIOY, 1864; *Octacantha* LIOY, 1864.

Berismyia GIGLIO-TOS, Boll. Mus. Zool. Univ. Torino, vol. 6, No. 108, p. 2, 1891. No species. In Mem. Reale Accad. Sci. Torino, ser. 2, vol. 43, 1892, 1 species. Type, *Berismyia fusca* GIGLIO-TOS.

Bertieria KIEFFER, Bull. Soc. Ent. France for 1896, p. 189, 1896. 1 species. Type, *Bertieria gemmicola* KIEFFER. Equals **Rabdophaga** WESTWOOD, 1847.

Beskia BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 56, p. 139, 1889. 1 species. Type, *Tachina vlops* WALKER (as *cornuta*, new species). Syn., *Ocypterosipha* TOWNSEND, 1894.

Besseria DESVOIDY, Essai Myod., p. 232, 1830. 1 species. Type, *Ocyptera lateralis* FALLEN (as *reflexa*, new species). Syn., *Wahlbergia* ZETTERSTEDT, 1842; *Apostrophus* LOEW, 1870.

Bezzia KIEFFER, Bull. Soc. Ent. France for 1899, p. 69, 1899. 1 species. Type, *Ceratopogon ornatus* MEIGEN. Syn., *Probezzia* KIEFFER, 1906.

Bibio GEOFFROY, Hist. Abrégée Ins., vol. 2, p. 568, 1762. 5 species. Type, *Tipula hortulana* LINNÆUS, the third species, by designation of LATREILLE, Consider. Général., p. 442, 1810. Syn., *Pullata* HARRIS, 1776.

Bibiocephala OSTEN SACKEN, Ann. Rep. U. S. Geol. Surv. for 1873, p. 564, 1874. 1 species. Type, *Bibiocephala grandis* OSTEN SACKEN. Syn., *Agathon* RÖDER, 1890.

Bibioides COQUILLETT, Proc. Ent. Soc. Washington, vol. 6, p. 171, 1904. 1 species. Type, *Bibioides halteralis* COQUILLETT.

Bicellaria MACQUART, Monogr. Empides, p. 155, 1823. 1 species. Type, *Empis spuria* FALLEN (as *nigra*, new species). Syn., *Cyrtoma* MEIGEN, 1824.

Bigotia DESVOIDY, Hist. Nat. Dipt., vol. 1, p. 1048, 1863. 1 species. Type, *Tachina simulans* MEIGEN (as *brevicornis* MACQUART). Equals **Exorista** MEIGEN, 1803.

Biomya RONDANI, Dipt. Ital. Prodr., vol. 1, p. 72, 1856. No species. *Viviania* RONDANI, 1861, was a change of name. Type, *Tachina cinerea* FALLEN. Syn., *Fabricia* MEIGEN, 1838 (preoccupied); *Viviania* RONDANI, 1861; *Masiphya* BRAUER and BERGENSTAMM, 1891.

Bischofia HENDEL, Abh. Zool.-Bot. Ges. Wien, vol. 2, p. 52, 1902. 3 species. Type, *Sciomyza simplex* FALLEN, the first species, by present desig ation. Equals **Sciomyza** FALLEN, 1820.

Bittacomorpha WESTWOOD, Lond. Edinb. Philos. Mag., vol. 6, p. 281, 1835. 1 species. Type, *Tipula clavipes* FABRICIUS.

Blacodes LOEW, Berliner Ent. Zeitschr., vol. 18, p. 377, 1874. Change of name for *Blax* LOEW, 1872, not THOMSON, 1860. Type, *Blax bellus* LOEW. Not *Blacodes* DEJEAN, 1859. Equals **Cophura** OSTEN SACKEN, 1887.

Blax LOEW, Berliner Ent. Zeitschr., vol. 16, p. 241, 1872. 1 species. Type, *Blax bellus* LOEW. Not *Blax* THOMSON, 1860. Equals **Cophura** OSTEN SACKEN, 1887.

Blepharepium RONDANI, Studi Ent., vol. 1, p. 89, 1848. 1 species. Type, *Blepharepium luridum* RONDANI. Syn., *Planetolestes* ARRIBALZAGA, 1879.

Blepharicera MACQUART, Ann. Soc. Ent. France for 1843, p. 61, 1843. 1 species. Type, *Asthenia fasciata* WESTWOOD (as *limbipennis*, new species). Syn., *Asthenia* WESTWOOD, 1842, preoccupied.

Blepharidea RONDANI, Dipt. Ital. Prodr., vol. 1, p. 67, 1856. 1 species. Type, *Tachina vulgaris* FALLEN. Equals **Phryxe** DESVOIDY, 1830.

Blepharidopsis BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 58, p. 329, 1891. 1 species. Type, *Tachina nemea* MEIGEN. Equals **Phryxe** DESVOIDY, 1830.

Blepharigena RONDANI, Dipt. Ital. Prodr., vol. 1, p. 69, 1856. 1 species. Type, *Tachina trepida* MEIGEN. Equals **Voria** DESVOIDY, 1830.

Blepharipa RONDANI, Dipt. Ital. Prodr., vol. 1, p. 71, 1856. 1 species. Type, *Nemoræa scutellata* DESVOIDY (as *Masicera ciliata* MACQUART). Equals **Sturmia** DESVOIDY, 1830.

Blepharipeza MACQUART, Dipt. Exot., vol. 2, pt. 3, p. 211, 1843. 1 species. Type, *Tachina leucophrys* WIEDEMANN (as *rufipalpis*, new species). Syn., *Rileya* BRAUER and BERGENSTAMM, 1893; *Rileymyia* TOWNSEND, 1893.

Blephariptera MACQUART, Hist. Nat., Dipt., vol. 2, p. 412, 1835. 12 species. Type, *Musca serrata* LINNÆUS, the second species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 145. Equals **Heleomyza** FALLEN, 1810.

Blepharoneura LOEW, Monogr. Dipt. N. Amer., vol. 3, p. 272, 1873. 1 species. Type, *Trypeta pœcilogaster* LOEW.

Blepharoprocta LOEW, Berliner Ent. Zeitschr., vol. 6, p. 194, 1862. 3 species. Type, *Brachystoma nigrimana* LOEW, the first species, by designation of COQUILLETT, Proc. Ent. Soc. Washington, vol. 5, p. 246, 1903.

Blissonia DESVOIDY, Hist. Nat. Dipt., vol. 2, p. 648, 1863. 1 species (as 3). Type, *Musca assimilis* FALLEN. Equals **Muscina** DESVOIDY, 1830.

Blondelia DESVOIDY, Essai Myod., p. 122, 1830. 2 species (as 4). Type, *Tachina nigripes* FALLEN, the first two and the last supposed species, by present designation. Equals **Lydella** DESVOIDY, 1830.

Blumia DESVOIDY, Hist. Nat. Dipt., vol. 1, p. 468, 1863. 1 species. Type, *Tachina vulgaris* FALLEN (as *occlusa*, new species). Equals **Phryxe** DESVOIDY, 1830.

Bogeria AUSTEN, Ann. Mag. Nat. Hist. for 1895, p. 391, 1895. 1 species. Type, *Bogeria princeps* AUSTEN.

Bolbomyia LOEW, Bernst. und Bernstein-fauna, p. 39, 1850.* No species. In 1862, 1 species. Type, *Bolbomyia nana* LOEW.

Boletina STEGER, Nat. Tijdschr., vol. 3, p. 233, 1840. 9 species. Type, *Leia trivittata* MEIGEN, the first species, by designation of JOHANNSEN in Wytsman's Gen. Ins., Dipt., Mycet., 1909, p. 73.

Bolitophila MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 1, p. 220, 1818. 1 species. Type, *Macrocera hybrida* MEIGEN (as *fusca*, new species). Syn., *Messala* CURTIS, 1836.

Bolomyia BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 58, p. 347, 1891. 1 species. Type, *Exorista rufata* BIGOT (as *Mystacella violacea* WULP).

Bombibia LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 1326, 1864. 1 species. Type, *Conops flavipes* LINNÆUS. Equals **Conops** LINNÆUS, 1758.

Bombyliomyia BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 56, p. 131, 1889. 1 species. Type, *Hystricia flavipalpus* MACQUART.

Bombylius LINNÆUS, Syst. Nat., 10th ed., p. 606, 1758. 3 species. Type, *Bombylius major* LINNÆUS, the first species, by designation of LATREILLE, Consider. Général., 1810, p. 443.

Bonellia DESVOIDY, Essai Myod., p. 56, 1830. 1 species (as 3). Type, *Tachina hæmorrhoidalis* FALLEN. Equals **Linnæmya** DESVOIDY, 1830.

Bonnetia DESVOIDY, Essai Myod., p. 55, 1830. 1 species (as 2). Type, *Tachina comta* FALLEN. Syn., *Marshamia* DESVOIDY, 1830; *Micropalpis* MACQUART, 1834.

Bophrosia RONDANI, Dipt. Ital. Prodr., vol. 1, p. 183, 1856. 1 species. Type, *Limonia immaculata* MEIGEN. Equals **Tricyphona** ZETTERSTEDT, 1837.

Borborus MEIGEN, Illiger's Mag., vol. 2, p. 276, 1803. No species. In 1830, 29 species. Type, *Musca subsultans* FABRICIUS, the second species, by designation of CURTIS, Brit. Ent., 1833, p. 469. Equals **Cypsela** MEIGEN, 1800. (*Borborus* of authors equals *Copromyza* FALLEN.

Boreodromia COQUILLETT, Proc. Ent. Soc. Washington, vol. 5, p. 247, 1903. 1 species. Type, *Synamphotera bicolor* LOEW.

Botanobia LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 1125, 1864. 1 species (as 2). Type, *Oscinis dubia* MACQUART. Syn., *Oscinisoma* LIOY, 1864; *Oscinimorpha* LIOY, 1864; *Macrostyla* LIOY, 1864.

Botanophila LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 990, 1864. 1 species. Type, *Anthomyia varicolor* MEIGEN. Equals **Pegomya** DESVOIDY, 1830.

Brachicoma RONDANI, Dipt. Ital. Prodr., vol. 1, p. 69, 1856. 1 species. Type, *Tachina devia* FALLEN (as *nitidula* MEIGEN). Syn., *Oppia* DESVOIDY, 1863; *Laccoprosopa* TOWNSEND, 1891; *Sarcotachinella* TOWNSEND, 1892.

Brachiomyia THEOBALD, Monogr. Culic., vol. 2, p. 343, Nov. 23, 1901. 1 species. Type, *Deinocerites cancer* THEOBALD (as *magna*, new species). Equals **Deinocerites** THEOBALD, July 15, 1901.

Brachiophyra GIGLIO-TOS, Boll. Mus. Zool. Torino, vol. 8, No. 147, p. 9, 1893. 1 species. Type, *Brachiophyra effrons* GIGLIO-TOS.

Brachiosoma THEOBALD, Journ. Trop. Med. for 1901, p. 235, July 15, 1901. No species. *Brachiomyia* THEOBALD, November 23, 1901, is evidently a change of name. Type, *Deinocerites cancer* THEOBALD. Equals **Deinocerites** THEOBALD, July 15, 1901.

Brachycampta WINNERTZ, Verh. Zool.-Bot. Ges. Wien, vol. 13, p. 833, 1863. 8 species. Type, *Mycetophila alternans* ZETTERSTEDT, the first species, by present designation. Equals **Allodia** WINNERTZ, 1863.

Brachydeutera LOEW, Monogr. Dipt. N. Amer., vol. 1, p. 162, 1862. 1 species. Type, *Notiphila argentata* WALKER (as *dimidiata*, new species).

Brachygaster MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 5, p. 244, 1826. 1 species (as 2). Type, *Cordilura analis* MEIGEN. Not *Brachygaster* LEACH, 1817. Equals **Mycetaulus** LOEW, 1845.

Brachymyia WILLISTON, Can. Ent., vol. 14, p. 77, 1882. 2 species. Type, *Brachymyia lupina* WILLISTON, the first species, by present designation. Equals **Penthesilia** MEIGEN, 1800.

Brachyneura RONDANI, Mem. 2a. Serv. Ditt. Ital., p. 18, 1840.* 1 species. Type, *Brachyneura fuscogrisea* RONDANI.

Brachyopa MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 3, p. 260, 1822. 3 species. Type, *Musca conica* PANZER, the first species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 137. Syn., *Hammerschmidtia* SCHUMMEL, 1834; *Exocheila* RONDANI, 1857; *Eugeniamyia* WILLISTON, 1882.

Brachypalpus MACQUART, Hist. Nat., Dipt., vol. 1, p. 523, 1834. 3 species (as 5). Type, *Syrphus valgus* PANZER, the last species (as *tuberculatus*), by designation of RONDANI, Nuovi Ann. Soc. Nat., 1844, p. 456.

Brachypremna OSTEN SACKEN, Berliner Ent. Zeitschr., vol. 30, p. 161, 1886. 2 species. Type, *Tipula dispellans* WALKER, the first species, by present designation.

Brachypteromyia WILLISTON, Ent. News, vol. 7, p. 184, 1896. 1 species. Type, *Anapera fimbriata* WATERHOUSE (as *femorata*, new species).

Brachypus MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 4, p. 34, 1824. 1 species. Type, *Diaphorus cyanocephalus* MEIGEN. Equals **Diaphorus** MEIGEN, 1824.

Brachystoma MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 3, p. 12, 1822. 2 species. Type, *Syrphus vesiculosus* FABRICIUS, the second species, by designation of BLANCHARD, Hist. Nat. Ins., vol. 3, 1840, p. 582.

Brachystomus COSTA, Il Giamb. Vico, Napoli, vol. 2, p. 445, 1857.* 1 species. Type, *Tabanus gigas* HERBST (as *ursus*, new species). Equals **Tabanus** LINNÆUS, 1758.

Brachystylum MACQUART, Ann. Soc. Ent. France for 1855, p. 199, 1855. 1 species. Type *Brachystylum nigra* MACQUART. Equals **Wagneria** DESVOIDY, 1830.

Brauerimyia TOWNSEND, Smiths. Misc. Coll., vol. 51, p. 65, 1908. Change of name for *Wulpia* BRAUER and BERGENSTAMM, 1893, not of BIGOT, 1886. Type, *Wulpia aperta* BRAUER and BERGENSTAMM. Equals **Vanderwulpia** TOWNSEND, 1891.

Bremia RONDANI, Atti Soc. Ital. Nat., vol. 2, p. 289, 1861. 1 species. Type, *Diplosis decorata* LOEW.

Bricinnia WALKER, Trans. Ent. Soc. Lond., n. ser., vol. 5, p. 324, 1861. 1 species. Type, *Bricinnia flexivitta* WALKER.

Bricinniella GIGLIO-TOS, Boll. Mus. Zool. Univ. Torino, vol. 8, No. 158, p. 13, 1893. 1 species. Type, *Bricinniella cyanea* GIGLIO-TOS.

Brontæa KOWARZ, Verh. Zool.-Bot. Ges. Wien, vol. 23, p. 461, 1873. 2 species. Type, *Anthomyia polystigma* MEIGEN, the first species, by present designation. Equals **Limnophora** DESVOIDY, 1830.

Bryocrypta KIEFFER, Berliner Ent. Zeitschr., vol. 41, p. 8, 1891. 1 species. Type, *Bryocrypta dubia* KIEFFER.

Bucentes LATREILLE, Gen. Crust. et Ins., vol. 4, p. 339, 1809. 1 species. Type, *Musca geniculata* DE GEER (as *cinereus*, new species). Equals **Crocuta** MEIGEN, 1800.

Byomya DESVOIDY, Essai Myod., p. 392, 1830. 2 species (as 3). Type, *Musca tempestiva* FALLEN, the first and last supposed species, by present designation. Equals **Musca** LINNÆUS, 1758.

Cacomyia COQUILLETT, Class. Mosq. Amer., p. 16, 1906. 2 species. Type, *Haemagogus albomaculatus* THEOBALD, the first species, by present designation.

Cacoxenus LOEW, Wien. Ent. Monatschr., vol. 2, p. 217, 1858. 1 species. Type, *Cacoxenus indagator* LOEW.

Cænis DESVOIDY, Hist. Nat. Dipt., vol. 1, p. 675, 1863. 2 species. Type, *Cænis prompta* DESVOIDY, the first species, by original designation. Equals **Ceranthia** DESVOIDY, 1830.

Calirrhoe MEIGEN, Nouv. Class. Mouch., p. 39, 1800.* No species. Equals *Prosena* ST. FARGEAU and SERVILLE, 1828. Type, *Stomoxys siberita* FABRICIUS. Syn., *Prosena* ST. FARGEAU and SERVILLE, 1828.

Callicera PANZER, Fauna Ins. Germ., heft 104, no. 17, 1806. 1 species. Type, *Bibio ænea* FABRICIUS.

Callinicus LOEW, Berliner Ent. Zeitschr., vol. 16, p. 247, 1872. 1 species. Type, *Callinicus calcaneus* LOEW.

Calliphora DESVOIDY, Essai Myod., p. 433, 1830. 17 species. Type, *Musca erythrocephala* MEIGEN, by original designation (as *vomitoria* LINNÆUS). Syn., *Compsomyia* RONDANI, 1875; *Eucalliphora* TOWNSEND, 1908.

Callomyia MEIGEN, Klass. Beschr. Zweifl. Ins., p. 311, 1804. 1 species. Type, *Callomyia elegans* MEIGEN. Equals **Cleona** MEIGEN, 1800.

Callomyza FALLEN, Platyp. Bombyl. Sveciæ, p. 6, 1815. 2 species. Type, *Heteroneura leptiformis* FALLEN, the first species, by designation of ZETTERSTEDT, Dipt. Scand., vol. 3, 1844, p. 910. Equals **Cleona** MEIGEN, 1800.

Callopistria LOEW, Monogr. Dipt. N. Amer., vol. 3, p. 140, 1873. 1 species. Type, *Platystoma annulipes* MACQUART. Not *Callopistria* HÜBNER, 1816. Equals **Callopistromyia** HENDEL, 1907.

Callopistromyia HENDEL, Wien. Ent. Zeit., vol. 26, p. 98, 1907. Change of name for *Callopistria* LOEW, 1873, not of HÜBNER, 1816. Type, *Platystoma annulipes* MACQUART. Syn., *Callopistria* LOEW, 1873, preoccupied.

Calobata MEIGEN, Illiger's Mag., vol. 2, p. 276, 1803. 2 species. Type, *Musca petronella* LINNÆUS, the second species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 148. Equals **Trepidaria** MEIGEN, 1800.

Calodexia WULP, Biol. Centr.-Amer., Dipt., vol. 2, p. 257, 1891. 3 species. Type, *Calodexia majuscula* WULP, the first species, by present designation.

Caloptera GUERIN, Voy. Monde *Coquille*, Zool., Plates, Ins., No. 20, fig. 2, 1829. 1 species. Type, *Caloptera fasciata* GUERIN. Syn., *Eranioptera* GUERIN, 1838; *Eriocera* MACQUART, 1838; *Pterocosmos* WALKER, 1848; *Oligomera* DOLESCHALL, 1857; *Physecrania* BIGOT, 1859; *Arrhenica* OSTEN SACKEN, 1860.

Calopterella, new genus. Type, *Diastata vagans* LOEW. Syn., *Trichoptera* LIOY, 1864, preoccupied.

Calotarsa TOWNSEND, Can. Ent., vol. 26, p. 50, 1894. 1 species. Type, *Platypeza pallipes* LOEW (as *ornatipes*, new species). Equals **Clythia** MEIGEN, 1800.

Calyptia DESVOIDY, Hist. Nat. Dipt., vol. 2, p. 576, 1863. 1 species (as 2). Type, *Sarcophaga melanura* MEIGEN. Equals **Sarcophaga** MEIGEN, 1826.

Calyptidia DESVOIDY, Hist. Nat. Dipt., vol. 2, p. 59, 1863. 1 species. Type, *Calyptidia occlusa* DESVOIDY. Equals **Leucostoma** MEIGEN, 1803.

Camarona WULP, Biol. Centr.-Amer., Dipt., vol. 2, page 241, 1891. 2 species. Type, *Camarona xanthogastra* WULP, the first species, by present designation.

Camerania GIGLIO-TOS, Boll. Mus. Zool. Univ. Torino, vol. 6, No. 117, p. 3, 1892. 1 species. Type, *Camerania macrocephala* GIGLIO-TOS (as *Temnocera megacephala* LOEW?). Equals **Volucella** GEOFFROY, 1762.

Camilla DESVOIDY, Hist. Nat. Dipt., vol. 2, p. 641, 1863. 3 species. Type, *Morellia æmuscens* DESVOIDY, the first species, by present designation. Equals **Morellia** DESVOIDY, 1830.

Campeprosopa MACQUART, Dipt. Exot., Suppl. 4, p. 46, 1850. 1 species. Type *Campeprosopa flavipes* MACQUART.

Campiglossa RONDANI, Bull. Soc. Ent. Ital., vol. 2, p. 121, 1870. 1 species. Type, *Tephritis irrorata* FALLEN. Equals **Spathulina** RONDANI, 1856.

Campineura RONDANI, Dipt. Ital. Prodr., vol. 1, p. 52, 1856. 1 species. Type, *Chrysogaster frontalis* LOEW (as *venusta*, new species). Equals **Chrysogaster** MEIGEN, 1800.

Campsicnemus HALIDAY, in Walker's Ins. Britt., Dipt., vol. 1, p. 187, 1851. 6 species. Type, *Dolichopus curripes* FALLEN, the second species, by present designation. Equals **Camptosceles** HALIDAY, 1831.

Camptocladius WULP, Tijdschr. Ent., vol. 17, p. 133, 1874. 3 species. Type, *Tipula byssina* SCHRANK, the first species, by present designation.

Camptoneuromyia FELT, 23d Rep. State Ent. N. Y., p. 334, 1908. 5 species. Type, *Dasineura virginica* FELT, the first species, by present designation.

Camptonevra MACQUART, Dipt. Exot., vol. 2, pt. 3, p. 200, 1843. 2 species. Type, *Musca picta* FABRICIUS, the first species, by original designation. Equals **Delphinia** DESVOIDY, 1830.

Camptoprosopella HENDEL, Wien. Ent. Zeit., vol. 26, p. 223, 1907. 3 species. Type, *Camptoprosopella melanoptera* HENDEL, the first species, by present designation.

Camptosceles HALIDAY, Zool. Journ., vol. 5, p. 357, 1831. 4 species. Type, *Dolichopus scambus* FALLEN, the first species, by present designation. Syn., *Campsicnemus* HALIDAY, 1851.

Campylocheta RONDANI, Dipt. Ital. Prodr., vol. 3, p. 157, 1859. 1 species. Type, *Tachina obscura* FALLEN (as *Phorocera schistacea* MEIGEN). Syn., *Fallenia* MEIGEN, 1838, preoccupied; *Frivaldskia* SCHINER, 1861; *Hypochata* BRAUER and BERGENSTAMM, 1889.

Campylomyza MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 1, p. 101, 1818. 4 species. Type, *Campylomyza flavipes* MEIGEN, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 126.

Canace HALIDAY, Ann. Nat. Hist., vol. 3, p. 411, 1839. 1 species. Type, *Ephydra nasica* HALIDAY.

Carbonia DESVOIDY, Hist. Nat. Dipt., vol. 1, p. 806, 1863. 1 species. Type, *Ocyptera costata* FALLEN (as *impatiens*, new species). Equals **Wagneria** DESVOIDY, 1830.

Carcelia DESVOIDY, Essai Myod., p. 176, 1830. . 21 species. Type, *Tachina gnava* MEIGEN (as *bombylans*, new species), the second species, by designation of DESVOIDY, Hist. Nat. Dipt., vol. 1, 1863, p. 220. Syn., *Chetoliga* RONDANI, 1856; *Paraëxorista* BRAUER and BERGENSTAMM, 1889; *Sisyropa* BRAUER and BERGENSTAMM, 1889; *Eusisyropa* TOWNSEND, 1908.

Cardiacephala MACQUART, Dipt. Exot., vol. 2, pt. 3, p. 242, 1843. 1 species. Type, *Musca longipes* FABRICIUS.

Caricea DESVOIDY, Essai Myod., p. 530, 1830. 18 supposed species. Type, *Musca tigrina* FABRICIUS (the supposed species 2 to 7), by designation of RONDANI, Dipt. Ital. Prodr., vol. 1, 1856, p. 98. Equals **Coenosia** MEIGEN, 1826.

Carlottæmyia BIGOT, Bull. Soc. Ent. France for 1877, p. 26, 1877. 1 species. Type, *Diacrita costalis* GERSTAECKER (as *marcus*, new species). Equals **Diacrita** GERSTAECKER, 1860.

Carpomya RONDANI, Dipt. Ital. Prodr., vol. 1, p. 111, 1856. 1 species. Type, *Musca tussilaginis* FABRICIUS (as *aretii* DE GEER). Equals **Terellia** DESVOIDY, 1830.

Cassidæmyia MACQUART, Hist. Nat., Dipt., vol. 2, p. 162, 1835. 9 species. Type, *Tachina gagatina* MEIGEN, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 139. Equals **Rhinophora** DESVOIDY, 1830.

Catabomba OSTEN SACKEN, Bull. 3, U. S. Geol. Surv., p. 326, 1877. 1 species. Type, *Musca pyrastri* LINNÆUS. Equals **Scæva** FABRICIUS, 1805.

Catachata BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 58, p. 329, 1891. 1 species. Type, *Catachata depressaria* BRAUER and BERGENSTAMM. Equals **Phryxe** DESVOIDY, 1830.

Catagonia BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 58, p. 348, 1891. 1 species. Type, *Exorista aberrans* RONDANI (as *nemestrina*, new species). Equals **Winthemia** DESVOIDY, 1830.

Catemophrys TOWNSEND, Smiths. Misc. Coll., vol. 51, p. 65, 1908. 1 species. Type, *Vanderwulpia sequens* TOWNSEND. Equals **Vanderwulpia** TOWNSEND, 1891.

Cecidogona LOEW, Ent. Zeit. Stettin, vol. 5, p. 324, 1844. 1 species. Type, *Lestremia carnea* LOEW. Equals **Lestremia** MACQUART, 1826.

Cecidomyia MEIGEN, Illiger's Mag., vol. 2, p. 261, 1803. 1 species. Type, *Tipula pini* DE GEER. Equals **Itonida** MEIGEN, 1800.

Celatoria COQUILLETT, Ins. Life, vol. 2, p. 235, 1891. 1 species. Type, *Melanophora diabroticæ* SHIMER (as *crawii*, new species).

Celeripes MONTAGU, Trans. Linn. Soc. Lond., vol. 11, p. 11, 1815. 1 species. Type, *Pediculus vespertilionis* LINNÆUS. Equals **Nycteribia** LATREILLE, 1796.

Cellia THEOBALD, Journ. Trop. Med., vol. 5, p. 183, June 16, 1902. 1 species. Type, *Anopheles pharoensis* THEOBALD. Syn., *Laverania* THEOBALD, June 16, 1902; *Nyssorhynchus* BLANCHARD, July 4, 1902; *Arribalzagia* THEOBALD, 1903.

Cenosoma WULP, Biol. Centr.-Amer., Dipt., vol. 2, p. 166, 1890. 1 species. Type, *Cenosoma signifera* WULP. Equals **Ormia** DESVOIDY, 1830.

Centor LOEW, Zeitschr. Ent. Breslau, vol. 15, p. 7, 1866.* 3 species. Type, *Oscinis cereris* FALLEN, the first species, by present designation. Not *Centor* SCHÖNHERR, 1847. Equals **Cetema** HENDEL, 1907.

Centrocera POKORNY, Verh. Zool.-Bot. Ges. Wien, vol. 43, p. 537, 1893. 1 species. Type, *Musca pedella* FALLEN (as *Cenosia decipiens* MEIGEN). Equals **Coenosia** MEIGEN, 1826.

Cephalomyia LATREILLE, Nouv. Dict. Hist. Nat., vol. 23, p. 273, 1818. 1 species. Type, *Œstrus ovis* LINNÆUS. Equals **Oestrus** LINNÆUS, 1758.

Cephalia MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 5, p. 293, 1826. 1 species (as 2). Type, *Cephalia rufipes* MEIGEN. Syn., *Myrmecomya* DESVOIDY, 1830.

Cephalops FALLEN, Spec. Ent. Dipt. Exh., p. 10, 1810. 1 species. Type, *Cephalops æneus* FALLEN. Equals **Dorilas** MEIGEN, 1800.

Cephenemyia LATREILLE, Nouv. Dict. Hist. Nat., vol. 23, p. 271, 1818. 1 species. Type, *Oestrus trompe* LINNÆUS. Syn., *Endocephala* LIOY, 1865.

Cephenus BERTHOLD, Nat. Fam. Thier., p. 506, 1827. Change of name for *Systropus* WIEDEMANN, 1820 (misspelled *Systrophus*), under the mistaken impression that it is preoccupied by *Systropha* ILLIGER, 1806. Type, *Systropus macilentus* WIEDEMANN. Equals **Systropus** WIEDEMANN, 1820.

Cephysa DESVOIDY, Hist. Nat. Dipt., vol. 2, p. 677, 1863. 1 species. Type, *Musca rudis* FABRICIUS (as *muscidea*, new species). Equals **Pollenia** DESVOIDY, 1830.

Cerajocera RONDANI, Dipt. Ital. Prodr., vol. 1, p. 111, 1856. 1 species. Type, *Musca cornuta* FABRICIUS. Equals **Terellia** DESVOIDY, 1830.

Ceranthia DESVOIDY, Essai Myod., p. 88, 1830. 1 species (as 2). Type, *Ceranthia fulvipes* DESVOIDY. Syn., *Ceromya* DESVOIDY, 1830; *Canis* DESVOIDY, 1853; *Vafrellia* DESVOIDY, 1863; *Cerophora* DESVOIDY, 1863; *Talmonia* DESVOIDY, 1863; *Lythia* DESVOIDY, 1863; *Entomophaga* LIOY, 1864.

Ceratitis MACLEAY, Zool. Journ., vol. 4, p. 482, 1829. 1 species. Type, *Trypeta capitata* WIEDEMANN (as *citriperda*, new species). Syn., *Petalophora* MACQUART, 1835; *Halterophora* RONDANI, 1861.

Ceratobarys COQUILLETT, Journ. N. Y. Ent. Soc , vol. 6, p. 45, 1898. 1 species. Type, *Hippelates eulophus* LOEW.

Ceratochata BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 56, p. 92, 1889. 1 species. Type, *Ceratochæta prima* BRAUER and BERGENSTAMM. Equals **Phryxe** DESVOIDY, 1830.

Ceratocystia DYAR and KNAB, Journ. N. Y. Ent. Soc., vol. 14, p. 183, 1906. 1 species. Type, *Culex discolor* COQUILLETT. Equals **Grabhamia** THEOBALD, July 25, 1903.

Ceratolophus KIEFFER, Bull. Soc. Ent. France for 1899, p. 69, 1899. 1 species. Type, *Ceratopogon femorata* MEIGEN. Equals **Serromyia** MEIGEN, 1818.

Ceratomyiella TOWNSEND, Trans. Amer. Ent. Soc., vol. 18, p. 379, 1891. 1 species. Type, *Ceratomyiella conica* TOWNSEND. Equals **Paradidyma** BRAUER and BERGENSTAMM, 1891.

Ceratomyza SCHINER, Wien. Ent. Monatschr., vol. 6, p. 434, 1862. Change of name for *Odontocera* MACQUART, 1835, not of SERVILLE, 1833. Type, *Chlorops denticornis* PANZER. Equals **Cerodontha** RONDANI, 1861.

Ceratophya WIEDEMANN, Anal. Ent., p. 14, 1824.* 2 species. Type, *Ceratophya notata* WIEDEMANN, the first species, by present designation. Equals **Microdon** MEIGEN, 1803.

Ceratopogon MEIGEN, Illiger's Mag., vol. 2, p. 261, 1803. 1 species. Type, *Ceratopogon communis* MEIGEN (as *Tipula barbicornis* FABRICIUS). Equals **Helea** MEIGEN, 1800.

Ceratoxys RONDANI, Dipt. Ital. Prodr., vol. 4, p. 10, 1861. Change of name for *Meckelia* DESVOIDY, 1830, not of LEUCKART, 1828. Type, *Musca hortulana* ROSSI. Equals **Ceroxys** MACQUART, 1835.

Ceraturgopsis JOHNSON, Psyche, vol. 10, p. 111, 1903. 1 species. Type, *Dasypogon cornutus* WIEDEMANN.

Ceraturgus WIEDEMANN, Anal. Ent., p. 12, 1824.* 1 species. Type, *Dasypogon aurulentus* FABRICIUS.

Ceria SCOPOLI, Ent. Carn., p. 351, 1763. 2 species. Type, *Tipula notata* LINNÆUS, the first species (as *decemmodia*, new species), by present designation. Equals **Scathopse** GEOFFROY, 1762.

Ceria FABRICIUS, Ent. Syst., vol. 4, p. 277, 1794. 1 species (without name). Type, *Musca conopsoides* LINNÆUS. Not *Ceria* SCOPOLI, 1763. Equals **Cerioides** RONDANI, 1850.

Ceriogaster WILLISTON, Trans. Amer. Ent. Soc., vol. 15, p. 285, 1888. 1 species. Type, *Ceriogaster fascithorax* WILLISTON.

Cerioides RONDANI, Ann. Soc. Ent. France for 1850, p. 211, 1850. 1 species. Type, *Ceria subsessilis* ILLIGER. Syn., *Ceria* FABRICIUS, 1794, preoccupied; *Sphixinorpha* RONDANI, 1850.

Cerodontha RONDANI, Dipt. Ital. Prodr., vol. 4, p. 10, 1861. Change of name for *Odontocera* MACQUART, 1835, preoccupied. Type, *Chlorops denticornis* PANZER. Syn., *Odontocera* MACQUART, 1835, preoccupied; *Ceratomyza* SCHINER, 1862.

Ceromasia RONDANI, Dipt. Ital. Prodr., vol. 1, p. 71, 1856. No species. In vol. 4, 1861, pp. 18 and 19, 10 species. Type, *Tachina rutila* MEIGEN, the last species, by designation of BRAUER, Verh. Zool.-Bot. Ges. Wien, vol. 43, 1893, p. 476.

Ceromya DESVOIDY, Essai Myod., p. 86, 1830. 3 species (as 5). Type, *Tachina bicolor* MEIGEN, the fourth supposed species (as *testacea*, new species), by present designation. Equals **Ceranthia** DESVOIDY, 1830.

Cerophora DESVOIDY, Hist. Nat. Dipt., vol. 1, p. 700, 1863. 1 species. Type, *Cerophora funesta* DESVOIDY. Equals **Ceranthia** DESVOIDY, 1830.

Ceroplatus. See **Keroplatus.**

Cerotainia SCHINER, Verh. Zool.-Bot. Ges. Wien, vol. 16, p. 673, 1866. 1 species. Type, *Laphria xanthoptera* WIEDEMANN.

Cerotelion RONDANI, Dipt. Ital. Prodr., vol. 1, p. 191, 1856. 1 species. Type, *Tipula linearis* FABRICIUS (as *Platyura laticornis* MEIGEN). Equals **Keroplatus** BOSC, 1792.

Ceroxys MACQUART, Hist. Nat. Dipt., vol. 2, p. 437, 1835. 8 species. Type, *Musca urticæ* LINNÆUS, the second species, by designation of WESTWOOD, Intr., vol. 2, Synops., p. 149, 1840. Syn., *Meckelia* DESVOIDY, 1830, preoccupied; *Ceratoxys* RONDANI, 1861; *Anacampta* LOEW, 1868.

Cestonia RONDANI, Dipt. Ital. Prodr., vol. 4, p. 105, 1861. 1 species. Type, *Cestonia cineraria* RONDANI.

Cetema HENDEL, Wien. Ent. Zeit., vol. 26, p. 98, 1907. Change of name for *Centor* LOEW, 1866, not SCHÖNHERR, 1847. Type, *Oscinis cereris* FALLEN. Syn., *Centor* LOEW, 1866, preoccupied.

Chætoclusia COQUILLETT, Proc. Ent. Soc. Washington, vol. 6, p. 93, 1904. 1 species. Type, *Chætoclusia bakeri* COQUILLETT.

Chætocœlia GIGLIO-TOS, Boll. Mus. Zool. Univ. Torino, vol. 8, No. 158, p. 11, 1893. 1 species. Type, *Chætocœlia palans* GIGLIO-TOS.

Chætogædia BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 58, p. 336, 1891. 2 species. Type, *Prospherysa vilis* WULP, the first species, by designation of TOWNSEND, Smiths. Misc. Coll., vol. 51, 1908, p. 94. Syn., *Phrissopolia* TOWNSEND, 1908.

Chætoglossa TOWNSEND, Trans. Amer. Ent. Soc., vol. 19, p. 125, 1892. 2 species (as 3). Type, *Chætoglossa picticornis* TOWNSEND, the first species, by original designation.

Chætona WULP, Biol. Centr.-Amer., Dipt., vol. 2, p. 253, 1891. 2 species. Type, *Dexia longiseta* WIEDEMANN, the first species, by present designation.

Chætopeleteria MIK, Wien. Ent. Zeit., vol. 13, p. 100, 1894. 1 species. Type, *Echinomyia popelii* PORTSCHINSKY. Equals **Peleteria** DESVOIDY, 1830.

Chætophleps COQUILLETT, Journ. N. Y. Ent. Soc., vol. 3, p. 51, 1895. 1 species. Type, *Chaetophleps setosa* COQUILLETT.

Chætoplagia COQUILLETT, Journ. N. Y. Ent. Soc., vol. 3, p. 98, 1895. 1 species. Type, *Chætoplagia atripennis* COQUILLETT.

Chætopsis LOEW, Berliner Ent. Zeitschr., vol. 11, p. 315, 1868. 2 species. Type, *Ortalis ænea* WIEDEMANN, the first species, by present designation.

Chætosa COQUILLETT, Journ. N.Y. Ent. Soc., vol. 6, p. 163, 1898. 1 species. Type, *Cordilura punctipes* MEIGEN.

Chætotachina BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 56, p. 98, 1889. 1 species. Type, *Tachina simulans* MEIGEN (as *rustica* MEIGEN). Equals **Exorista** MEIGEN, 1803.

Chalarus WALKER, Ent. Mag., vol. 2, p. 269, 1834. 1 species (as 2). Type, *Cephalops spurius* FALLEN. Syn., *Atelenevra* MACQUART, 1834.

Chalcidimorpha WESTWOOD, Ann. Soc. Ent. France for 1835, p. 685, 1835. 4 species. Type, *Chalcidimorpha fulvipes* WESTWOOD, the first species, by designation of MACQUART, Dipt. Exot., vol. 1, pt. 2, 1838, p. 153. Equals **Xenomyza** WIEDEMANN, 1817.

Chalcomyia WILLISTON, Bull. Brooklyn Ent. Soc., vol. 7, p. 133, 1885. 1 species. Type, *Myolepta ærea* LOEW.

Chamæmyia MEIGEN, Illiger's Mag., vol. 2, p. 278, 1803. No species. In his Syst. Beschr., vol. 6, p. 93, 1830, he mentioned 1 species. Type, *Chamæmyia elegans* PANZER. Syn., *Ochtiphila* FALLEN, 1823; *Estelia* DESVOIDY, 1830.

Chamæsyrphus MIK, Wien. Ent. Zeit., vol. 14, p. 133, 1895. 1 species. Type. *Rhingia scævoides* FALLEN.

Chaoborus LICHTENSTEIN, Arch. Zool. (Wiedemann's), vol. 1, p. 174, 1800. 1 species. Type, *Tipula crystallina* DE GEER (as *antisepticus*, new species). Syn., *Sayomyia* COQUILLETT, 1903.

Charadrella WULP, Biol. Centr.-Amer., Dipt., vol. 2, p. 341, 1896. 1 species. Type, *Charadrella macrosoma* WULP.

Chasmatonotus LOEW, Berliner Ent. Zeitschr., vol. 8, p. 51, 1864. 1 species. Type, *Chasmatonotus unimaculatus* LOEW.

Chauna LOEW, Ent. Zeit. Stettin, vol. 8, p. 370, 1847. 1 species. Type, *Chauna variabilis* LOEW. Not *Chauna* ILLIGER, 1811. Equals **Neochauna** WILLISTON, 1896.

Cheilopogon RONDANI, Dipt. Ital. Prodr., vol. 1, p. 157, 1856. 1 species. Type, *Asilus diadema* FABRICIUS (as *Dasypogon punctatus* FABRICIUS). Equals **Dasypogon** MEIGEN, 1803.

Cheilosia MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 3, p. 289, 1822. 1 species. Type, *Syrphus flavipes* PANZER (as *depila*, new species).

Chelifera MACQUART, Monogr. Empides, p. 150, 1823. 1 species. Type, *Tachydromia pravatoria* FALLEN (as *raptor*, new species). Syn., *Mantipeza* RONDANI, 1856; *Polydromya* BIGOT, 1857.

Cheligaster MACQUART, Hist. Nat., Dipt., vol. 2, p. 479, 1835. 3 species. Type, *Musca patris* LINNÆUS, the first species, by present designation. Equals **Themira** DESVOIDY, 1830.

Chelipoda MACQUART, Monogr. Empides, p. 148, 1823. 2 species. Type, *Empis melanocephala* FABRICIUS, the second species, by designation of COQUILLETT, Proc. Ent. Soc. Washington, vol. 5, 1903, p. 247. Equals **Hemerodromia** MEIGEN, 1822.

Chemalida RONDANI, Dipt. Ital. Prodr., vol. 1, p. 180, 1856. 1 species. Type, *Erioptera tænionota* MEIGEN. Equals **Polymeda** MEIGEN, 1800.

Chenesia MACQUART, Hist. Nat., Dipt., vol. 1, p. 151, 1834. 1 species. Type, *Orphnephila deria* HALIDAY (as *testacea*, new species). Equals **Orphnephila** HALIDAY, 1831.

Chersodromia WALKER, List Dipt. Brit. Mus., vol. 4, p. 1157, 1849. 2 species. Type, *Tachypeza arenaria* HALIDAY (as *brevipennis* Zetterstedt).

Chetocera DESVOIDY, Essai Myod., p. 697, 1830. 1 species. Type, *Sciomyza albocostata* FALLEN (as *claripennis*, new species). Syn., *Melina* DESVOIDY, 1830; *Arina* DESVOIDY, 1830.

Chetogena RONDANI, Dipt. Ital. Prodr., vol. 1, p. 68, 1856. 1 species. Type, *Tachina assimilis* FALLEN (as *gramma* MEIGEN). Equals **Phorocera** DESVOIDY, 1830.

Chetoliga RONDANI, Dipt. Ital. Prodr., vol. 1, p. 66, 1856. 1 species. Type, *Tachina gnava* MEIGEN. Equals **Carcelia** DESVOIDY, 1830.

Chiastocheta POKORNY, Verh. Zool.-Bot. Ges. Wien, vol. 39, p. 568, 1889. 1 species. Type, *Aricia trollii* ZETTERSTEDT. Equals **Chirosia** RONDANI, 1856.

Chionea DALMAN, Kongl. Vet. Acad. Handl. for 1816, p. 104, 1816. 1 species. Type, *Chionea araneoides* DALMAN.

Chiromyza WIEDEMANN, Nova Dipt. Gen., p. 20, 1820.* 2 species. Type, *Chiromyza vittata* WIEDEMANN, the first species, by designation of BRAUER, Denkschr. Kais. Akad. Wiss. Wien, vol. 44, p. 86, 1882.

Chironomus MEIGEN, Illiger's Mag., vol. 2, p. 260, 1803. 3 species. Type, *Tipula plumosa* LINNÆUS, the first species, by designation of LATREILLE, Consider. Général., p. 442, 1810. Equals **Tendipes** MEIGEN, 1800.

Chirosia RONDANI, Dipt. Ital. Prodr., vol. 1, p. 102, 1856. 1 species. Type, *Aricia albitarsis* ZETTERSTEDT. Syn., *Chiastocheta* POKORNY, 1889; *Rhadina* KOWARZ, 1893.

Chloria SCHINER, Wien. Ent. Monatschr., vol. 6, p. 151, 1862. 1 species. Type, *Musca demandata* FABRICIUS. Equals **Physiphora** FALLEN, 1810.

Chlorina DESVOIDY, Essai Myod., p. 603, 1830. 2 species. Type, *Chlorina thoracica* DESVOIDY, the first species, by present designation. Equals **Pegomya** DESVOIDY, 1830.

Chloromyia DUNCAN, Mag. Zool. and Bot., vol. 1, p. 164, 1837. 3 species. Type, *Musca formosa* SCOPOLI, the first species, by present designation.

Chloropisca LOEW, Zeitschr. Ent. Breslau, vol. 15, p. 79, 1866.* 5 species. Type, *Chlorops glabra* MEIGEN, the third species, by present designation.

Chloroprocta WULP, Biol. Centr.-Amer., Dipt., vol. 2, p. 296, 1896. 1 species. Type, *Chloroprocta semiviridis* WULP.

Chlorops MEIGEN, Illiger's Mag., vol. 2, p. 278, 1803. No species. In his Syst. Beschr., vol. 6, 1830, pp. 140 to 163, 60 species. Type, *Chlorops læta* MEIGEN, the sixth species, by designation of RONDANI, Dipt. Ital. Prodr., vol. 1, 1856, p. 125. Equals **Titania** MEIGEN, 1800.

Chlorosia RONDANI, Dipt. Ital. Prodr., vol. 4, p. 11, 1861. Change of name for *Clorisoma* RONDANI, 1856, under the erroneous impression that it is preoccupied by *Chlorisoma* SWAINSON, 1837. Type, *Musca parvula* HARRIS. Equals **Chrysomyia** MACQUART, 1834.

Cholomyia BIGOT, Bull. Soc. Ent. France for 1884, p. 37, 1884. 1 species. Type, *Cholomyia inæquipes* BIGOT.

Chordonota GERSTÆCKER, Linn. Ent., vol. 11, p. 311, 1857. 1 species. Type, *Cyphomyia inermis* WIEDEMANN.

Choristomma STEIN, Berliner Ent. Zeitschr., vol. 40, p. 138, 1895. 1 species. Type, *Platycænosia mikii* STROBL (as *pokornyi*, new species). Equals Platycœnosia STROBL, 1894.

Choristoneura RÜBSAAMEN, Berliner Ent. Zeitschr., vol. 37, p. 342, 1892. 1 species. Type, *Lasioptera obtusa* LOEW.

Chortophila MACQUART, Hist. Nat., Dipt., vol. 2, p. 323, 1835. 22 species. Type, *Anthomyia sepia* MEIGEN, the fifteenth species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 142. Equals **Pegomya** DESVOIDY, 1830.

Chremia DESVOIDY, Hist. Nat. Dipt., vol. 2, p. 335, 1863. 1 species. Type, *Tachina inanis* FALLEN (as *ciligera*, new species). Equals **Leskia** DESVOIDY, 1830.

Chromatomyia HARDY, Ann. Mag. Nat. Hist., ser. 3, vol. 4, p. 390, 1849. 7 species. Type, *Phytomyza obscurella* FALLEN, the third species, by present designation. Equals **Phytomyza** FALLEN, 1810.

Chrysanthrax OSTEN SACKEN, Biol. Centr.-Amer., Dipt., vol. 1, p. 121, 1886. 4 species. Type, *Anthrax fulvohirta* WIEDEMANN, the fourth species, by present designation. Equals **Villa** LIOY, 1864.

Chryseria DESVOIDY, Hist. Nat. Dipt., vol. 2, p. 288, 1863. 2 species. Type, *Musca helluo* FABRICIUS (as *gentilis*, new species), the second species, by present designation. Equals **Eliozeta** RONDANI, 1856.

Chrysoceria WILLISTON, Journ. N. Y. Ent. Soc., vol. 15, p. 1, 1907. 1 species. Type, *Laparus pictitarsis* BIGOT.

Chrysochlora LATREILLE, in Cuvier's Regne Anim., new ed., vol. 5, p. 486, 1829. 1 species. Type, *Sargus amethystinus* FABRICIUS.

Chrysochroma WILLISTON, Man. N. Amer. Dipt., p. 47, 1896. Change of name for *Chrysonotus* LOEW, 1855, not of SWAINSON, 1837. Type, *Musca bipunctata* SCOPOLI. Syn., *Chrysonotus* LOEW, 1855, preoccupied; *Chrysonotomyia* HUNTER, 1900.

Chrysoclamis RONDANI, in Walker's Ins. Britt., Dipt., vol. 1, p. 279, 1851. Change of name for *Ferdinandea* RONDANI, 1844, because the latter name had not been adopted by the other entomologists. Type, *Conops cupreus* SCOPOLI. Equals **Ferdinandea** RONDANI, 1844.

Chrysogaster MEIGEN, Nouv. Class. Mouch., p. 32, 1800.* No species. In Illiger's Mag., vol. 2, p. 274, 1803, 3 species. Type, *Eristalis solstitialis* FALLEN, the first species (as *cæmiteriorum* FABRICIUS), by designation of ZETTERSTEDT, Dipt. Scand., vol. 2, 1843, p. 816. Syn., *Orthonevra* MACQUART, 1829; *Campineura* RONDANI, 1856; *Melanogaster* RONDANI, 1857; *Lejogaster* RONDANI, 1857; *Cryptineura* BIGOT, 1859.

[Chrysomya DESVOIDY, Essai Myod., p. 444, 1830. 22 supposed species. Type, *Chrysomya regalis* DESVOIDY, the fourteenth species, by designation of RONDANI, Arch. Zool. Modena, vol. 3, 1864, p. 27. Syn., *Pycnosoma* BRAUER and BERGENSTAMM, 1894; *Paracompsomyia* HOUGH, 1898. Not American.] (*Chrysomya* of authors equals *Paralucilia* BRAUER and BERGENSTAMM.)

Chrysomyia MACQUART, Hist. Nat., Dipt., vol. 1, p. 262, 1834. 5 species. Type, *Musca polita* LINNÆUS, the third species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 130. Syn., *Microchrysa* LOEW, 1855; *Clorisoma* RONDANI, 1856; *Myochrysa* RONDANI, 1861; *Chlorosia* RONDANI, 1861.

Chrysomyza FALLEN, Scen. et Conop. Sveciae, p. 3, 1817. 1 species. Type, *Musca demandata* FABRICIUS (as *splendida*, new species). Equals **Physiphora** FALLEN, 1810.

Chrysonotomyia HUNTER, Trans. Amer. Ent. Soc., vol. 27, p. 124, 1900. Change of name for *Chrysonotus* LOEW, 1855, not of SWAINSON, 1837. Type, *Musca bipunctata* SCOPOLI. Equals **Chrysochroma** WILLISTON, 1896.

Chrysonotus LOEW, Verh. Zool.-Bot. Ges. Wien, vol. 5, p. 146, 1855. 1 species. Type, *Musca bipunctata* SCOPOLI. Not *Chrysonotus* SWAINSON, 1837. Equals **Chrysochroma** WILLISTON, 1896.

Chrysopilus MACQUART, Mem. Soc. Sci. Lille for 1826, p. 403, 1826. 3 species. Type, *Musca diadema* LINNÆUS, the third species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 134. Equals **Styrex** SCOPOLI, 1763.

Chrysops MEIGEN, Nouv. Class. Mouch., p. 23, 1800.* No species. In Illiger's Mag., vol. 2, 1803, p. 267, 1 species. Type, *Tabanus cæcutiens* LINNÆUS.

Chrysotimus LOEW, Neue Beitr., vol. 5, p. 48, 1857. No species. In vol. 8, p. 74, 1861, 2 species. Type, *Chrysotimus pusio* LOEW, the first species, by present designation.

Chrysotoxum MEIGEN, Illiger's Mag., vol. 2, p. 275, 1803. 2 species. Type, *Musca bicincta* LINNÆUS, the second species, by designation of LATREILLE, Consid. Général., 1810, p. 443. Equals **Antiopa** MEIGEN, 1800.

Chrysotus MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 4, p. 40, 1824. 8 species. Type, *Musca nigripes* FABRICIUS, the sixth species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 134.

Chrysozona MEIGEN, Nouv. Class. Mouch., p. 23, 1800.* No species. *Hæmatopota* MEIGEN, 1803, is a change of name. Type, *Tabanus pluvialis* LINNÆUS. Syn., *Hæmatopota* MEIGEN, 1803.

Chyliza FALLEN, Opomyz. Sveciae, p. 6, 1820. 2 species. Type, *Musca leptogaster* PANZER, the second species, by MEIGEN, who, in his Syst. Beschr., vol. 5, 1826, p. 370, selected the first species as type of a new genus, *Lissa*. Syn., *Dasyna* DESVOIDY, 1830.

Chymophila MACQUART, Hist. Nat., Dipt., vol. 1, p. 485, 1834. 1 species. Type, *Microdon aurifex* WIEDEMANN (as *splendens*, new species). Equals **Microdon** MEIGEN, 1803.

Chyromantis RONDANI, Dipt. Ital. Prodr., vol. 1, p. 148, 1856. 1 species. Type, *Tachydromia vocatoria* FALLEN. Syn., *Litanomyia* MELANDER, 1902.

Chyromya DESVOIDY, Essai Myod., p. 621, 1830. 1 species. Type, *Musca flava* LINNÆUS (as *fenestrarum*, new species). Syn., *Lisella* DESVOIDY, 1830; *Scyphella* DESVOIDY, 1830; *Thyrimyza* ZETTERSTEDT, 1847.

Cimbometopia LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 1114, 1864. 1 species. Type, *Borborus stercorarius* MEIGEN. Equals **Leptocera** OLIVIER, 1813.

Cincticornia FELT, 23d Rep. State Ent. N. Y., p. 379, 1908. 15 species. Type, *Asphondylia transversa* FELT, the first species, by original designation.

Cinxia MEIGEN, Nouv. Class. Mouch., p. 35, 1800.* No species. *Sericomyia* MEIGEN, 1803, was a change of name. Type, *Musca lappona* LINNÆUS. Syn., *Sericomyia* MEIGEN, 1803.

Cistogaster LATREILLE, in Cuvier's Regne Anim., new ed., vol. 5, p. 511, 1829. No species. MACQUART, Ins. Dipt. Nord France, Ather., 1834, pp. 74 and 75, refers three supposed species to this genus. Type, *Musca globosa* FABRICIUS, the first species, by designation of BLANCHARD, Hist. Nat. Ins., vol. 3, 1840, p. 612. Syn., *Pallasia* DESVOIDY, 1830; *Gymnoclytia* BRAUER and BERGENSTAMM, 1893.

Cladochæta COQUILLETT, Proc. U. S. Nat. Mus., vol. 22, p. 263, 1900. 1 species. Type, *Cladochæta nebulosa* COQUILLETT.

Cladura OSTEN SACKEN, Proc. Acad. Nat. Sci. Phila. for 1859, p. 229, 1860. 1 species. Type, *Cladura flavoferruginea* OSTEN SACKEN.

Clanis WALKER, Ins. Saund., Dipt., p. 9, 1850. 18 species. Type, *Pangonius lasiophthalmus* MACQUART, the first species (as *contigua* WALKER), by present designation. Equals **Pangonius** LATREILLE, 1802.

Clasiopa STENHAMMAR, Kongl. Vet. Acad. Handl. for 1843, p. 159, 1844. 1 species. Type, *Notiphila obscurella* FALLEN. Equals **Discocerina** MACQUART, 1835.

Clausicella RONDANI, Dipt. Ital. Prodr., vol. 1, p. 61, 1856. 1 species. Type, *Clausicella suturata* RONDANI. Syn., *Istoglossa* RONDANI, 1856.

Clelia DESVOIDY, Essai Myod., p. 255, 1830. 2 species (as 4). Type, *Musca aterrima* VILLIERS, the first and last supposed species (as *agilis* and *erythrocera*, new species), by designation of DESVOIDY, Hist. Nat. Dipt., vol. 2, 1863, p. 61. Equals **Leucostoma** MEIGEN, 1803.

Clemelis DESVOIDY, Hist. Nat. Dipt., vol. 1, p. 481, 1863. 1 species (as 6). Type, *Musca libatrix* PANZER. Equals **Zenilla** DESVOIDY, 1830.

Cleodora DESVOIDY, Hist. Nat. Dipt., vol. 1, p. 1047, 1863. 1 species. Type, *Tachina simulans* MEIGEN (as *ancilla*, new species). Equals Exorista MEIGEN, 1803.

Cleona MEIGEN, Nouv. Class. Mouch., p. 30, 1800.* No species. *Callomyia* MEIGEN, 1804, is a change of name. Type, *Callomyia elegans* MEIGEN. Syn., *Callomyia* MEIGEN, 1804; *Heteroneura* FALLEN, 1810; *Callomyza* FALLEN, 1815.

Cleonice DESVOIDY, Hist. Nat. Dipt., vol. 1, p. 1097, 1863. 1 species. Type, *Tachina grisea* FALLEN. Equals **Macquartia** DESVOIDY, 1830.

Clinocera MEIGEN, Illiger's Mag., vol. 2, p. 271, 1803. No species. In 1804, 1 species. Type, *Clinocera nigra* MEIGEN. Equals **Atalanta** MEIGEN, 1800.

Clinodiplosis KIEFFER, Bull. Soc. Ent. France for 1894, p. 280, 1894. 1 species. Type, *Diplosis cilicrus* KIEFFER.

Clinogaster WULP, Tijdschr. Ent., vol. 35, p. 189, 1892. 1 species. Type, *Clinogaster notabilis* WULP.

Clinoneura BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 56, p. 119, 1889. 1 species. Type, *Estheria tibialis* DESVOIDY (as *Dexia rubriventris* MACQUART). Equals **Phorostoma** DESVOIDY, 1830.

Clinopera WULP, Biol. Centr.-Amer., Dipt., vol. 2, p. 305, 1896. 9 species. Type, *Clinopera hieroglyphica* WULP, the third species, by present designation. Equals **Cyrtoneurina** GIGLIO-TOS, 1893.

Clinorhyncha LOEW, Dipt. Beitr., vol. 4, p. 21, 1850. 1 species. Type, *Clinorhyncha chrysanthemi* LOEW.

Clista MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 7, p. 208, 1838. 7 species. Type, *Tachina murens* MEIGEN, the second species, by designation of RONDANI, Dipt. Ital. Prodr., vol. 1, 1856, p. 76. Equals **Rhinophora** DESVOIDY, 1830.

Clistomorpha TOWNSEND, Can. Ent., vol. 24, p. 79, 1892. 1 species. Type, *Xysta didyma* LOEW (as *hyalomoides*, new species). Equals **Eliozeta** RONDANI, 1856.

[*Clitellaria* MEIGEN, Illiger's Mag., vol. 2, p. 265, 1803. 1 species. Type, *Stratiomys ephippium* FABRICIUS. Equals **Potamida** MEIGEN, 1800. Not American.] (*Clitellaria* of authors equals *Adoxomyia* KERTESZ.)

Clorisoma RONDANI, Dipt. Ital. Prodr., vol. 1, p. 168, 1856. 1 species. Type, *Musca parvula* HARRIS (as *Sargus pallipes* MEIGEN). Equals **Chrysomyia** MACQUART, 1834.

Clusia HALIDAY, Ann. Nat. Hist., vol. 2, p. 188, Nov., 1838. 1 species. Type, *Heteromyza flava* MEIGEN. Syn., *Macrochira* ZETTERSTEDT, 1838; *Peratochetus* RONDANI, 1856; *Stomphastica* LOEW, 1864.

Clusiodes COQUILLETT, Proc. Ent. Soc. Washington, vol. 6, p. 93, 1904. Change of name for *Heteroneura* FALLEN, 1823, not of FALLEN, 1810. Type, *Heteroneura albimana* MEIGEN. Syn., *Heteroneura* FALLEN, 1823, preoccupied.

Clythia MEIGEN, Nouv. Class. Mouch., p. 30, 1800.* No species. *Platypeza* MEIGEN, 1803, is a change of name. Type, *Platypeza fasciata* MEIGEN. Syn., *Platypeza* MEIGEN, 1803; *Calotarsa* TOWNSEND, 1894.

Clytia DESVOIDY, Essai Myod., p. 287, 1830. 5 species (as 7). Type, *Musca continua* PANZER, the last three supposed species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 139. Not *Clytia* LAMARCK, 1812. Equals **Eliozeta** RONDANI, 1856.

Clytiomya RONDANI, Dipt. Ital. Prodr., vol. 4, p. 9, 1861. Change of name for *Clytia* DESVOIDY, preoccupied. Type, *Musca continua* PANZER. Equals **Eliozeta** RONDANI, 1856.

Cnemacantha MACQUART, Hist. Nat., Dipt., vol. 2, p. 586, 1835. 1 species. Type, *Heteroneura muscaria* FALLEN. Equals **Sapromyza** FALLEN, 1810.

Cnephalia RONDANI, Dipt. Ital. Prodr., vol. 1, p. 62, 1856. 1 species. Type, *Tachina bucephala* MEIGEN (as *Gonia hebes* MEIGEN). Equals **Spallanzania** DESVOIDY, 1830.

Cnephaliodes BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 58, p. 253, 1891. 1 species. Type, *Cnephaliodes perversus* BRAUER and BERGENSTAMM. Equals **Larvævora** MEIGEN, 1800.

Cnephaotachina BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 61, p. 612, 1894. 1 species. Type, *Cnephaotachina crepusculi* BRAUER and BERGENSTAMM. Syn., *Eudora* DESVOIDY, 1863, preoccupied; *Eudoromyia* BEZZI, 1906.

Cœlodiazesis DYAR and KNAB, Journ. N. Y. Ent. Soc., vol. 14, p. 177, 1906. 1 species. Type, *Anopheles barberi* COQUILLETT. Equals **Anopheles** MEIGEN, 1818.

Cœloglutus ALDRICH, Trans. Ent. Soc. Lond. for 1896, p. 338, 1896. 1 species. Type, *Cœloglutus concavus* ALDRICH.

Cœlomyia HALIDAY, in Westwood's Intr., vol. 2, Synops., p. 143, 1840. 1 species. Type, *Cœlomyia mollissima* HALIDAY.

Cœlopa MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 6, p. 8, 1830. 1 species. Type, *Cœlopa pilipes* HALIDAY (as *Musca frigida* FABRICIUS). Syn., *Fucomyia* HALIDAY, 1838.

Cœlosia WINNERTZ, Verh. Zool.-Bot. Ges. Wien, vol. 13, p. 796, 1863. 2 species. Type, *Boletina flava* STÆGER, the first species, by designation of JOHANNSEN in Wytsman's Gen. Ins., Dipt., Mycet., 1909, p. 86.

Cœnia DESVOIDY, Essai Myod., p. 800, 1830. 1 species. Type, *Ephydra palustris* FALLEN (as *caricicola*, new species).

Cœnomyia LATRIELLE, Precis, p. 159, 1796. No species. In his Hist. Nat. Crust. et Ins., vol. 3, p. 439, 1802, 1 species. Type, *Musca ferruginea* SCOPOLI.

Cœnosia MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 5, p. 210, 1826. 28 species. Type, *Musca geniculata* FALLEN, the twentieth species, by designation of RONDANI Atti Soc. Ital. Sci. Nat., vol. 9, 1866, p. 9. Syn., *Caricea* DESVOIDY, 1830; *Limosia* DESVOIDY, 1830; *Palusia* DESVOIDY, 1830; ? *Eriostyla* LIOY, 1864; *Centrocera* POKORNY, 1893; *Limnospila* SCHNABL, 1902.

Coilometopia MACQUART, Dipt. Exot., Suppl. 2, p. 91, 1847. 1 species. Type, *Scatophaga trimaculata* FABRICIUS (as *ferruginea*, new species).

Coloboneura MELANDER, Trans. Amer. Ent. Soc., vol. 28, p. 229, 1902. 1 species, Type, *Coloboneura inusitata* MELANDER.

Colpodia WINNERTZ, Linn. Ent., vol. 8, p. 188, 1853. 1 species. Type, *Colpodia angustipennis* WINNERTZ.

Comastes OSTEN SACKEN, Bull. 3, U. S. Geol. Surv., p. 256, 1877. 1 species. Type, *Comastes robustus* OSTEN SACKEN. Equals **Heterostylum** MACQUART, 1848.

Comatacta COQUILLETT, Can. Ent.., vol. 34, p. 199, 1902. 1 species. Type, *Brachycoma pallidula* WULP.

Commoptera BRUES, Amer. Nat., vol. 35, p. 344, 1901. 1 species. Type, *Commoptera solenopsidia* BRUES.

Compsilura BOUCHÉ, Nat. Ins., p. 58, 1834. 2 species (as 3). Type, *Tachina concinnata* MEIGEN, the first species, by present designation. Syn., *Doria* MEIGEN, 1838; *Machærœa* RONDANI, 1859.

Compsomyia RONDANI, Ann. Mus. Civ. Stor. Nat. Genova, vol. 7, p. 425, 1875. 4 species. Type, *Musca dux* ESCHSCHOLZ, the first species, by present designation. Equals **Calliphora** DESVOIDY, 1830.

Comyops WULP, Biol. Centr.-Amer., Dipt., vol. 2, p. 262, 1891. 2 species. Type, *Comyops nigripennis* WULP, by designation of BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 60, 1893, p. 183.

Cona SCHELLENBERG, Genres Mouch. Dipt., pl. 13, figs. 1 and 2; 1803. 1 species. Type, *Musca fenestralis* LINNÆUS. Equals **Omphrale** MEIGEN, 1800.

Conchyliastes THEOBALD, in Howard's Mosquitoes, p. 235, 1901. 2 species. Type, *Culex posticatus* WIEDEMANN (as *musicus* SAY), the first species, by present designation. Equals **Janthinosoma** ARRIBALZAGA, 1891.

Condidea COQUILLETT, Can. Ent., vol. 39, p. 75, 1907. 1 species. Type, *Condidea lata* COQUILLETT.

Coniceps LOEW, Monogr. Dipt. N. Amer., vol. 3, p. 177, 1873. 1 species. Type, *Coniceps niger* LOEW.

Conicera MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 6, p. 226, 1830. 1 species. Type, *Conicera atra* MEIGEN.

Conopejus RONDANI, Mag. Zool., ser. 2, vol. 7, Ins., p. 7, 1845. 3 species. Type, *Conops quadrifasciatus* DE GEER, the first species, by original designation. Equals **Conops** LINNÆUS, 1758.

Conophorus MEIGEN, Illiger's Mag., vol. 2, p. 268, 1803. 1 species. Type, *Bombylius virescens* FABRICIUS (as *maurus* MIKAN). Syn., *Ploas* LATREILLE, 1805.

Conopoideus RONDANI, Mag. Zool., ser. 2, vol. 7, Ins., p. 9, 1845. 1 species. Type, *Conops ferruginea* MACQUART. Equals **Conops** LINNÆUS, 1758.

Conops LINNÆUS, Syst. Nat., 10th ed., p. 604, 1758. 6 species. Type, *Conops flavipes* LINNÆUS, the fifth species, by designation of CURTIS, Brit. Ent., 1831, p. 377. Syn., *Conopejus* RONDANI, 1845; *Conopoideus* RONDANI, 1845; *Sphyxosoma* RONDANI, 1856; *Bombibia* LIOY, 1864.

Conopsida MACQUART, Dipt. Exot., Suppl. 4, pt. 2, p. 267, 1851. 1 species. Type, *Cephalia femoralis* WIEDEMANN. Equals **Michogaster** MACQUART, 1835.

Contarinia RONDANI, Atti Soc. Ital. Sci. Nat., vol. 2, p. 289, 1861. 1 species. Type, *Tipula loti* DE GEER. Syn., *Stictodiplosis* KIEFFER, 1894; *Endiplosis* KIEFFER, 1894.

Copecrypta TOWNSEND, Smiths. Misc. Coll., vol. 51, p. 109, 1908. 1 species. Type, *Schineria ruficauda* WULP. Equals **Cuphocera** MACQUART, 1845.

Copestylum MACQUART, Dipt. Exot., Suppl. 1, p. 124, 1846. 1 species. Type, *Volucella marginata* SAY (as *flaviventris*, new species).

Cophura OSTEN SACKEN, Biol. Centr.-Amer., Dipt., vol. 1, p. 181, 1887. 1 species. Type, *Cophura sodalis* OSTEN SACKEN. Syn., *Blax* LOEW, 1872, preoccupied; *Blacodes* LOEW, 1874, preoccupied; *Loewiella* WILLISTON, 1896.

Coprina DESVOIDY, Essai Myod., p. 810, 1830. 1 species. Type, *Borborus denticulatus* MEIGEN (as *bovina*, new species). Equals **Cypsela** MEIGEN, 1800.

Coprina ZETTERSTEDT, Isis von Oken for 1837, p. 35, 1837. 1 species. Type, *Musca pipiens* LINNÆUS. Equals **Syritta** ST. FARGEAU and SERVILLE, 1828.

Coprodiplosis KIEFFER, Bull. Soc. Ent. France for 1894, p. 280, 1894. 1 species. Type, *Diplosis polypori* LOEW. Equals **Leptodiplosis** KIEFFER, 1894.

Coproica RONDANI, Dipt. Ital. Prodr., vol. 4, p. 10, 1861. Change of name for *Heteroptera* MACQUART, 1835, preoccupied. Type, *Copromyza pusilla* FALLEN. Equals **Cypsela** MEIGEN, 1800.

Copromyza FALLEN, Spec. Ent. Dipt. Exh., p. 19, 1810. No species. In his Het. Sveciæ, 1820, pp. 6 to 8, 7 species. Type, *Copromyza equina* FALLEN, the second species, by designation of ZETTERSTEDT, Dipt. Scand., vol. 6, 1847, p. 2475. Syn., *Mycetia* DESVOIDY, 1830; *Cimbometopia* LIOY, 1864; *Isogaster* LIOY, 1864; *Fungobia* LIOY, 1864.

Coquillettia WILLISTON, Man. N. Amer. Dipt., p. 65, 1896. 1 species. Type, *Spogostylum vandykei* COQUILLETT. Not *Coquillettia* UHLER, 1890. Equals **Anthrax** SCOPOLI, 1763.

Coquillettidia DYAR, Proc. Ent. Soc. Washington, vol. 7, p. 45, 1905. 4 species. Type, *Culex perturbans* WALKER, the first species, by original designation.

Coquillettomyia FELT, 23d Rep. State Ent. N. Y., p. 398, 1908. 3 species. Type, *Mycodiplosis lobata* FELT, the first species, by original designation.

Cordilura FALLEN, Spec. Ent. Dipt. Exh., p. 15, 1810. 1 species. Type, *Musca pubera* LINNÆUS. Syn., *Mosina* DESVOIDY, 1830.

Cordylidexia GIGLIO-TOS, Boll. Reale Acad. Sci. Torino, ser. 2, vol. 44, p. 537, 1894. Change of name for *Cordyligaster* MACQUART, 1843, under the mistaken impression that it is preoccupied by *Cordylegaster* BILLBERG, 1820. Type, *Dexia petiolata* WIEDEMANN. Equals **Cordyligaster** MACQUART, 1843.

Cordyligaster MACQUART, Dipt. Exot., vol. 2, pt. 3, p. 90, 1843. 1 species. Type, *Dexia petiolata* WIEDEMANN. Syn., *Cordylidexia* GIGLIO-TOS, 1894.

Corethra MEIGEN, Illiger's Mag., vol, 2, p. 260, 1803. 1 species. Type, *Tipula culiciformis* DE GEER. Syn., *Mochlonyx* LOEW, 1844.

Corethrella COQUILLETT, Journ. N. Y. Ent. Soc., vol. 10, p. 191, 1902. 1 species. Type, *Corethrella brakeleyi* COQUILLETT.

Corizoneura RONDANI, Arch. Zool., vol. 3, p. 85, 1864. 3 species. Type, *Pangonius appendiculata* MACQUART, the first species, by present designation. Equals **Pangonius** LATREILLE, 1802.

Coronimyia TOWNSEND, Trans. Amer. Ent. Soc., vol. 19, p. 128, 1892. 1 species. Type, *Coronimyia geniculata* TOWNSEND. Equals **Epigrimyia** TOWNSEND, 1891.

Coryneta MEIGEN, Nouv. Class. Mouch., p. 27, 1800.* No species. *Tachydromia* MEIGEN, 1803, is a change of name. Type, *Tachydromia connexa* MEIGEN. Syn., *Sicus* LATREILLE, 1796, preoccupied; *Tachydromia* MEIGEN, 1803; *Tachista* LOEW, 1860.

Corynoneura WINNERTZ, Ent. Zeit. Stettin, vol. 7, p. 12, 1846. 2 species. Type, *Corynoneura scutellata* WINNERTZ, the first species, by present designation.

Cotilea LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 1123, 1864. 1 species. Type, *Chlorops gracilis* MEIGEN. Equals **Titania** MEIGEN, 1800.

Crameria DESVOIDY, Essai Myod., p. 59, 1830. 1 species. Type, *Crameria œstroidea* DESVOIDY. Equals **Trixa** MEIGEN, 1824.

Crassiseta VON ROSER, Corr. Landw. Ver. Wurtemburg for 1840, p. 63, 1840.* 1 species (as 5). Type, *Oscinis cornuta* FALLEN. Syn., *Macrochetum* RONDANI, 1856.

Cricotopus WULP, Tijdschr. Ent., vol. 17, p. 132, 1874. 9 species. Type, *Chironomus tibialis* MEIGEN, the first species, by present designation.

Crioprora OSTEN SACKEN, Cat. Dipt. N. Amer., p. 251, 1878. 3 species. Type, *Pocota alopex* OSTEN SACKEN, the third species, by designation of WILLISTON, Synops. N. Amer. Syrph., 1886, p. 217. Syn., *Romaleosyrphus* BIGOT, 1882.

Criorhina MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 3, p. 236, 1822. 6 species. Type, *Syrphus asilicus* FALLEN, the fifth species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 136. Equals **Penthesilia** MEIGEN, 1800.

Crocuta MEIGEN, Nouv. Class. Mouch., p. 84, 1800.* No species. *Siphona* MEIGEN, 1803, is a change of name. Type, *Musca geniculata* DE GEER. Syn., *Siphona* MEIGEN, 1803; *Bucentes* LATREILLE, 1809.

Crossocosmia MIK, Wien. Ent. Zeit., vol. 9, p. 313, 1890. 1 species. Type, *Ugimyia sericariæ* RONDANI. Equals **Sturmia** DESVOIDY, 1830.

Crossopalpus BIGOT, Ann. Soc. Ent. France for 1857, p. 557, 1857. 1 species. Type, *Platypalpus ambiguus* MACQUART. Equals **Drapetis** MEIGEN, 1822.

Crunobia KOLENATI, Wien. Ent. Monatschr., vol. 4, p. 391, 1860. 1 species. Type, *Crunobia schineri* KOLENATI. Equals **Trycyphona** ZETTERSTEDT, 1837.

Cryptneura BIGOT, Rev. Mag. Zool., vol. 11, p. 307, 1859. 1 species. Type, *Chrysogaster nitidus* WIEDEMANN (as *hieroglyphica*, new species). Equals **Chrysogaster** MEIGEN, 1800.

Cryptochetum RONDANI, Bull. Soc. Ent. Ital. for 1875, p. 172, 1875. 1 species. Type, *Cryptochetum grandicorne* RONDANI. Syn., *Lestophonus* WILLISTON, 1888.

Cryptodiplosis KIEFFER, Bull. Soc. Ent. France for 1895, p. 194, 1895. 1 species. Type, *Tipula pini* DE GEER. Equals **Itonida** MEIGEN, 1800.

Cryptolabis OSTEN SACKEN, Proc. Acad. Nat. Sci. Phila. for 1859, p. 224, 1860. 1 species. Type *Cryptolabis paradoxa* OSTEN SACKEN.

Cryptomeigenia BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 58, p. 311, 1891. 1 species. Type, *Cryptomeigenia setifacies* BRAUER and BERGENSTAMM. Syn., *Emphanopteryx* TOWNSEND, 1892.

Cryptonevra LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 1125, 1864. 1 species. Type, *Cholrops flavitarsis* MEIGEN. Syn., *Haplegis* LOEW, 1866.

Cryptopalpus RONDANI, Nuovi Ann. Sci. Nat. (Bologna), ser. 3, vol. 2, p. 169, 1850. 3 species. Type, *Micropalpus ornatus* MACQUART, the first species, by present designation. Equals **Epalpus** RONDANI, 1850.

Ctenoceria RONDANI, Dipt. Ital. Prodr., vol. 1, p. 187, 1856. 1 species. Type, *Ptychoptera pectinata* MACQUART. Equals **Liriope** MEIGEN, 1800.

Ctenocnemis KOWARZ, Verh. Zool.-Bot. Ges. Wien, vol. 22, p. 460, 1873. Change of name for *Sturmia* DESVOIDY, 1830, previously used in Botany, and *Blepharipa* RONDANI, 1856, on the score of the faulty construction of the latter. Type, *Nemoræa scutellata* DESVOIDY. Equals **Sturmia** DESVOIDY, 1830.

Ctenophora MEIGEN, Illiger's Mag., vol. 2, p. 263, 1803. 4 species. Type, *Tipula atrata* LINNÆUS, the third species, by designation of LATREILLE, Consider. Général., 1810, p. 442. Equals **Flabellifera** MEIGEN, 1800. (*Ctenophora* of authors equals *Phoroctenia* COQUILLETT.)

Culex LINNÆUS, Syst. Nat., 10th ed., p. 602, 1758. 6 species. Type, *Culex pipiens* LINNÆUS, the first species, by designation of LATREILLE, Consider Général., 1810, p. 442. Syn., *Heteronycha* ARRIBALZAGA, 1891; *Neoculex* DYAR, 1905.

Culicada FELT, Mosq. Culic. N. Y. State, p. 391b, 1904. 7 species. Type, *Culex canadensis* THEOBALD, the first species, by original designation. Equals **Ochlerotatus** ARRIBALZAGA, 1891.

Culicella FELT, Mosq. Culic. N. Y. State, p. 391c, 1904. 1 species. Type, *Culex dyari* COQUILLETT.

Culicelsa FELT, Mosq. Culic. N. Y. State, p. 391b, 1904. 2 species. Type, *Culex taeniorhynchus* WIEDEMANN, the first species, by original designation. Equals **Ochlerotatus** ARRIBALZAGA, 1891.

Culicoides LATREILLE, Gen. Crust. et Ins., vol. 4, p. 251, 1809. 1 species. Type, *Culex pulicaris* LINNÆUS (as *punctata*, new species). Syn., *Forcipomyia* MEIGEN, 1818; *Labidomyia* STEPHENS, 1829; *Œcacta* POEY, 1851.

Culiseta FELT, Mosq. Culic. N. Y. State, p. 391c, 1904. 2 species. Type, *Culex absobrinus* FELT, the first species, by original designation.

Cuphocera MACQUART, Ann. Soc. Ent. France for 1845, p. 267, 1845. 1 species. Type, *Micropalpus ruficornis* MACQUART. Syn., *Palpibraca* RONDANI, 1845; *Copecrypta* TOWNSEND, 1908; *Deopalpus* TOWNSEND, 1908.

Curtonevra MACQUART, Ins. Dipt. Nord France, Ather., p. 146, 1834. 12 species. Type, *Musca maculata* SCOPOLI, the ninth species, by designation of WESTWOOD, Intr., vol. 2. Synops., 1840, p. 141. Equals, **Graphomya** DESVOIDY, 1830.

Curtonotum MACQUART, Dipt. Exot., vol. 2, pt. 3, p. 193, 1843. 1 species. Type. *Musca gibba* FABRICIUS. Syn., *Diplocentra* LOEW, 1859.

Cuterebra CLARK, Essay on Bots, p. 70, 1815.* 4 species. Type, *Œstrus cuniculi* CLARK, the first species, by present designation. Syn., *Trypoderma* WIEDEMANN, 1830.

Cyclolepteron THEOBALD, Journ. Trop. Med., vol. 4, p. 234, July 15, 1901. No species. In his Monogr. Culic., vol. 2, p. 312, Nov. 23, 1901, 1 species. Type, *Anopheles grabhamii* THEOBALD.

Cyclorhynchus MACQUART, Dipt. Exot., vol. 2, pt. 1, p. 114, 1840. 1 species. Type, *Cyclorhynchus testaceus* MACQUART. Equals **Phthiria** MEIGEN, 1803.

Cylindrogaster LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 1329, 1864. 1 species. Type, *Conops ferruginea* LINNÆUS. Equals **Sicus** SCOPOLI, 1763.

Cylindromyia MEIGEN, Illiger's Mag., vol. 2, p. 279, 1803. 1 species. Type, *Musca brassicaria* FABRICIUS. Syn., *Ocyptera* LATREILLE, 1805; *Parthenia* DESVOIDY, 1830.

Cylindrotoma MACQUART, Hist. Nat., Dipt., vol. 1, p. 107, 1834. 3 species. Type, *Limnobia distinctissima* MEIGEN, the first species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 128.

Cyniphes COSTA, Ann. Accad. Aspir. Nat., vol. 1, p. 4, 1843.* 1 species. Type, *Bibio papatasii* SCOPOLI (as *molestus*, new species). Equals **Flebotomus** RONDANI, 1840.

Cynipimorpha BRAUER, Denkschr. Kais. Akad. Wiss. Wien, vol. 39, p. 19, 1882. 1 species. Type, *Cynipimorpha bilimeki* BRAUER.

Cynisca DESVOIDY, Hist. Nat. Dipt., vol. 1, p. 200, 1863. 1 species. Type, *Tachina arvicola* MEIGEN. Equals **Aplomya** DESVOIDY, 1830.

Cynomya DESVOIDY, Essai Myod., p. 363, 1830. 4 species. Type, *Musca mortuorum* LINNÆUS, the first species, by designation of MACQUART, Recueil Soc. Sci. Arts Lille, 1834, p. 174. Syn., *Cynophaga* LIOY, 1864.

Cynophaga LIOY, Atti Inst. Veneto., ser. 3, vol. 9, p. 890, 1864. Change of name for *Cynomya* DESVOIDY, 1830, because of *Cynomyia* LATREILLE, 1796. Type, *Musca mortuorum* LINNÆUS. Equals **Cynomya** DESVOIDY, 1830.

Cynorhina WILLISTON, Synops. N. Amer. Syrph., p. 209, 1886. 2 species. Type, *Milesia analis* MACQUART, the first species, by present designation. Equals **Penthesila** MEIGEN, 1800.

Cyphomyia WIEDEMANN, Zool. Mag., stuck 3, p. 55, 1819. 3 species. Type, *Cyphomyia auriflamma* WIEDEMANN, the first species, by designation of BRAUER, Denkschr. Kais. Akad. Wiss. Wien, vol. 44, 1882, p. 87.

Cypsela MEIGEN, Nouv. Class. Mouch., p. 31, 1800.* No species. *Borborus* MEIGEN, 1803, is a change of name. Type, *Musca subsultans* FABRICIUS. Syn., *Borborus* MEIGEN, 1803; *Sphærocera* LATREILLE, 1805; *Lordatia* DESVOIDY, 1830; *Coprina* DESVOIDY, 1830; *Heteroptera* MACQUART, 1835; *Coproica* RONDANI, 1861; *Lotobia* LIOY, 1864.

Cyrillia DESVOIDY, Hist. Nat. Dipt., vol. 2, p. 31, 1863. 1 species. Type, *Tachina nigripes* FALLEN (as *Blondelia fasciata* DESVOIDY). Equals **Lydella** DESVOIDY, 1830.

Cyrtoma MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 4, p. 1, 1824. 3 species. Type, *Empis spuria* FALLEN, the first species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 133. Equals **Bicellaria** MACQUART, 1823.

Cyrtometopa LOEW, Monogr. Dipt. N. Amer., vol. 3, p. 179, 1873. 1 species. Type, *Odontomera ferruginea* MACQUART. Equals **Odontomera** MACQUART, 1843.

Cyrtoneurina GIGLIO-TOS, Boll. Mus. Zool. Univ. Torino, vol. 8, no. 147, p. 5, 1893. 8 species. Type, *Cyrtoneurina uber* GIGLIO-TOS, the eighth species, by present designation. Syn., *Clinopera* WULP, 1896.

Cyrtophleba RONDANI, Dipt. Ital. Prodr., vol. 1, p. 68, 1856. 1 species. Type, *Tachina ruricola* MEIGEN.

Cyrtopogon LOEW, Linn. Ent., vol. 2, p. 516, 1847. 4 species. Type, *Asilus ruficornis* FABRICIUS, the first species, by designation of RONDANI, Dipt. Ital. Prodr., vol. 1, 1856, p. 157. Syn., *Euarmostus* WALKER, 1851; *Eupalamus* JÆNNICKE, 1867.

Cyrtosoma BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 58, p. 372, 1891. No species. In vol. 60, p. 132, 1893, 1 species. Type, *Cyrtosoma rufum* BRAUER and BERGENSTAMM. Not *Cyrtosoma* WALKER, 1829.

Dactiliscus RONDANI, Dipt. Ital. Prodr., vol. 1, p. 158, 1856. 1 species. Type, *Asilus striatus* FABRICIUS. Equals **Habropogon** LOEW, 1847.

Dactylocladius KIEFFER, Mem. Soc. Sci. Bruxelles, vol. 30, p. 356, 1906. 1 species. Type, *Orthocladius brevicornis* KIEFFER. Equals **Orthocladius** WULP, 1874.

Dactylolabis OSTEN SACKEN, Proc. Acad. Nat. Sci. Phila. for 1859, p. 240, 1860. 1 species. Type, *Limnophila montana* OSTEN SACKEN. Equals **Phylidorea** BIGOT, 1854.

Dæochæta TOWNSEND, Trans. Amer. Ent. Soc., vol. 19, p. 97, 1892. 1 species. Type, *Dæochæta harveyi* TOWNSEND.

Dalmannia DESVOIDY, Essai Myod., p. 248, 1830. 6 species. Type, *Myopa punctata* FABRICIUS, the third species, by designation of RONDANI, Dipt. Ital. Prodr., vol. 1, 1856, p. 59. Syn., *Stachynia* MACQUART, 1834; *Arpagita* LIOY, 1864.

[Damalis FABRICIUS, Syst. Antliatorum, p. 147, 1805. 4 species. Type, *Damalis curvipes* FABRICIUS, the first species, by designation of WESTWOOD, Ann. Soc. Ent. France for 1835, p. 684. Not American (or equals *Næza* MEIGEN?).] (*Damalis* of authors equals *Xenomyza* WIEDEMANN.)

Dasineura RONDANI, Mem. Sec. Ditt. Ital., p. 18, 1840.* 2 species. Type, *Dasineura luteofusca* RONDANI, the first species, by present designation. Syn., *Perrisia* RONDANI, 1846.

Dasiopa RONDANI, Dipt. Ital. Prodr., vol. 1, p. 120, 1856. 1 species. Type, *Chortophila lasiophthalma* MACQUART (as *lonchæus*, new species). Equals Lonchæa FALLEN, 1820.

Dasylechia WILLISTON, Journ. N. Y. Ent. Soc., vol. 15, p. 1, 1907. 1 species. Type, *Hyperechia atrox* WILLISTON.

Dasyllis LOEW, Bemerk. Asiliden, p. 20, 1851. 4 species. Type, *Laphria hæmorrhoa* WIEDEMANN, the first species, by present designation.

Dasymyia EGGER, Verh. Zool.-Bot. Ges. Wien, vol. 8, p. 711, 1858. 1 species. Type, *Musca apiformis* SCHRANK. Equals Pocota ST. FARGEAU and SERVILLE, 1828.

Dasyna DESVOIDY, Essai Myod., p. 667, 1830. 2 species. Type, *Dasyna fuscipennis* DESVOIDY, the first species, by present designation. Equals Chyliza FALLEN, 1820.

Dasypogon MEIGEN, Illiger's Mag., vol. 2, p. 270, 1803. 2 species. Type, *Asilus diadema* FABRICIUS, the second species, by designation of LATREILLE, Consider. Général., 1810, p. 443. Syn., *Seilopogon* COSTA, 1854; *Cheilopogon* RONDANI, 1856.

Dasyptera SCHINER, Wien. Ent. Monatschr., vol. 7, p. 221, 1863. 1 species. Type, *Erioptera varia* MEIGEN. Equals Ormosia RONDANI, 1856.

Daulopogon LOEW, Berliner Ent. Zeitschr., vol. 18, p. 377, 1874. Change of name of *Lasiopogon* LOEW, 1847, on account of an earlier use of this name for a genus of plants. Type, *Dasypogon pilosellus* LOEW. Equals Lasiopogon LOEW, 1847.

Defilippia LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 733, 1864. 2 species. Type, *Anthrax minos* MEIGEN, the second species, by present designation. Equals Mima MEIGEN, 1820.

Degeeria MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 7, p. 249, 1838. 16 species. Type, *Tachina collaris* FALLEN, the seventh species, by designation of RONDANI, Dipt. Ital. Prodr., vol. 1, 1856, p. 72. Equals Medina DESVOIDY, 1830.

Deinocerites THEOBALD, Journ. Trop. Med., vol. 4, p. 235, July 15, 1901. No species. In his Monogr. Culic., vol. 2, p. 215, November 23, 1901, 1 species. Type, *Deinocerites cancer* THEOBALD. Syn., *Brachiosoma* THEOBALD, July 15, 1901; *Brachiomyia* THEOBALD, November 23, 1901.

Dejeania DESVOIDY, Essai Myod., p. 33, 1830. 2 species. Type, *Stomoxys bombylans* FABRICIUS, (as *capensis*, new species), the second species, by present designation.

Delia DESVOIDY, Essai Myod., p. 571, 1830. 30 species. Type, *Anthomyia cardui* MEIGEN (as *floricola*, new species), the first species, by present designation. Equals Hylemya DESVOIDY, 1830.

Delphinia DESVOIDY, Essai Myod., p. 719, 1830. 1 species. Type, *Musca picta* FABRICIUS (as *thoracica*, new species). Syn., *Camptonevra* MACQUART, 1843.

Demoticus MACQUART, Ann. Soc. Ent. France for 1854, p. 442, 1854. 1 species. Type, *Tachina plebejus* FALLEN. Syn., *Entomobosca* LIOY, 1864; *Parafischeria* TOWNSEND, 1908; *Neofischeria* TOWNSEND, 1908; *Apachemyia* TOWNSEND, 1908.

Dendromyia THEOBALD, Monogr. Culic., vol. 3, p. 313, 1903. 5 species. Type, *Dendromyia ulocoma* THEOBALD, the first species, by present designation.

Dendrophila LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 909, 1864. 1 species. Type, *Musca hilaris* FALLEN. Not *Dendrophila* SWAINSON, 1837. Equals Eustalomyia KOWARZ, 1873.

Dentifibula FELT, 23d Rep. State Ent. N. Y., p. 389, 1908. 3 species. Type, *Cecidomyia viburni* FELT, the third species, by original designation.

Deopalpus TOWNSEND, Smiths. Misc. Coll., vol. 51, p. 110, 1908. 1 species. Type, *Micropalpus californiensis* MACQUART (as *hirsutus*, new species). Equals Cuphocera MACQUART, 1845.

Deromyia PHILIPPI, Verh. Zool.-Bot. Ges. Wien, vol. 15, p. 705, 1865. 3 species. Type, *Deromyia gracilis* PHILIPPI, the first species, by designation of WILLISTON, Biol. Centr.-Amer., Dipt., vol. 1, 1901, p. 311. Syn., *Diogmites* LOEW, 1866.

Desmatomyia WILLISTON, Kansas Univ. Quart., vol. 3, p. 268, 1895. 1 species. Type, *Desmatomyia anomala* WILLISTON.

Desmatoneura Williston, Kansas Univ. Quart., vol. 3, p. 267, 1895. 1 species. Type, *Desmatoneura argentifrons* Williston.

Desmometopa Loew, Berliner Ent. Zeitschr., vol. 9, p. 185, 1865. 2 species. Type, *Agromyza m-atrum* Meigen, the second species, by designation of Hendel, Wien. Ent. Zeit., vol. 22, 1903, p. 251. Syn., *Macrurus* Lioy, 1864, preoccupied.

Dexia Meigen, Syst. Beschr. Zweifl. Ins., vol. 5, p. 33, 1826. 24 species. Type, *Musca rustica* Fabricius, the twenty-second species, by designation of Westwood, Intr., vol. 2, Synops., 1840, p. 140. Syn., *Dexilla* Westwood, 1840; *Ida* Desvoidy, 1863.

Dexilla Westwood, Intr., vol. 2, Synops., p. 140, 1840. 1 species. Type, *Musca rustica* Fabricius. Equals **Dexia** Meigen, 1826.

Dexiopsis Pokorny, Verh. Zool.-Bot. Ges. Wien, vol. 43, p. 533, 1893. 1 species. Type, *Aricia lacteipennis* Zetterstedt.

Dexiosoma Rondani, Dipt. Ital. Prodr., vol. 1, p. 85, 1856. 1 species. Type, *Musca canina* Fabricius.

Dexodes Brauer and Bergenstamm, Denkschr. Kais. Akad. Wiss. Wien, vol. 56, p. 87, 1889. 1 species. Type, *Tachina albisquama* Zetterstedt (as *spectabilis* Meigen). Equals **Lydella** Desvoidy, 1830.

Diabasis Macquart, Hist. Nat., Dipt., vol. 1, p. 207, 1834. 4 species. Type, *Tabanus bicinctus* Fabricius, the first species, by present designation. Not *Diabasis* Hoffmannsegg, 1819. Equals **Diachlorus** Osten Sacken, 1876.

Diachlorus Osten Sacken, Mem. Boston Soc. Nat. Hist., vol. 2, p. 475, 1876. Change of name for *Diabasis* Macquart, 1834, not of Hoffmannsegg, 1819. Type, *Tabanus bicinctus* Fabricius. Syn., *Diabasis* Macquart, 1834, preoccupied.

Diacrita Gerstæcker, Ent. Zeit. Stettin, vol. 21, p. 195, 1860. 1 species. Type, *Diacrita costalis* Gerstæcker. Syn., *Carlottæmyia* Bigot, 1877.

Diadocidia Ruthe, Isis von Oken for 1831, p. 1210, 1831. 1 species. Type *Mycetobia ferruginosa* Meigen (as *flavicans*, new species). Syn., *Macronevra* Macquart, 1834.

Dialineura Rondani, Dipt. Ital. Prodr., vol. 1, p. 155, 1856. 1 species. Type, *Musca anilis* Linnæus. Equals **Thereva** Latreille, 1796.

Dialysis Walker, Ins. Saund., Dipt., p. 4, 1850. 1 species. Type, *Stygia elongata* Say (as *dissimilis*, new species). Syn., *Agnotomyia* Williston, 1886.

Diamesa Meigen, Syst. Beschr. Zweifl. Ins., vol. 7, p. 12, 1838. 2 species. Type, *Diamesa waltlii* Meigen, the first species, by present designation.

Diaphoropeza Townsend, Smiths. Misc. Coll., vol. 51, p. 66, 1908. 1 species. Type, *Atrophopoda braueri* Williston. Equals **Paradidyma** Brauer and Bergenstamm, 1891.

Diaphorus Meigen, Syst. Beschr. Zweifl. Ins., vol. 4, p. 32, 1824. 4 species. Type, *Dolichopus oculatus* Fallen (as *flavocinctus*, new species), the first species, by designation of Westwood, Intr., vol. 2, Synops., 1840, p. 134. Syn., *Brachypus* Meigen, 1824; *Lyroneurus* Loew, 1857.

Diasemocera Bezzi, Wien. Ent. Zeit., vol. 14, p. 137, 1895. 1 species. Type, *Psilopa röderi* Girschner (as *nigrotæniata*, new species). Equals **Psilopa** Fallen, 1823.

[**Diastata** Meigen, Syst. Beschr. Zweifl. Ins., vol. 6, p. 94, 1830. 16 species. Type, *Geomyza obscurella* Fallen, the third species, by designation of Westwood, Intr., vol. 2, Synops., 1840, p. 152. Not American]. (*Diastata* of authors equals *Calopterella*, new name.)

Diathronomyia Felt, 23d Rep. State. Ent. N. Y., p. 339, 1908. 1 species. Type, *Diathronomyia artemisiæ* Felt.

Diatomineura Rondani, Arch. Zool., vol. 3, p. 84, 1864. 5 species. Type, *Pangonius depressus* Macquart, the first species, by present designation. Equals **Pangonius** Latreille, 1802.

Dichæta Meigen, Syst. Beschr. Zweifl. Ins , vol. 6, p. 61, 1830. 1 species. Type, *Notiphila caudata* Fallen.

Dichætoneura Johnson, Psyche, vol. 14, p, 9, 1907. 1 species. Type, *Dichætoneura leucoptera* Johnson.

Dichelacera MACQUART, Dipt. Exot., vol. 1, pt. 1, p. 112, 1838. 4 species. Type, *Dichelacera unifasciata* MACQUART, the third species, by present designation.

Dichelomyia RUBSAAMEN, Berliner Ent. Zeitschr., vol. 37, p. 346, 1892. 21 species. Type, *Cecidomyia saliciperda* DUFOUR, the second species, by present designation. Equals **Rabdophaga** WESTWOOD, 1847.

Dichocera WILLISTON, Ent. News, vol. 6, p. 31, 1895. 1 species. Type, *Dichocera lyrata* WILLISTON.

Dichrodiplosis KIEFFER, Bull. Soc. Ent. France for 1895, p. 194, 1895. 1 species. Type, *Dichrodiplosis faciata* KIEFFER.

Diclisa SCHINER, Verh. Zool.-Bot. Ges. Wien, vol. 17, p. 311, 1867. 1 species. Type, *Pangonius incompletus* MACQUART. Equals **Scione** WALKER, 1850.

Dicolonus LOEW, Berliner Ent. Zeitschr., vol. 10, p. 32, 1866. 1 species. Type, *Dicolonus simplex* LOEW.

Dicranomyia STEPHENS, Syst. Cat. Brit. Ins., vol. 2, p. 243, 1829. 8 species. Type, *Limnobia modesta* MEIGEN, the fourth species, by present designation. Equals **Furcomyia** MEIGEN, 1818.

Dicranophragma OSTEN SACKEN, Proc. Acad. Nat. Sci. Phila. for 1859, p. 240, 1860. 1 species. Type, *Limnophila fuscovaria* OSTEN SACKEN. Equals **Phylidorea** BIGOT, 1854.

Dicranoptycha OSTEN SACKEN, Proc. Acad. Nat. Sci. Phila. for 1859, p. 217, 1860. 4 (supposed) species. Type, *Dicranoptycha germana* OSTEN SACKEN, the first species, by present designation. Equals **Marginomyia** MEIGEN, 1818.

Dicranota ZETTERSTEDT, Ins. Lapp., p. 851, 1838. 1 species. Type, *Tipula bimaculata* SCHUMMEL (as *guerini*, new species).

Dicranus LOEW, Bemerk. Asiliden, p. 13, 1851. 1 species. Type, *Dasypogon rutilus* WIEDEMANN.

Didea MACQUART, Hist. Nat., Dipt., vol. 1, p. 508, 1834. 1 species. Type, *Didea fasciata* MACQUART. Syn., *Enica* MEIGEN, 1838.

Didyma WULP, Biol. Centr.-Amer., Dipt., vol. 2, p. 156, 1890. 18 species. Type, *Didyma albomicans* WULP, the twelfth species, by designation of TOWNSEND in Williston's Man. N. Amer. Dipt., 1908, p. 379.

Dilophus MEIGEN, Illiger's Mag., vol. 2, p. 264, 1803. No species. In his Klass. Beschr. Zweifl. Ins., 1804, pp. 115 and 116, 3 species. Type, *Tipula febrilis* LINNÆUS, the first species, by designation of LATREILLE, Consider. Général., 1810, p. 442. Equals **Philia** MEIGEN, 1800.

Dimeraspis NEWMAN, Ent. Mag., vol. 5, p. 372, 1838. 1 species. Type, *Mulio globosus* FABRICIUS (as *podagra*, new species). Equals **Microdon** MEIGEN, 1803.

Dinevra LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 1315, 1864. 4 species. Type, *Phytomyza elegans* MEIGEN, the first species, by present designation. Equals **Napomyza** HALIDAY, 1840.

Dioctria MEIGEN, Illiger's Mag., vol. 2, p. 270, 1803. 3 species. Type, *Asilus atricapillus* LINNÆUS, the first species, by designation of LATREILLE, Consider. Général., p. 443, 1810.

Diogmites LOEW, Berliner Ent. Zeitschr., vol. 10, p. 21, 1866. 8 species. Type, *Diogmites platypterus* LOEW, the first species, by present designation. Equals **Deromyia** PHILIPPI, 1865.

Diomonus WALKER, List Dipt. Brit. Mus., vol. 1, p. 87, 1848. 1 species. Type, *Diomonus nebulosus* WALKER.

Diomyza MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 1, p. 89, 1818. 1 species. Type, *Lasioptera picta* MEIGEN. Equals **Lasioptera** MEIGEN, 1818.

Dionæa DESVOIDY, Essai Myod., p. 253, 1830. 2 species. Type, *Tachina forcipata* MEIGEN, the first species, by designation of DESVOIDY, Hist. Nat. Dipt., vol. 2, 1863, p. 54. Syn., *Labigastera* MACQUART, 1834.

Dionnæa MEIGEN, Nouv. Class. Mouch., p. 24, 1800.* No species. *Platyptera* MEIGEN, 1803, is a change of name. Type, *Empis platyptera* PANZER. Syn., *Platyptera* MEIGEN, 1803; *Macrostomus* WIEDEMANN, 1817; *Rhamphomyia* MEIGEN, 1822; *Enicopteryx* STEPHENS, 1829; *Holoclera* SCHINER, 1860; *Megacyttarus* BIGOT, 1880.

Diostracus LOEW, Neue Beitr., vol. 8, p. 43, 1861. 1 species. Type, *Diostracus prasinus* LOEW.

Diotrepha OSTEN SACKEN, Cat. Dipt. N. Amer., p. 219, 1878. 1 species. Type, *Diotrepha mirabilis* OSTEN SACKEN.

Dipalta OSTEN SACKEN, Bull. 3, U. S. Geol. Surv., p. 236, 1877. 1 species. Type, *Dipalta serpentina* OSTEN SACKEN.

Diphysa MACQUART, Dipt. Exot., vol. 1, pt. 1, p. 172, 1838. 2 species. Type, *Xylophagus rufipalpus* WIEDEMANN, the second species, by present designation. Not *Diphysa* BLAINVILLE, 1834. Equals **Exaireta** SCHINER, 1867.

Diplocentra LOEW, Zeitschr. Ent. Breslau, vol. 13, p. 13, 1859. Change of name for *Curtonotum* MACQUART, 1843, on account of alleged preoccupation. Type, *Musca gibba* FABRICIUS. Equals **Curtonotum** MACQUART, 1843.

Diplomera LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 1349, 1864. 2 species (as 3). Type, *Tachina bisignata* MEIGEN, the first species (as *bigattata* MEIGEN), by present designation. Equals **Meigenia** DESVOIDY, 1830.

Diplosis LOEW, Dipt. Beitr., vol. 4, p. 20, 1851. 15 species. Type, *Tipula pini* DE GEER, the ninth species, by designation of RONDANI, Atti Soc. Ital. Sci. Nat., vol. 2, 1861, p. 289. Equals **Itonida** MEIGEN, 1800.

Diplotoxa LOEW, Berliner Ent. Zeitschr., vol. 7, p. 54, 1863. 1 species. Type, *Chlorops versicolor* LOEW.

Dipsa FALLEN, Spec. Ent. Meth. Exh., p. 20, 1810. 1 species. Type, *Lonchoptera lutea* PANZER (as *bifurcata*, new species). Equals **Lonchoptera** MEIGEN, 1803.

Dirhiza LOEW, Dipt. Beitr., vol. 4, p. 21, 1850. 1 species. Type, *Dirhiza lateritia* LOEW.

Discobola OSTEN SACKEN, Proc. Acad. Nat. Sci. Phila. for 1861, p. 226, 1862. 2 species. Type, *Limnobia argus* SAY, the second species, by present designation. Syn., *Trochobola* OSTEN SACKEN, 1869.

Discocephala MACQUART, Dipt. Exot., vol. 1, pt. 2, p. 50, 1838. 3 species. Type, *Dasypogon abdominalis* SAY (as *ruficentris*, new species), the third species, by present designation. Not *Discocephala* LAPORTE, 1832. Equals **Holcocephala** JENNICKE, 1867.

Discocerina MACQUART, Hist. Nat., Dipt., vol. 2, p. 527, 1835. 4 species. Type, *Notiphila obscurella* FALLEN, the first species, by present designation. Syn., *Clasiopa* STENHAMMER, 1844.

Discomyza MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 6, p. 76, 1830. 1 species. Type, *Psilopa incurva* FALLEN.

Distichona WULP, Biol. Centr.-Amer., Dipt., vol. 2, p. 44, 1890. 1 species. Type, *Distichona varia* WULP. Syn., *Pseudogermaria* BRAUER and BERGENSTAMM, 1891; *Olenochata* TOWNSEND, 1892.

Ditomyia WINNERTZ, Ent. Zeit. Stettin, vol. 7, p. 14, 1846. 1 species. Type, *Mycetobia fasciata* MEIGEN (as *trifasciata*, new species).

Dixa MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 1, p. 316, 1818. 3 species (as 4). Type, *Dixa maculata* MEIGEN, the third (valid) species, by designation of CURTIS, Brit. Ent., 1832, p. 409.

Dizonias LOEW, Berliner Ent. Zeitschr., vol. 10, p. 30, 1866. 1 species. Type, *Dizonias phœnicurus* LOEW.

Docosia WINNERTZ, Verh. Zool.-Bot. Ges. Wien, vol, 13, p. 802, 1863. 2 species. Type, *Docosia valida* WINNERTZ, the second species, by designation of JOHANNSEN, Gen. Ins., Dipt., Mycet., 1909, p. 92.

Dolichocephala MACQUART, Monogr. Empides, p. 147, 1823. 1 species. Type, *Tachydromia irrorata* FALLEN (as *maculata*, new species). Syn., *Ardoptera* MACQUART, 1827; *Leptoscelcs* HALIDAY, 1833.

Dolichocodia TOWNSEND, Smiths. Misc. Coll., vol. 51, p. 59, 1908. 1 species. Type, *Myocera bivittata* COQUILLETT.

Dolichogaster MACQUART, Dipt. Exot., Suppl. 3, p. 178, 1848. 1 species. Type, *Mydas brevicornis* WIEDEMANN.

Dolichoglossa STEIN, Berliner Ent. Zeitschr., vol. 42, p. 230, 1898. 1 species. Type, *Proboscimyia siphonina* BIGOT (as *americana*, new species). Equals Proboscimyia BIGOT, 1883.

Dolichomyia WIEDEMANN, Auss. Zweifl. Ins., vol. 2, p. 642, 1830. 1 species. Type, *Dolichomyia nigra* WIEDEMANN.

Dolichopeza CURTIS, Brit. Ent., p. 62, 1825. 1 species. Type, *Tipula albipes* STROM (as *silvicola*, new species). Syn., *Leptina* MEIGEN, 1830; *Apelesis* MACQUART, 1846.

Dolichopus LATREILLE, Precis, p. 159, 1796. No species. In his Hist. Nat. Crust. et Ins., vol. 3, 1802, p. 440, 2 species. Type, *Musca ungulata* LINNÆUS, the first species, by designation of LATREILLE, Consider. Général., 1810, p. 443. Syn., *Iphia* MEIGEN, 1800; *Satyra* MEIGEN, 1803; *Ragheneura* RONDANI, 1856; *Hygroceleuthus* LOEW, 1857; *Spathichira* BIGOT, 1888.

Doliosyrphus BIGOT, Bull. Soc. Ent. France for 1882, p. 120, 1882. 3 species. Type, *Doliosyrphus scutellatus* BIGOT, the first species, by designation of WILLISTON, Synops. N. Amer. Syrph., 1886, p. 178.

Dorbinia DESVOIDY, Ann. Soc. Ent. France for 1847, p. 272, 1847. 2 species (as 4). Type, *Musca quadripustulata* FABRICIUS (as *ludibunda* and *nitida*, new species), the first two supposed species, by designation of DESVOIDY, Hist. Nat. Dipt., vol. 1, 1863, p. 217. Equals **Winthemia** DESVOIDY, 1830.

Doria MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 7, p. 263, 1838. 4 species. Type, *Tachina concinnata* MEIGEN, the first species, by designation of DESVOIDY, Hist. Nat. Dipt., vol. 1, 1863, p. 535. Equals **Compsilura** BOUCHE, 1834.

Dorilas MEIGEN, Nouv. Class. Mouch., p. 31, 1800.* No species. *Microcera* MEIGEN, 1803, is a change of name. Type, *Pipunculus campestris* LATREILLE. Syn., *Pipunculus* LATREILLE, 1802; *Microcera* MEIGEN, 1803; *Cephalops* FALLEN, 1810; *Prothecus* RONDANI, 1856; *Alloneura* RONDANI, 1856.

Doryclus JÆNNICKE, Abh. Seckenb. Ges., vol. 6, p. 365, 1867. 1 species. Type, *Asilus distendens* WIEDEMANN. Equals **Ampyx** WALKER, 1855.

Drapetis MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 3, p. 91, 1822. 1 species. Type, *Drapetis exilis* MEIGEN. Syn., *Crossopalpus* BIGOT, 1857.

Drepanoglossa TOWNSEND, Trans. Amer. Ent. Soc., vol. 18, p. 377, 1891. 1 species. Type, *Drepanoglossa lucens* TOWNSEND. Equals **Epigrimyia** TOWNSEND, 1891.

Drepanomyia WHEELER, Zool. Bull., vol. 1, p. 217, 1898. 2 species. Type, *Drepanomyia pruinosa* WHEELER, the first species, by present designation. Equals **Hypocharassus** MIK, 1879.

Drepanophora STROBL, Programm Seiten., vol. 14, p. 40, 1880.* 1 species. Type, *Phora gabrata* HALIDAY (as *braueri*, new species). Equals **Metopina** MACQUART, 1835.

Drosophila FALLEN, Geomyzides Sveciæ, p. 4, 1823.* 12 species. Type, *Musca funebris* FABRICIUS, the third species, by designation of CURTIS, Brit. Ent., 1833, p. 473 (as *cellaris* MEIGEN, not LINNÆUS).

Drymeia MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 5, p. 204, 1826. 1 species. Type, *Musca hamata* FALLEN (as *obscura*, new species).

Dryomyza FALLEN, Sciomyz. Sveciæ, p. 15, 1820. 2 species. Type, *Musca flaveola* FABRICIUS (as *ctula*, new species), the first species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 145. Syn., *Dryope* DESVOIDY, 1830.

Dryope DESVOIDY, Essai Myod., p. 618, 1830. 2 species. Type, *Musca flaveola* FABRICIUS (as *communis*, new species), the first species, by present designation. Equals **Dryomyza** FALLEN, 1820.

Duponchelia DESVOIDY, Hist. Nat. Dipt., vol. 1, p. 531, 1863. 1 species (as 2). Type, *Clytogena segregata* RONDANI (as *sylvestris* and *infuscata*, new species). Not *Duponchelia* ZELLER, 1847. Equals **Parasetigena** BRAUER and BERGENSTAMM, 1891.

Dynatosoma WINNERTZ, Verh. Zool.-Bot. Ges. Wien, vol. 13, p. 947, 1863. 2 species. Type, *Mycetophila fuscicornis* MEIGEN, the first species, by designation of JOHANNSEN, Gen. Ins., Dipt., Mycet., p. 114, 1909.

Dysmachus LOEW, Dipt.-Fauna Südafrika, p. 143, 1860. 4 species. Type, *Asilus trigonus* MEIGEN, the third species, by present designation. Syn., *Lophonotus* MACQUART, 1838, preoccupied.

Earomyia ZETTERSTEDT, Dipt. Scand., vol. 1, p. 78, 1842. No species. In vol. 7, 1848, p. 2690, 1 species. Type, *Earomyia lonchæoides* ZETTERSTEDT. Equals **Lonchæa** FALLEN, 1820.

Eccoptomera LOEW, Zeitschr. Ent. Breslau, vol. 13, p. 47, 1862. 7 species. Type, *Helcomyza longiseta* MEIGEN, the second species, by present designation.

Eccritosia SCHINER, Verh. Zool.-Bot. Ges. Wien, vol. 16, p. 674, 1866. 2 species. Type, *Asilus barbatus* FABRICIUS, the first species, by original designation.

Eeculex FELT, Mosq. Culic. N. Y. State, p. 391c, 1904. 2 species. Type, *Culex sylvestris* THEOBALD, the first species, by original designation. Equals **Ochlerotatus** ARRIBALZAGA, 1891.

Echinodexia BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 60, p. 174, 1893. 1 species. Type, *Hystrisyphona pseudohystricia* BRAUER and BERGENSTAMM.

Echinogaster LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 1335, 1864. 1 species. Type, *Tachina prompta* MEIGEN (as *Echinomya argentifrons* MACQUART). Equals **Peleteria** DESVOIDY, 1830.

Echinomya LATREILLE, Hist. Nat. Crust. et Ins., vol. 14, p. 377, 1805. 2 species. Type, *Musca grossa* LINNÆUS, the first species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 138. Equals **Larvævora** MEIGEN, 1800.

Echthodopa LOEW, Berliner Ent. Zeitschr., vol. 10, p. 16, 1866. 1 species. Type, *Echthodopa pubera* LOEW.

Ecitomyia BRUES, Amer. Nat., vol 35, p. 347, 1901. 1 species. Type, *Ecitomyia wheeleri* BRUES.

Eclimus LOEW, Ent. Zeit. Stettin, vol. 5, p. 154, 1844. 2 species. Type, *Eclimus perspicillaris* LOEW, the first species, by present designation. Syn., *Thevenemyia* BIGOT, 1875; *Epibates* OSTEN SACKEN, 1877.

Ectecephala MACQUART, Dipt. Exot., Suppl. 4, pt. 2, p. 280, 1851. 1 species. Type, *Ectecephala albistylum* MACQUART.

Ectyphus GERSTÆCKER, Ent. Zeit. Stettin, vol. 29, p. 92, 1868. 1 species. Type, *Ectyphus pinguis* GERSTÆCKER.

Efferia COQUILLETT, Can. Ent., vol. 25, p. 175, 1893. 5 species. Type, *Efferia candida* COQUILLETT, the fifth species, by present designation. Equals **Eichoichemus** BIGOT, 1857.

Egeria DESVOIDY, Essai Myod., p. 555, 1830. 3 species. Type, *Egeria silvatica* DESVOIDY, the first species, by present designation. Equals **Hylemya** DESVOIDY, 1830.

Eggeria SCHINER, Wien. Ent. Monatschr., vol. 5, p. 142, 1861. 1 species. Type, *Fallenia fasciata* EGGER. Equals **Phorocera** DESVOIDY, 1830.

Egle DESVOIDY, Essai Myod., p. 584, 1830. 21 species. Type, *Egle parva* DESVOIDY, the twentieth species, by present designation. Equals **Pegomya** DESVOIDY, 1830.

Eicherax BIGOT, Ann. Soc. Ent. France for 1857, p. 545, 1857. 1 species. Type, *Erax simplex* MACQUART. Syn., *Eristicus* LOEW, 1848, preoccupied; *Neoeristicus* OSTEN SACKEN, 1878.

Eichoichemus BIGOT, Ann. Soc. Ent. France for 1857, p. 543, 1857. 1 species. Type, *Erax flavianalis* MACQUART. Syn., *Efferia* COQUILLETT, 1893.

[**Elachiptera** MACQUART, Hist. Nat., Dipt., vol. 2, p. 621, 1835. 1 species. Type, *Chlorops brevipennis* MEIGEN. Not American.]

Elachisoma RONDANI, Bull. Soc. Ent. Ital., vol. 12, p. 5, 1880. 1 species. Type, *Borborus nigerrimus* HALIDAY. Equals **Leptocera** OLIVIER, 1813.

Elxotoma COSTA, Atti Accad. Sci. Fis. Mat., vol. 1, p. 49, 1863. 1 species. Type, *Laphria albibarbis* MEIGEN (as *adustiventris*, new species). Equals **Andrenosoma** RONDANI, 1856.

Elaphropeza MACQUART, Ins. Dipt. Nord France, Separata, p. 86, 1827. 1 species. Type, *Tachydromia ephippiata* FALLEN.

Elephantomyia OSTEN SACKEN, Proc Acad. Nat. Sci. Phila. for 1859, p. 220, 1860. 1 species. Type, *Elephantomyia westwoodi* OSTEN SACKEN (as *Limnobiorhynchus canadensis* WESTWOOD).

Elfia DESVOIDY, Ann. Soc. Ent. France for 1850, p. 190, 1850. 2 species. Type, *Actia cingulata* DESVOIDY, the first species, by designation of DESVOIDY, Hist. Nat. Dipt., vol. 1, 1863, p. 672. Equals **Actia** DESVOIDY, 1830.

Elgiva MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 7, p. 365, 1838. 4 species. Type, *Musca cucullaria* LINNÆUS, the fourth species, by designation of RONDANI, Dipt. Ital. Prodr., vol. 1, 1856, p. 106. Syn., *Gymnostyla* LIOY, 1864.

Eliozeta RONDANI, Dipt. Ital. Prodr., vol. 1, p. 82, 1856. 1 species. Type, *Tachina pellucens* FALLEN. Syn., *Clytia* DÉSVOIDY, 1830, preoccupied; *Clytiomyia* RONDANI, 1861; *Chryseria* DESVOIDY, 1863; *Arisbæa* DESVOIDY, 1863; *Phanigaster* LIOY, 1864; *Clistomorpha* TOWNSEND, 1892; *Subclytia* PANDELLÉ, 1894; *Euclytia* TOWNSEND, 1908.

Elliponeura LOEW, Berliner Ent. Zeitschr., vol. 13, p. 44, 1869. 1 species. Type, *Elliponeura debilis* LOEW.

Elliptera SCHINER, Wien. Ent. Monatschr., vol. 7, p. 222, 1863. 1 species. Type, *Elliptera omissa* SCHINER.

Elophilus MEIGEN, Illiger's Mag., vol. 2, p. 274, 1803. 4 species. Type, *Musca tenax* LINNÆUS, the first species, by designation of LATREILLE, Consider. Général., 1810, p. 443. Equals **Tubifera** MEIGEN, 1800.

Elpe DESVOIDY, Hist. Nat. Dipt., vol. 1, p. 488, 1863. 1 species. Type, *Tachina inepta* MEIGEN. Equals **Zenilla** DESVOIDY, 1830.

Elpigia DESVOIDY, Hist. Nat. Dipt., vol. 2, p. 149, 1863. 1 species (as 4). Type, *Miltogramma heteroneura* MEIGEN. Equals **Taxigramma** PERRIS, 1852.

Empeda OSTEN SACKEN, Monogr. Dipt. N. Amer., vol. 4, p. 183, 1869. 1 species. Type, *Empeda stigmatica* OSTEN SACKEN.

Emphanopteryx TOWNSEND, Trans. Amer. Ent. Soc., vol. 19, p. 120, 1892. 1 species. Type, *Tachina theutis* WALKER (as *cumyothyroides*, new species). Equals **Cryptomeigenia** BRAUER and BERGENSTAMM, 1891.

Empheria WINNERTZ, Verh. Zool.-Bot. Ges. Wien, vol. 13, p. 738, 1863. 7 species. Type, *Sciophila striata* MEIGEN, the first species, by present designation. Not *Empheria* HAGEN, 1856. Equals **Neoempheria** OSTEN SACKEN, 1878.

Empimorpha COQUILLETT, Proc. U. S. Nat. Mus., vol. 18, p. 396, 1896. 2 species. Type, *Empimorpha comantis* COQUILLETT, by original designation.

Empis LINNÆUS, Syst. Nat., 10th ed., p. 603, 1758. 3 species. Type, *Empis pennipes* LINNÆUS, the second species, by designation of LATREILLE, Consider. Général., 1810, p. 443. Syn. *Platypterygia* STEPHENS, 1829; *Pachymeria* STEPHENS, 1829; *Pachymerina* MACQUART, 1834; *Eriogaster* MACQUART, 1838; *Enoplempis* BIGOT, 1880.

Endocephala LIOY, Atti Inst. Veneto, ser. 3, vol. 10, p. 81, 1865. Change of name for *Cephenemyia* LATREILLE, 1818, because it is too near *Cephalomyia* LATREILLE, 1818. Type, *Œstrus trompe* LINNÆUS. Equals **Cephenemyia** LATREILLE, 1818.

Enica MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 7, p. 140, 1838. 1 species. Type, *Didea fasciata* MACQUART (as *fœrsteri*, new species). Equals **Didea** MACQUART, 1834.

Enicita WESTWOOD, Intr., vol. 2, Synops., p. 148, 1840. Change of name for *Enicopus* WALKER, 1833, not of STEPHENS, 1830. Type, *Sepsis annulipes* MEIGEN. Syn., *Enicopus* WALKER, 1833, preoccupied.

Enicopteryx STEPHENS, Syst. Cat. Brit. Ins., p. 264, 1829. 2 species. Type, *Rhamphomyia infuscata* MEIGEN, the first species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 131. Equals **Dionnæa** MEIGEN, 1800.

Enicopus WALKER, Ent. Mag., vol. 1, p. 253, 1833. 1 species. Type, *Sepsis annulipes* MEIGEN. Not *Enicopus* STEPHENS, 1830. Equals **Enicita** WESTWOOD, 1840.

Ennyomma TOWNSEND, Trans. Amer. Ent. Soc., vol. 18, p. 371, Dec., 1891. 1 species. Type, *Tachina ænea* WIEDEMANN (as *elistoides*, new species). Equals **Myiophasia** BRAUER and BERGENSTAMM, 1891.

Enoplempis BIGOT, Bull. Soc. Ent. France for 1880, p. 47, 1880. 1 species. Type, *Enoplempis mira* BIGOT. Equals **Empis** LINNÆUS, 1758.

Ensina DESVOIDY, Essai Myod., p. 751, 1830. 1 species (as 6). Type, *Musca sonchi* LINNÆUS.

Enteromyza RONDANI, Dipt. Ital. Prodr., vol. 2, p. 20, 1857. Change of name for *Gasterophilus* LEACH, 1817, and *Gastrus* MEIGEN, 1824, because of their inappropriateness. Type, *Œstrus intestinalis* DE GEER. Equals **Gasterophilus** LEACH, 1817.

Enthenis DESVOIDY, Hist. Nat. Dipt., vol. 1, p. 199, 1863. 1 species. Type, *Tachina dubia* FALLEN (as *ciligera*, new species). Equals **Lypha** DESVOIDY, 1830.

Entomobosca LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 1350, 1864. 1 species. Type, *Tachina plebejus* FALLEN (as *spectabilis* MEIGEN). Equals **Demoticus** MACQUART, 1854.

Entomophaga LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 1332, 1864. 2 species. Type, *Tachina exoleta* MEIGEN, the first species, by present designation. Equals **Ceranthia** DESVOIDY, 1830.

Epacmus OSTEN SACKEN, Biol. Centr.-Amer., Dipt., vol. 1, p. 142, 1887. Change of name for *Leptochilus* LOEW, 1872, not of SAUSSURE, 1852. Type, *Leptochilus modestus* LOEW. Syn., *Leptochilus* LOEW, 1872, preoccupied.

Epalpus RONDANI, Nuovi Ann. Sci. Nat. (Bologna), ser. 3, vol. 2, p. 169, 1850. 6 species. Type, *Micropalpus rufipennis* MACQUART, the fourth species, by present designation. Syn., *Cryptopalpus* RONDANI, 1850; *Saundersia* SCHINER, 1868; *Rhachoepalpus* TOWNSEND, 1908.

Ephydra FALLEN, Spec. Ent. Meth. Exh., p. 22, 1810. No species. In 1813, 4 species. Type, *Ephydra riparia* FALLEN, the first species, by designation of CURTIS, Brit. Ent., 1832, p. 413.

Ephydrosoma LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 1103, 1864. 1 species., Type, *Ephydra rufipes* MEIGEN. Equals **Napæa** DESVOIDY, 1830.

Ephygrobia SCHINER, Wien. Ent. Monatschr., vol. 6, p. 432, 1862. Change of name for *Psilopa* FALLEN, 1823, on account of *Psilopus* MEIGEN, 1824. Type, *Notiphila nitidula* FALLEN. Equals **Psilopa** FALLEN, 1823.

Epibates OSTEN SACKEN, Bull. 3, U. S. Geol. Surv., p. 268, 1877. 7 species. Type, *Epibates funestus* OSTEN SACKEN, the first species, by present designation. Equals **Eclimus** LOEW, 1844.

Epicypta WINNERTZ, Verh. Zool.-Bot. Ges. Wien, vol. 13, p. 909, 1863. 3 species. Type, *Mycetophila scatophora* PERRIS, the second species, bydesignation of JOHANNSEN Gen. Ins., Dipt., Mycet., 1909, p. 110.

Epidapus HALIDAY, in Walker's Ins. Britt., Dipt., vol. 3, p. 56, 1856. 1 species. Type, *Chionea venatica* HALIDAY. Syn., *Atomaria* BIGOT, 1854, preoccupied.

Epidesmia RONDANI, Dipt. Ital. Prodr., vol. 1, p. 112, 1856. 1 species. Type, *Tephritis cognata* WIEDEMANN. Equals **Acidia** DESVOIDY, 1830.

Epidiplosis FELT, 23d Rep. State Ent. N. Y., p. 406, 1908. 1 species. Type *Epidiplosis sayi* FELT.

Epigrimyia TOWNSEND, Trans. Amer. Ent. Soc., vol. 18, p. 375, 1891. 1 species. Type, *Epigrimyia polita* TOWNSEND. Syn., *Drepanoglossa* TOWNSEND, 1891; *Siphoclytia* TOWNSEND, 1892; *Siphophyto* TOWNSEND, 1892; *Coronimyia* TOWNSEND, 1892.

Epipela STENHAMMAR, Kongl. Vet. Akad. Handl. for 1843, p. 143, 1844. 1 species. Type, *Ephydra spilota* CURTIS (as *notata*, new species). Equals Ilythea HALIDAY, 1839.

Epiphragma OSTEN SACKEN, Proc. Acad. Nat. Sci. Phila. for 1859, p. 238, 1860. 2 species. Type, *Limnobia fascipennis* SAY (as *paronina*, new species), the second species, by present designation.

Epiplatea LOEW, Berliner Ent. Zeitschr., vol. 11, p. 324, 1868. 1 species. Type, *Epiplatea erosa* LOEW.

Epistrophe WALKER, Ins. Saund., Dipt., p. 242, 1852. 1 species. Type *Musca formosa* HARRIS (as *conjungens*, new species).

Epitriptus LOEW, Linn. Ent., vol 4, p. 108, 1849. 6 species. Type, *Asilus cingulatus* FABRICIUS, the first species, by present designation.

Epochra LOEW, Monogr. Dipt. N. Amer., vol. 3, p. 238, 1873. 1 species. Type, *Trypeta canadensis* LOEW.

[**Erax** SCOPOLI, Ent. Carn., p. 359, 1763. 14 species. Type, *Erax barbatus* SCOPOLI, the fifth species, by present designation. Syn., *Protophanes* LOEW, 1860. Not American.] (*Erax* of authors equals *Eicherax* BIGOT.)

Eremomyia STEIN, Berliner Ent. Zeitschr., vol. 42, p. 223, 1898. 4 species, Type, *Eremomyia humeralis* STEIN, the first species, by designation of COQUILLETT, Journ. N. Y. Ent. Soc., vol. 9, 1901, p. 137.

Erephopsis RONDANI, Arch. Zool., vol. 3, p. 85, 1864. 7 species. Type, *Pangonius fulvithorax* WIEDEMANN, the second species, by present designation. Equals **Pangonius** LATREILLE, 1802.

Eretmoptera KELLOGG, Biol. Bull., vol. 1, p. 82, 1900. 1 species. Type, *Eretomoptera browni* KELLOGG.

Eribea DESVOIDY, Hist. Nat. Dipt., vol. 1, p. 1033, 1863. 1 species (as 16). Type, *Tachina simulans* MEIGEN. Equals **Exorista** MEIGEN, 1803.

Erichsonia DESVOIDY, Hist. Nat. Dipt., vol. 2, p. 481, 1863. 2 species (as 35). Type, *Sarcophaga hæmorrhoa* MEIGEN (the first 24 supposed species), by original designation. Not *Erichsonia* WESTWOOD, 1849; nor of DANA, 1849. Equals **Hartigia** DESVOIDY, 1863.

Erigone DESVOIDY, Essai Myod., p. 65, 1830. 3 species (as 8). Type, *Musca radicum* FABRICIUS (as *anthophila*, *flaripennis*, and *scatellaris*, new species), the first species, by designation of DESVOIDY, Hist. Nat. Dipt., vol. 1, 1863, p. 152. Equals **Ernestia** DESVOIDY, 1830.

Erinia DESVOIDY, Hist. Nat. Dipt., vol. 1, p. 467, 1863. 1 species. Type, *Tachina vulgaris* FALLEN (as *silvatica*, new species). Equals **Phryxe** DESVOIDY, 1830.

Erinna MEIGEN, Nouv. Class. Mouch., p. 21, 1800.* No species. *Xylophagus* MEIGEN, 1803, is a change of name. Type, *Nemotelus cinctus* DE GEER. Syn., *Xylophagus* MEIGEN, 1803; *Pachystomus* LATREILLE, 1809.

Eriocera MACQUART, Dipt. Exot., vol. 1, pt. 1, p. 74, 1838. 1 species. Type, *Limnobia nigra* WIEDEMANN. Equals **Caloptera** GUERIN, 1829.

Eriogaster MACQUART, Dipt. Exot., vol. 1, pt. 2, p. 162, 1838. 1 species. Type, *Empis laniventris* ESCHSCHOLZ. Not *Eriogaster* GERMAR, 1811. Equals **Empis** LINNÆUS, 1758.

Erioischia LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 991, 1864. 1 species. Type, *Chortophila floccosa* MACQUART. Equals **Pegomya** DESVOIDY, 1830.

Eriophora PHILIPPI, Verh. Zool.-Bot. Ges. Wien, vol. 15, p. 735, 1865. 1 species. Type, *Eriophora aureorufa* PHILIPPI. Equals **Penthesilia** MEIGEN, 1800.

Erioptera MEIGEN, Illiger's Mag., vol. 2, p. 262, 1803. No species. In 1804, 6 species. Type, *Erioptera lutea* MEIGEN, the 5th species, by present designation. Equals **Polymeda** MEIGEN, 1800.

Eriostyla LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 997, 1864. 2 species. Type, *Coenosia dubia* MACQUART, the second species, by designation of COQUILLETT, Journ. N. Y. Ent. Soc., vol. 9, 1901, p. 137. Equals(?) **Coenosia** MEIGEN, 1826.

Eristalinus RONDANI, Nuovi Ann. Sci. Nat. (Bologna) for 1844, p. 453, 1844. No species. In his Dipt. Ital. Prodr., vol. 2, 1857, p. 38, 1 species. Type, *Musca sepulchralis* LINNÆUS. Equals **Tubifera** MEIGEN, 1800.

Eristalis LATREILLE, Nouv. Dict. Hist. Nat., vol. 24, p. 194, 1804.* 7 species. Type, *Musca tenax* LINNÆUS, the third species, by designation of CURTIS, Brit. Ent., 1832, p. 432. Equals **Tubifera** MEIGEN, 1800.

Eristaloides RONDANI, Nuovi Ann. Sci. Nat. (Bologna) for 1844, p. 453, 1844. No species. *Eristalomya* RONDANI, 1857, is a change of name. Type, *Musca tenax* LINNÆUS. Equals **Tubifera** MEIGEN, 1800.

Eristalomya RONDANI, Dipt. Ital. Prodr., vol. 2, p. 38, 1857. 1 species. Type, *Musca tenax* LINNÆUS. Equals **Tubifera** MEIGEN, 1800.

Eristicus LOEW, Linn. Ent., vol. 3, p. 396, 1848. No species. In Abh. Nat. Ver. Sach. Thur. Halle, vol. 2, 1860, p. 213, he stated that the species of this genus were found in America. Osten Sacken, Cat. Descr. Dipt. N. Amer., 1878, p. 79, said that there is a specimen of *Erax ambiguus* MACQUART (equals *Asilus interruptus* MACQUART) in the Museum of Comparative Zoology in Cambridge, Mass., evidently so named by Loew, and as it agrees with the characters of *Eristicus*, it may therefore be taken as the type. Type, *Asilus interruptus* MACQUART. Not *Eristicus* WESMAEL, 1844. Equals **Eicherax** BIGOT, 1857.

Ernestia DESVOIDY, Essai Myod., p. 60, 1830. 1 species. Type, *Tachina rudis* FALLEN (as *microcera*, new species). Syn., *Fausta* DESVOIDY, 1830; *Mericia* DESVOIDY, 1830; *Erigone* DESVOIDY, 1830; *Panzeria* DESVOIDY, 1830; *Varichæta* SPEISER, 1903.

Ervia DESVOIDY, Essai Myod., p. 225, 1830. 1 species. Type, *Ocyptera triquetra* OLIVIER. Syn., *Paranaphora* TOWNSEND, 1908.

Erythrandra BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 58, p. 368, 1891. 1 species. Type, *Erythrandra picipes* BRAUER and BERGENSTAMM.

Esila DESVOIDY, Hist. Nat. Dipt., vol. 1, p. 1063, 1863. 1 species. Type, *Tachina simulans* MEIGEN (as *arvorum*, new species). Equals **Exorista** MEIGEN, 1803.

Estelia DESVOIDY, Essai Myod., p. 635, 1830. 3 species. Type, *Ochtiphila juncorum* FALLEN (as *herbarum*, new species), the second species, by present designation. Equals **Chamæmyia** MEIGEN, 1803.

Ethilla DESVOIDY, Hist. Nat. Dipt., vol. 1, p. 202, 1863. 1 species. Type, *Tachina æmula* MEIGEN. Equals **Aplomya** DESVOIDY, 1830.

Euacaulona TOWNSEND, Smiths. Misc. Coll., vol. 51, p. 131, 1908. 1 species. Type, *Euacaulona semichrasti* TOWNSEND. Equals **Acaulona** WULP, 1888.

Euantha WULP, Tijdschr. Ent., vol. 28, p. 198, 1885. 1 species. Type, *Ocyptera litturata* OLIVIER (as *Dexia dives* WIEDEMANN).

Euaresta LOEW, Monogr. Dipt. N. Amer., vol. 3, p. 296, 1873. 10 species. Type, *Trypeta festiva* LOEW, the second species, by present designation.

Euarmostus WALKER, Ins. Saund., Dipt., p. 102, 1851. 1 species. Type, *Euarmostus bimacula* WALKER. Equals **Cyrtopogon** LOEW, 1847.

Eucalliphora TOWNSEND, Smiths. Misc. Coll., vol. 51, p. 118, 1908. 1 species. Type, *Calliphora latifrons* HOUGH. Equals **Calliphora** DESVOIDY, 1830.

Eucalodexia TOWNSEND, Smiths. Misc. Coll., vol. 51, p. 64, 1908. 1 species. Type, *Homodexia flavipes* BIGOT.

Euceratomyia WILLISTON, Wien. Ent. Zeit., vol. 3, p. 185, 1884. 1 species. Type, *Euceratomyia pergandei* WILLISTON. Equals **Pelecocera** MEIGEN, 1822.

Eucessia COQUILLETT, Can. Ent., vol. 18, p. 82, 1886. 1 species. Type, *Eucessia rubens* COQUILLETT.

Euchætogyne TOWNSEND, Smiths. Misc. Coll., vol. 51, p. 59, 1908. 1 species. Type, *Hystrichodexia röderi* WILLISTON.

Euclytia TOWNSEND, Smiths. Misc. Coll., vol. 51, p. 60, 1908. 1 species. Type, *Clytia flava* TOWNSEND. Equals **Eliozeta** RONDANI, 1856.

Eucnephalia TOWNSEND, Can. Ent., vol. 24, p. 166, 1892. 1 species. Type, *Eucnephalia gonoides* TOWNSEND.

Eucorethra UNDERWOOD, Science, vol. 18, p. 182, Aug. 7, 1903. 1 species. Type, *Eucorethra underwoodi* UNDERWOOD. Syn., *Peleracapis* JOHANNSEN, August 11, 1903.

Eudexia BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 56, p. 120, 1889. 1 species. Type, *Rhamphinina formidabilis* BIGOT (as *goliath*, new species).

Eudicrana LOEW, Berliner Ent. Zeitschr., vol. 13, p. 142, 1869. 1 species. Type, *Eudicrana obumbrata* LOEW.

Eudiplosis KIEFFER, Bull. Soc. Ent. France for 1894, p. 28, 1894. 2 MS. species (described in 1896). Type, *Contarinia sorbi* KIEFFER, the first species, by present designation. Equals **Contarinia** RONDANI, 1861.

Eudora DESVOIDY, Hist. Nat. Dipt., vol. 1, p. 623, 1863. 1 species. Type, *Echinomya lefeburei* DESVOIDY (as *illustris*, new species). Not *Eudora* LESSON, 1809. Equals **Cnephaotachina** BRAUER and BERGENSTAMM, 1894.

Eudoromyia BEZZI, Zeitschr. Hym. Dipt., vol. 6, p. 49, 1906. Change of name for *Eudora* DESVOIDY, 1863, not LESSON, 1809. Type, *Echinomya lefeburei* DESVOIDY. Equals **Cnephaotachina** BRAUER and BERGENSTAMM, 1894.

Eugeniamyia WILLISTON, Can. Ent., vol. 14, p. 80, 1882. 1 species. Type, *Rhingia ferruginea* FALLEN (as *rufa*, new species). Equals **Brachyopa** MEIGEN, 1822.

Eugnoriste COQUILLETT, Proc. Ent. Soc. Washington, vol. 3, p. 321, 1896. 1 species. Type, *Eugnoriste occidentalis* COQUILLETT.

Euhybus COQUILLETT, Proc. U. S. Nat. Mus., vol. 18, p. 437, 1896. 3 species. Type, *Hybos purpureus* WALKER, the second species, by designation of COQUILLETT, Proc. Ent. Soc. Washington, vol. 5, 1903, p. 250.

Eujurinia TOWNSEND, Smiths. Misc. Coll., vol. 51, p. 113, 1908. 1 species. Type, *Hystricia pollinosa* WULP. Equals **Jurinella** BRAUER and BERGENSTAMM, 1889.

Eulalia MEIGEN, Nouv. Class. Mouch., p. 21, 1800.* No species. *Odontomyia* MEIGEN, 1803, is a change of name. Type, *Musca hydroleon* LINNÆUS. Syn., *Odontomyia* MEIGEN, 1803.

Eulasiona TOWNSEND, Trans. Amer. Ent. Soc., vol. 19, p. 119, 1892. 1 species. Type, *Eulasiona comstockii* TOWNSEND.

Euleia WALKER, Ent. Mag., vol. 3, p. 81, 1836. 1 species. Type, *Musca cæsio* HARRIS. Equals **Acidia** DESVOIDY, 1830.

Eulonchus GERSTÆCKER, Ent. Zeit. Stettin, vol. 17, p. 359, 1856. 1 species. Type, *Eulonchus smaragdinus* GERSTÆCKER.

Eumacronychia TOWNSEND, Trans. Amer. Ent. Soc., vol. 19, p. 98, 1892. 2 species. Type, *Eumacronychia decens* TOWNSEND, the first species, by original designation. Equals **Hillarella** RONDANI, 1856.

Eumegaparia TOWNSEND, Smiths. Misc. Coll., vol. 51, p. 58, 1908. 1 species. Type, *Megaparia flaveola* COQUILLETT.

Eumeros MEIGEN, Illiger's Mag., vol. 2, p. 273, 1803. 2 species. Type, *Musca segnis* LINNÆUS, the first species, by ST. FARGEAU and SERVILLE, who, in Encycl. Meth., vol. 10, pt. 2, 1828, p. 808, selected the second species as type of a new genus, *Syritta*. Equals **Zelima** MEIGEN, 1800.

Eumesembrina TOWNSEND, Smiths. Misc. Coll., vol. 51, p. 50, 1908. 1 species (as 2). Type, *Mesembrina latreillei* DESVOIDY.

Eumetopia MACQUART, Dipt. Exot., Suppl. 2, p. 87, 1847. 1 species. Type, *Eumetopia rufipes* MACQUART. Not *Eumetopia* WESTWOOD, 1837. Equals **Eumetopiella** HENDEL, 1907.

Eumetopia BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 56. p. 114, 1889. 1 species. Type, *Tachina fastuosa* MEIGEN. Not *Eumetopia* WESTWOOD, 1837. Equals **Sphenometopa** TOWNSEND, 1908.

Eumetopiella HENDEL, Wien. Ent. Zeit., vol. 26, p. 98, 1907. Change of name for *Eumetopia* MACQUART, 1847, not of WESTWOOD, 1837. Type, *Eumetopia rufipes* MACQUART. Syn., *Eumetopia* MACQUART, 1847, preoccupied.

Eumyothyria TOWNSEND, Trans. Amer. Ent. Soc., vol. 19, p. 121, 1892. 1 species. Type, *Eumyothyria illinoisensis* TOWNSEND.

Euœstrophasia TOWNSEND, Trans. Amer. Ent. Soc., vol. 19, p. 133, 1892. 1 species. Type, *Œstrophasia aperta* BRAUER and BERGENSTAMM. Equals **Ormia** DESVOIDY, 1830.

Euomogenia TOWNSEND, Smiths. Misc. Coll., vol. 51, p. 132, 1908. 1 species. Type, *Euomogenia lacteata* TOWNSEND. Equals **Trichiopoda** LATREILLE, 1829.

Eupalamus JÆNNICKE, Berliner Ent. Zeitschr., vol. 11, p. 86, 1867. 1 species. Type, *Cyrtopogon longibarbus* LOEW (as *alpestris*, new species). Equals **Cyrtopogon** LOEW, 1847.

Euparyphus GERSTÆCKER, Linn. Ent., vol. 11, p. 314, 1857. 1 species. Type, *Cyphomyia elegans* WIEDEMANN.

Eupeitenus MACQUART, Dipt. Exot., vol. 1, pt. 1, p. 85, 1838. 1 species. Type, *Penthetria atra* MACQUART.

Eupelateria TOWNSEND, Smiths. Misc. Coll., vol. 51, p. 111, 1908. 3 species. Type, *Musca fera* LINNÆUS, the first species, by designation of TOWNSEND, Can. Ent., vol. 41, p. 244, 1909. Equals **Larvaevora** MEIGEN, 1800.

Eupeodes OSTEN SACKEN, Bull. 3, U. S. Geol. Surv., p. 328, 1877. 1 species. Type, *Eupeodes volucris* OSTEN SACKEN.

Euphemia DESVOIDY, Essai Myod., p. 485, 1830. 4 species. Type, *Musca læta* FALLEN (as *pratensis*, new species), the first species, by designation of COQUILLETT, Journ. N. Y. Ent. Soc., vol. 9, 1901, p. 137. Equals **Phaonia** DESVOIDY, 1830.

Euphoria DESVOIDY, Hist. Nat. Dipt., vol. 2, p. 799, 1863. 1 species (as 58). Type, *Musca cornicina* FABRICIUS. Not *Euphoria* BURMEISTER, 1842. Equals **Orthellia** DESVOIDY, 1863.

Euphorocera TOWNSEND, Trans. Amer. Ent. Soc., vol. 19, p. 112, 1892. 1 species. Type, *Euphorocera tachinomoides* TOWNSEND. Equals **Phorocera** DESVOIDY, 1830.

Euphrosyne MEIGEN, Nouv. Class. Mouch., p. 16, 1800.* No species. *Macrocera* MEIGEN, 1803, is a change of name. Type, *Macrocera lutea* MEIGEN. Syn., *Macrocera* MEIGEN, 1803; *Geneja* LIOY, 1864.

Euphyto TOWNSEND, Smiths. Misc. Coll., vol. 51, p. 63, 1908. 1 species. Type, *Leucostoma subopaca* COQUILLETT.

Eurhinomallota BIGOT, Bull. Soc. Ent. France for 1882, p. 67, 1882. 1 species. Type, *Eurhinomallota metallica* BIGOT. Equals **Penthesilia** MEIGEN, 1800.

Euribia MEIGEN, Nouv. Class. Mouch., p. 36, 1800.* No species. *Trypeta* MEIGEN, 1803, is a change of name. Type, *Musca artemisiæ* FABRICIUS. Syn., *Trypeta* MEIGEN, 1803; *Forellia* DESVOIDY, 1830; *Spilographa* LOEW, 1862.

Eurigastrina LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 1343, 1864. 1 species (as 2). Type, *Tachina vulgaris* FALLEN. Equals **Phryxe** DESVOIDY, 1830.

Eurimyia BIGOT, Bull. Soc. Ent. France for 1883, p. 20, 1883. 1 species. Type, *Rhingia lineata* FABRICIUS (as *rhingoides*, new species). Equals **Helophilus** MEIGEN, 1822.

[**Eurina** MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 6, p. 3, 1830. 2 species (as 3). Type, *Eurina lurida* MEIGEN, the second species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 147. Not American.]

Eurimella MEUNIER, Bull. Soc. Ent. France for 1893, p. 193, 1893. 1 species. Type, *Oscinis oscinina* FALLEN. Equals **Madiza** FALLEN, 1810.

Eurosta LOEW, Monogr. Dipt. N. Amer., vol. 3, p. 280, 1873. 3 species. Type, *Acinia solidaginis* FITCH, the first species, by present designation.

Eurycephala RÖDER, Berliner Ent. Zeitschr., vol. 25, p. 211, 1881. 1 species. Type, *Eurycephala myopæformis* RÖDER. Not *Eurycephala* LAPORTE, 1833. Equals **Eurycephalomyia** HENDEL, 1907.

Eurycephalomyia HENDEL, Wien. Ent. Zeit., vol. 26, p. 98, 1907. Change of name for *Eurycephala* RÖDER, 1881, not of LAPORTE, 1833. Type, *Eurycephala myopæformis* RÖDER. Syn., *Eurycephala* RÖDER, 1881, preoccupied.

Eurycerомyia TOWNSEND, Trans. Amer. Ent. Soc., vol. 19, p. 115, 1892. 1 species. Type, *Eurycerомyia robertsonii* TOWNSEND.

Eurycnemus WULP, Tijdschr. Ent., vol. 17, p. 135, 1874. 1 species. Type, *Chironomus crassipes* PANZER.

Euryneura SCHINER, Verh. Zool.-Bot. Ges. Wien, vol. 17, p. 308, 1867. 1 species. Type, *Stratiomys fascipennis* FABRICIUS.

Euryomma STEIN, Ent. Nachr., vol. 25, p. 19, 1899. 1 species. Type, *Anthomyia peregrinum* MEIGEN (as *hispaniense*, new species).

Eurytion JÆNNICKE, Berliner Ent. Zeitschr., vol. 11, p. 99, 1867. 1 species. Type, *Atherix unicolor* CURTIS (as *paradoxus*, new species). Equals **Ptiolina** ZETTERSTEDT, 1842.

Euscopolia TOWNSEND, Trans. Amer. Ent. Soc., vol. 19, p. 123, 1892. 1 species. Type, *Euscopolia dakotensis* TOWNSEND.

Eusiphona COQUILLETT, Rev. Tach., p. 30, 1897. 1 species. Type, *Eusiphona mira* COQUILLETT.

Eusisyropa TOWNSEND, Smiths. Misc. Coll., vol. 51, p. 97, 1908. 1 species. Type, *Exorista blanda* OSTEN SACKEN. Equals **Carcelia** DESVOIDY, 1830.

Eustalomyia KOWARZ, Verh. Zool.-Bot. Ges. Wien, vol. 23, p. 461, 1873. 1 species. Type, *Musca hilaris* FALLEN. Syn., *Dendrophila* LIOY, 1864, preoccupied.

Eutachina BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 56, p. 98, 1889. 1 species. Type, *Musca larvarum* LINNÆUS. Equals **Exorista** MEIGEN, 1803.

Eutanypus COQUILLETT, Fur Seals N. Pacific Ocean, vol. 4, p. 341, 1899. 1 species. Type, *Eutanypus borealis* COQUILLETT.

Eutarsus LOEW, Neue Beitr., vol. 5, p. 45, 1857. 1 species. Type, *Porphyrops aulicus* MEIGEN.

Euthera LOEW, Berliner Ent. Zeitschr., vol. 10, p. 47, 1866. 1 species. Type, *Euthera tentatrix* LOEW.

Euthyneura MACQUART, Ann. Soc. Ent. France for 1836, p. 517, 1836. 1 species. Type, *Euthyneura myrtilli* MACQUART. Syn., *Anthalia* ZETTERSTEDT, 1838.

Euthyprosopa TOWNSEND, Trans. Amer. Ent. Soc., vol. 19, p. 106, 1892. 1 species. Type, *Euthyprosopa petiolata* TOWNSEND.

Eutreta LOEW, Monogr. Dipt. N. Amer., vol. 3, p. 276, 1873. 2 species. Type, *Trypeta sparsa* WIEDEMANN, the first species, by present designation. Syn., *Icaria* SCHINER, 1868, preoccupied.

Eutrichopoda TOWNSEND, Smiths. Misc. Coll., vol. 51, p. 134, 1908. 1 species. Type, *Eutrichopoda nigra* TOWNSEND. Equals **Trichiopoda** LATREILLE, 1829.

Eutrixa COQUILLETT, Rev. Tach., p. 39, 1897. 1 species. Type, *Clytiomya exile* COQUILLETT.

Euxesta LOEW, Berliner Ent. Zeitschr., vol. 11, p. 297, 1868. 14 species. Type, *Ortalis notata* WIEDEMANN, the third species, by present designation.

Evanioptera GUERIN, Voy. Monde, *Coquille*, Zool., vol. 2, pt. 2, p. 287, 1838. Change of name for *Caloptera* GUERIN, 1829, under the false impression that it is preoccupied by *Calopteron* LAPORTE, 1836. Type, *Caloptera fasciata* GUERIN. Equals **Caloptera** GUERIN, 1829.

Evibrissa RONDANI, Dipt. Ital. Prodr., vol. 4, p. 74, 1861. 1 species. Type, *Phania obscuripennis* MEIGEN.

Exaireta SCHINER, Verh. Zool.-Bot. Ges. Wien, vol. 17, p. 309, 1867. 1 species. Type, *Xylophagus spiniger* WIEDEMANN. Syn., *Diphysa* MACQUART, 1838, preoccupied; *Neoexaireta* OSTEN SACKEN, 1878.

Exechia WINNERTZ, Verh. Zool.-Bot. Ges. Wien, vol. 13, p. 879, 1863. 21 species. Type, *Tipula fungorum* DEGEER, the seventh species, by designation of JOHANNSEN, Gen. Ins., Dipt., Mycet., 1909, p. 106.

Exepacmus COQUILLETT, Trans. Amer. Ent. Soc., vol. 21, p. 101, 1894. 1 species. Type, *Exepacmus johnsoni* COQUILLETT.

Exocheila RONDANI, Dipt. Ital. Prodr., vol. 2, p. 170, 1857. 1 species. Type, *Rhingia ferruginea* FALLEN. Equals **Brachyopa** MEIGEN, 1822.

Exocheila RONDANI, Atti Soc. Ital. Sci. Nat., vol. 11, p. 54, 1868. Change of name for *Heterocheila* RONDANI, 1857, under the mistaken impression that it is preoccupied by 3 somewhat similar names. Type, *Heteromyza buccata* FALLEN. Equals **Heteromyza** FALLEN, 1820.

Exoprosopa MACQUART, Dipt. Exot., vol. 2, pt. 1, p. 35, 1840. 41 species. Type, *Bibio capucina* FABRICIUS (as *pandora* FABRICIUS), the ninth species, by designation of RONDANI, Dipt. Ital. Prodr., vol. 1, 1856, p. 162. Equals **Mima** MEIGEN, 1820.

Exoptata COQUILLETT, Can. Ent., vol. 19, p. 13, 1887. 1 species. Type, *Exoptata divisa* COQUILLETT.

Exorista MEIGEN, Illiger's Mag., vol. 2, p. 280, 1803. 1 species. Type, *Musca larvarum* LINNÆUS. Syn., *Guerinia* DESVOIDY, 1830; *Stægeria* DESVOIDY, 1863; *Zelleria* DESVOIDY, 1863; *Walkeria* DESVOIDY, 1863; *Zetterstedtia* DESVOIDY, 1863; *Eribea* DESVOIDY, 1863; *Adenia* DESVOIDY, 1863; *Cleodora* DESVOIDY, 1863; *Bigotia* DESVOIDY, 1863; *Futilia* DESVOIDY, 1863; *Gaubilia* DESVOIDY, 1863; *Esila* DESVOIDY, 1863; *Himera* DESVOIDY, 1863; *Eutachina* BRAUER and BERGENSTAMM, 1889; *Chætotachina* BRAUER and BERGENSTAMM, 1889; *Ptilotachina* BRAUER and BERGENSTAMM, 1891; *Microtachina* MIK, 1892; *Tachinomyia* TOWNSEND, 1892. (*Exorista* of authors equals *Carcelia* DESVOIDY.)

Exoristoides COQUILLETT, Rev. Tach., p. 31, 1897. 2 species. Type, *Exoristoides johnsoni* COQUILLETT, the second species, by original designation.

Fabricia MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 7, p. 250, 1838. 1 species. Type, *Tachina cinerea* FALLEN (as *pacta* MEIGEN). Not *Fabricia* BLAINVILLE, 1828. Equals **Biomya** RONDANI, 1856.

Fairmairia DESVOIDY, Dipt. Env. Paris, Myop., p. 31, 1853.* 1 species. Type, *Myopa morio* MEIGEN. Equals **Stomoxoides** SCHÆFFER, 1766.

Fallenia MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 7, p. 265, 1838. 2 species. Type, *Tachina longicornis* FALLEN, the first species, by present designation. Not *Fallenia* MEIGEN, 1820. Equals **Campylochæta** RONDANI, 1859.

Falosoma LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 1102, 1864. 5 species. Type, *Ephydra aquila* FALLEN, the first species, by present designation. Equals **Napæa** DESVOIDY, 1830.

Fannia DESVOIDY, Essai Myod., p. 567, 1830. 1 species. Type, *Musca scalaris* FABRICIUS (as *saltatrix*, new species). Syn., *Philinta* DESVOIDY, 1830; *Aminta* DESVOIDY, 1830; *Homalomyia* BOUCHÉ, 1834; *Myantha* RONDANI, 1856.

Fannia DESVOIDY, Essai Myod., p. 279, 1830. Change of name for *Tachina* MEIGEN, 1803, under the mistaken impression that it is preoccupied by *Tachinus* GRAVENHORST, 1802. Type, *Musca grossa* LINNÆUS. Equals **Larvævora** MEIGEN, 1800.

Faurella DESVOIDY, Essai Myod., p. 41, 1830. 1 species. Type, *Faurella meridionalis* DESVOIDY. Equals **Peleteria** DESVOIDY, 1830.

Fausta DESVOIDY, Essai Myod., p. 62, 1830. 2 species (as 5). Type, *Tachina nemorum* MEIGEN (the first two and last two supposed species), by designation of DESVOIDY, Hist. Nat. Dipt., vol. 1, 1863, p. 158. Equals **Ernestia** DESVOIDY, 1830.

Fellæa DESVOIDY, Essai Myod., p. 476, 1830. 4 species (as 5). Type, *Fellæa fera* DESVOIDY, the first species, by designation of COQUILLETT, Journ. N. Y. Ent. Soc., vol. 9, 1901, p. 137. Equals **Phaonia** DESVOIDY, 1830.

Feltidia DYAR, Proc. Ent. Soc. Washington, vol 7, p. 45, 1905. 3 species. Type, *Culex jamaicensis* THEOBALD, the first species, by original designation. Equals **Grabhamia** THEOBALD, 1903.

Ferdinandea RONDANI, Nuovi Ann. Sci. Nat. (Bologna) for 1844, p. 196, 1844. 2 species. Type, *Conops cupreus* SCOPOLI, the second species, by designation of RONDANI, Dipt. Ital. Prodr., vol. 1, 1856, p. 51. Syn., *Chrysoclamis* RONDANI, 1851.

Feronia LEACH, On Gen. Species Eproboscideous Ins., p. 4, 1817. 3 species. Type, *Feronia spinifera* LEACH, the first species, by designation of SPEISER, Wien. Ent. Zeit., vol. 18, 1899, p. 202. Not *Feronia* LATREILLE, 1817. Equals **Olfersia** WIEDEMANN, 1830.

Fidena WALKER, Ins. Saund., Dipt., p. 8, 1850. 4 species. Type, *Pangonius leucopogon* WIEDEMANN, the first species, by present designation. Equals **Pangonius** LATREILLE, 1802.

Flabellifera MEIGEN, Nouv. Class. Mouch., p. 13, 1800.* No species. *Ctenophora* MEIGEN, 1803, is a change of name. Type, *Tipula atrata* LINNÆUS. Syn., *Ctenophora* MEIGEN, 1803; *Tanyptera* LATREILLE, 1804; *Xiphura* BRULLÉ, 1832.

Flebotomus RONDANI, Mem. Prima Serv. Dipt. Ital., p. 12, 1840.* 1 species. Type, *Bibio papatasii* SCOPOLI. Syn., *Cyniphes* COSTA, 1843; *Hæmasson* LOEW, 1844.

Forcipomyia MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 1, p. 73, 1818. 2 species. Type, *Ceratopogon ambiguus* MEIGEN, the first species, by present designation. Equals **Culicoides** LATREILLE, 1809.

Forellia DESVOIDY, Essai Myod., p. 760, 1830. 3 species. Type, *Musca artemisiæ* FABRICIUS (as *onopordi*, new species), the first species, by designation of RONDANI, Bull. Soc. Ent. Ital., vol. 2, 1870, p. 7. Equals **Euribia** MEIGEN, 1800.

Frauenfeldia EGGER, Verh. Zool.-Bot. Ges. Wien, vol. 15, p. 297, 1865. 1 species. Type, *Tachina rubricosa* MEIGEN. Equals **Tricogena** RONDANI, 1856.

Freræa DESVOIDY, Essai Myod., p. 285, 1830. 1 species. Type, *Freræa gagatea* DESVOIDY. Syn., *Gymnophania* BRAUER and BERGENSTAMM, 1889.

Frivaldskia SCHINER, Wien. Ent. Monatschr., vol. 5, p. 142, 1861. Change of name for *Fallenia* MEIGEN, 1838, not of MEIGEN, 1820. Type, *Tachina longicornis* FALLEN. Equals **Campylochæta** RONDANI, 1859.

Frontina MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 7, p. 247, 1838. 3 species. Type, *Tachina lata* MEIGEN, the first species, by designation of DESVOIDY, Hist. Nat. Dipt., vol. 1, 1863, p. 580. Syn., *Achætoneura* BRAUER and BERGENSTAMM, 1891; *Parafrontina* BRAUER and BERGENSTAMM, 1893.

Fucellia DESVOIDY, Ann. Soc. Ent. France for 1841, p. 269, 1841. 1 species. Type, *Halithea maritima* HALIDAY (as *arenaria*, new species). Syn., *Halithea* HALIDAY, 1838, preoccupied.

Fucomyia HALIDAY, Ann. Nat. Hist., vol. 2, p. 186, 1838. 3 species. Type, *Calopa eximia* STENHAMMER (as *Musca frigida* FABRICIUS), the first species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 144. Equals **Cœlopa** MEIGEN, 1830.

Fungivora MEIGEN, Nouv. Class. Mouch., p. 16, 1800.* No species. *Mycetophila* MEIGEN, 1803, is a change of name. Type, *Mycetophila agarici* OLIVIER. Syn., *Mycetophila* MEIGEN, 1803; *Mycetina* RONDANI, 1856; *Mycozetæa* RONDANI, 1861.

Fungobia LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 1114, 1864. 1 species. Type, *Borborus nitidus* MEIGEN. Equals **Copromyza** FALLEN, 1810.

Furcinerva RONDANI, Nuovi Ann. Sci. Nat. (Bologna) for 1846, pp. 368, 369, 1846. No species. Founded on the union of four genera: *Zygoneura* MEIGEN, *Lestremia* MACQUART, *Mimosciara* RONDANI, and *Catocha* HALIDAY. The second and third are congeneric, and the present genus may take the type of the third. Type, *Mimosciara molobrina* RONDANI. Equals **Lestremia** MACQUART, 1826.

Furcomyia MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 1, p. 134, 1818. 1 species. Type, *Limonia lutea* MEIGEN. Syn., *Dicranomyia* STEPHENS, 1829; *Glochina* MEIGEN, 1830; *Siagona* MEIGEN, 1830; *Numantia* BIGOT, 1854.

Furina JÆNNICKE, Abh. Sencken. Ges., vol. 6, p. 318, 1867. 1 species. Type, *Limnobia rufithorax* WIEDEMANN. Equals **Gnophomyia** OSTEN SACKEN, 1860.

Futilia DESVOIDY, Hist. Nat. Dipt., vol. 1, p. 1049, 1863. 1 species (as 23). Type, *Tachina simulans* MEIGEN. Equals **Exorista** MEIGEN, 1803.

Gædiophana BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 60, p. 201, 1893. 1 species. Type, *Gædiophana atra* BRAUER and BERGENSTAMM.

Gædiopsis BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 58, p. 336, 1891. 1 species. Type, *Gædiopsis mexicana* BRAUER and BERGENSTAMM. Syn., *Poliophrys* TOWNSEND, 1908.

Galactomyia TOWNSEND, Smiths. Misc. Coll., vol. 51, p. 135, 1908. 1 species (as 3). Type, *Thereva lanipes* FABRICIUS. Equals **Trichiopoda** LATREILLE, 1829.

Gasterophilus LEACH, On Arrang. Oestrideous Ins., p. 2, 1817. 3 species. Type, *Œstrus intestinalis* DE GEER (as *Œstrus equi* CLARK), the first species, by designation of CURTIS, Brit. Ent., 1826, p. 138. Syn., *Gastrus* MEIGEN, 1824; *Enteromyza* RONDANI, 1857.

Gastrichelius RONDANI, Dipt. Ital. Prodr., vol. 1, p. 156, 1856. 1 species. Type, *Triclis olivaceus* LOEW (as *halictivorus*, new species). Equals **Triclis** LOEW, 1851.

Gastrolepta LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 909, 1864. 1 species. Type, *Musca coarctata* FALLEN. Equals **Hylemya** DESVOIDY, 1830.

Gastrops WILLISTON, Kansas Univ. Quart., vol. 6, p. 3, 1897. 1 species. Type, *Gastrops niger* WILLISTON.

Gastrus MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 4, p. 174, 1824. Change of name for *Gasterophilus* LEACH, 1817; reason for the change not mentioned. Type, *Œstrus intestinalis* DE GEER. Equals **Gasterophilus** LEACH, 1817.

Gaubilia DESVOIDY, Hist. Nat. Dipt., vol. 1, p. 1062, 1863. 1 species. Type, *Tachina simulans* MEIGEN (as *dominula*, new species). Equals **Exorista** MEIGEN, 1803.

Gaurax LOEW, Berliner Ent. Zeitschr., vol. 7, p. 35, 1863. 1 species. Type, *Gaurax festivus* LOEW.

Geminaria COQUILLETT, Trans. Amer. Ent. Soc., vol. 21, p. 109, 1894. 2 species. Type, *Lordotus canalis* COQUILLETT, the first species, by original designation.

Geneja LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 229, 1864. 6 species. Type, *Macrocera fasciata* MEIGEN, the third species, by present designation. Equals **Euphrosyne** MEIGEN, 1800.

Geomyza FALLEN, Spec. Ent. Meth. Exh., p. 18, 1810. 1 species. Type, *Musca combinata* LINNÆUS. Syn. *Balioptera* LOEW, 1865.

Geosargus BEZZI, Wien. Ent. Zeit., vol. 26, p. 53, 1907. Change of name for *Sargus* FABRICIUS, 1798, not of Walbridge, 1792. Type, *Musca cuprarius* LINNÆUS. Syn., *Sargus* FABRICIUS, 1798, preoccupied.

Geranomyia HALIDAY, Ent. Mag., vol. 1, p. 154, 1833. 1 species. Type, *Geranomyia unicolor* HALIDAY. Syn., *Limnobiorhynchus* WESTWOOD, 1835; *Aporosa* MACQUART, 1838; *Plettusa* PHILIPPI, 1865.

Geron MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 2, p. 223, 1820. 1 species (as 2). Type, *Bombylius hybridus* MEIGEN.

Gervasia DESVOIDY, Hist. Nat. Dipt., vol. 2, p. 36, 1863. 1 species. Type, *Tachina nigripes* FALLEN (as *piniariæ* HARTIG). Equals **Lydella** DESVOIDY, 1830.

Giardomyia FELT, 23d Rep. State Ent. N. Y., p. 405, 1908. 6 species. Type, *Cecidomyia photophila* FELT, the third species, by original designation.

Ginglymyia TOWNSEND, Trans. Amer. Ent. Soc., vol. 19, p. 118, 1892. 1 species. Type, *Ginglymyia acrirostris* TOWNSEND.

Glabrinus RONDANI, Dipt. Ital. Prodr., vol. 1, p. 132, 1856. 1 species. Type, *Syrphus subsultans* FABRICIUS (as *murorum*, new species). Equals **Mosillus** LATREILLE, 1805.

Glaphyroptera WINNERTZ, Verh. Zool.-Bot. Ges. Wien, vol. 13, p. 781, 1863. 11 species. Type, *Leia fascipennis* MEIGEN, the first species, by present designation. Equals **Leia** MEIGEN, 1818.

Glaucophana BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 58, p. 354, 1891. 1 species. Type, *Glaucophana amasiæ* BRAUER and BERGENSTAMM. Equals **Neæra** DESVOIDY, 1830.

Glaurotricha THOMSON, Kongl. Sven. Freg. *Eugenies* Resa, Dipt., p. 493, 1868. 1 species. Type, *Glaurotricha muscaria* THOMSON. Equals **Phalacromya** RONDANI, 1848.

Glochina MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 6, p. 280, 1830. 1 species. Type, *Glochina sericata* MEIGEN. Equals **Furcomyia** MEIGEN, 1818.

Glutops BURGESS, Proc. Bost. Soc. Nat. Hist., vol. 19, p. 321, 1878. 1 species. Type, *Glutops singularis* BURGESS.

Gnamptopsilopus ALDRICH, Kansas Univ. Quart., vol. 2, p. 48, 1893. 4 species. Type, *Psilopus scintillans* LOEW, the first species, by present designation. Equals **Sciapus** ZELLER, 1842.

Gnophomyia OSTEN SACKEN, Proc. Acad. Nat. Sci. Phila. for 1859, p. 223, 1860. 2 species. Type, *Gnophomyia tristissima* OSTEN SACKEN, the second species, by present designation. Syn. *Furina* JÆNNICKE, 1867.

Gnoriste MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 1, p. 243, 1818. 1 species. Type, *Gnoriste apicalis* MEIGEN.

Gonia MEIGEN, Illiger's Mag., vol. 2, p. 280, 1803. No species. In his Syst. Beschr., vol. 5, 1826, pp. 2 to 7, 13 species. Type, *Musca capitata* DE GEER, the second species, by designation of CURTIS, Brit. Ent., 1835, p. 533. Equals **Salmacia** MEIGEN, 1800.

Goniglossum RONDANI, Dipt. Ital. Prodr., vol. 1, p. 110, 1856. 1 species. Type, *Trypeta wiedemanni* MEIGEN. Equals **Orellia** DESVOIDY, 1830.

Goniochæta TOWNSEND, Trans. Amer. Ent. Soc., vol. 18, p. 351, 1891. 1 species. Type, *Goniochæta plagioides* TOWNSEND.

Goniomima TOWNSEND, Smiths. Misc. Coll., vol. 51, p. 105, 1908. 1 species. Type, *Belvosia luteola* COQUILLETT.

Gonioneura RONDANI, Bull. Soc. Ent. Ital., vol. 12, p. 5, 1880. 1 species. Type, *Gonioneura bisangula* RONDANI. Equals **Leptocera** OLIVIER, 1813.

Goniops ALDRICH, Psyche, vol. 6, p. 236, 1892. 1 species. Type, *Pangonius chrysocoma* OSTEN SACKEN (as *hippoboscoides*, new species).

Gonioscelis SCHINER, Verh. Zool.-Bot. Ges. Wien, vol. 16, p. 670, 1866. 1 species. Type, *Dasypogon hispidus* WIEDEMANN. Equals **Stenopogon** LOEW, 1847.

Gonirhyncus RONDANI, Dipt. Ital. Prodr., vol. 1, p. 58, 1856. 1 species. Type, *Myopa occulta* MEIGEN (as *dispar*, new species). Equals **Stomoxoides** SCHLEFFER, 1766.

Gonomyia MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 1, p. 146, 1818. 1 species. Type, *Limnobia tenella* MEIGEN. Syn., *Taphrosia* RONDANI, 1856.

Gonypes LATREILLE, Hist. Nat. Crust. et Ins., vol. 14, p. 309, 1805. 1 species. Type, *Asilus cylindricus* DE GEER (as *tipuloides* LINNÆUS). Equals **Leptogaster** MEIGEN, 1803.

Grabhamia THEOBALD, Monogr. Culic., vol. 3, p. 243, 1903. 10 species. Type, *Culex jamaicensis* THEOBALD, the third species, by designation of FELT, Bull. 323, N. Y. State Museum, 1904, p. 391b. Syn., *Feltidia* DYAR, 1905; *Ceratocystia* DYAR and KNAB, 1906.

Grallopoda RONDANI, Nuovi Ann. Sci. Nat. (Bologna), ser. 3, vol. 2, p. 180, 1850. 1 species. Type, *Musca lasciva* FABRICIUS (as *Calobata albimana* MACQUART).

Graphomya DESVOIDY, Essai Myod., p. 403, 1830. 3 species (as 5). Type, *Musca maculata* SCOPOLI, the first species, by designation of RONDANI, Dipt. Ital. Prodr., vol. 1, 1856, p. 91. Syn., *Curtonevra* MACQUART, 1834.

Grassia THEOBALD, Journ. Trop. Med., vol. 5, p. 181, June 16, 1902. 1 species. Type, *Anopheles rossii* GILES. Not *Grassia* FISCH, 1885. Equals **Myzomyia** BLANCHARD, July 4, 1902.

Griphoneura SCHINER, Reise *Novara*, Zool., vol. 2, p. 281, 1868. 1 species. Type, *Lauxania imbuta* WIEDEMANN.

Guerinia DESVOIDY, Essai Myod., p. 196, 1830. 1 species (as 6). Type, *Guerinia festiva* DESVOIDY. Equals **Exorista** MEIGEN, 1803.

Gymnocheta DESVOIDY, Essai Myod., p. 371, 1830. 1 species. Type, *Tachina viridis* FALLEN.

Gymnoclytia BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 60, p. 157, 1893. 1 species. Type, *Cistogaster immaculata* MACQUART (as *divisa* LOEW). Equals **Cistogaster** LATREILLE, 1829.

Gymnodia DESVOIDY, Hist. Nat. Dipt., vol. 2, p. 635, 1863. 1 species. Type, *Anthomyia polystigma* MEIGEN (as *pratensis*, new species). Equals **Limnophora** DESVOIDY, 1830.

Gymnogaster LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 989, 1864. 1 species. Type, *Anthomyia dissecta* MEIGEN. Equals **Pegomya** DESVOIDY, 1830.

Gymnometopa COQUILLETT, Proc. Ent. Soc. Washington, vol. 7, p. 183, 1906. 4 species. Type, *Stegomyia mediorittata* COQUILLETT, the first species, by original designation.

Gymnomma WULP, Biol. Centr.-Amer., Dipt., vol. 2, p. 38, 1888. 1 species. Type, *Gymnomma nitidiventris* WULP.

Gymnopa FALLEN, Oscinides Sveciæ, p. 10, 1820. 1 species. Type, *Syrphus subsultans* FABRICIUS. Equals **Mosillus** LATREILLE, 1805.

Gymnopareia BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 56, p. 103, 1889. 1 species. Type, *Tachina crassicornis* MEIGEN. Equals **Actia** DESVOIDY, 1830.

Gymnophania BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 56, p. 143, 1889. 1 species. Type, *Gymnophania nigripennis* BRAUER and BERGENSTAMM. Equals **Freræa** DESVOIDY, 1830.

Gymnophora MACQUART, Hist. Nat., Dipt., vol. 2, p. 631, 1835. 1 species. Type, *Phora arcuata* MEIGEN.

Gymnophtalma LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 1341, 1864. 1 species. Type, *Tachina crassicornis* MEIGEN. Equals **Actia** DESVOIDY, 1830.

Gymnoprosopa TOWNSEND, Trans. Amer. Ent. Soc., vol. 19, p. 108, 1892. 1 species (as 3). Type, *Gymnoprosopa polita* TOWNSEND. Equals **Hilarella** RONDANI, 1856.

Gymnopsis RONDANI, Dipt. Ital. Prodr., vol. 3, p. 90, 1859. 1 species. Type, *Tachina chalconota* MEIGEN. Equals **Macquartia** DESVOIDY, 1830.

Gymnoptera LIOY, Atti Inst. Veneto, ser. 3, vol. 10, p. 79, 1864. 1 species. Type, *Phora vitripennis* MEIGEN. Equals **Hypocera** LIOY, 1864.

Gymnopternus LOEW, Neue Beitr., vol. 5, p. 10, 1857. 28 species. Type, *Dolichopus cupreus* FALLEN, the twenty-first species, by present designation.

Gymnosoma MEIGEN, Illiger's Mag., vol. 2, p. 278, 1803. 1 species. Type, *Musca rotundata* LINNÆUS. Equals **Rhodogyne** MEIGEN, 1800.

Gymnostyla LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 1000, 1864. 1 species. Type, *Musca cucularia* LINNÆUS. Equals **Elgiva** MEIGEN, 1838.

Habropogon LOEW, Linn. Ent., vol. 2, p. 463, 1847. 2 species. Type, *Dasypogon exquisitus* MEIGEN, the first species, by present designation. Syn., *Dactiliscus* RONDANI, 1856.

Hadromyia WILLISTON, Can. Ent., vol. 14, p. 78, 1882. 1 species. Type, *Hadromyia grandis* WILLISTON. Equals **Pocota** ST. FARGEAU and SERVILLE, 1828.

Hadrus PERTY, Delect. Anim., p. 182, 1834. 5 species. Type, *Hæmatopota crassipes* FABRICIUS, the first species (as *Tabanus lepidotus* WIEDEMANN), by present designation. Syn., *Lepiselaga* MACQUART, 1838.

Hæmagogus WILLISTON, Trans. Ent. Soc. Lond. for 1896, p. 271, 1896. 1 species. Type, *Hæmagogus splendens* WILLISTON.

Hæmasson LOEW, Ent. Zeit. Stettin, vol. 5, p. 115, 1844. 1 species. Type, *Bibio papatasii* SCOPOLI (as *minutus*, new species). Equals **Phlebotomus** RONDANI, 1840.

Hæmatobia ST. FARGEAU and SERVILLE, Encycl. Meth., vol. 10, pt. 2, p. 499, 1828. 2 species. Type, *Conops irritans* LINNÆUS, the second species, by designation of WESTWOOD, Intr., vol. 2. Synops., 1840, p. 140. Syn., *Lyperosia* RONDANI, 1856; *Priophora* DESVOIDY, 1863.

Hæmatopota MEIGEN, Illiger's Mag., vol. 2, p. 267, 1803. 1 species. Type, *Tabanus pluvialis* LINNÆUS. Equals **Chrysozona** MEIGEN, 1800.

Hæmobora CURTIS, Brit. Ent., p. 14, 1824. 1 species. Type, *Pediculis cervi* LINNÆUS. Equals **Lipoptena** NITZSCH, 1818.

Halidaya RONDANI, Dipt. Ital. Prodr., vol. 1, p. 117, 1856. 1 species. Type, *Themira pilosa* DESVOIDY (as *setosa* DESVOIDY). Equals **Themira** DESVOIDY, 1830.

Halithea HALIDAY, Ann. Nat. Hist., ser. 1, vol. 2, p. 185, 1838. 2 species. Type, *Scatomyza fucorum* FALLEN, the first species, by designation of COQUILLETT, Journ. N. Y. Ent. Soc., vol. 9, 1901, p. 137. Not *Halithea* SAVIGNY, 1817. Equals **Fucellia** DESVOIDY, 1841.

Halterophora RONDANI, Dipt. Ital. Prodr., vol. 4, p. 10, 1861. Change of name for *Ceratitis* MACLEAY, 1829, under the mistaken impression that it is preoccupied by *Ceratites* HAAN, 1825. Type, *Trypeta capitata* WIEDEMANN. Equals **Ceratitis** MACLEAY, 1829.

Hammerschmidtia SCHUMMEL, Isis von Oken for 1834, p. 740, 1834. 1 species. Type, *Rhingia ferruginea* FALLEN (as *vittata*, new species). Equals **Brachyopa** MEIGEN, 1822.

Hammomyia RONDANI, Dipt. Ital. Prodr., vol. 6, p. 13, 1877. 1 species. Type, *Leucophora cinerea* DESVOIDY (as *Tricia albescens* ZETTERSTEDT). Equals **Leucophora** DESVOIDY, 1830.

Haplegis LOEW, Zeitschr. Ent. Breslau, vol. 15, p. 22, 1866.* 3 species. Type, *Chlorops diadema* MEIGEN, the first species, by present designation. Equals **Cryptonevra** LIOY, 1864.

Harrisia MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 7, p. 260, 1838. 3 species. Type, *Tachina ænea* MEIGEN, the third species (as *Tachina simplicitarsis* ZETTERSTEDT), by designation of RONDANI, Dipt. Ital. Prodr., vol. 1, 1856, p. 65. Equals **Lydina** DESVOIDY, 1830.

Hartigia DESVOIDY, Hist. Nat. Dipt., vol. 2, p. 521, 1863. 1 species (as 17). Type, *Sarcophaga dissimilis* MEIGEN. Syn., *Erichsonia* DESVOIDY, 1863; *Mulsantia* DESVOIDY, 1863; *Helicobia* COQUILLETT, 1895.

Hebecnema SCHNABL, Hor. Soc. Ent. Ross., vol. 23, p. 331, 1889. 5 species. Type, *Anthomyia umbratica* MEIGEN, the first species, by designation of COQUILLETT, Journ. N. Y. Ent. Soc., vol. 9, 1901, p. 137. Equals **Hydrophoria** DESVOIDY, 1830.

Hebia DESVOIDY, Essai Myod., p. 98, 1830. 1 species. Type, *Hebia flavipes* DESVOIDY. Equals **Leskia** DESVOIDY, 1830.

Helcomyza CURTIS, Brit. Ent., p. 66, 1825. 1 species. Type, *Helcomyza ustulata* CURTIS. Syn., *Actora* MEIGEN, 1826.

Helea MEIGEN, Nouv. Class. Mouch., p. 18, 1800.* No species. *Ceratopogon* MEIGEN, 1803, is a change of name. Type, *Ceratopogon communis* MEIGEN. Syn., *Ceratopogon* MEIGEN, 1803; *Palpomyia* MEIGEN, 1818; *Apogon* RONDANI, 1856; *Alasion* RONDANI, 1857; *Atrichopogon* KIEFFER, 1906.

Heleodromia HALIDAY, Ent. Mag., vol. 1, p. 159, 1833. 4 species. Type, *Heleodromia immaculata* HALIDAY, the first species, by designation of CURTIS, Brit. Ent., 1834, p. 519. Syn., *Sciodromia* HALIDAY, 1840; *Microcera* ZETTERSTEDT, 1838.

Heleomyza FALLEN, Spec. Ent. Meth. Exh., p. 19, 1810. 1 species. Type, *Musca serrata* LINNÆUS. Syn., *Leria* DESVOIDY, 1830; *Orbellia* DESVOIDY, 1830; *Blephariptera* MACQUART, 1835. (*Heleomyza* of authors equals *Suillia* DESVOIDY.)

Helicobia COQUILLETT, Proc. Acad. Nat. Sci. Phila. for 1895, p. 317, 1895. 1 species. Type, *Sarcophaga helicis* TOWNSEND. Equals **Hartigia** DESVOIDY, 1863.

Heligmonevra BIGOT, Thompson's Arch. Ent., vol. 2, p. 356, 1858. 1 species. Type, *Heligmonevra modesta* BIGOT. Syn., *Mochtherus* LOEW, 1849, preoccupied; *Neomochtherus* OSTEN SACKEN, 1878.

Helina DESVOIDY, Essai Myod., p. 493, 1830. 6 species (as 7). Type, *Anthomyia pertusa* MEIGEN (as *cuphemioidea*, new species), the first species, by designation of COQUILLETT, Journ. N. Y. Ent. Soc., vol. 9, 1901, p. 137. Equals **Mydæa** DESVOIDY, 1830.

Heliophilus MEIGEN, Illiger's Mag., vol. 2, p. 273, 1803. 1 species. Type, *Musca sylvarum* LINNÆUS. Equals **Zelima** MEIGEN, 1800.

Helius ST. FARGEAU and SERVILLE, Encycl. Meth., vol. 10, pt. 2, p. 832, 1828. Change of name of *Megarhina* ST. FARGEAU and SERVILLE, 1828, on account of *Magarhinus* DESVOIDY, 1827. Type, *Limnobia longirostris* MEIGEN. Equals **Megarhina** ST. FARGEAU and SERVILLE, 1828.

Helobia ST. FARGEAU and SERVILLE, Encycl. Meth., vol. 10, pt. 2, p. 585, 1828. 1 species. Type, *Limonia hybrida* MEIGEN (as *Limnobia punctipennis* MEIGEN). Not *Helobia* STEPHENS, 1827. Equals **Symplecta** MEIGEN, 1830.

Helophilus MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 3, p. 368, 1822. 7 species. Type, *Musca pendula* LINNÆUS, the sixth species, by designation of CURTIS, Brit. Ent., 1832, p. 429. Syn., *Lejops* RONDANI, 1857; *Mesembrius* RONDANI, 1857; *Anasimyia* SCHINER, 1864; *Eurimyia* BIGOT, 1883.

[**Hemerodromia** MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 3, p. 61, 1822. 9 species. Type, *Empis melanocephala* FABRICIUS (as *Tachydromia mantispa* PANZER), the fifth species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 132. Syn., *Chelipoda* MACQUART, 1823; *Phyllodromia* ZETTERSTEDT, 1837; *Lepidomya* BIGOT, 1857; *Thamnodromia* MIK, 1886. Not American.] (*Hemerodromia* of authors equals *Chelifera* MACQUART.)

Hemeromyia COQUILLETT, Journ. N. Y. Ent. Soc., vol. 10, p. 190, 1902. 1 species. Type, *Hemeromyia obscura* COQUILLETT.

Hemiargyra TOWNSEND, Smiths. Misc. Coll., vol. 51, p. 88, 1908. 1 species. Type, *Hemiargyra nigra* TOWNSEND. Equals **Metadoria** BRAUER and BERGENSTAMM, 1893.

Hemichlora WULP, Biol. Centr.-Amer., Dipt., vol. 2, p. 303, 1896. 1 species. Type, *Cyrtonevra vittigera* BIGOT.

Hemipenthes LOEW, Berliner Ent. Zeitschr., vol. 13, p. 28, 1869. 1 species (as 2). Type, *Musca morio* LINNÆUS. Equals **Villa** LIOY, 1864.

Hemithæa DESVOIDY, Hist. Nat. Dipt., vol. 1, p. 318, 1863. 1 species. Type, *Tachina erythrostoma* HARTIG. Equals **Phryxe** DESVOIDY, 1830.

Hemithrixion BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 58, p. 357, 1891. 1 species. Type, *Hemithrixion astriforme* BRAUER and BERGENSTAMM.

Hemyda DESVOIDY, Essai Myod., p. 226, 1830. 1 species. Type, *Hemyda aurata* DESVOIDY. Syn., *Ancylogaster* BIGOT, 1884.

Henicomyia COQUILLETT, Journ. N. Y. Ent. Soc., vol. 6, p. 187, 1898. 1 species. Type, *Henicomyia hubbardii* COQUILLETT.

Henops MEIGEN, Klass. Beschr. Zweifl. Ins., p. 150, 1804. 1 species (as 2). Type, *Musca gibbosa* LINNÆUS. Equals **Ogcodes** LATREILLE, 1796.

Herbina DESVOIDY, Essai Myod., p. 698, 1830. 2 species. Type, *Herbina suillioidea* DESVOIDY. Equals **Suillia** DESVOIDY, 1830.

Herbstia DESVOIDY, Ann. Soc. Ent. France for 1851, p. 184, 1851. 1 species. Type, *Herbstia tibialis* DESVOIDY. Equals **Actia** DESVOIDY, 1830.

Hercostomus LOEW, Neue Beitr., vol. 5, p. 9, 1857. 3 species. Type, *Sybistroma longiventris* LOEW, the first species, by original designation.

Heringia RONDANI, Dipt. Ital. Prodr., vol. 1, p. 53, 1856. 1 species. Type, *Pipiza heringi* ZETTERSTEDT. Equals **Pipiza** FALLEN, 1810.

Hermetia LATREILLE, Hist. Nat. Crust. et Ins., vol. 14, p. 338, 1805. 1 species. Type, *Musca illucens* LINNÆUS.

Hermione MEIGEN, Nouv. Class. Mouch., p. 22, 1800.* No species. *Oxycera* MEIGEN, 1803, is a change of name. Type, *Musca hypoleon* LINNÆUS. Syn., *Oxycera* MEIGEN, 1803.

Hesperempis MELANDER, Ent. News, vol. 17, p. 377, 1906. 1 species. Type, *Ragas mabelæ* MELANDER.

Hesperinus WALKER, List Dipt. Brit. Mus., vol. 1, p. 81, 1848. 1 species. Type, *Hesperinus brevifrons* WALKER. Syn., *Spodius* LOEW, 1858.

Hesperodes COQUILLETT, Ent. News, vol. 11, p. 429, 1900. 1 species. Type, *Hesperodes johnsoni* COQUILLETT.

Hesperomyia BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 56, p. 114, 1889. 1 species. Type, *Hesperomyia erythrocera* BRAUER and BERGENSTAMM.

Hesyquillia DESVOIDY, Essai Myod., p. 708, 1830. 2 species. Type, *Musca umbrarum* FABRICIUS (as *lugubris*, new species), the first species, by present designation. Equals **Platystoma** MEIGEN, 1803.

Heteracanthia MACQUART, Dipt. Exot., Suppl. 4, p. 43, 1850. 1 species. Type, *Heteracanthia ruficornis* MACQUART.

Heteralonia RONDANI, Arch. Zool., vol. 3, p. 57, 1864. 1 species. Type, *Exoprosopa occulta* MACQUART. Equals **Mima** MEIGEN, 1820.

Heterocheila RONDANI, Dipt. Ital. Prodr., vol. 2, p. 13, 1857. Change of name for *Heterostoma* RONDANI, 1856, preoccupied. Type, *Heteromyza buccata* FALLEN. Equals **Heteromyza** FALLEN, 1820.

Heteromyia SAY, Amer. Ent., vol. 2, p. 79, 1825, 1 species. Type, *Heteromyia fasciata* SAY.

Heteromyza FALLEN, Heter. Sveciæ, p. 1, 1820. 2 species. Type, *Heteromyza buccata* FALLEN, the second species, by DESVOIDY, Essai Myod., 1830, p. 655, who took the first species as type of a new genus, *Thelida*. Syn., *Heterostoma* RONDANI, 1856; *Heterocheila* RONDANI, 1857; *Œdoparea* LOEW, 1862; *Exocheila* RONDANI, 1868.

Heteroneura FALLEN, Spec. Ent. Meth. Exh., p. 7, 1810. 1 species. Type, *Heteroneura leptiformis* FALLEN. Equals **Callomyia** MEIGEN, 1804.

Heteroneura FALLEN, Agromyzides Sveciæ, p. 2, 1823. 4 species (as 3 and 1 variety). Type, *Heteroneura albimana* MEIGEN (the variety *b*, of the second species), by designation of CURTIS, Brit. Ent., 1838, p. 721. Not *Heteroneura* FALLEN, 1810. Equals **Clusiodes** COQUILLETT, 1904.

Heteronycha ARRIBALZAGA, Rev. Mus. La Plata, vol. 1, p. 397, 1891. 1 species. Type, *Culex æstuans* WIEDEMANN (as *dolosa*, new species). Equals **Culex** LINNÆUS, 1758.

Heteropogon LOEW, Linn. Ent., vol. 2, p. 488, 1847. 3 species. Type, *Dasypogon manicatus* MEIGEN, the first species, by designation of BACK, Trans. Amer. Ent. Soc., vol. 35, p. 318, 1909. Syn., *Anisopogon* LOEW, 1874.

Heteroptera MACQUART, Hist. Nat., Dipt., vol. 2, p. 570, 1835. 1 species. Type, *Copromyza pusilla* FALLEN. Equals **Cypsela** MEIGEN, 1800.

Heteropterina MACQUART, Ann. Soc. Ent. France for 1854, p. 426; 1854. 1 species. Type, *Miltogramma heteroneura* MEIGEN. Equals **Taxigramma** PERRIS, 1852.

Heterostoma RONDANI, Dipt. Ital. Prodr., vol. 1, p. 104, 1856. 1 species. Type, *Heteromyza buccata* FALLEN. Not *Heterostoma* HARTMAN, 1843. Equals **Heteromyza** FALLEN, 1820.

Heterostylum MACQUART, Dipt. Exot., Suppl. 3, p. 35, 1848. 1 species. Type, *Heterostylum flavum* MACQUART. Syn., *Comastes* OSTEN SACKEN, 1877.

Hexacantha MEIGEN, Illiger's Mag., vol. 2, p. 264, 1803. 2 species. Type, *Musca chalybeata* FORSTER (as *Stratiomys sexdentata* FABRICIUS), the second species, by tautonomy. Equals **Beris** LATREILLE, 1802.

Hexachæta LOEW, Monogr. Dipt. N. Amer., vol. 3, p. 219, 1873. 3 species. Type, *Trypeta eximia* WIEDEMANN, the first species, by present designation.

Hexamitocera BECKER, Berliner Ent. Zeitschr., vol. 39, p. 107, 1894. 1 species. Type, *Cordilura loxocerata* FALLEN.

Hexatoma LATREILLE, Gen. Crust. et Ins., vol. 4, p. 260, 1809. 1 species. Type, *Hexatoma nigra* LATREILLE. Syn., *Nematocera* MEIGEN, 1818; *Anisomera* WIEDEMANN, 1818.

Hiatus CRESSON, Trans. Amer. Ent. Soc., vol. 32, p. 280, 1906. 1 species. Type, *Hiatus fulvipes* CRESSON.

Hilara MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 3, p. 1, 1822. 21 species. Type, *Empis maura* FABRICIUS, the second species, by designation of CURTIS, Brit. Ent., 1826, p. 130.

Hilarella RONDANI, Dipt. Ital. Prodr., vol. 1, p. 70, 1856. 1 species. Type, *Miltogramma hilarella* ZETTERSTEDT. Syn., *Eumacronycha* TOWNSEND, 1892; *Gymnoprosopa* TOWNSEND, 1892.

Hilarimorpha SCHINER, Wien. Ent. Monatschr., vol. 4, p. 54, 1860. 1 species. Type, *Hilarimorpha singularis* SCHINER.

Himantostoma LOEW, Berliner Ent. Zeitschr., vol. 7, p. 321, 1863. 1 species. Type, *Himantostoma sugens* LOEW. Not *Himantostoma* AGASSIZ, 1862.

Himera DESVOIDY, Hist. Nat. Dipt., vol. 1, p. 1124, 1863. 1 species (as 4). Type, *Guerinia festiva* DESVOIDY. Equals **Exorista** MEIGEN, 1803.

Himerœssa LOEW, Monogr. Dipt. N. Amer., vol. 3, p. 85, 1873. 1 species. Type, *Himerœssa pretiosa* LOEW.

Hippelates LOEW, Berliner Ent. Zeitschr., vol. 7, p. 36, 1863. 2 species. Type, *Hippelates plebejus* LOEW, the second species, by present designation. Syn., *Siphomyia* WILLISTON, 1896.

Hippobosca LINNÆUS, Syst. Nat., 10th ed., p. 607, 1758. 4 species. Type, *Hippobosca equina* LINNÆUS, the first species, by designation of LATREILLE, Consider. Général., 1810, p. 444. Syn., *Nirmomyia* NITZSCH, 1818.

Hirmoneura MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 2, p. 132, 1820. 1 species. Type, *Hirmoneura obscura* WIEDEMANN. Syn., *Parasymmictus* BIGOT, 1879.

Histiodroma SCHINER, Verh. Zool.-Bot. Ges. Wien, vol. 17, p. 308, 1867. 1 species. Type, *Sargus inermis* WIEDEMANN.

Holcocephala JENNICKE, Neue Exot. Dipt., p. 51, 1867. Change of name for *Discocephala* MACQUART, 1838, not of LAPORTE, 1832. Type, *Dasypogon abdominalis* SAY. Syn., *Discocephala* MACQUART, 1838, preoccupied.

Holmbergia ARRIBALZAGA, An. Soc. Cient. Argentina, vol. 32, p. 196, Oct., 1891. 1 species. Type, *Holmbergia guntherii* ARRIBALZAGA. Equals **Rhopalosyrphus** GIGLIO-TOS, Sept. 20, 1891.

Holoclera SCHINER, Wien. Ent. Monatschr, vol. 4, p. 53, 1860. 1 species. Type, *Rhamphomyia umbripennis* MEIGEN (as *pulchra*, new species). Equals **Dionnæa** MEIGEN, 1800.

Holoneura KIEFFER, Ann. Soc. Ent. France for 1894, p. 312, 1894. 1 species. Type, *Holoneura cincta* KIEFFER.

Holopogon LOEW, Linn. Ent., vol. 2, p. 473, 1847. 7 species. Type, *Dasypogon nigripennis* MEIGEN, the third species, by present designation.

Holorusia LOEW, Berliner Ent. Zeitschr., vol. 7, p. 277, 1863. 1 species. Type, *Holorusia grandis* BERGROTH (as *rubiginosa*, new species, preoccupied).

Homalocephala ZETTERSTEDT, Ins. Lapp., p. 749, 1838. 1 species. Type, *Homalocephala albitarsis* ZETTERSTEDT. Syn., *Psairoptera* WAHLBERG, 1839.

Homalomyia BOUCHÉ, Nat. Ins., p. 89, 1834. 3 species. Type, *Musca canicularis* LINNÆUS, the first species, by designation of Westwood, Intr., vol. 2, Synops. 1840, p. 143. Equals **Fannia** DESVOIDY, 1830.

Homogenia WULP, Tijdschr. Ent., vol. 35, p. 184, 1892. 3 species. Type, *Homogenia rufipes* WULP, the first species by designation of BRAUER and BERGENSTAMM, Denkschr. Kais. Acad. Wiss. Wien, vol. 61, 1894, p. 623. Equals **Trichiopoda** LATREILLE, 1829.

Hoplomyia ZELLER, Isis von Oken for 1842, p. 882, 1842. Change of name for *Stratiomys* GEOFFROY, 1762, because the latter name was incorrectly formed. Type, *Musca chamæleon* LINNÆUS. Equals **Stratiomys** GEOFFROY, 1762.

Hormomyia LOEW, Dipt. Beitr., vol. 4, p. 20, 1850. 6 species. Type, *Hormomyia crassipes* LOEW, the second species, by present designation.

Hormopeza ZETTERSTEDT, Ins. Lapp., p. 540, 1838. 1 species. Type, *Hormopeza obliterata* ZETTERSTEDT.

Houghia COQUILLETT, Rev. Tach., p. 118, 1897. 1 species. Type, *Houghia setipennis* COQUILLETT.

Howardina THEOBALD, Monogr. Culic., vol. 3, p. 287, 1903. 2 species. Type, *Culex walkeri* THEOBALD, the first species, by designation of DYAR, Proc. Ent. Soc. Washington, vol. 7, 1905, p. 49.

Hubneria DESVOIDY, Ann. Soc. Ent. France for 1847, p. 601, 1847. 22 species. Type, *Tachina affinis* FALLEN (as *Carcelia nigripes* DESVOIDY), the fifth species, by designation of DESVOIDY, Hist. Nat. Dipt., vol. 1, 1863, p. 279. Equals **Aplomya** DESVOIDY, 1830.

Hyadesimyia BIGOT, Miss. Cape Horn, vol. 6, Zool., Dipt., p. 26, 1888. 2 species. Type, *Hyadesimyia clausa* BIGOT, the first species, by present designation.

Hyadina HALIDAY, Ann. Nat. Hist., vol. 3, p. 406, 1839. 2 species. Type, *Notiphila guttata* FALLEN, the first species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 153. Equals **Hydrina** DESVOIDY, 1830.

Hyalanthrax OSTEN SACKEN, Biol. Centr.-Amer., Dipt., vol. 1, p. 134, 1887. 5 species. Type, *Anthrax faustina* OSTEN SACKEN, the first species, by present designation. Equals **Villa** LIOY, 1864.

Hyalomya DESVOIDY, Essai Myod., p. 298, 1830. 2 species (as 11). Type, *Phasia pusilla* MEIGEN, the last species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 140. Equals **Phasia** LATREILLE, 1805.

Hyalomyodes TOWNSEND, Psyche, vol. 6, p. 429, 1893. 1 species. Type, *Hyalomya triangulifera* LOEW (as *weedii*, new species).

Hyalurgus BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 60, p. 136, 1893. 1 species. Type, *Tachina lucida* MEIGEN.

Hybos MEIGEN, Illiger's Mag., vol. 2, p. 269, 1803. No species. In his Klass. Beschr. Zweifl. Ins., 1804, pp. 240, 241, 2 species. Type, *Musca grossipes* LINNÆUS (as *funebris*, new species), the first species, by designation of CURTIS, Brit. Ent., 1837, p. 661. Equals **Nœza** MEIGEN, 1800.

Hydrellia DESVOIDY, Essai Myod., p. 790, 1830. 11 species. Type, *Notiphila flaviceps* MEIGEN (as *aurifacies*, new species), the second species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 153. Syn., *Hydropota* RONDANI, 1861.

Hydrina DESVOIDY, Essai Myod., p. 794, 1830. 7 species. Type, *Notiphila guttata* FALLEN (as *vernalis*, new species), the third species, by present designation. Syn., *Hyadina* HALIDAY, 1839.

Hydrochus FALLEN, Monogr. Dolich. Sveciæ, p. 5, 1823. 4 species. Type, *Hydrochus longicornis* FALLEN, the first species, by present designation. Not *Hydrochus* GERMAR, 1817. Equals **Perithinus** HALIDAY, 1831.

Hydrodromia MACQUART, Hist. Nat., Dipt., vol. 2, p. 658, 1835. 2 species. Type, *Heleodromia stagnalis* HALIDAY, the second species, by designation of COQUILLETT, Proc. Ent. Soc. Washington, vol. 5, 1903, p. 251.

Hydromyza FALLEN, Kongl. Vet. Acad. Handl. for 1813, p. 243, 1813. 1 species. Type, *Musca livens* FABRICIUS. Syn., *Nupharia* DESVOIDY, 1830.

Hydrophoria DESVOIDY, Essai Myod., p. 503, 1830. 6 species (as 9). Type, *Musca vespertina* FALLEN (as *littoralis*, new species), the last species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 142 (as *nigrita* FALLEN). Syn., *Hebecnema* SCHNABL, 1889. (*Hydrophoria* of authors equals *Zaphne* DESVOIDY.)

Hydrophorus FALLEN, Monogr. Dolich. Sveciæ, p. 2, 1823. 7 species. Type, *Hydrophorus jaculus* FALLEN, the last species, by designation of MACQUART, Recueil Soc. Sci. Arts Lille for 1827, p. 249. Equals **Medetera** FISCHER, 1819. (*Hydrophorus* of authors equals *Aphrozeta* PERRIS.)

Hydropota RONDANI, Dipt. Ital. Prodr., vol. 4, p. 10, 1861. Change of name for *Hydrellia* DESVOIDY under the mistaken impression that it is interfered with by *Hydrelia* HÜBNER. Type, *Notiphila flaviceps* MEIGEN. Equals **Hydrellia** DESVOIDY, 1830.

Hydrotæa DESVOIDY, Essai Myod., p. 509, 1830. 12 species (as 17). Type, *Musca meteorica* LINNÆUS, the eleventh species, by designation of CURTIS, Brit. Ent., 1839, p. 768. Syn., *Lasiops* MEIGEN, 1838; *Onodontha* RONDANI, 1856; *Psiloptera* LIOY, 1864; *Microcera* LIOY, 1864.

Hygrella HALIDAY, Ann. Nat. Hist., vol. 3, p. 223, 1839. 2 species. Type, *Notiphila nitidula* FALLEN, the first species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 153. Equals **Psilopa** FALLEN, 1823.

Hygroceleuthus LOEW, Neue Beitr., vol. 5, p. 10, 1857. 3 species. Type, *Dolichopus latipennis* FALLEN, the first species, by present designation. Equals **Dolichopus** LATREILLE, 1796.

Hygrophila LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 1102, 1864. 1 species. Type, *Ephydra coarctata* FALLEN? (as *fascipennis* MACQUART?, an error for *fuscipennis*). Equals **Napæa** DESVOIDY, 1830.

Hylemya DESVOIDY, Essai Myod., p. 550, 1830. 11 species (as 16). Type, *Musca strigosa* FABRICIUS (as *strenua* and *plebeia*, new species), the first species, by designation of RONDANI, Dipt. Ital. Prodr., vol. 1, 1856, p. 96. Syn., *Delia* DESVOIDY, 1830; *Egeria* DESVOIDY, 1830; *Musciosoma* LIOY, 1864; *Gastrolepta* LIOY, 1864; *Nevrota* LIOY, 1864; *Pachystoma* LIOY, 1864.

Hylephila RONDANI, Dipt. Ital. Prodr., vol. 6, p. 13, 1877. 1 species. Type, *Musca buccata* FALLEN. Equals **Leucophora** DESVOIDY, 1830.

Hyperæa DESVOIDY, Hist. Nat. Dipt., vol. 2, p. 379, 1863. 1 species. Type, *Hyperæa abdominalis* DESVOIDY. Equals **Stevenia** DESVOIDY, 1830.

Hyperalonia RONDANI, Arch. Zool., vol. 3, p. 57, 1864. 13 species. Type, *Stomoxys morio* FABRICIUS (as *Anthrax erythrocephala* FABRICIUS), the fifth species, by present designation. Syn., *Velocia* COQUILLETT, 1886.

Hyperdiplosis FELT, 23d Rep. State Ent. N. Y., p. 405, 1908. 1 species. Type, *Cecidomyia lobata* FELT.

Hyperecteina SCHINER, Wien. Ent. Monatschr., vol. 5, p. 143, 1861. 1 species. Type, *Hyperecteina metopina* SCHINER. Syn., *Admontia* BRAUER and BERGENSTAMM, 1889.

Hypertrophocera TOWNSEND, Trans. Amer. Ent. Soc., vol. 18, p. 360, 1891. 1 species. Type, *Hypertrophocera parvipes* TOWNSEND. Syn., *Neotractocera* TOWNSEND, 1892.

Hyphantrophaga TOWNSEND, Psyche, vol. 6, p. 247, 1892. 1 species. Type, *Meigenia hyphantriæ* TOWNSEND.

Hypocera LIOY, Atti Inst. Veneto, ser. 3, vol. 10, p. 78, 1864. 3 species. Type, *Trineura mordellaria* FALLEN, the first species, by designation of BRUES, Gen. Ins., Dipt., Phoridæ, 1906, p. 6. Syn., *Nemosia* LIOY, 1864; *Gymnoptera* LIOY, 1864.

Hypochata BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 56, p. 93, 1889. 1 species. Type, *Tachina distincta* MEIGEN (as *longicornis* SCHINER). Equals **Campylochæta** RONDANI, 1859.

Hypocharassus MIK, Verh. Zool.-Bot. Ges. Wien, vol. 28, p. 627, 1879. 1 species. Type, *Hypocharassus gladiator* MIK. Syn., *Drepanomyia* WHEELER, 1898.

Hypoderma LATREILLE, Nouv. Dict. Hist. Nat., vol. 23, p. 272, 1818. 1 species. Type, *Œstrus bovis* LINNÆUS.

[*Hypostena* MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 7, p. 239, 1838. 1 species. Type, *Musca volvulus* FABRICIUS (as *procera*, new species). Equals **Phyllomya** DESVOIDY, 1830. Not American.] (*Hypostena* of authors equals *Tachinophyto* TOWNSEND.)

Hypselura MEIGEN, Illiger's Mag., vol. 2, p. 273, 1803. 1 species. Type, *Musca fenestralis* LINNÆUS (as *senilis* FABRICIUS). Equals **Omphrale** MEIGEN, 1800.

Hyria DESVOIDY, Hist. Nat. Dipt., vol. 1, p. 1100, 1863. 1 species. Type, *Tachina tibialis* FALLEN. Not *Hyria* LAMARCK, 1819. Equals **Pelatachina** MEADE, 1894.

Hystrichodexia RÖDER, Ent. Zeit. Stettin, vol. 47, p. 266, 1886. 1 species. Type, *Hystrichodexia armata* RÖDER.

Hystricia MACQUART, Dipt. Exot., vol. 2, pt. 3, p. 43, 1843. 4 species. Type, *Hystricia amana* MACQUART, the third species, by present designation.

Hystrisyphona BIGOT, Rev. Mag. Zool. for 1859, p. 309, 1859. 1 species. Type, *Hystrisyphona niger* BIGOT.

Ibisia RONDANI, Dipt. Ital. Prodr., vol. 1, p. 154, 1856. 1 species. Type, *Bibio marginata* FABRICIUS. Equals **Atherix** MEIGEN, 1803.

Icaria SCHINER, Reise *Novara*, Zool., vol. 2, Dipt., p. 276, 1868. 3 species. Type, *Trypeta sparsa* WIEDEMANN, the first species, by original designation. Not *Icaria* SAUSSURE, 1853. Equals **Eutreta** LOEW, 1873.

Ichneumonops TOWNSEND, Smiths. Misc. Coll., vol. 51, p. 82, 1908. 1 species. Type *Ichneumonops mirabilis* TOWNSEND.

Icterica LOEW, Monogr. Dipt. N. Amer., vol. 3, p. 287, 1873. 3 species. Type, *Trypeta seriata* LOEW, the first species, by present designation.

Ida DESVOIDY, Hist. Nat. Dipt., vol. 2, p. 389, 1863. 1 species. Type, *Musca rustica* FABRICIUS (as *petiolata*, new species). Equals **Dexia** MEIGEN, 1826.

Idana LOEW, Monogr. Dipt. N. Amer., vol. 3, p. 115, 1873. 1 species. Type, *Ortalis marginata* SAY.

Idioneura PHILIPPI, Verh. Zool.-Bot. Ges. Wien, vol. 15, p. 615, 1865. 1 species. Type, *Idioneura macroptera* PHILIPPI. Equals **Symplecta** MEIGEN, 1830.

Idioplasta OSTEN SACKEN, Cat. Dipt. N. Amer., p. 222, 1878. Change of name for *Protoplasa* OSTEN SACKEN, 1860, under the erroneous impression that it interferes with *Protoplasta* LEIDY, 1879. Type, *Protoplasa fitchii* OSTEN SACKEN. Equals **Protoplasa** OSTEN SACKEN, 1860.

Idiotypa LOEW, Monogr. Dipt. N. Amer., vol. 3, p. 183, 1873. 1 species. Type, *Idiotypa appendiculata* LOEW. Not *Idiotypa* FOERSTER, 1856. Equals **Neoidiotypa** OSTEN SACKEN, 1878.

Illigeria DESVOIDY, Essai Myod., p. 273, 1830. 1 species (as 2). Type, *Musca roralis* LINNÆUS. Equals **Melanophora** MEIGEN, 1803.

Ilythea HALIDAY, Ann. Nat. Hist., vol. 3, p. 408, 1839. 1 species. Type, *Ephydra spilota* CURTIS. Syn., *Epipela* STENHAMMER, 1844.

Imatisma MACQUART, Dipt. Exot., vol. 2, pt. 2, p. 67, 1842. 2 species. Type, *Eristalis posticata* FABRICIUS, the first species, by original designation. Equals **Mallota** MEIGEN, 1822.

Iphis MEIGEN, Nouv. Class. Mouch., p. 27, 1800.* No species. Equals *Dolichopus* LATREILLE. Type, *Musca ungulata* LINNÆUS. Equals **Dolichopus** LATREILLE, 1796.

Ischiodonta LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 1328, 1864. 2 species (as 3). Type, *Myopa fasciata* MEIGEN, the first species, by present designation. Equals **Stomoxoides** SCHÆFFER, 1766.

Ischnomyia Loew, Berliner Ent. Zeitschr., vol. 7, p. 325, 1863. 1 species. Type, *Diastata? albicosta* Walker (as *vittula*, new species).

Isogaster Lioy, Atti Inst. Veneto, ser. 3, vol. 9, p. 1114, 1864. 1 species. Type, *Borborus nigrifemoratus* Macquart. Equals **Copromyza** Fallen, 1810.

Isoglossa Coquillett, Can. Ent., vol. 27, p. 125, 1895. 1 species. Type, *Isoglossa hastata* Coquillett. Not *Isoglossa* Casey, 1893. Equals **Eucoronymyia** Townsend, 1908.

Isomera Desvoidy, Ann. Soc. Ent. France for 1851, p. 315, 1851. 2 species. Type, *Rhedia sicula* Desvoidy (as *Reaumeria blondeli* Desvoidy), the first species, by present designation. Equals **Salmacia** Meigen, 1800.

Isopenthes Osten Sacken, Biol. Centr.-Amer., Dipt., vol. 1, p. 96, 1886. 2 species. Type, *Isopenthes jænnickeana* Osten Sacken, the second species, by present designation. Equals **Villa** Lioy, 1864.

Isoplastus Skuse, Proc. Linn. Soc. N. S. Wales, ser. 2, vol. 4, p. 279, 1889. 3 species. Type, *Isoplastus notabilis* Skuse, the first species, by present designation.

Isostomyia Coquillett, Class. Mosq., p. 16, 1906. 1 species. Type, *Aëdes perturbans* Williston.

Istoglossa Rondani, Dipt. Ital. Prodr., vol. 1, p. 77, 1856. 1 species. Type, *Istoglossa puella* Rondani. Equals **Clausicella** Rondani, 1856.

Itamus Loew, Linn. Ent., vol. 4, p. 84, 1849. 4 species. Type, *Asilus cyanurus* Loew, the first species, by present designation. Not *Itamus* Schmidt-Gœbel, 1846. Equals **Neoitamus** Osten Sacken, 1878.

Iteaphila Zetterstedt, Ins. Lapp., p. 540, 1838. 2 species. Type, *Iteaphila macquarti* Zetterstedt, the first species, by designation of Coquillett, Proc. Ent. Soc. Washington, vol. 5, 1903, p. 251. Syn., *Steleocheta* Becker, 1887.

Itonida Meigen, Nouv. Class. Mouch., p. 19, 1800.* No species. *Cecidomyia* Meigen, 1803, is a change of name. Type, *Tipula pini* De Geer. Syn., *Cecidomyia* Meigen, 1803; *Diplosis* Loew, 1851.

Janetiella Kieffer, Syn. Cec. Eur. Alger., p. 23, 1898. 3 species. Type, *Cecidomyia thymi* Kieffer, the first species, by present designation.

Janthinosoma Arribalzaga, Rev. Mus. La Plata, vol. 1, p. 394, 1891. 1 species. Type, *Culex discrucians* Walker. Syn., *Conchyliastes* Theobald, 1901.

Javetia Desvoidy, Hist. Nat. Dipt., vol. 1, p. 1115, 1863. 1 species (as 3). Type, *Tachina chalconota* Meigen. Equals **Macquartia** Desvoidy, 1830.

Joannisia Kieffer, Bull. Soc. Ent. France for 1894, p. 175, 1894. 2 species. Type, *Joannisia aurantiaca* Kieffer, the first species, by present designation.

Joblotia Blanchard, Compt. Rend. Soc. Biol., vol. 53, p. 1046, Dec. 6, 1901. Change of name for *Trichoprosopon* Theobald, July 15, 1901, under the mistaken idea that this is preoccupied by *Trichoprosopus* Macquart, 1843. Type, *Trichoprosopon niveipes* Theobald. Equals **Trichoprosopon** Theobald, July 15, 1901.

Johannseniella Williston, Journ. N. Y. Ent. Soc., vol. 15, p. 1, 1907. Change of name for *Ceratolophus* Kieffer, 1899, not of Bocourt, 1873. Type, *Ceratopogon femorata* Meigen. Equals **Serromyia** Meigen, 1818.

Johnsonia Coquillett, Proc. Acad. Nat. Sci. Phila. for 1895, p. 316, 1895. 1 species. Type, *Johnsonia elegans* Coquillett.

Johnsonomyia Felt, 23d Rep. State Ent. N. Y., p. 417, 1908. 3 species. Type, *Johnsonomyia rubra* Felt, the last species, by original designation.

Jurinella Brauer and Bergenstamm, Denkschr. Kais. Akad. Wiss. Wien, vol. 56, p. 132, 1889. 1 species. Type, *Jurinia cæruleonigra* Macquart. Syn., *Pseudohystricia* Brauer and Bergenstamm, 1889; *Eujurinia* Townsend, 1908.

Jurinia Desvoidy, Essai Myod., p. 34, 1830. 10 species (as 12). Type, *Jurinia gagatea* Desvoidy, the fifth species, by present designation.

Karshomyia Felt, 23d Rep. State Ent. N. Y., p. 398, 1908. 1 species. Type, *Mycodiplosis vibarni* Felt.

Keratocera DESVOIDY, Essai Myod., p. 788, 1830. 5 species (as 7). Type, *Notiphila cinerea* FALLEN (as 1 *palustris*, 3 *trapæ* and 4 *fulvicornis*, new species), by present designation. Equals **Notiphila** FALLEN, 1810.

Keroplatus BOSC, Actes Soc. Hist. Nat. Paris, vol. 1, pt. 1, p. 42, 1792. 1 species. Type, *Keroplatus tipuloides* BOSC. Syn., *Cerotelion* RONDANI, 1856.

Kirbya DESVOIDY, Essai Myod., p. 267, 1830. 1 species (as 2). Type, *Tachina mœrens* MEIGEN (as *vernalis* and *hiemalis*, new species). Equals **Rhinophora** DESVOIDY, 1830.

Klugia DESVOIDY, Hist. Nat. Dipt., vol. 1, p. 787, 1863. 1 species (as 3). Type, *Tachina marginata* MEIGEN. Equals **Voria** DESVOIDY, 1830.

Kockia DESVOIDY, Hist. Nat. Dipt., vol. 1, p. 818, 1863. 2 species. Type, *Kockia claripennis* DESVOIDY, the first species, by present designation. Equals **Phyto** DESVOIDY, 1830.

Labidomyia STEPHENS, Syst. Cat. Brit. Ins., vol. 2, p. 239, 1829. 5 species. Type, *Tipula bipunctata* LINNÆUS, the first species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 126. Equals **Culicoides** LATREILLE, 1809.

Labigastera MACQUART, Recueil Soc. Sci. Arts Lille for 1834, p. 244, 1834. 2 species. Type, *Tachina aurifrons* MEIGEN (as *Clelia agilis* DESVOIDY), the second species, by designation of RONDANI, Dipt. Ital. Prodr., vol. 1, 1856, p. 76. Equals **Dionæa** DESVOIDY, 1830.

Laccoprosopa TOWNSEND, Trans. Amer. Ent. Soc., vol. 18, p. 365, 1891. 1 species. Type, *Laccoprosopa sarcophagina* TOWNSEND. Equals **Brachicoma** RONDANI, 1856.

Lachnomma TOWNSEND, Trans. Amer. Ent. Soc., vol. 19, p. 103, 1892. 1 species. Type, *Atrophopoda singularis* TOWNSEND (as *magnicornis*, new species). Equals **Paradidyma** BRAUER and BERGENSTAMM, 1891.

Lactistomyia MELANDER, Trans. Amer. Ent. Soc., vol. 28, p. 250, 1902. 1 species. Type, *Lactistomyia insolita* MELANDER. Equals **Noeza** MEIGEN, 1800.

Lambertia DESVOIDY, Hist. Nat. Dipt., vol. 2, p. 30, 1863. 1 species. Type, *Blondelia pallidipalpis* DESVOIDY. Equals **Sturmia** DESVOIDY, 1830.

Lampetia MEIGEN, Nouv. Class. Mouch., p. 34, 1800.* No species. *Merodon* MEIGEN, 1803, is a change of name. Type, *Syrphus clavipes* FABRICIUS. Syn., *Merodon* MEIGEN, 1803.

Lamprempis WHEELER and MELANDER, Biol. Centr.-Amer., Dipt., vol. 1, p. 366, 1901. 6 species. Type, *Empis chichimeca* WHEELER and MELANDER, the fourth species, by designation of COQUILLETT, Proc. Ent. Soc. Washington, vol. 5, 1903, p. 252.

Lampria MACQUART, Dipt. Exot., vol. 1, pt. 2, p 60, 1838. 2 species. Type, *Laphria clavipes* FABRICIUS, the second species, by present designation.

Laphria MEIGEN, Nouv. Class. Mouch., p. 25, 1800.* No species. In Illiger's Mag., vol. 2, 1803, p. 270, 6 species. Type, *Asilus gibbosus* LINNÆUS, the first species, by designation of LATREILLE, Consider. Général., 1810, p. 443. Syn., *Ropalocera* MEIGEN, 1820.

Laphystia LOEW, Linn. Ent., vol. 2, p. 538, 1847. 1 species. Type, *Laphystia sabulicola* LOEW.

Larvævora MEIGEN, Nouv. Class. Mouch., p. 38, 1800.* No species. *Tachina* MEIGEN, 1803, is a change of name. Type, *Musca grossa* LINNÆUS. Syn., *Tachina* MEIGEN, 1803; *Echinomya* LATREILLE, 1805; *Faunia* DESVOIDY, 1830; *Cnephaliodes* BRAUER and BERGENSTAMM, 1891; *Pareudora* WACHTL, 1894; *Nowickia* WACHTL, 1894; *Pararchytas* BRAUER and BERGENSTAMM, 1894; *Eupeleteria* TOWNSEND, 1908.

Lasia WIEDEMANN, Anal. Ent., p. 11, 1824.* 1 species. Type, *Lasia splendens* WIEDEMANN.

Lasiargyra MIK, Jahresb. k. k. Akad. Gymnas., p. 5, 1878. No species. *Musca diaphana* FABRICIUS, being one of the commonest species which possesses the generic characters mentioned, may be taken as the type. Type, *Musca diaphana* FABRICIUS. Equals **Porphyrops** MEIGEN, 1824.

Lasiomastix OSTEN SACKEN, Proc. Acad. Nat. Sci. Phila. for 1859, p. 233, 1860. 1 species. Type, *Limnobia macrocera* SAY. Equals **Phylidorea** BIGOT, 1854.

Lasiona WULP, Biol. Centr.-Amer., Dipt., vol. 2, p. 127, 1890. 1 species. Type, *Lasiona multisetosa* WULP.

Lasioneura COQUILLETT, Journ. N. Y. Ent. Soc., vol. 3, p. 50, 1895. 2 species. Type, *Lasioneura johnsoni* COQUILLETT, the first species, by present designation.

Lasiophthicus RONDANI, Nuovi Ann. Sci. Nat. (Bologna) for 1844, p. 459, 1844. 1 species. Type, *Musca pyrastri* LINNÆUS. Equals **Scæva** FABRICIUS, 1805.

Lasiopogon LOEW, Linn. Ent., vol. 2, p. 508, 1847. 3 species. Type, *Dasypogon pilosellus* LOEW (as *hirtellus* MEIGEN), the second species, by designation of RONDANI, Dipt. Ital. Prodr., vol. 1, 1856, p. 156. Syn., *Daulopogon* LOEW, 1874.

Lasiops MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 7, p. 323, 1838. 5 species. Type, *Musca hirticeps* FALLEN, the fourth species, by designation of COQUILLETT, Journ. N. Y. Ent. Soc., vol. 9, 1901, p. 138. Equals **Hydrotæa** DESVOIDY, 1830. (*Lasiops* of authors equals *Opsolasia*, new name.)

Lasioptera MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 1, p. 88, 1818. 4 species. Type, *Cecidomyia albipennis* MEIGEN, the third species, by present designation. Syn., *Diomyza* MEIGEN, 1818.

Lasiosoma WINNERTZ, Verh. Zool.-Bot. Ges. Wien, vol. 13, p. 748, 1863. 13 species. Type, *Sciophila pilosa* MEIGEN, the fourth species, by present designation. Equals **Sciophila** MEIGEN, 1818.

Lastaurus LOEW, Bemerk. Asiliden, p. 11, 1851. 2 species. Type, *Dasypogon anthracinus* LOEW, the first species, by present designation. Syn., *Morimna* WALKER, 1851.

Lathyrophthalmus MIK, Wien. Ent. Zeit., vol, 16, p. 114, 1897. 1 species. Type, *Conops æneus* SCOPOLI. Equals **Tubifera** MEIGEN, 1800.

Latreillia DESVOIDY, Essai Myod., p. 104, 1830. 5 species (as 10). Type, *Musca bifasciata* FABRICIUS, the first species, by present designation. Not *Latreillia* ROUX, 1827. Equals **Belvosia** DESVOIDY, 1830.

Latreillimyia TOWNSEND, Smiths. Misc. Coll., vol. 51, p. 105, 1908. Change of name for *Latreillia* DESVOIDY, 1830, not of ROUX, 1827. Type, *Musca bifasciata* FABRICIUS. Equals **Belvosia** DESVOIDY, 1830.

Lauxania LATREILLE, Hist. Nat. Crust. et Ins., vol. 14, p. 390, 1805, 1 species. Type, *Musca cylindricornis* FABRICIUS.

Laverania THEOBALD, Journ. Trop. Med., vol. 5, p. 183, June 16, 1902. 1 species. Type, *Anopheles argyritarsis* DESVOIDY. Not *Laverania* GRASSI and FELETTI, 1890. Equals **Cellia** THEOBALD, June 16, 1902.

Leia MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 1, p. 253, 1818. 10 species. Type, *Leia fascipennis* MEIGEN, the fifth species, by designation of CURTIS, Brit. Ent., 1837, p. 645. Syn., *Lejomya* RONDANI, 1856; *Lejosoma* RONDANI, 1856; *Glaphyroptera* WINNERTZ, 1863; *Neoglaphyroptera* OSTEN SACKEN, 1878. (*Leia* of authors equals *Rondaniella*, JOHANNSEN.)

Lejogaster RONDANI, Dipt. Ital. Prodr., vol. 2, p. 166, 1857. 1 species. Type, *Chrysogaster splendida* MEIGEN (as *tarsatus* MEIGEN). Equals **Chrysogaster** MEIGEN, 1800.

Lejomya RONDANI, Dipt. Ital. Prodr., vol. 1, p. 195, 1856. 1 species. Type, *Mycetophila bimaculata* MEIGEN. Equals **Leia** MEIGEN, 1818.

Lejops RONDANI, Dipt. Ital. Prodr., vol. 2, p. 33, 1857. 1 species. Type, *Mallota vittata* MEIGEN. Equals **Helophilus** MEIGEN, 1822.

Lejosoma RONDANI, Dipt. Ital. Prodr., vol. 1, errata, 1856. Change of name of *Lejomya* RONDANI, 1856. Type, *Mycetophila bimaculata* MEIGEN. Equals **Leia** MEIGEN, 1818.

Lemtopeza MACQUART, Ins. Dipt. Nord France, Separata, p. 143, 1827. 1 species. Type, *Ocydromia flavipes* MEIGEN (as *flavipes*, new species).

Lentiphora DESVOIDY, Essai Myod., p. 656, 1830. 1 species. Type, *Lentiphora flaveola* DESVOIDY. Syn., *Tephrochlamys* LOEW, 1862.

Lepidanthrax OSTEN SACKEN, Biol. Centr.-Amer., Dipt., vol 1, p. 107, 1886. 3 species. Type, *Anthrax disjuncta* WIEDEMANN, the first species, by present designation.

Lepidomya BIGOT, Ann. Soc. Ent. France for 1857, p. 557, 1857. 1 species. Type, *Empis melanocephala* FABRICIUS (as *Hemerodromia mantispa* MEIGEN). Equals **Hemerodromia** MEIGEN, 1822.

Lepidomyia LOEW, Berliner Ent. Zeitschr., vol. 8, p. 69, 1864. 1 species. Type, *Lepidomyia calopus* LOEW. Syn., *Lepromyia* WILLISTON, 1886; *Lepidostola* MIK, 1886.

Lepidophora WESTWOOD, Lond. Edinb. Philos. Mag., vol. 6, p. 447, 1834. 1 species. Type, *Ploas ægeriiformis* GRAY.

Lepidoplatys COQUILLETT, Science, vol. 23, p. 314, 1906. 1 species. Type, *Culex squamiger* COQUILLETT.

Lepidosia COQUILLETT, Science, vol. 23, p. 314, 1906. 1 species. Type, *Culex cyanescens* COQUILLETT.

Lepidostola MIK, Wien. Ent. Zeit., vol. 5, p. 278, Oct., 1886. Change of name for *Lepidomyia* LOEW, 1864, under the mistaken impression that it is preoccupied by *Lepidomya* BIGOT, 1857. Type, *Lepidomyia calopus* LOEW. Equals **Lepidomyia** LOEW, 1864.

Lepiselaga MACQUART, Dipt. Exot., vol. 1, pt. 1, p. 153, 1838. 1 species. Type, *Hæmatopota crassipes* FABRICIUS (as *Tabanus lepidota* WIEDEMANN). Equals **Hadrus** PERTY, 1834.

Lepopteryx SPEISER, Arch. Natur. for 1900, p. 53, 1900. 2 species. Type, *Lipoptena phyllostomatis* PERTY, the first species, by original designation. Equals **Aspidoptera** COQUILLETT, 1899.

Lepromyia WILLISTON, Synops. N. Amer. Syrph., p. 31, 1886. Change of name for *Lepidomyia* LOEW, under the mistaken impression that the latter is preoccupied by *Lepidomya* BIGOT. Type, *Lepidomyia calopus* LOEW. Equals **Lepidomyia** LOEW, 1864.

Leptina MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 6, pl. 65, fig 10, 1830. 1 species. Type, *Tipula albipes* STROM (as *Dolichopeza sylvicola* CURTIS). Equals **Dolichopeza** CURTIS, 1825.

Leptis FABRICIUS, Syst. Antliatorum, p. 69, 1805. Change of name of *Rhagio* FABRICIUS, 1775, under the mistaken impression that it is preoccupied by *Rhagium* FABRICIUS, 1775. Type, *Musca scolopacea* LINNÆUS. Equals **Rhagio** FABRICIUS, 1775.

Leptocera OLIVIER, Mem. Soc. Agric. Dep. Seine, vol. 16, p. 16, 1813.* 1 species. Type, *Leptocera nigra* OLIVIER. Syn., *Nerea* DESVOIDY, 1830; *Bacchis* DESVOIDY, 1830; *Limosina* MACQUART, 1835; *Gonioneura* RONDANI, 1880; *Elachisoma* RONDANI, 1880.

Leptochilus LOEW, Berliner Ent. Zeitschr., vol. 16, p. 254, 1872. 1 species. Type, *Leptochilus modestus* LOEW. Not *Leptochilus* SAUSSURE, 1852. Equals **Epacmus** OSTEN SACKEN, 1887.

Leptocorypha ALDRICH, Trans. Ent. Soc. Lond. for 1896, p. 315, 1896. 1 species. Type, *Leptocorypha pavo* ALDRICH.

Leptoda WULP, Tijdschr. Ent., vol. 28, p. 196, 1885. 2 species. Type, *Dexia gracilis* WIEDEMANN, the first species, by designation of WULP, Biol. Centr.-Amer., Dipt., vol. 2, 1891, p. 250.

Leptodiplosis KIEFFER, Bull. Soc. Ent. France for 1894, p. 28, 1894. 5 manuscript species. Type, *Leptodiplosis septemguttata* KIEFFER (equals *Cecidomyia pictipennis* PERRIS, 1870, not of MEIGEN, 1830), the second species, by designation of KIEFFER, Bull. Soc. Ent. France, 1894, page cclxxx. Syn., *Coprodiplosis* KIEFFER, 1894.

Leptogaster MEIGEN, Illiger's Mag., vol. 2, p. 269, 1803. 1 species. Type, *Asilus cylindricus* DE GEER (as *tipuloides* FABRICIUS). Syn., *Gonypes* LATREILLE, 1805.

Leptomorphus CURTIS, Brit. Ins., p. 365, 1831. 1 species. Type, *Leptomorphus walkeri* CURTIS.

Leptomydas GERSTÆCKER, Ent. Zeit. Stettin, vol. 29, p. 81, 1868. 8 species. Type, *Mydas lusitanicus* WIEDEMANN, the first species, by present designation.

Leptomyza MACQUART, Hist. Nat., Dipt., vol. 2, p. 580, 1835. Change of name for *Anthomyza* FALLEN, 1810, supposed to interfere with *Anthomyia* MEIGEN, 1803. Type, *Anthomyza gracilis* FALLEN. Equals **Anthomyza** FALLEN, 1810.

Leptophora SIX, Tijdschr. Ent., vol. 21, p. 185, 1878. 1 species. Type, *Phora galeata* HALIDAY (as *perpusilla*, new species). Equals **Metopina** MACQUART, 1835.

Leptopus FALLEN, Monogr. Dolich. Sveciæ, p. 23, 1823. 4 species. Type, *Dolichopus contristans* WIEDEMANN, the third species, by present designation. Not *Leptopus* LATREILLE, 1809. Equals **Sciapus** ZELLER, 1842.

Leptopus HALIDAY, Zool. Journ., vol. 5, p. 358, 1831. 2 species. Type, *Medetera ornata* HALIDAY, the second species, by present designation. Not *Leptopus* LATREILLE, 1809. Equals **Xanthochlorus** LOEW, 1857.

Leptorhethum ALDRICH, Kansas Univ. Quart., vol. 2, p. 50, 1893. 1 species. Type, *Leptorhethum angustatum* ALDRICH.

Leptorhina STEPHENS, Syst. Cat. Brit. Ins., vol. 2, p. 243, 1829. 1 species. Type, *Limnobia longirostris* WIEDEMANN. Equals **Megarhina** ST. FARGEAU and SERVILLE, 1828.

Leptosceles HALIDAY, Ent. Mag., vol. 1, p. 160, 1833. 3 species. Type, *Leptosceles guttata* HALIDAY, the first species, by designation of COQUILLETT, Proc. Ent. Soc. Washington, vol. 5, 1903, p. 252. Equals **Dolichocephala** MACQUART, 1823.

Leria DESVOIDY, Essai Myod., p. 653, 1830. 7 species. Type, *Musca serrata* LINNÆUS (as *fenestrarum*, new species), the fourth species, by designation of RONDANI, Dipt. Ital. Prodr., vol. 1, 1856, p. 103. Equals **Heleomyza** FALLEN, 1810.

Leskia DESVOIDY, Essai Myod., p. 100, 1830. 1 species. Type, *Tachina aurea* FALLEN (as *flavescens*, new species). Syn., *Myobia* DESVOIDY, 1830; *Hebia* DESVOIDY, 1830; *Solieria* DESVOIDY, 1848; *Orellia* DESVOIDY, 1848; *Pyrrosia* RONDANI, 1856; *Anthoica* RONDANI, 1861; *Chremia* DESVOIDY, 1863.

Leskiomima BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 58, p. 372, 1891. 1 species. Type, *Stomoxys tenera* WIEDEMANN.

Lesticocampa DYAR and KNAB, Journ. N. Y. Ent. Soc., vol. 14, p. 226, 1906. 1 species. Type, *Wyeomyia lunata* THEOBALD.

Lestomyia WILLISTON, Trans. Amer. Ent. Soc., vol. 11, p. 19, 1883. 2 species. Type, *Clavator sabulonum* OSTEN SACKEN, the first species, by original designation.

Lestophonus WILLISTON, Ins. Life, vol. 1, p. 21, 1888. 1 species. Type, *Lestophonus icteryx* WILLISTON. Equals **Cryptochetum** RONDANI, 1875.

Lestremia MACQUART, Rec. Trav. Soc. Sci. Lille for 1826, p. 173, 1826. 1 species. Type, *Lestremia cinerea* MACQUART. Syn., *Mimosciara* RONDANI, 1840; *Cecidogona* LOEW, 1844; *Furcinerva* RONDANI, 1846; *Yposatea* RONDANI, 1856.

Leucomelina MACQUART, Dipt. Exot., Suppl. 4, p. 261, 1851. 1 species. Type, *Leucomelina pica* MACQUART.

Leucophenga MIK, Wien. Ent. Zeit., vol. 5, p. 317, 1886. 1 species. Type, *Drosophila maculata* DUFOUR.

Leucophora DESVOIDY, Essai Myod., p. 562, 1830. 5 species. Type, *Leucophora cinerea* DESVOIDY, the third species, by designation of COQUILLETT, Journ. N. Y. Ent. Soc., vol. 9, 1901, p. 138. Syn., *Ocromyia* LIOY, 1864; *Hylephila* RONDANI, 1877; *Hammomyia* RONDANI, 1877.

Leucopis MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 6, p. 133, 1830. 4 species. Type, *Leucopis annulipes* ZETTERSTEDT (as *griseola* MEIGEN), the first species, by designation of BLANCHARD, Hist. Nat. Ins., vol. 3, 1840, p. 627.

Leucostola LOEW, Neue Beitr., vol. 5, p. 39, 1857. 1 species. Type, *Dolichopus vestita* WIEDEMANN.

Leucostoma MEIGEN, Illiger's Mag., vol. 2, p. 279, 1803. No species. In his Syst. Beschr., vol. 4, 1824, p. 234, 1 species. Type, *Ocyptera simplex* FALLEN. Syn., *Clelia* DESVOIDY, 1830; *Psalida* RONDANI, 1856; *Calyptidia* DESVOIDY, 1863.

Leucozona SCHINER, Wien. Ent. Monatschr., vol. 4, p. 214, 1860. 1 species. Type, *Musca lucorum* LINNÆUS. Equals **Syrphus** FABRICIUS, 1775.

Liancalus LOEW, Neue Beitr., vol. 5, p. 22, 1857. 2 species. Type, *Musca virens* SCOPOLI, the first species, by present designation. Equals **Orthoceratium** SCHRANK, 1803.

Lilæa WALKER, Ins. Saund., Dipt., p. 11, 1850. 2 species. Type, *Pangonius luridus* WALKER, the second species, by present designation. Equals **Pangonius** LATREILLE, 1802.

Limatus THEOBALD, Monogr. Culic., vol. 2, p. 349, 1901. 1 species. Type, *Limatus durhamii* THEOBALD. Syn., *Simondella* LAVERAN, 1902.

Limnobia MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 1, p. 116, 1818. Change of name for *Limonia* MEIGEN, 1803, because the latter name has another meaning beside that intended. Type, *Tipula tripunctata* FABRICIUS. Equals **Amphinome** MEIGEN, 1800.

Limnobiorhynchus WESTWOOD, Ann. Soc. Ent. France for 1835, p. 683, 1835. 2 species. Type, *Limnobiorhynchus brasiliensis* WESTWOOD, the first species, by present designation. Equals **Geranomyia** HALIDAY, 1833.

Limnœa RONDANI, Dipt. Ital. Prodr., vol. 1, p. 181, 1856. 1 species. Type, *Tipula flavescens* LINNÆUS. Equals **Polymeda** MEIGEN, 1800.

Limnoica RONDANI, Dipt. Ital. Prodr., vol. 4, p. 11, 1861. Change of name for *Limnœa* RONDANI, 1856, on account of *Limnæa* POLI, 1791. Type, *Tipula flavescens* LINNÆUS. Equals **Polymeda** MEIGEN, 1800.

Limnomyza RONDANI, Dipt. Ital. Prodr., vol. 1, p. 185, 1856. 1 species. Type, *Tipula tripunctata* FABRICIUS. Equals **Amphinome** MEIGEN, 1800.

[**Limnophila** MACQUART, Hist. Nat., Dipt., vol. 1, p. 95, 1834. 21 species. Type, *Limnobia pictipennis* MEIGEN, the first species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 128. Syn., *Limnomya* RONDANI, 1861; *Pœcilostola* SCHINER, 1863. Not American.] (*Limnophila* of authors equals *Phylidorea* BIGOT.)

Limnophora DESVOIDY, Essai Myod., p. 517, 1830. 20 species. Type, *Limnophora palustris* DESVOIDY, the second species, by present designation. Syn., *Gymnodia* DESVOIDY, 1863; *Melanochelia* RONDANI, 1866; *Brontæa* KOWARZ, 1873; *Pseudolimnophora* STROBL, 1893; *Stroblia* POKORNY, 1893; *Neolimnophora* SCHNABL, 1902.

Limnospila SCHNABL, Wien. Ent. Zeit., vol. 21, p. 111, 1902. 1 species. Type, *Aricia albifrons* ZETTERSTEDT. Equals **Cœnosia** MEIGEN, 1830.

Limonia MEIGEN, Illiger's Mag., vol. 2, p. 262, 1803. 5 species. Type, *Tipula tripunctata* FABRICIUS, the first species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 129. Equals **Amphinome** MEIGEN, 1800.

Limosia DESVOIDY, Essai Myod., p. 535, 1830. 14 species (as 28). Type, *Limosia campestris* DESVOIDY, the sixth species, by designation of COQUILLETT, Journ. N. Y. Ent. Soc., vol. 9, 1901, p. 138. Equals **Cœnosia** MEIGEN, 1830.

Limosina MACQUART, Hist. Nat., Dipt., vol. 2, p. 571, 1835. 9 species. Type, *Borborus sylvaticus* MEIGEN, the first species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 145. Equals **Leptocera** OLIVIER, 1813.

Linnæmya DESVOIDY, Essai Myod., p. 52, 1830. 3 species (as 7). Type, *Tachina vulpina* FALLEN (as *silvestris*, new species), the second species, by designation of DESVOIDY, Hist. Nat. Dipt., vol. 1, 1863, p. 131. Syn., *Bonellia* DESVOIDY, 1830.

Liogma OSTEN SACKEN, Monogr. Dipt. N. Amer., vol. 4, p. 298, 1869. 2 species. Type, *Triogma nodicornis* OSTEN SACKEN, the second species, by present designation.

Lipochæta COQUILLETT, Ent. News, vol. 7, p. 220, 1896. 1 species. Type, *Lipochæta slossonæ* COQUILLETT.

Lipoptena NITZSCH, Germ. Mag. Ent., vol. 3, p. 310, 1818. 1 species. Type, *Pediculus cervi* LINNÆUS (as *cervina* PANZER). Syn., *Hæmobora* CURTIS, 1824; *Ornithobia* MEIGEN, 1830; *Alcephagus* GIMMERTHAL, 1845.

Liriope MEIGEN, Nouv. Class. Mouch., p. 14, 1800.* No species. *Ptychoptera* MEIGEN, 1803, is a change of name. Type, *Tipula contaminata* LINNÆUS. Syn., *Ptychoptera* MEIGEN, 1803; *Ctenoceria* RONDANI, 1856.

Lisella DESVOIDY, Essai Myod., p. 649, 1830. 1 species. Type, *Musca flava* LINNÆUS (as *flava*, new species). Equals **Chyromya** DESVOIDY, 1830.

Lispe LATREILLE, Precis, p. 169, 1796. No species. In 1802, 1 species. Type, *Musca tentaculata* DE GEER.

Lispidea COQUILLETT, Journ. N. Y. Ent. Soc., vol. 3, p. 51, 1895. 1 species. Type, *Lispidea palpiger* COQUILLETT.

Lissa MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 5, p. 370, 1826. 1 species. Type, *Oeyptera dolium* FABRICIUS. Not *Lissa* LEACH, 1815. Equals **Megamerina** RONDANI, 1861.

Listeria DESVOIDY, Hist. Nat. Dipt., vol. 2, p. 600, 1863. 1 species. Type, *Musca lineata* FALLEN (as *agrestis*, new species). Equals **Sarcophaga** MEIGEN, 1826.

Listropoda KOLENATI, Wien. Ent. Monatschr., vol. 1, p. 62, 1857. 4 species. Type, *Listropoda blasii* KOLENATI, the second species, by present designation. Equals **Nycteribia** LATREILLE, 1796.

Litanomyia MELANDER, Trans. Amer. Ent. Soc., vol. 28, p. 231, 1902. 2 species. Type, *Sciodromia mexicana* WHEELER and MELANDER, the first species, by designation of COQUILLETT, Proc. Ent. Soc. Wash., vol. 5, 1903, p. 252. Equals **Chyromantis** RONDANI, 1856.

Litorella RONDANI, Dipt. Ital. Prodr., vol. 1, p. 101, 1856. 1 species. Type, *Ochtiphila litorella* FALLEN. Equals **Schœnomyza** HALIDAY, 1833.

Litorhynchus MACQUART, Dipt. Exot., vol. 2, pt. 1, p. 78, 1840. 4 species. Type, *Litorhynchus hamatus* MACQUART, the second species, by present designation. Equals **Mima** MEIGEN, 1820.

Lixophaga TOWNSEND, Smiths. Misc. Coll., vol. 51, p. 86, 1908. 1 species. Type, *Lixophaga parva* TOWNSEND. Equals **Tachinophyto** TOWNSEND, 1892.

Lobodiplosis FELT, 23d Rep. State Ent. N. Y., p. 397, 1908. 2 species. Type, *Micodiplosis acerina* FELT, the first species, by original designation.

Lobopteromyia FELT, 23d Rep. State Ent. N. Y., p. 389, 1908. 8 species. Type, *Cecidomyia filicis* FELT, the first species, by original designation.

Loewiella WILLISTON, Man. N. Amer. Dipt., p. 57, 1896. Change of name for *Blacodes* LOEW, 1874, not of DEJEAN, 1859. Type, *Blax bellus* LOEW. Equals **Cophura** OSTEN SACKEN, 1887.

Lonchæa FALLEN, Ortalides Sveciæ, p. 25, 1820. 3 species. Type, *Musca chorea* FABRICIUS, the second species (as *vaginalis*, new species), by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 150. Syn., *Teremyia* MACQUART, 1835; *Earomyia* ZETTERSTEDT, 1842; *Dasiops* RONDANI, 1856.

Lonchopalpus DESVOIDY, Dipt. Env. Paris, Myop., p. 35, 1853.* 1 species. Type, *Myopa dorsalis* FABRICIUS. Equals **Stomoxoides** SCHAEFFER, 1766.

Lonchoptera MEIGEN, Illiger's Mag., vol. 2, p. 272, 1803. No species. In 1824, 10 supposed species. Type, *Lonchoptera lutea* PANZER, the first species, by designation of CURTIS, Brit. Ent., 1839, p. 761. Syn., *Dipsa* FALLEN, 1810.

Longurio LOEW, Berliner Ent. Zeitschr., vol. 13, p. 3, 1869. 1 species. Type, *Longurio testaceus* LOEW.

Lophonotus MACQUART, Dipt. Exot., vol. 1, pt. 2, p. 125, 1838. 12 species. Type, *Asilus chalcogaster* WIEDEMANN (as *auribarbis*, new species), the first species, by present designation. Not *Lophonotus* STEPHENS, 1829. Equals **Dysmachus** LOEW, 1860.

Lophoteles LOEW, Berliner Ent. Zeitschr., vol. 2, p. 110, 1858. 1 species. Type, *Lophoteles plumula* LOEW

Lordatia DESVOIDY, Essai Myod., p. 808, 1830. 2 species (as 5). Type, *Lordatia coprina* DESVOIDY, the second (fourth supposed) species, by present designation. Equals **Cypsela** MEIGEN, 1800.

Lordotus LOEW, Berliner Ent. Zeitschr., vol. 7, p. 303, 1863. 1 species. Type, *Lordotus gibbus* LOEW.

Lotobia LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 1114, 1864. 1 species. Type, *Borborus pallidiventris* MEIGEN. Equals **Cypsela** MEIGEN, 1800.

Loxocera MEIGEN, Illiger's Mag., vol. 2, p. 275, 1803. 1 species (as 2). Type, *Musca ichneumonea* LINNÆUS.

Lucilia DESVOIDY, Essai Myod., p. 452, 1830. 17 species (as 37). Type, *Musca cæsar* LINNÆUS, the first species, by designation of MACQUART, Recueil Soc. Sci. Arts Lille for 1833–34, p. 162. Syn., *Mya* RONDANI, 1850; *Somomya* RONDANI, 1861; *Phenicia* DESVOIDY, 1863.

Lutzia THEOBALD, Monogr. Culic., vol. 3, p. 155, 1903. 1 species. Type, *Culex bigotii* BELLARDI.

Lycastrirhyncha BIGOT, Rev. Mag. Zool. for 1859, p. 3, 1859. 1 species. Type, *Lycastrirhyncha nitens* BIGOT.

Lycia DESVOIDY, Essai Myod., p. 637, 1830. 10 species. Type, *Sapromyza rorida* FALLEN (as *flava*, new species), the first species, by present designation. Equals **Sapromyza** FALLEN, 1810.

Lycoria MEIGEN, Nouv. Class. Mouch., p. 17, 1800.* No species. *Sciara* MEIGEN, 1803, is a change of name. Type, *Tipula thomæ* LINNÆUS. Syn., *Sciara* MEIGEN, 1803; *Molobrus* LATREILLE, 1805.

Lydella DESVOIDY, Essai Myod., p. 112, 1830. 7 species (as 12). Type, *Tachina nigripes* FALLEN (as *grisescens*, new species), the first species, by designation of DESVOIDY, Hist. Nat. Dipt., vol. 1, 1863, p. 855. Syn., *Blondelia* DESVOIDY, 1830; *Anetia* DESVOIDY, 1863; *Cyrillia* DESVOIDY, 1863; *Picconia* DESVOIDY, 1863; *Gervaisia* DESVOIDY, 1863; *Dexodes* BRAUER and BERGENSTAMM, 1889; *Aporotachina* MEADE, 1894; *Allophorocera* HENDEL, 1901; *Paradexodes* TOWNSEND, 1908.

Lydina DESVOIDY, Essai Myod., p. 124, 1830. 1 species (as 3). Type, *Tachina ænea* MEIGEN. Syn., *Harrisia* MEIGEN, 1838; *Polidea* MACQUART, 1848; *Somoleja* RONDANI, 1865.

Lynchia WEYENBERG, Anal. Soc. Cient. Argentim. for 1881, p. 195, 1881. 1 species. Type, *Lynchia penelopes* WEYENBERG.

Lynchiella LAHILLE, Act. Trab. Congr. Med. Lat.-Amer., vol. 2, p. 13, 1904. Change of name of *Megarhinus* DESVOIDY, 1827, under the mistaken idea that the latter is preoccupied by *Megarhina* ST. FARGEAU and SERVILLE, 1828. Type, *Culex hæmorrhoidalis* FABRICIUS. Equals **Megarhinus** DESVOIDY, 1827.

Lyperosia RONDANI, Dipt. Ital. Prodr., vol. 1, p. 93, 1856. 1 species. Type, *Conops irritans* LINNÆUS. Equals **Hæmatobia** ST. FARGEAU and SERVILLE, 1828.

Lyphe DESVOIDY, Essai Myod., p. 141, 1830. 1 species (as 2). Type, *Tachina dubia* FALLEN. Syn., *Aporomya* RONDANI, 1859; *Enthenis* DESVOIDY, 1863.

Lyroneurus LOEW, Wien. Ent. Monatschr., vol. 1, p. 38, 1857. 2 species. Type, *Lyroneurus cærulescens* LOEW, the first species, by present designation. Equals **Diaphorus** MEIGEN, 1824.

Lythia DESVOIDY, Hist. Nat. Dipt., vol. 1, p. 707, 1863. 1 species. Type, *Lythia flavicornis* DESVOIDY. Equals **Ceranthia** DESVOIDY, 1830.

Lytogaster BECKER, Berliner Ent. Zeitschr., vol. 41, p. 202, 1896. 1 species. Type, *Philygria abdominalis* STENHAMMER.

Macellocerus MIK, Jahresb. k.-k. Akad. Gymas., p. 3, 1878. 1 species. Type, *Tachytrechus macchus* LOEW. Equals **Tachytrechus** HALIDAY, 1851.

Machærxa RONDANI, Dipt. Ital. Prodr., vol. 3, p. 159, 1859. 1 species. Type, *Tachina concinnata* MEIGEN (as *serricentris*, new species). Equals **Compsilura** BOUCHÉ, 1834.

Machimus LOEW, Linn. Ent., vol. 4, p. 1, 1849. 15 species. Type, *Asilus chrysitis* MEIGEN, the second species, by present designation.

Macquartia DESVOIDY, Essai Myod., p. 204, 1830. 5 species (as 8). Type, *Tachina chalconota* MEIGEN (as *germanica* and *viridescens*, new species), the fourth and fifth supposed species, by designation of RONDANI, Dipt. Ital. Prodr., vol. 1, 1856, p. 65. Syn., *Amedea* DESVOIDY, 1830; *Albinia* DESVOIDY, 1830; *Gymnopsis* RONDANI, 1859; *Cleonice* DESVOIDY, 1863; *Bebricia* DESVOIDY, 1863; *Javetia* DESVOIDY, 1863; *Pherecida* DESVOIDY, 1863; *Rondanimyia* TOWNSEND, 1908.

Macrocera MEIGEN, Illiger's Mag., vol. 2, p. 261, 1803. No species. In his Klass. Beschr. Zweifl. Ins., 1804, pp. 46, 47, 3 species. Type, *Macrocera lutea* MEIGEN, the first species, by designation of CURTIS, Brit. Ent., 1837, p. 637. Equals **Euphrosyne** MEIGEN, 1800.

Macroceromys BIGOT, Bull. Soc. Ent. France for 1877, p. 73, 1877. 1 species. Type, *Macroceromys fulviventris* BIGOT. Equals **Solva** WALKER, 1860.

Macrochetum RONDANI, Dipt. Ital. Prodr., vol. 1, p. 127, 1856. 1 species. Type, *Oscinis cornuta* FALLEN. Equals **Crassiseta** VON ROSER, 1840.

Macrochira MEIGEN, Illiger's Mag., vol. 2, p. 278, 1803. 1 species. Type, *Musca mantis* DE GEER (as *manicata* FABRICIUS). Equals **Ochthera** LATREILLE, 1802.

Macrochira ZETTERSTEDT, Ins. Lapp., p. 784, 1838. 1 species. Type, *Heteromyza flava* MEIGEN (as *flava*, new species). Not *Machrochira* MEIGEN, 1803. Equals **Clusia** HALIDAY, 1838.

Macromeigenia BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 58, p. 311; 1891. 1 species. Type, *Tachina chrysoprocta* WIEDEMANN.

Macrometopa BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 56, p. 117, 1889. 1 species. Type, *Microphthalma calogaster* BIGOT (as *mexicana*, new species).

Macronevra MACQUART, Hist. Nat., Dipt., vol. 1, p. 146, 1834. 1 species. Type, *Myetobia ferruginosa* MEIGEN (as *winthemi*, new species). Equals **Diadocidia** RUTHE, 1831.

Macronichia RONDANI, Dipt. Ital. Prodr., vol. 3, p. 229, 1859. 1 species. Type, *Miltogramma ungulans* PANDELLE (as *Tachina agrestis* FALLEN). Equals **Amobia** DESVOIDY, 1830.

Macronix BIGOT, Ann. Soc. Ent. France for 1857, p. 549, 1857. 1 species. Type, *Dasypogon longiungulatus* MACQUART. Equals **Dicranus** LOEW, 1851.

Macroptera LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 224, 1864. 1 species. Type, *Limnobia macroptera* MACQUART. Equals **Ula** HALIDAY, 1833.

Macrorrhyncha WINNERTZ, Ent. Zeit. Stettin, vol. 7, p. 16, 1846. 1 species. Type, *Macrorrhyncha flava* WINNERTZ. Equals **Asindulum** LATREILLE, 1805.

Macrosargus BIGOT, Ann. Soc. Ent. France for 1879, p. 187, 1879. Change of name of *Pedicella* BIGOT, 1856. Type, *Macrosargus tenuiventris* BIGOT. Equals **Pedicella** BIGOT, 1856.

Macrostenomyia HENDEL, Wien. Ent. Zeit., vol. 26, p. 98, 1907. Change of name for *Stenomacra* LOEW, 1873, not of STAL, 1870. Type, *Sepsis guerini* BIGOT. Syn., *Stenomacra* LOEW, 1873, preoccupied.

Macrostomus WIEDEMANN, Zool. Mag., vol. 1, pt. 1, p. 60, 1817. 1 species. Type, *Hybos ferrugineus* FABRICIUS. Equals **Dionnæa** MEIGEN, 1800.

Macrostyla LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 1126, 1864. 1 species. Type, *Chlorops plumiger* MEIGEN. Equals **Botanobia** LIOY, 1864.

Macrurus LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 1313, 1864. 1 species. Type, *Agromyza latipes* MEIGEN. Not *Macrurus* BONAPARTE, 1841. Equals **Desmometopa** LOEW, 1865.

Madiza FALLEN, Spec. Ent. Meth. Exh., p. 19, 1810. No species. In 1820, 5 species. Type, *Madiza oscinina* FALLEN, the second species, by designation of RONDANI, Dipt.

Ital. Prodr., vol. 1, p. 128, 1856. Syn., *Siphonella* MACQUART, 1835; *Siphunculina* RONDANI, 1856; *Eurinella* MEUNIER, 1893.

Mækistocera WIEDEMANN, Dipt. Exot., p. 41, 1821. 2 species. Type, *Tipula filipes* FABRICIUS, the second species, by designation of MACQUART, Dipt. Exot., vol. 1, pt. 1, 1838, p. 59.

Mallophora MACQUART, Hist. Nat., Dipt., vol. 1, p. 300, 1834. 5 species. Type, *Asilus bomboides* WIEDEMANN, the second species, by present designation.

Mallota MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 3, p. 377, 1822. 3 species. Type, *Syrphus fuciformis* FABRICIUS, the third species, by designation of RONDANI, Nuovi Ann. Sci. Nat. (Bologna), 1844, p. 452. Syn., *Imatisma* MACQUART, 1842; *Zetterstedtia* RONDANI, 1844.

Mancia COQUILLETT, Can. Ent., vol. 18, p. 159, 1886. 1 species. Type, *Mancia nana* COQUILLETT.

Manota WILLISTON, Trans. Ent. Soc. Lond. for 1896, p. 260, 1896. 1 species. Type *Manota defecta* WILLISTON.

Mansonia BLANCHARD, Comp. Rend. Soc. Biol. for 1901, p. 1046, 1901. Change of name for *Panoplites* THEOBALD, 1900, not of GOULD, 1853. Type, *Culex titillans* WALKER. Equals **Tæniorhynchus** ARRIBALZAGA, 1891.

Mantipeza RONDANI, Dipt. Ital. Prodr., vol. 1, p. 148, 1856. 1 species. Type, *Tachydromia præcatoria* FALLEN (as *Hemerodromia monostigma* MEIGEN). Equals **Chelifera** MACQUART, 1823.

Maravigna LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 891, 1864. 1 species. Type, *Tachina obsoleta* MEIGEN (as *clausa* MACQUART). Equals **Onesia** DESVOIDY, 1830.

Marginomyia MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 1, p. 147, 1818. 1 species. Type, *Limnobia cinerascens* MEIGEN. Syn., *Dicranoptycha* OSTEN SACKEN, 1860.

Marshamia DESVOIDY, Essai Myod., p. 57, 1830. 1 species (as 2). Type, *Tachina comta* FALLEN. Equals **Bonnetia** DESVOIDY, 1830.

Masicera MACQUART, Rec. Trav. Soc. Sci. Lille for 1834, p. 285, 1834. 10 species. Type, *Tachina sylvatica* FALLEN, the first species, by designation of Desvoidy, Hist. Nat. Dipt., 1863, p. 872 (as *Phryxe pavonix* DESVOIDY).

Masiphya BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 58, p. 313, 1891. 1 species. Type, *Masiphya brasiliana* BRAUER and BERGENSTAMM. Equals **Biomya** RONDANI, 1856.

Masipoda BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 56, p. 162, 1889. 1 species. Type *Exorista rufilatera* RONDANI (as *geminata*, new species). Equals **Winthemia** DESVOIDY, 1830.

Masistylum BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 60, p. 125, 1893. 1 species. Type, *Pachystylum arcuatum* MIK.

Mauromyia COQUILLETT, Rev. Tach., p. 51, 1897. 1 species. Type, *Mauromyia pulla* COQUILLETT.

Mayetia KIEFFER, Misc. Ent., vol. 4, p. 5, 1896. 1 species. Type, *Cecidomyia destructor* Say. Equals **Phytophaga** RONDANI, 1840.

Meckelia DESVOIDY, Essai Myod., p. 714, 1830. 2 species. Type, *Musca hortulana* ROSSI (as *Oscinis elegans* DESVOIDY), the first species, by present designation. Not *Meckelia* LEUCKART, 1828. Equals **Ceroxys** MACQUART, 1835.

Medetera FISCHER, Programme Not. Mouche Carn., p. 11, 1819.* 1 species. Type, *Musca diadema* LINNÆUS (as *carnivorus*, new species). Syn., *Hydrophorus* FALLEN, 1823; *Taxhobates* HALIDAY, 1831; *Orthobates* WAHLBERG, 1844; *Anorthus* LOEW, 1850; *Oligochætus* MIK, 1878.

Medina DESVOIDY, Essai Myod., p. 138, 1830. 4 species (as 6). Type, *Tachina collaris* FALLEN (as *cylindrica*, new species), the second species, by present designation. Syn., *Degeeria* MEIGEN, 1838; *Amedoria* BRAUER and BERGENSTAMM, 1889.

Megacyttarus BIGOT, Bull. Soc. Ent. France for 1880, p. 47, 1880. 1 species. Type, *Rhamphomyia limbata* LOEW (as *argenteus*, new species). Equals **Dionnæa** MEIGEN, 1800.

Megaglossa RONDANI, Bull. Soc. Ent. Ital., vol. 1, p. 32, 1869. Change of name for *Platystoma* MEIGEN, 1803, not of KLEIN, 1753 (pre-Linnæan and not since used in the Mollusca). Type, *Musca seminationis* LINNÆUS. Equals **Platystoma** MEIGEN, 1803.

Megalomyia BIGOT, Bull. Soc. Ent. France for 1880, p. 5, 1880. 2 species. Type, *Acanthomera seticornis* WIEDEMANN, the first species, by present designation. Equals **Pantophthalmus** THUNBERG, 1819.

Megamerina RONDANI, Dipt. Ital. Prodr., vol. 4, p. 10, 1861. Change of name for *Lissa* MEIGEN, 1826, not of LEACH, 1815. Type, *Ocyptera dolium* FABRICIUS. Syn., *Lissa* MEIGEN, 1826, preoccupied.

Megametopon GIGLIO-TOS, Boll. Mus Zool. Univ. Torino, vol. 6, No. 108, p. 5, Sept. 20, 1891. No species. In Mem. Acad. Sci. Torino for 1892, 1 species. Type, *Ophromyia nasica* WILLISTON. Syn., *Ophromyia* WILLISTON, December, 1891.

Megaparia WULP, Biol. Centr.-Amer., Dept., vol. 2, p. 240, 1891. 1 species. Type, *Megaparia venosa* WULP.

Megaphthalma BECKER, Berliner Ent. Zeitschr., vol. 39, p. 105, 1894. 2 species. Type, *Cordilura pallida* FALLEN, the first species, by original designation.

Megapollyon WALKER, List Dipt. Brit. Mus., vol. 6, p. 452, 1854. 13 species. Type, *Microstylum acutirostre* LOEW, the first species, by present designation. Equals **Microstylum** MACQUART, 1838.

Megaprosopus MACQUART, Dipt. Exot., vol. 2, pt. 3, p. 83, 1843. 1 species. Type, *Megaprosopus rufiventris* MACQUART.

Megarhina ST. FARGEAU and SERVILLE, Encycl. Meth., vol. 10, pt. 2, p. 585, 1828. 1 species. Type, *Limnobia longirostris* MEIGEN. Syn., *Helius* ST. FARGEAU and SERVILLE, 1828; *Leptorhina* STEPHENS, 1829; *Rhamphidia* MEIGEN, 1830.

Megarhinus DESVOIDY, Mem. Soc. Hist. Nat. Paris, vol. 3, p. 412, 1827. 1 species. Type, *Culex hæmorrhoidalis* FABRICIUS. Syn., *Lynchiella* LAHILLE, 1904.

Megaselia RONDANI, Dipt. Ital. Prodr., vol. 1, p. 137, 1856. 1 species. Type, *Phora costalis* VON ROSER (as *crassineura*, new species). Syn., *Trisometopia* LIOY, 1864; *Aphiochæta* BRUES, 1903.

Meghyperus LOEW, Ent. Zeit. Stettin, vol. 11, p. 303, 1850. 1 species. Type, *Meghyperus sudeticus* LOEW.

Megistopoda MACQUART, Ann. Soc. Ent. France for 1852, p. 332, 1852. 1 species. Type, *Megistopoda pilatei* MACQUART.

Megistostylus BIGOT, Ann. Soc. Ent. France for 1859, p. 215, 1859. 1 species. Type, *Psilopus crinicornis* WIEDEMANN.

Meigenia DESVOIDY, Essai Myod., p. 198, 1830. 2 species (as 11). Type, *Tachina floralis* FALLEN (equals the last four supposed species), by designation of DESVOIDY, Hist. Nat. Dipt., vol. 1, 1863, p. 1065. Syn., *Spylosia* RONDANI, 1856; *Diplomera* LIOY, 1864; *Tenuicera* PANDELLE, 1896.

Meigeniella COQUILLETT, Proc. U. S. Nat. Mus., vol. 25, p. 104, 1902. 1 species. Type, *Meigeniella hinei* COQUILLETT.

Melaleuca WULP, Biol. Centr.-Amer., Dept., vol. 2, p. 247, 1891. 1 species. Type, *Melaleuca spectabilis* WULP.

Melanochelia RONDANI, Atti Soc. Ital. Sci. Nat., vol. 9, p. 5, 1866. 1 species. Type, *Limnophora exsurda* PANDELLE (as *Aricia surda* ZETTERSTEDT) Equals **Limnophora** DESVOIDY, 1830.

Melanoconion THEOBALD, Monogr. Culic., vol. 3, p. 238, 1903. 6 species. Type, *Culex atratus* THEOBALD, the first species, by designation of DYAR, Proc. Ent. Soc. Washington, vol. 7, 1905, p. 49. Syn., *Mochlostyrax* DYAR and KNAB, April 15, 1906.

Melanodexia WILLISTON, N. Amer. Fauna, No. 7, p. 256, 1893. 1 species. Type, *Melanodexia tristis* WILLISTON.

Melanogaster RONDANI, Dipt. Ital. Prodr., vol. 2, p. 166, 1857. 4 species. Type, *Melanogaster nubilis* RONDANI, the first species, by present designation. Equals **Chrysogaster** MEIGEN, 1800.

Melanophora MEIGEN, Illiger's Mag., vol. 2, p. 279, 1803. 1 species. Type, *Musca roralis* LINNÆUS (as *grossificationis* FABRICIUS). Syn., *Pogkullia* DESVOIDY, 1830; *Illigeria* DESVOIDY, 1830.

Melanophrys WILLISTON, Trans. Amer. Ent. Soc., vol. 13, p. 305, 1886. 1 species. Type, *Tachina insolita* WALKER (as *flavipennis*, new species). Syn., *Atropharista* TOWNSEND, 1892.

Melanostoma SCHINER, Wien. Ent. Monatschr., vol. 4, p. 213, 1860. 1 species. Type, *Musca mellina* LINNÆUS.

Melieria DESVOIDY, Essai Myod., p. 715, 1830. 5 species. Type, *Musca crassipennis* FABRICIUS (as *gangrenosa* DESVOIDY), the first species, by designation of RONDANI, Dipt. Ital. Prodr., vol. 1, 1856, p. 108.

Melina DESVOIDY, Essai. Myod., p. 695, 1830. 1 species. Type, *Melina riparia* DESVOIDY. Equals **Chetocera** DESVOIDY, 1830.

Melinda DESVOIDY, Essai Myod., p. 439, 1830. 2 species (as 7). Type, *Musca cognata* MEIGEN (equals six of the supposed species), by present designation. Equals **Onesia** DESVOIDY, 1830.

Melithreptus LOEW, Isis von Oken for 1840, p. 577, 1840. Change of name for *Sphærophoria* St. FARGEAU and SERVILLE, 1828, because of nearly identical older names. Type, *Musca scripta* LINNÆUS. Equals **Sphærophoria** St. FARGEAU and SERVILLE, 1828.

Melitrophus WALKER, Ins. Britt., Dipt., vol. 3, p. xxi, 1856. Change of name for *Melithreptus* LOEW, 1840, preoccupied by a genus of birds. Type, *Musca scripta* LINNÆUS. Equals **Sphærophoria** St. FARGEAU and SERVILLE, 1828.

Melophagus LATREILLE, Hist. Nat. Crust. et Ins., vol. 3, p. 466, 1802. 1 species. Type, *Hippobosca ovina* LINNÆUS. Syn., *Melophila* NITZSCH, 1818.

Melophila NITZSCH, Germ. Mag. Ent., vol. 3, p. 311, 1818. 1 species. Type, *Hippobosca ovina* LINNÆUS. Equals **Melophagus** LATREILLE, 1802.

Melpia WALKER, Ins. Saund., Dipt., p. 8, 1850. 9 species. Type, *Pangonius fulvithorax* WIEDEMANN, the third species, by present designation. Equals **Pangonius** LATREILLE, 1802.

Melusina MEIGEN, Nouv. Class. Mouch., p. 19, 1800.* No species. *Atractocera* MEIGEN, 1803, is a change of name. Type, *Simulium ornatum* MEIGEN. Syn., *Simulium* LATREILLE, 1802; *Atractocera* MEIGEN, 1803.

Merapioidus BIGOT, Bull. Soc. Ent. France for 1879, p. 50, 1879. 1 species. Type, *Merapioidus villosus* BIGOT.

Meriania DESVOIDY, Essai Myod., p. 69, 1830. 2 species (as 3). Type, *Musca puparum* FABRICIUS (as *silvatica*, new species), the first species, by designation of DESVOIDY, Hist. Nat. Dipt., vol. 1, p. 169, 1863. Syn., *Platychira* RONDANI, 1856.

Mericia DESVOIDY, Essai Myod., p. 64, 1830. 1 species. Type, *Mericia erigonea* DESVOIDY. Equals **Ernestia** DESVOIDY, 1830.

Merodina MACQUART, Hist. Nat., Dipt., vol. 2, p. 378, 1835. 1 species. Type, *Dacus podagrica* FABRICIUS. Equals **Richardia** DESVOIDY, 1830.

Merodon MEIGEN, Illiger's Mag., vol. 2, p. 274, 1803. 2 species. Type, *Syrphus clavipes* FABRICIUS (as *curvipes* FABRICIUS), the second species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 137. Equals **Lampetia** MEIGEN, 1800.

Meromacrus RONDANI, Studi Ent., vol. 1, p. 70, 1848. 1 species. Type, *Meromacrus ghilianii* RONDANI. Syn., *Plagiocera* MACQUART, 1842, preoccupied; *Pteroptila* LOEW, 1865.

Meromyza MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 6, p. 163, 1830. 3 species. Type, *Musca saltatrix* LINNÆUS, the third species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 147.

Meroplius RONDANI, Bull. Soc. Ent. Ital., vol. 6, p. 170, 1874. 1 species. Type, *Nemopoda stercoraria* DESVOIDY. Equals **Nemopoda** DESVOIDY, 1830.

Merosargus LOEW, Verh. Zool.-Bot. Ges. Wien, vol. 5, p. 144, 1855. 4 species. Type, *Sargus obscurus* WIEDEMANN, the third species, by original designation.

Mesembrina MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 5, p. 10, 1826. 2 species. Type, *Musca meridiana* LINNÆUS, the first species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 141. Syn., *Metamesembrina* TOWNSEND, 1908.

Mesembrinella GIGLIO-TOS, Boll. Mus. Zool. Univ. Torino, vol. 8, No. 147, p. 4, 1893. 1 species. Type, *Mesembrinella bicolor* GIGLIO-TOS.

Mesembrius RONDANI, Dipt. Ital. Prodr., vol. 2, p. 50, 1857. 1 species. Type, *Helophilus peregrinus* LOEW. Equals **Helophilus** MEIGEN, 1822.

Mesogramma LOEW, Berliner Ent. Zeitschr., vol. 9, p. 157, 1865. 12 species. Type, *Syrphus gurgus* WALKER (as *parcula*, new species), the first species, by designation of WILLISTON, Synops. N. Amer. Syrph., 1886, p. 98. Equals **Toxomerus** MACQUART, 1855.

Mesograpta LOEW, Berliner Ent. Zeitschr., vol. 16, p. 290, 1872. Change of name for *Mesogramma* LOEW, 1865, under the mistaken idea that the latter is preoccupied by a genus of plants. Type, *Syrphus gurges* WALKER. Equals **Toxomerus** MACQUART, 1855.

Mesophila WALKER, List Dipt. Brit. Mus., vol. 4, p. 1157, 1849. 1 species. Type, *Ceratophya fuscipennis* MACQUART. Equals **Microdon** MEIGEN, 1803.

Mesorhaga SCHINER, Reise *Novara*, Zool., vol. 2, Dipt., p. 217, 1868. 1 species. Type, *Mesorhaga tristis* SCHINER. Syn., *Aptorthus* ALDRICH, 1893.

Messala CURTIS, Brit. Ent., p. 581, 1836. 1 species. Type, *Macrocera hybrida* MEIGEN (as *saundersii*, new species). Equals **Bolitophila** MEIGEN, 1818.

Metachæta COQUILLETT, Journ. N. Y. Ent. Soc., vol. 3, p. 98, 1895. 1 species. Type, *Tachina helymus* WALKER (as *atra*, new species).

Metachela COQUILLETT, Proc. Ent. Soc. Washington, vol. 5, p. 253, 1903. 1 species. Type, *Hemerodromia collusor* MELANDER.

Metacosmus COQUILLETT, West. Amer. Sci., vol. 7, p. 220, 1891. 1 species. Type, *Metacosmus exilis* COQUILLETT.

Metadexia COQUILLETT, Journ. N. Y. Ent. Soc., vol. 7, p. 220, 1899. 1 species. Type, *Metadexia tricolor* COQUILLETT.

Metadiplosis FELT, 23d Rep. State Ent. N. Y., p. 406, 1908. 1 species. Type, *Metadiplosis spinosa* FELT.

Metadoria BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 60, p. 117, 1893. 1 species. Type, *Phorocera barbata* BIGOT (as *mexicana*, new species). Syn., *Hemiargyra* TOWNSEND, 1908.

Metamesembrina TOWNSEND, Smiths. Misc. Coll., vol. 51, p. 50, 1908. 1 species. Type, *Musca meridiana* LINNÆUS. Equals **Mesembrina** MEIGEN, 1826.

Metapelastoneurus ALDRICH, Kansas Univ. Quart., vol. 2, p. 152, 1894. 1 species. Type, *Metapelastoneurus kansensis* ALDRICH. Equals **Pelastoneurus** LOEW, 1861.

Metaphragma COQUILLETT, Journ. N. Y. Ent. Soc., vol. 2, p. 97, 1894. 1 species. Type, *Xestomyza planiceps* LOEW.

Metaphyto COQUILLETT, Rev. Tach., p. 36, 1897. 1 species. Type, *Metaphyto genalis* COQUILLETT.

Metaplagia COQUILLETT, Journ. N. Y. Ent. Soc., vol. 3, p. 102, 1895. 1 species. Type, *Metaplagia occidentalis* COQUILLETT.

Metapogon COQUILLETT, Proc. Ent. Soc. Washington, vol. 6, p. 181, 1904. 2 species. Type, *Metapogon gilvipes* COQUILLETT, the first species, by original designation.

Metatrichia COQUILLETT, Ent. News., vol. 11, p. 500, 1900. 1 species. Type, *Scenopinus bulbosus* OSTEN SACKEN.

Methypostena TOWNSEND, Smiths. Misc. Coll., vol. 51, p. 67, 1908. 1 species. Type, *Hypostena barbata* COQUILLETT. Equals **Tachinophyto** TOWNSEND, 1892.

Metopia MEIGEN, Illiger's Mag., vol. 2, p. 280, 1803. 1 species. Type, *Musca leucocephala* Rossi. Syn., *Ophelia* DESVOIDY, 1830; *Araba* DESVOIDY, 1830; *Argyria* DESVOIDY, 1863; *Argyrella* DESVOIDY, 1863; *Arabella* DESVOIDY, 1863; *Anicia* DESVOIDY, 1863.

Metopilla RONDANI, Dipt. Ital. Prodr., vol. 3, p. 210, 1859. Originally published as a synonym of *Heteropterina* MACQUART, with 1 species. Type, *Heteropterina multipunctata* RONDANI. Equals **Taxigramma** PERRIS, 1852.

Metopina MACQUART, Hist. Nat., Dipt., vol. 2, p. 666, 1835. 1 species. Type, *Phora galeata* HALIDAY. Syn., *Leptophora* SIX, 1878; *Drepanophora* STROBL, 1880.

Metriocnemus WULP, Tijdschr. Ent., vol. 17, p. 136, 1874. 6 species. Type, *Chironomus albolineatus* MEIGEN, the first species, by present designation.

Miastor MEINERT, Nat. Tidsskr. for 1864, p. 42, 1864.* 1 species. Type, *Miastor metraloas* MEINERT.

Micetoica RONDANI, Dipt. Ital. Prodr., vol. 4, p. 12, 1861. Change of name for *Mycetobia* MEIGEN, 1818, under the mistaken idea that it is preoccupied by Mycetobia DUMERIL, 1806, used for a section in Coleoptera. Type, *Mycetobia pallipes* MEIGEN. Equals **Mycetobia** MEIGEN, 1818.

Michogaster MACQUART, Hist. Nat., Dipt., vol. 2, p. 483, 1835. 3 species. Type, *Cephalia femoralis* WIEDEMANN, the first species, by designation of SCHINER, Reise *Novara*, Zool., vol. 2, 1868, p. 255. Syn., *Conopsida* MACQUART, 1851.

Micraëdes COQUILLETT, Proc. Ent. Soc. Washington, vol. 7, p. 185, 1906. 1 species. Type, *Micraëdes bisulcatus* COQUILLETT.

Micraptoma WESTWOOD, Intr., vol. 2, Synops., p. 136, 1840. 1 species. Type, *Musca segnis* LINNÆUS. Equals **Zelima** MEIGEN, 1800.

Microcera MEIGEN, Illiger's Mag., vol. 2, p. 273, 1803. No species. In his Syst. Beschr., vol. 4, 1824, p. 19, he states that it equals *Pipunculus* LATREILLE, 1802. Type, *Pipunculus campestris* LATREILLE. Equals **Dorilas** MEIGEN, 1800.

Microcera ZETTERSTEDT, Ins. Lapp., p. 572, 1838. 1 species. Type, *Heleodromia immaculata* HALIDAY (as *rostrata*, new species). Not *Microcera* MEIGEN, 1803. Equals **Heleodromia** HALIDAY, 1833.

Microcera LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 906, 1864. 1 species (as 2). Type, *Musca ciliata* FABRICIUS. Equals **Hydrotæa** DESVOIDY, 1830.

Microchætina WULP, Biol. Centr.-Amer., Dipt., vol. 2, p. 240, 1891. 1 species. Type, *Microchætina cinerea* WULP.

Microcheilosia MACQUART, Ann. Soc. Ent. France for 1855, p. 183, 1855. 1 species. Type, *Microcheilosia nitida* MACQUART. Equals **Rhinophora** DESVOIDY, 1830.

Microchira BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 60, p. 128, 1893. 1 species. Type, *Microchira mexicana* BRAUER and BERGENSTAMM. Equals **Paradidyma** BRAUER and BERGENSTAMM, 1891.

Microchrysa LOEW, Verh. Zool.-Bot. Ges. Wien, vol. 5, p. 146, 1855. 1 species. Type, *Musca polita* LINNÆUS. Equals **Chrysomyia** MACQUART, 1834.

Microdon MEIGEN, Illiger's Mag., vol. 2, p. 275, 1803. 1 species. Type, *Musca mutabilis* LINNÆUS. Syn., *Aphritis* LATREILLE, 1805; *Ceratophya* WIEDEMANN, 1824; *Chymophila* MACQUART, 1834; *Dimeraspis* NEWMAN, 1838; *Mesophila* WALKER, 1849; *Ubristes* WALKER, 1852.

Microdromya BIGOT, Ann. Soc. Ent. France for 1857, p. 557, 1857. No species. The characters given apply to *Tachydromia oratorio* FALLEN, which may be taken as the type. Type *Tachydromia oratorio* FALLEN.

Micropalpis MACQUART, Rec. Trav. Soc. Sci. Lille for 1834, p. 316, 1834. 6 supposed species. Type, *Tachina comta* FALLEN (the first, third, and fourth supposed species), by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 138 (as *fulgens* MEIGEN). Equals **Bonnetia** DESVOIDY, 1830.

Micropeza MEIGEN, Illiger's Mag., vol. 2, p. 276, 1803. 1 species. Type, *Musca corrigiolata* LINNÆUS. Equals **Tylos** MEIGEN, 1800.

Microphorus MACQUART, Ins. Dipt. Nord France, separata, p. 139, 1827. 3 supposed species. Type, *Microphorus velutinus* MACQUART, the second species, by designation of RONDANI, Dipt. Ital. Prodr., vol. 1, 1856, p. 151.

Microphthalma MACQUART, Dipt. Exot., vol. 2, pt. 3, p. 84, 1843. 1 species. Type, *Tachina disjuncta* WIEDEMANN (as *nigra*, new species). Syn., *Amesia* DESVOIDY, 1863.

Microprosopa BECKER, Berliner Ent. Zeitschr., vol. 39, p. 147, 1894. 9 species. Type, *Cordilura hæmorrhoidalis* MEIGEN, the eighth species, by original designation.

Microstylum MACQUART, Dipt. Exot., vol. 1, pt. 2, p. 26, 1838. 10 species. Type, *Dasypogon venosus* WIEDEMANN, the first species, by designation of BACK, Trans. Amer. Ent. Soc., vol 35, p. 213, 1909. Syn., *Megapollyon* WALKER, 1854.

Microtachina MIK, Wien. Ent. Zeit., vol. 11, p. 116, 1892. 1 species. Type, *Tachina nympharum* RONDANI. Equals **Exorista** MEIGEN, 1803.

Microtrichomma GIGLIO-TOS, Boll. Mus. Zool. Univ. Torino, vol. 8, no. 158, p. 1, 1893. 3 species. Type, *Nemoræa forreri* WULP, the first species, by present designation. Equals **Arthrochæta** BRAUER and BERGENSTAMM, 1889.

Mikimyia BIGOT, Bull. Soc. Ent. France for 1884, p. 29, 1884. 1 species. Type, *Toxotrypana curvicauda* GERSTÆCKER (as *furcifera*, new species). Equals **Toxotrypana** GERSTÆCKER, 1860.

Milesia LATREILLE, Hist. Nat. Crust. et Ins., vol. 14, p. 361, 1805. 2 species. Type, *Musca diophthalma* LINNÆUS, the first species, by designation of RONDANI, Nuovi Ann. Sci. Nat. (Bologna), 1844, p. 455. Equals **Spilomyia** MEIGEN, 1803. (*Milesia* of authors equals *Sphixea* RONDANI).

Milesiformis RONDANI, Nuovi Ann. Sci. Nat. (Bologna) for 1844, p. 454, 1844. 1 species. Type, *Musca scita* HARRIS (as *milesiformis* FALLEN). Equals **Tropidia** MEIGEN, 1822.

[**Milichia** MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 6, p. 131, 1830. 2 species. Type, *Milichia speciosa* MEIGEN, the first species, by designation of WESTWOOD, Intr., vol. 2, 1840, Synops. p. 151. Not American.] (The American species belong to *Rhynchomilichia* HENDEL.)

Milichiella GIGLIO-TOS, Ann. Soc. Ent. France for 1895, p. 367, 1895. 1 species. Type, *Milichiella tosi* BECKER (as *Tephritis argentea* FABRICIUS). Syn., *Ophthalmomyia* WILLISTON, 1896; *Stenoporomyia* HENDEL, 1903.

Mima MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 2, p. 175, 1820. 1 species. Type, *Anthrax phæoptera* MEIGEN. Syn., *Exoprosopa* MACQUART, 1840; *Litorhynchus* MACQUART, 1840; *Trinaria* MULSANT, 1852; *Argyrospyla* RONDANI, 1856; *Heteralonia* RONDANI, 1864; *Defilippia* LIOY, 1864.

Mimosciara RONDANI, Mem. Sec. Ditt. Ital., p. 25, 1840.* 2 species. Type, *Mimosciara molobrina* RONDANI, the first species, by present designation. Equals **Lestremia** MACQUART, 1826.

Minettia DESVOIDY, Essai Myod., p. 646, 1830. 7 species. Type, *Musca longipennis* FABRICIUS (as *luctuosa*, new species), the first species, by present designation. Equals **Sapromyza** FALLEN, 1810.

Misgomyia COQUILLETT, Proc. Ent. Soc. Washington, vol. 9, p. 145, 1908. 1 species. Type, *Misgomyia obscura* COQUILLETT.

Mixogaster MACQUART, Dipt. Exot., vol. 2, pt. 2, p. 14, 1842. 1 species. Type, *Mixogaster conopsoides* MACQUART.

Mixtemyia MACQUART, Hist. Nat., Dipt., vol. 1, p. 491, 1834. 1 species. Type, *Paragus quadrifasciatus* SAY. Equals **Spilomyia** MEIGEN, 1803.

Mochlonyx LOEW, Ent. Zeit. Stettin, vol. 5, p. 121, 1844. 1 species. Type, *Corethra velutina* RUTHE. Equals **Corethra** MEIGEN, 1803.

Mochlosoma BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 56, p. 126, 1889. 1 species. Type, *Mochlosoma validum* BRAUER and BERGENSTAMM.

Mochlostyrax DYAR and KNAB, Journ. N. Y. Ent. Soc., vol. 14, p. 223, 1906. 6 species. Type, *Mochlostyrax caudelli* DYAR and KNAB, the fifth species, by original designation. Equals **Melanoconion** THEOBALD, July 25, 1903.

Mochtherus LOEW, Linn. Ent., vol. 4, p. 58, 1849. 7 species. Type, *Asilus pallipes* MEIGEN, the fifth species, by present designation. Not *Mochtherus* SCHMIDT-GOEBEL, 1846. Equals **Heligmonevra** BIGOT, 1858.

Molobrus LATREILLE, Hist. Nat. Crust. et Ins., vol. 14, p. 288, 1805. 1 species. Type, *Tipula thomæ* LINNÆUS (as the "Tipule de Thomas"). Equals **Lycoria** MEIGEN, 1800.

Molophilus CURTIS, Brit. Ent., p. 444, 1833. 1 species. Type, *Erioptera atra* MEIGEN (as *brevipennis*, new species).

Molynocœlia GIGLIO-TOS, Boll. Mus. Zool. Univ. Torino, vol. 8, No. 158, p. 11, 1893. 1 species. Type, *Molynocœlia lutea* GIGLIO-TOS.

Mongoma WESTWOOD, Trans. Ent. Soc. Lond. for 1881, p. 364, 1881. 1 species. Type, *Mongoma fragillima* WESTWOOD.

Morellia DESVOIDY, Essai Myod., p. 405, 1830. 3 species (as 4). Type, *Musca hortorum* FALLEN (as *agilis* and *horticola*, new species), the first species, by present designation. Syn., *Alina* DESVOIDY, 1863; *Camilla* DESVOIDY, 1863.

Morimna WALKER, Ins. Saund., Dipt., p. 104, 1851. 1 species. Type, *Morimna mallophorides* WALKER. Equals **Lastaurus** LOEW, 1851.

Morinia DESVOIDY, Essai Myod., p. 264, 1830. 2 species (as 5). Type, *Musca melanoptera* FALLEN (as *velox*, new species), the first species, by designation of RONDANI, Dipt. Ital. Prodr., vol. 5, 1862, p. 159. Syn., *Anthracomya* RONDANI, 1856.

Morphomya RONDANI, Dipt. Ital. Prodr., vol. 1, p. 83, 1856. 1 species. Type, *Musca tachinoides* FALLEN.

Moschusa DESVOIDY, Hist. Nat. Dipt., vol. 2, p. 139, 1863. 1 species. Type, *Tachina polyodon* MEIGEN. Equals **Amobia** DESVOIDY, 1830.

Mosillus LATREILLE, Hist. Nat. Crust. et Ins., vol. 14, p. 389, 1805. 1 species. Type, *Syrphus subsultans* FABRICIUS (as *arcuatus*, new species). Syn., *Gymnopa* FALLEN, 1820; *Glabrinus* RONDANI, 1856.

Mosina DESVOIDY, Essai Myod., p. 670, 1830. 7 species. Type, *Musca pubera* LINNÆUS, the first species, by present designation. Equals **Cordilura** FALLEN, 1810.

Mufetia DESVOIDY, Essai Myod., p. 431, 1830. 1 species. Type, *Mufetia autissiodorensis* DESVOIDY. Equals **Calliphora** DESVOIDY, 1830.

Mulsantia DESVOIDY, Hist. Nat. Dipt., vol. 2, p. 557, 1863. 4 species (as 30). Type, *Sarcophaga hæmorrhoa* MEIGEN (as *campestris*, new species), the first species, by present designation. Equals **Hartigia** DESVOIDY, 1863.

Murana MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 4, p. 223, 1824. 1 species. Type, *Trixa alpina* MEIGEN. Equals **Trixa** MEIGEN, 1824.

Musca LINNÆUS, Syst. Nat., 10th ed., p. 589, 1758. 100 species. Type, *Musca domestica* LINNÆUS, the fifty-fourth species, by designation of MACQUART, Ins. Dipt. Nord France, Ather., 1834, p. 20. Syn., *Plaxemya* DESVOIDY, 1830; *Byomya* DESVOIDY, 1830.

Muscina DESVOIDY, Essai Myod., p. 406, 1830. 4 species (as 6). Type, *Musca stabulans* FALLEN, the second species, by present designation. Syn , *Blissomia* DESVOIDY, 1863; *Pararicia* BRAUER and BERGENSTAMM, 1891.

Musciosoma LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 908, 1864. Change of name for *Hylemya* DESVOIDY, 1830, under the mistaken impression that it is too near *Hyalomya* DESVOIDY, 1830. Type, *Musca strigosa* FABRICIUS. Equals **Hylemya** DESVOIDY, 1830.

Muscopteryx TOWNSEND, Can. Ent., vol. 24, p. 170, 1892. 1 species. Type, *Muscopteryx chætosula* TOWNSEND.

Mutiloptera COQUILLETT, Proc. Ent. Soc. Washington, vol. 9, p. 147, 1908. 1 species. Type, *Mutiloptera apicalis* COQUILLETT.

Mya RONDANI, Nuovi Ann. Sci. Nat. (Bologna) for 1850, p. 175, 1850. 3 species. Type, *Musca segmentaria* FABRICIUS, the third species, by present designation. Equals **Lucilia** DESVOIDY, 1830.

Myantha RONDANI, Dipt. Ital. Prodr., vol. 1, p. 95, 1856. 1 species. Type, *Musca canicularis* LINNÆUS. Equals **Fannia** DESVOIDY, 1830.

Mycetaulus LOEW, Dipt. Beitr., vol. 1, p. 37, 1845. 1 species. Type, *Geomyza bipunctata* FALLEN (as *hoffmeisteri*, new species). Syn., *Brachygaster* MEIGEN, 1826, preoccupied.

Mycetia DESVOIDY, Essai Myod., p. 805, 1830. 5 species. Type, *Copromyza equina* FALLEN (as *vulgaris*, new species), the fourth species, by present designation. Equals **Copromyza** FALLEN, 1810.

Mycetina RONDANI, Dipt. Ital. Prodr., vol. 1, p. 195, 1856. 1 species. Type, *Mycetophila flavipes* MACQUART. Not *Mycetina* MULSANT, 1846. Equals **Fungivora** MEIGEN, 1800.

Mycetobia MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 1, p. 229, 1818. 2 species. Type, *Mycetobia pallipes* MEIGEN, the first species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 127. Syn., *Micetoica* RONDANI, 1861.

Mycetophila MEIGEN, Illiger's Mag., vol. 2, p. 263, 1803. 2 species. Type, *Mycetophila agarici* OLIVIER, the second species, by designation of JOHANNSEN, Gen. Ins., Dipt., Mycet., p. 116, 1909. Equals **Fungivora** MEIGEN, 1800.

Mycodiplosis RÜBSAAMEN, Ent. Nach., vol. 21, p. 186, 1895. 1 species. Type, *Diplosis coniophaga* WINNERTZ.

Mycomya RONDANI, Dipt. Ital. Prodr., vol. 1, p. 194, 1856. 1 species. Type, *Sciophila marginata* MEIGEN.

Mycothera WINNERTZ, Verh. Zool.-Bot. Ges. Wien, vol. 13, p. 913, 1863. 2 species. Type, *Mycetophila dimidiata* STÆGER, the first species, by designation of JOHANNSEN, Gen. Ins., Dipt., Mycet., 1909, p. 111.

Mycozetæa RONDANI, Dipt. Ital. Prodr., vol. 4, p. 12, 1861. Change of name for *Mycetina* RONDANI, 1856, not of MULSANT, 1846. Type, *Mycetophila flavipes* MACQUART. Equals **Fungivora** MEIGEN, 1800.

Mydæa DESVOIDY, Essai Myod., p. 479, 1830. 7 species (as 9). Type, *Musca pagana* FABRICIUS (as *scutellaris*, new species), the fifth species, by designation of COQUILLETT, Journ. N. Y. Ent. Soc., vol. 9, 1901, p. 139. Syn., *Aricia* DESVOIDY, 1830; *Helina* DESVOIDY, 1830; *Mydina* DESVOIDY, 1830; *Spilogaster* MACQUART, 1835; *Myospila* RONDANI, 1856; *Yetodesia* RONDANI, 1861; *Aspilia* RONDANI, 1866.

Mydas FABRICIUS, Ent. Syst., vol. 4, p. 252, 1794. 3 species. Type, *Musca clavata* DRURY, the first species, by designation of LATREILLE, Consid. Général., 1810, p. 443. Syn., *Phyllomydas* BIGOT, 1880.

Mydina DESVOIDY, Essai Myod., p. 495, 1830. 16 species (as 22). Type, *Musca quadrum* FABRICIUS (as *dispar*, new species), the fourth species, by designation of COQUILLETT, Journ. N. Y. Ent. Soc., vol. 9, 1901, p. 139. Equals **Mydæa** DESVOIDY, 1830.

Myelaphus BIGOT, Bull. Soc. Ent. France for 1882, p. 91, 1882. 1 species. Type, *Myelaphus melas* BIGOT.

Myennis DESVOIDY, Essai Myod., p. 717, 1830. 1 species. Type, *Musca octopunctata* COQUEBERT (as *fasciata*, new species).

Myiomima BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 56, p. 119, 1889. 1 species. Type, *Myiomima sarcophagina* BRAUER and BERGENSTAMM.

Myiopharus BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 56, p. 161, 1889. 1 species. Type, *Myiopharus metopia* BRAUER and BERGENSTAMM.

Myiophasia BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 58, p. 362, 1891. 1 species. Type, *Clytia atra* DESVOIDY (as *Tachina ænea* WIEDEMANN, 1830, not of MEIGEN, 1824). Syn., *Phasioclista* TOWNSEND, 1891; *Ennyomma* TOWNSEND, 1891.

Myioscotiptera GIGLIO-TOS, Boll. Mus. Zool. Univ. Torino, vol. 8, No. 147, p. 2, 1893. 1 species. Type, *Myioscotiptera cincta* GIGLIO-TOS.

Myobia DESVOIDY, Essai Myod., p. 98, 1830. 2 species (as 7). Type, *Tachina inanis* FALLEN (equals the first three and last two supposed species), by designation of

WESTWOOD, Intr., vol. 2, 1840, Synops., p. 139. Not *Myobia* HEYDEN, 1826. Equals **Leskia** DESVOIDY, 1830.

Myocera DESVOIDY, Essai Myod., p. 328, 1830. 2 species (as 6). Type, *Musca ferina* FALLEN, the first two supposed species, by designation of BRAUER, Verh. Zool.-Bot. Ges. Wien, vol. 43, 1893, p. 507. Equals **Phorostoma** DESVOIDY, 1830.

Myochrysa RONDANI, Dipt. Ital. Prodr., vol. 4, p. 11, 1861. Change of name for *Chrysomyia* MACQUART, 1834, under the mistaken impression that it is preoccupied by *Chrysomya* DESVOIDY, 1830. Type, *Musca polita* LINNÆUS. Equals **Chrysomyia** MACQUART, 1834.

Myodina DESVOIDY, Essai Myod., p. 727, 1830. 1 species. Type, *Musca vibrans* LINNÆUS (as *urticæ* FABRICIUS). Equals **Ortalis** FALLEN, 1810.

Myoleja RONDANI, Dipt. Ital. Prodr., vol. 1, p. 112, 1856. 1 species. Type, *Tephritis lucida* FALLEN. Equals **Acidia** DESVOIDY, 1830.

Myolepta NEWMAN, Ent. Mag., vol. 5, p. 373, 1838. 1 species. Type, *Musca luteola* GMELIN. Syn. *Xylotæja* RONDANI, 1844.

Myopa FABRICIUS, Syst. Ent., p. 798, 1775. 4 species. Type, *Conops buccata* LINNÆUS, the fourth species, by designation of CURTIS, Brit. Ent., 1838, p. 677. Equals **Stomoxoides** SCHÆFFER, 1766.

Myopella DESVOIDY, Dipt. Env. Paris, Myop., p. 19, 1853.* 3 species (as 9). Type, *Myopa stigma* MEIGEN (equals the last three supposed species), by present designation. Equals **Stomoxoides** SCHÆFFER, 1766.

Myophora DESVOIDY, Essai Myod., p. 337, 1830. Change of name for *Sarcophaga* MEIGEN, 1826, because all of the species are not flesh-eaters. Type, *Musca carnaria* LINNÆUS. Equals **Sarcophaga** MEIGEN, 1826.

Myopina DESVOIDY, Dipt. Env. Paris, Myop., p. 39, 1853.* 1 species. Type, *Myopa variegata* MEIGEN. Equals **Stomoxoides** SCHÆFFER, 1766.

Myospila RONDANI, Dipt. Ital. Prodr., vol. 1, p. 91, 1856. 1 species. Type, *Musca meditabunda* FABRICIUS. Equals **Mydæa** DESVOIDY, 1830.

Myothyria WULP, Biol. Centr.-Amer., Dipt., vol. 2, p. 208, 1890. 3 species. Type, *Myothyria majorina* WULP, the second species, by present designation.

Myrmecomya DESVOIDY, Essai Myod., p. 721, 1830. 2 species. Type, *Cephalia rufipes* MEIGEN (as *formicaria*, new species), the first species, by present designation. Equals **Cephalia** MEIGEN, 1826.

Mystacella WULP, Biol. Centr.-Amer., Dipt., vol. 2, p. 51, 1890. 12 species. Type, *Mystacella solita* WULP, the fifth species, by present designation.

Mystacomyia GIGLIO-TOS, Boll. Mus. Zool. Univ. Torino, vol. 8, No. 158, p. 4, 1893. 1 species. Type, *Mystacella rubriventris* WULP.

Mythicomyia COQUILLETT, Ent. News, vol. 4, p. 208, 1893. 1 species. Type, *Mythicomyia rileyi* COQUILLETT.

Myxexorista BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 58, p. 331, 1891. 9 species. Type, *Musca libatrix* PANZER, the eighth species, by designation of BRAUER and BERGENSTAMM, Verh. Zool.-Bot. Ges. Wien, vol. 43, 1893, p. 479. Equals **Zenilla** DESVOIDY, 1830.

Myxosargus BRAUER, Denkschr. Kais. Akad. Wiss. Wien, vol. 44, p. 77, 1882. 1 species. Type, *Myxosargus fasciatus* BRAUER.

Myzomyia BLANCHARD, Compt. Rend. Soc. Biol., vol. 54, p. 795, July 4, 1902. Change of name for *Grassia* THEOBALD, June 16, 1902, not of FISCH, 1885. Type, *Anopheles rossii* GILES. Syn., *Grassia* THEOBALD, June 16, 1902, preoccupied.

Myzorhynchella THEOBALD, Monogr. Culic., vol. 4, p. 78, 1907. 1 species. Type, *Myzorhynchella nigra* THEOBALD. Equals **Anopheles** MEIGEN, 1818.

Napæa DESVOIDY, Essai Myod., p. 799, 1830. 2 species. Type, *Ephydra coarctata* FALLEN (as *stagnicola*, new species), the first species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 153. Syn., *Parydra* STENHAMMAR, 1843; *Hygrophila* LIOY, 1864; *Falosoma* LIOY, 1864; *Ephydrosoma* LIOY, 1864.

Napomyza HALIDAY, in Westwood's Intr., vol. 2, Synops., p. 152, 1840. 1 species. Type, *Phytomyza elegans* MEIGEN (as *festina* MEIGEN). Syn., *Dinevra* LIOY, 1864.

Nausigaster WILLISTON, Trans. Amer. Ent. Soc., vol. 11, p. 33, 1883. 1 species. Type, *Nausigaster punctulata* WILLISTON.

Neæra DESVOIDY, Essai Myod., p. 84, 1830. 1 species. Type, *Tachina albicollis* MEIGEN (as *immaculata*, new species). Syn., *Thapsia* DESVOIDY, 1863; *Glaucophana* BRAUER and BERGENSTAMM, 1891.

Neaspilota OSTEN SACKEN, Cat. Dipt. N. Amer., p. 192, 1878. Change of name for *Aspilota* LOEW, 1873, not of FŒRSTER, 1862. Type, *Trypeta alba* LOEW. Syn., *Aspilota* LOEW, 1873, preoccupied.

Nebritus COQUILLETT, Journ. N. Y. Ent. Soc., vol. 2, p. 98, 1894. 1 species. Type, *Nebritus pellucidus* COQUILLETT.

Nematocera MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 1, p. 209, 1818. 1 species. Type, *Nematocera bicolor* MEIGEN. Equals **Hexatoma** LATREILLE, 1809.

Nematoproctus LOEW, Neue Beitr., vol. 5, p. 40, 1857. 2 species. Type, *Chrysotus distendens* MEIGEN (as *Porphyrops annulatus* MACQUART), the first species, by present designation.

Nemochæta WULP, Biol. Centr.-Amer., Dipt., vol. 2, p. 38, 1888. 1 species. Type, *Nemochæta dissimilis* WULP. Equals **Archytas** JÆNNICKE, 1867.

Nemopoda DESVOIDY, Essai Myod., p. 743, 1830. 5 species. Type, *Musca cylindrica* FABRICIUS (as *putris*, new species), the first species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 148. Syn., *Meroplius* RONDANI, 1874.

Nemoræa DESVOIDY, Essai Myod., p. 71, 1830. 2 species (as 6). Type, *Tachina pellucida* MEIGEN (equaling the first three supposed species), by designation of RONDANI, Dipt. Ital. Prodr., vol. 1, 1856, p. 64.

Nemosia LIOY, Atti Inst. Veneto, ser. 3, vol. 10, p. 78, 1864. 1 species. Type, *Phora incrassata* MEIGEN. Equals **Hypocera** LIOY, 1864.

Nemotelus GEOFFROY, Hist. Abrégée Ins., vol. 2, p. 542, 1762. 2 species (without names). Type, *Musca pantherina* LINNÆUS, the first species, by designation of LATREILLE, Consid. General., 1810, p. 442 (as *uliginosus* and *marginatus*).

Neoascia WILLISTON, Synops. N. Amer. Syrph., p. 111, 1886. Change of name for *Ascia* MEIGEN, 1822, not of SCOPOLI, 1777. Type, *Ascia floralis* MEIGEN. Syn., *Ascia* MEIGEN, 1822, preoccupied.

Neocerata COQUILLETT, Bull. 22, n. ser., Div. Ent., U. S. Dept. Agr., p. 47, 1900. 1 species. Type, *Neocerata rhodophaga* COQUILLETT.

Neochauna WILLISTON, Man. N. Amer., Dipt., p. 48, 1896. Change of name for *Chauna* LOEW, 1847, not of ILLIGER, 1811. Type, *Chauna variabilis* LOEW. Syn., *Chauna* LOEW, 1847, preoccupied.

Neocota COQUILLETT, Proc. U. S. Nat. Mus., vol. 18, p. 434, 1896. 1 species. Type, *Neocota weedi* COQUILLETT.

Neoculex DYAR, Proc. Ent. Soc. Washington, vol. 7, p. 45, 1905. 1 species. Type, *Culex territans* WALKER. Equals **Culex** LINNÆUS, 1758.

Neoëmpheria OSTEN SACKEN, Cat. Dipt. N. Amer., p. 9, 1878. Change of name for *Empheria* WINNERTZ, 1863, not of HAGEN, 1856. Type, *Sciophila striata* MEIGEN. Syn., *Empheria* WINNERTZ, 1863, preoccupied.

Neoëristicus OSTEN SACKEN, Cat. Dipt. N. Amer., p. 81, 1878. Change of name for *Eristicus* LOEW, 1848, not of WESMAEL, 1844. Type, *Asilus interruptus* MACQUART. Equals **Eicherax** BIGOT, 1857.

Neoëxaireta OSTEN SACKEN, Cat. Dipt. N. Amer., p. 44, 1878. Change of name for *Exaireta* SCHINER, 1867, under the mistaken impression that the latter is preoccupied. Type, *Xylophagus spiniger* WIEDEMANN. Equals **Exaireta** SCHINER, 1867.

Neofischeria TOWNSEND, Smiths. Misc. Coll., vol. 51, p. 74, 1908. 1 species. Type, *Demoticus venatoris* COQUILLETT (as *flava*, new species). Equals **Demoticus** MACQUART, 1854.

Neoglaphyroptera OSTEN SACKEN, Cat. Dipt. N. Amer., p. 10, 1878. Change of name of *Glaphyroptera* WINNERTZ, 1863, not of HEER, 1852. Type, *Leia fascipennis* MEIGEN. Equals *Leia* MEIGEN, 1818.

Neoidiotypa OSTEN SACKEN, Cat. Dipt. N. Amer., p. 187, 1878. Change of name for *Idiotypa* LOEW, 1873, not of FŒRSTER, 1856. Type, *Idiotypa appendiculata* LOEW. Syn., *Idiotypa* LOEW, 1873, preoccupied.

Neoitamus OSTEN SACKEN, Cat. Dipt. N. Amer., p. 82, 1878. Change of name for *Itamus* LOEW, 1849, not of SCHMIDT-GŒBEL, 1846. Type, *Asilus cyanurus* LOEW. Syn., *Itamus* LOEW, 1849, preoccupied.

Neolasioptera FELT, 23d Rep. State Ent. N. Y., p. 330, 1908. 32 species. Type, *Lasioptera vitinea* FELT, the seventh species, by present designation.

Neolimnophora SCHNABL, Zeitschr. Hym. Dipt., vol. 2, p. 94, 1902. 1 species. Type, *Melanochelia maritima* RÖDER. Equals **Limnophora** DESVOIDY, 1830.

Neomochtherus OSTEN SACKEN, Cat. Dipt. N. Amer., p. 82, 1878. Change of name for *Mochtherus* LOEW, 1849, not of SCHMIDT-GŒBEL, 1846. Type, *Asilus pallipes* MEIGEN. Equals **Heligmonevra** BIGOT, 1858.

Neopachygaster AUSTEN, Ent. Monthly Mag., vol. 12, p. 245, 1901. 1 species. Type, *Sargus pachygaster* FALLEN (as *Pachygaster meromelas* DUFOUR). Equals **Pachygaster** MEIGEN, 1803.

Neopales COQUILLETT. New name for *Pales* DESVOIDY, 1830, not of MEIGEN, 1800. Type, *Tachina processionex* RATZEBURG. Syn., *Pales* DESVOIDY, 1830, preoccupied.

Neophoneus WILLISTON, Psyche, vol. 5, p. 255, 1889. Change of name for *Phoneus* MACQUART, 1838, not of KAUP, 1829. Type, *Phoneus servillei* MACQUART. Syn., *Phoneus* MACQUART, 1838, preoccupied.

Neophyto TOWNSEND, Smiths. Misc. Coll., vol. 51, p. 55, 1908. 1 species (as 2). Type, *Phyto setosa* COQUILLETT.

Neoplasta COQUILLETT, Proc. U. S. Nat. Mus., vol. 18, p. 392, 1896. 1 species. Type, *Hemerodromia scapularis* LOEW.

Neoptera WULP, Biol. Centr.-Amer., Dipt., vol. 2, p. 165, 1890. 1 species. Type, *Œstrophasia bilimekii* BRAUER and BERGENSTAMM (as *rufa*, new species). Equals **Ormia** DESVOIDY, 1830.

Neorondania OSTEN SACKEN, Cat. Dipt. N. Amer., p. 50, 1878. Change of name for *Rondania* JÆNNICKE, 1867, not of DESVOIDY, 1850. Type, *Rondania obscura* JÆNNICKE. Syn., *Rondania* JÆNNICKE, 1867, preoccupied.

Neotractocera TOWNSEND, Trans. Amer. Ent. Soc., vol. 19, p. 105, 1892. 1 species. Type, *Neotractocera anomala* TOWNSEND. Equals **Hypertrophocera** TOWNSEND, 1891.

Nephrocerus ZETTERSTEDT, Ins. Lapp., p. 578, 1838. 1 species. Type, *Nephrocerus lapponicus* ZETTERSTEDT.

Nerea DESVOIDY, Essai Myod., p. 802, 1830. 3 species. Type, *Copromyza limosa* FALLEN (as *riparia*, new species), the first species, by present designation. Equals **Leptocera** OLIVIER, 1813.

Neria DESVOIDY, Essai Myod., p. 736, 1830. 9 species. Type, *Musca ephippium* FABRICIUS (as *inulæ*, new species), the eighth species, by present designation. Equals **Trepidaria** MEIGEN, 1800.

Nerina DESVOIDY, Essai Myod., p. 557, 1830. 5 species. Type, *Nerina albipennis* FALLEN, the second species, by present designation. Equals **Pegomya** DESVOIDY, 1830.

Nerius FABRICIUS, Syst. Antliatorum, p. 264, 1805. 3 species. Type, *Nerius pilifer* FABRICIUS, the first species, by present designation.

Neurigona RONDANI, Dipt. Ital. Prodr., vol. 1, p. 142, 1856. 1 species. Type, *Musca quadrifasciata* FABRICIUS. Syn., *Saucropus* LOEW, 1857; *Dactylomyia* ALDRICH, 1894.

Neuroctena RONDANI, Atti Soc. Ital. Sci., vol. 11, p. 56, 1868. 1 species. Type, *Dryomyza anilis* FALLEN.

Nevrorta Lioy, Atti Inst. Veneto, ser. 3, vol. 9, p. 910, 1864. 1 species. Type, *Musca grisea* Fallen. Equals **Hylemya** Desvoidy, 1830.

Nicocles Jennicke, Neue Exot. Dipt., p. 47, 1867. 1 species. Type, *Nicocles analis* Jennicke. Syn., *Pygostolus* Loew, 1866, preoccupied.

Nigrasilus Hine, Can. Ent., vol. 40, p. 203, 1908. 1 species. Type, *Nigrasilus nitidifacies* Hine.

Nilea Desvoidy, Hist. Nat. Dipt., vol. 1, p. 275, 1863. 1 species. Type, *Tachina fauna* Meigen (as *innoxia*, new species). Equals **Zenilla** Desvoidy, 1830.

Ninguis Wallengren, Ent. Tijdschr., vol. 2, p. 183, 1881. 3 species. Type, *Limnobia virgo* Zetterstedt, the last species, by present designation. Equals **Orimarga** Osten Sacken, 1869.

Nirmomyia Nitzsch, Germ. Mag. Ent., vol. 3, p. 309, 1818. 1 species. Type, *Hippobosca equina* Linnæus. Equals **Hippobosca** Linnæus, 1758.

Nitellia Desvoidy, Essai Myod., p. 417, 1830. 2 species. Type, *Musca vespillo* Fabricius, the first species, by present designation. Equals **Pollenia** Desvoidy, 1830.

Noda Schellenberg, Gen. Mouch. Dipt., pl. 12, fig. 1, 1803. 2 species (without names). Type, *Musca aterrima* Fabricius, the first species, by present designation. Equals **Phora** Latreille, 1796.

Nodutis Meigen, Syst. Beschr. Zweifl. Ins., vol. 2, p. 106, 1820. 1 species. Type, *Sylvicolæ melancholia* Harris (as *maculata*, new species). Equals **Atherix** Meigen, 1803.

Nœza Meigen, Nouv. Class. Mouch., p. 27, 1800.* No species. *Hybos* Meigen, 1803, is a change of name. Type, *Musca grossipes* Linnæus. Syn., *Hybos* Meigen, 1803; *Lactistomyia* Melander, 1902.

Nostima Coquillett, Can. Ent., vol. 32, p. 35, 1900. 1 species. Type, *Nostima slossonæ* Coquillett.

Nothomyia Loew, Berliner Ent. Zeitschr., vol. 13, p. 4, 1869. 2 species. Type, *Nothomyia scutellata* Loew, the first species, by designation of Brauer, Denkschr. Kais. Akad. Wiss. Wien, vol. 44, 1882, p. 88.

Nothosympycnus Wheeler, Proc. Cal. Acad. Sci., vol. 2, p. 51, 1899. 6 species. Type, *Nothosympycnus vegetus* Wheeler, the second species, by present designation.

Nothra Westwood, Trans. Ent. Soc. Lond. for 1876, p. 514, 1876. 1 species. Type, *Nothra bicolor* Westwood.

Notiphila Fallen, Spec. Ent. Meth. Exb., p. 22, 1810. No species. In the Kongl. Vet. Acad. Handl. for 1813, pp. 249 to 255, 15 species. Type, *Notiphila cinerea* Fallen, the second species, by designation of Westwood, Intr., vol. 2, 1840, Synops., p. 153. Syn., *Keratocera* Desvoidy, 1830.

Notogramma Loew, Berliner Ent. Zeitschr., vol. 11, p. 289, 1868. 1 species. Type, *Musca stigma* Fabricius (as *cimiciformis*, new species).

Nototricha Coquillett, Class. Mosq. N. Amer., p. 12, 1906. 1 species. Type, *Cyclolepteron mediopunctatus* Theobald.

Novia Desvoidy, Essai Myod., p. 210, 1830. 1 species. Type, *Tachina melanocephala* Meigen (as *cylindrica*, new species). Equals **Phyto** Desvoidy, 1830.

Nowickia Wachtl, Wien. Ent. Zeit., vol. 13, p. 142, 1894. 1 species. Type, *Tachina marklini* Zetterstedt (as *regalis* Rondani). Equals **Larvævora** Meigen, 1800.

Nuceria Walker, Ins. Saund., Dipt., p. 7, 1850. 5 species. Type, *Pangonius longirostris* Hardwicke, the first species, by present designation. Equals **Pangonius** Latreille, 1802.

Numantia Bigot, Ann. Soc. Ent. France for 1854, p. 470, 1854. 20 species. Type, *Limonia fusca* Meigen, the first species, by present designation. Equals **Furcomyia** Meigen, 1818.

Nupharia Desvoidy, Essai Myod., p. 785, 1830. 1 species. Type, *Musca livens* Fabricius (as *rivularis*, new species). Equals **Hydromyza** Fallen, 1813.

. **Nycteribia** LATREILLE, Precis, p. 176, 1796. 1 species. Type, *Pediculus vespertilionis* LINNÆUS. Syn., *Phthiridium* HERMANN, 1804; *Celeripes* MONTAGU, 1815; *Stylidia* WESTWOOD, 1840; *Acrocholidia* KOLENATI, 1857; *Listropoda* KOLENATI, 1857.

Nyssorhynchus BLANCHARD, Compt. Rend. Soc. Biol., p. 795, July 4, 1902. Change of name for *Lavernia* THEOBALD, June 16, 1902, not of GRASSI and FELETTI, 1890. Type, *Anopheles argyritarsis* DESVOIDY. Equals **Cellia** THEOBALD, June 16, 1902.

Oblicia DESVOIDY, Essai Myod., p. 620, 1830. 1 species. Type, *Musca fimetaria* LINNÆUS (as *testacea*, new species). Equals **Psila** MEIGEN, 1803.

Obolodiplosis FELT, 23d Rep. State Ent. N. Y., p. 410, 1908. 1 species. Type, *Cecidomyia orbiculata* FELT.

Ocalea DESVOIDY, Hist. Nat. Dipt., vol. 1, p. 810, 1863. 1 species. Type, *Ocyptera costata* FALLEN (as *heterocera*, new species). Equals **Wagneria** DESVOIDY, 1830.

Occemya DESVOIDY, Dipt. Env. Paris, Myop., p. 50, 1853.* 2 species. Type, *Myopa atra* FABRICIUS, the second species, by present designation. Equals **Thecophora** RONDANI, 1845.

Ochlerotatus ARRIBALZAGA, Rev. Mus. La Plata, vol. 1, p. 385, 1891. 2 species. Type, *Ochlerotatus confirmatus* ARRIBALZAGA, the second species, by present designation. Syn., *Culicada* FELT, 1904; *Culicelsa* FELT, 1904; *Ecculex* FELT, 1904; *Protoculex* FELT, 1904; *Pseudoculex* DYAR, 1905; *Pseudohowardina* THEOBALD, 1907; *Protomacleaya* THEOBALD, 1907.

Ochthera LATREILLE, Hist. Nat. Crust. et Ins., vol. 3, p. 462, 1802. 1 species (as 2). Type, *Musca mantis* DE GEER. Syn., *Macrochira* MEIGEN, 1803.

Ochtheroidea WILLISTON, Trans. Ent. Soc. Lond. for 1896, p. 401, 1896. 1 species Type, *Ochtheroidea atra* WILLISTON.

Ochtiphila FALLEN, Phytom. Ocht. Sveciæ, p. 9, 1823. 3 species. Type, *Ochtiphila aridella* FALLEN, the second species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 151. Equals **Chamæmyia** MEIGEN, 1803.

Ocnæa ERICHSON, Entomographien, p. 155, 1840. 3 species. Type, *Ocnæa micans* ERICHSON, the first species, by present designation.

Ocneros COSTA, Atti Acad. Sci., vol. 5, pt. 2, p. 102, 1844. 1 species. Type, *Musca pulchella* ROSSI. Equals **Palloptera** FALLEN, 1820.

Ocromyia LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 910, 1864. 1 species. Type, *Leucophora cinerea* DESVOIDY (as *pallida* MACQUART). Equals **Leucophora** DESVOIDY, 1830.

Octacantha LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 586, 1864. 2 species. Type, *Beris fuscipes* MEIGEN, the first species, by present designation. Equals **Beris** LATREILLE, 1802.

Octavia BIGOT, Ann. Soc. Ent. France for 1854, p. 474, 1854. 12 species. Type, *Erioptera taenionota* MEIGEN, the second species, by present designation. Equals **Polymeda** MEIGEN, 1800.

Ocydromia MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 2, p. 351, 1820. 5 species. Type, *Empis glabricula* FALLEN, the first species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 133.

Ocyptamus MACQUART, Hist. Nat., Dipt., vol. 1, p. 554, 1834. 2 species. Type, *Baccha fuscipennis* SAY (as *fascipennis*, new species), the second species, by present designation.

Ocyptera LATREILLE, Hist. Nat. Crust. et Ins., vol. 14, p. 378, 1805. 3 species. Type, *Musca brassicaria* FABRICIUS, the second species, by designation of CURTIS, Brit. Ent., 1837, p. 629. Equals **Cylindromyia** MEIGEN, 1803.

Ocypterosipha TOWNSEND, Journ. N. Y. Ent. Soc., vol. 2, p. 79, 1894. 1 species. Type, *Tachina xlops* WALKER (as *willistonii*, new species). Equals **Beskia** BRAUER and BERGENSTAMM, 1889.

Odinia DESVOIDY, Essai Myod., p. 648, 1830. 2 species. Type, *Milichia maculata* MEIGEN (as *trinotata*, new species), the first species, by designation of RONDANI, Bull. Soc. Ent. Ital., vol. 7, 1875, p. 2. Syn., *Alticomerus* RONDANI, 1856.

Odontocera MACQUART, Hist. Nat., Dipt., vol. 2, p. 614, 1835. 5 species. Type, *Chlorops denticornis* PANZER, the first species, by original designation. Not *Odontocera* SERVILLE, 1833. Equals **Cerodontha** RONDANI, 1861.

Odontodiplosis FELT, 23d Rep. State Ent. N. Y., p. 404, 1908. 1 species. Type, *Cecidomyia karnerensis* FELT.

Odontomera MACQUART, Dipt. Exot., vol. 2, pt. 3, p. 372, 1843. 1 species. Type, *Odontomera ferruginea* MACQUART. Syn., *Cyrtometopa* LOEW, 1873.

Odontomyia MEIGEN, Illiger's Mag., vol. 2, p. 265, 1803. 3 species. Type, *Musca hydroleon* LINNÆUS, the third species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 130. Equals **Eulalia** MEIGEN, 1800.

Odontomyx RUBSAAMEN, Berliner Ent. Zeitschr., vol. 39, p. 25, 1894. 3 species. Type, *Sciara nigra* WIEDEMANN, the second species, by present designation. Not *Odontonyx* STEPHENS, 1828. Equals **Phorodonta**, new name.

Odontopoda ALDRICH, 21st Ann. Rep. Geol. Ind., p. 187, 1897. 1 species. Type, *Odontopoda sayi* ALDRICH.

Œcacta POEY, Mem. Hist. Nat. Cuba, vol. 1, p. 236, 1851. 1 species. Type, *Œcacta furens* POEY. Equals **Culicoides** LATREILLE, 1809.

Œdalea MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 2, p. 355, 1820. 2 species. Type, *Empis hybotina* FALLEN, the first species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 133. Syn., *Xiphidicera* MACQUART, 1834.

Œdaspis LOEW, Monogr. Trypet., p. 46, 1862.* 4 species. Type, *Trypeta multifasciata* LOEW, the second species, by present designation. Equals **Orellia** DESVOIDY, 1830.

Œdemagena LATREILLE, Nouv. Dict. Hist. Nat., vol. 23, p. 272, 1818. 1 species. Type, *Œstrus tarandi* LINNÆUS.

Œdemapoda TOWNSEND, Smiths. Misc. Coll., vol. 51, p. 66, 1908. 1 species. Type, *Atrophopoda townsendi* WILLISTON. Equals **Paradidyma** BRAUER and BERGENSTAMM, 1891.

Œdemasoma TOWNSEND, Smiths. Misc. Coll., vol. 51, p. 80, 1908. 1 species. Type, *Œdemasoma nuda* TOWNSEND.

Œdicarena LOEW, Monogr. Dipt. N. Amer., vol. 3, p. 247, 1873. 1 species. Type, *Trypeta tetanops* LOEW.

Œdopa LOEW, Berliner Ent. Zeitschr., vol. 11, p. 287, 1868. 1 species. Type, *Œdopa capito* LOEW.

Œdoparea LOEW, Zeitschr. Ent. Breslau, vol. 13, p. 10, 1862. 1 species. Type, *Heteromyza buccata* FALLEN. Equals **Heteromyza** FALLEN, 1820.

Œstrophasia BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 56, p. 145, 1889. 2 species. Type, *Œstrophasia clausa* BRAUER and BERGENSTAMM, the first species, by designation of TOWNSEND, Trans. Amer. Ent. Soc., vol. 19, 1892, p. 133. Equals **Ormia** DESVOIDY, 1830.

Œstrus LINNÆUS, Syst. Nat., 10th ed., p. 584, 1758. 5 species. Type, *Œstrus ovis* LINNÆUS, the fifth species, by designation of CURTIS, Brit. Ent., 1826, p. 106. Syn., *Cephalemyia* LATREILLE, 1818.

Ogcodes LATREILLE, Precis, p. 154, 1796. No species. In his Hist. Nat. Crust. et Ins., vol. 3, 1802, p. 432, 1 species Type, *Ogcodes zonatus* ERICHSON (as *Syrphus gibbosus* FABRICIUS). Syn., *Henops* MEIGEN, 1804.

Ogcodocera MACQUART, Dipt. Exot., vol. 2, pt. 1, p. 83, 1840. 1 species. Type, *Mulio leucoprocta* WIEDEMANN (as *dimidiata*, new species).

Okenia ZETTERSTEDT, Ins. Lapp., p. 734, 1838. 2 species. Type, *Cordilura caudata* ZETTERSTEDT, the first species, by BECKER, who, in the Berliner Ent.

Zeitschr., vol. 39, 1894, p. 141, selected the second species as type of a new genus, *Bostrichopyga*. Not *Okenia* LEUCKART, 1826. Equals **Okeniella** HENDEL, 1907.

Okeniella HENDEL, Wien. Ent. Zeit., vol. 26, p. 98, 1907. Change of name for *Okenia* ZETTERSTEDT, 1838, not of LEUCKART, 1826. Type, *Cordilura caudata* ZETTERSTEDT. Syn., *Okenia* ZETTERSTEDT, 1838, preoccupied.

Olbiogaster OSTEN SACKEN, Biol. Centr.-Amer., Dipt., vol. 1, p. 20, 1886. 2 species. Type, *Rhyphus tæniatus* BELLARDI, the second species, by present designation.

Olenochaeta TOWNSEND, Trans. Amer. Ent. Soc., vol. 19, p. 114, 1892. 1 species. Type, *Distichona varia* WULP (as *kansensis*, new species). Equals **Distichona** WULP, 1890.

Olfersia WIEDEMANN, Auss. Zweifl. Ins., vol. 2, p. 605, 1830. Change of name for *Feronia* LEACH, 1817, not of LATREILLE, 1817. Type, *Feronia spinifera* LEACH. Syn., *Feronia* LEACH, 1817, preoccupied.

Oligarces MEINERT, Nat. Tidsskr. for 1865, p. 237, 1865.* 1 species. Type, *Oligarces paradoxus* MEINERT.

Oligochætus MIK, Jahresb. k. k. Akad. Gymnas., p. 7, 1878. 5 species. Type, *Medetera plumbella* MEIGEN, the first species, by original designation. Equals **Medetera** FISCHER, 1819.

Oligomera DOLESCHALL, Nat. Tijdschr. Ned. Indie, vol. 14, p. 387, 1857. 1 species. Type, *Limnobia acrostacta* WIEDEMANN (as *javensis*, new species). Equals **Caloptera** GUERIN, 1829.

Oligotrophus LATREILLE, Hist. Nat. Crust. et Ins., vol. 14, p. 288, 1805. 1 species. Type, *Tipula juniperina* LINNÆUS (as "Tipule des galles du genevrier" of DE GEER).

Olina DESVOIDY, Essai Myod., p. 812, 1830. 5 species. Type, *Olina hirtipes* DESVOIDY, the third species, by present designation.

Olivieria MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 7, p. 266, 1838. 1 species. Type, *Tachina longirostris* MEIGEN. Equals **Aphria** DESVOIDY, 1830.

Omalocephala MACQUART, Dipt. Exot., vol. 2, pt. 3, p. 231, 1843. 1 species. Type, *Omalocephala fusca* MACQUART. Not *Omalocephala* SPINOLA, 1839. Equals **Tylemyia** GIGLIO-TOS, 1893.

Omegasyrphus GIGLIO-TOS, Boll. Mus. Zool. Univ. Torino, vol. 6, no. 108, p. 4, 1891. No species. In 1892, 1 species. Type, *Microdon coarctatus* LOEW.

Ommatius WIEDEMANN, Dipt. Exot., p. 213, 1821. 3 species. Type, *Asilus marginellus* FABRICIUS, the first species, by present designation.

Omomyia COQUILLETT, Can. Ent., vol. 39, p. 76, 1907. 1 species. Type, *Omomyia hirsuta* COQUILLETT.

Omphrale MEIGEN, Nouv. Class. Mouch., p. 29, 1800.* No species. *Hypselura* MEIGEN, 1803, is a change of name. Type, *Musca fenestralis* LINNÆUS. Syn., *Scenopinus* LATREILLE, 1802; *Hypselura* MEIGEN, 1803; *Atrichia* SCHRANK, 1803; *Cona* SCHELLENBERG, 1803; *Astoma* LIOY, 1864.

Onesia DESVOIDY, Essai Myod., p. 365, 1830. 2 species (as 16). Type, *Musca sepulchralis* MEIGEN, (equalling 15 of the supposed species), by designation of RONDANI, Dipt. Ital. Prodr., vol. 1, 1856, p. 90 (as *vespillo* FABRICIUS). Syn., *Melinda* DESVOIDY, 1830; *Bellardia* DESVOIDY, 1863; *Maravigna* LIOY, 1864.

Onodontha RONDANI, Dipt. Ital. Prodr., vol. 1, p. 94, 1856. 1 species. Type, *Onodontha penicillata* RONDANI (as *Hydrotæa floccosa* MACQUART). Equals **Hydrotæa** DESVOIDY, 1830.

Onychogonia BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 56, p. 100, 1889. 1 species. Type, *Gonia flaviceps* ZETTERSTEDT. Equals **Salmacia** MEIGEN, 1800.

Ophelia DESVOIDY, Essai Myod., p. 120, 1830. 2 species (as 5). Type, *Tachina campestris* FALLEN (equaling the last 3 supposed species), by present designation. Equals **Metopia** MEIGEN, 1803.

Ophromyia WILLISTON, Biol. Centr.-Amer., Dipt., vol. 3, p. 55, Dec., 1891. 1 species. Type, *Ophromyia nasica* WILLISTON. Equals **Megametopon** GIGLIO-TOS, September, 1891.

Ophthalmomyia WILLISTON, Trans. Ent. Soc. Lond. for 1896, p. 426, 1896. 1 species. Type, *Lobioptera lacteipennis* LOEW. Equals **Milichiella** GIGLIO-TOS, 1895.

Ophyra DESVOIDY, Essai Myod., p. 516, 1830. 3 species (as 4). Type, *Anthomyia leucostoma* WIEDEMANN (equaling the first 2 supposed species), by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 142.

Oplachantha RONDANI, Arch. Zool., vol. 3, p. 87, 1864. 2 species. Type, *Beris mexicana* BELLARDI, the first species, by original designation. Equals **Beris** LATREILLE, 1802.

Oplogaster RONDANI, Dipt. Ital. Prodr., vol. 1, p. 98, 1856. 1 species. Type, *Musca mollicula* FALLEN.

Opomyza FALLEN, Opom. Sveciæ, p. 10, 1820. 3 species. Type, *Musca germinationis* LINNÆUS, the first species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 152.

Oppia DESVOIDY, Hist. Nat. Dipt., vol. 2, p. 404, 1863. 1 species. Type, *Tachina devia* FALLEN (as *ciligera*, new species). Equals **Brachicoma** RONDANI, 1856.

Opsebius COSTA, Rend. Soc. Borb. Accad. Sci., new ser., vol. 5, p. 20, 1856. 1 species. Type, *Opsebius perspicillatus* COSTA. Syn., *Pithogaster* LOEW, 1857.

Opsidia COQUILLETT, Journ. N. Y. Ent. Soc., vol. 3, p. 102, 1895. 1 species. Type, *Opsidia gonioides* COQUILLETT.

Opsiomyia COQUILLETT, Journ. N. Y. Ent. Soc., vol. 6, p. 162, 1898. 1 species. Type, *Opsiomyia palpalis* COQUILLETT.

Opsolasia, new genus. Type, *Lasiops calvicrura* COQUILLETT. (This is *Lasiops* of authors, not of MEIGEN.)

Orbellia DESVOIDY, Essai Myod., p. 656, 1830. 2 species. Type, *Orbellia myopiformis* DESVOIDY, the first species, by present designation. Equals **Heleomyza** FALLEN, 1810.

Orellia DESVOIDY, Essai Myod., p. 765, 1830. 1 species. Type, *Trypeta wiedemanni* MEIGEN (as *flavicans*, new species). Syn., *Goniglossum* RONDANI, 1856; *Edaspis* LOEW, 1862.

Oreogeton SCHINER, Wien. Ent. Monatschr., vol. 4, p. 53, 1860. 1 species. Type, *Gloma basalis* LOEW.

Oreomyza POKORNY, Wien. Ent. Zeit., vol. 6, p. 50, 1887. 3 species. Type, *Oreomyza glacialis* POKORNY, the first species, by present designation. Equals **Tipula** LINNÆUS, 1758.

Oreothalia MELANDER, Trans. Amer. Ent. Soc., vol. 28, p. 232, 1902. 1 species. Type, *Oreothalia pelops* MELANDER.

Orillia DESVOIDY, Ann. Soc. Ent. France for 1848, p. 474, 1848. 2 species (as 3). Type, *Orillia rectinervis* DESVOIDY, the second species, by present designation. Equals **Leskia** DESVOIDY, 1830.

Orimarga OSTEN SACKEN, Monogr. Dipt. N. Amer., vol. 4, p. 120, 1869. 1 species. Type, *Limnobia alpina* ZETTERSTEDT. Syn., *Ninguis* WALLENGREN, 1881.

Orimargula MIK, Wien. Ent. Zeit., vol. 2, p. 198, 1883. 2 species. Type, *Orimargula alpigena* MIK, the first species, by original designation. Equals **Antocha** OSTEN SACKEN, 1860.

Orizia DESVOIDY, Hist. Nat. Dipt., vol. 2, p. 678, 1863. 2 species (as 6). Type, *Musca rudis* FABRICIUS (equaling the first 5 supposed species), by present designation. Equals **Pollenia** DESVOIDY, 1830.

Ormia DESVOIDY, Essai Myod., p. 428, 1830. 1 species. Type, *Ormia punctata* DESVOIDY. Syn., *Estrophasia* BRAUER and BERGENSTAMM, 1889; *Phasiopteryx* BRAUER and BERGENSTAMM, 1889; *Cenosoma* WULP, 1890; *Neoptera* WULP, 1890; *Eustrophasia* TOWNSEND, 1892.

Ormosia RONDANI, Dipt. Ital. Prodr., vol. 1, p. 180, 1856. 1 species. Type, *Erioptera nodulosa* MACQUART. Syn., *Rypholophus* KOLENATI, 1860; *Dasyptera* SCHINER, 1863.

Ornidia ST. FARGEAU and SERVILLE, Encycl. Meth., vol. 10, pt. 2, p. 786, 1828. 1 species. Type, *Syrphus obesus* FABRICIUS. Equals **Volucella** GEOFFROY, 1762.

[**Ornitheza** SPEISER, Term. Fuzetek, vol. 25, p. 329, 1902. 3 species. Type, *Ornithomyia gestroi* RONDANI, the first species by original designation. Not American.]

Ornithobia MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 6, p. 229, 1830. 1 species. Type, *Pediculus cerri* LINNÆUS (as *pallida*, new species). Equals **Lipoptena** NITZSCH, 1818.

Ornithoctona SPEISER, Term. Fuzetek, vol. 25, p. 328, 1902. 10 species. Type, *Ornithomyia erythrocephala* LEACH, the first species, by original designation.

Ornithodes COQUILLETT, Proc. Wash. Acad. Sci., vol. 2, p. 400, 1900. 1 species. Type, *Ornithodes harrimani* COQUILLETT.

Ornithoica RONDANI, Ann. Mus. Civ. Genova, vol. 12, p. 159, 1878. 1 species. Type, *Ornithoica beccariina* RONDANI.

Ornithomyia LATREILLE, Hist. Nat. Crust. et Ins., vol. 3, p. 466, 1802. 1 species. Type, *Hippobosca avicularia* LINNÆUS.

Ornithopertha SPEISER, Zeitschr. Hym. Dipt., vol. 1, p. 167, 1902. 1 species. Type, *Ornithomyia nitens* BIGOT.

Oropeza NEEDHAM, in 23d Rep. State Ent. N. Y., p. 211, 1908. 1 species. Type, *Oropeza americana* NEEDHAM.

Orphnephila HALIDAY, Zool. Journ., vol. 5, p. 350, Sept., 1831. 1 species. Type, *Orphnephila devia* HALIDAY. Syn., *Thaumalea* RUTHE, November, 1831.

Ortalis FALLEN, Spec. Ent. Meth. Exh., p. 17, 1810. 3 species. Type, *Musca vibrans* LINNÆUS, the second species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 149. Syn., *Scioptera* KIRBY, 1817; *Myodina* DESVOIDY, 1830.

Orthacheta BECKER, Berliner Ent. Zeitschr., vol. 39, p. 101, 1894. 1 species. Type, *Cordilura pilosa* ZETTERSTEDT.

Orthellia DESVOIDY, Hist. Nat. Dipt., vol. 2, p. 837, 1863. 3 species (as 4). Type, *Musca cornicina* FABRICIUS, equalling the first two supposed species, by present designation. Syn., *Euphoria* DESVOIDY, 1863; *Pseudopyrellia* GIRSCHNER, 1893.

Orthobates WAHLBERG, Öfv. Kongl. Vet. Akad. Förh., vol. 1, p. 110, 1844. 2 species. Type, *Hydrophorus jaculus* FALLEN, the first species, by present designation. Equals **Medetera** FISCHER, 1819.

Orthoceratium SCHRANK, Fauna Boica, vol. 3, p. 151, 1803.* 1 species. Type, *Musca lacustris* SCOPOLI. Syn., *Liancalus* LOEW, 1857; *Allœoneurus* MIK, 1878.

Orthocladius WULP, Tijdschr. Ent., vol. 17, p. 132, 1874. 10 species. Type, *Tipula stercoraria* DE GEER, the first species, by present designation. Syn., *Psectrocladius* KIEFFER, 1906; *Dactylocladius* KIEFFER, 1906.

Orthoneuromyia WILLISTON, Kansas Univ. Quart., vol. 2, p. 67, 1893. 1 species. Type, *Orthoneuromyia modesta* WILLISTON. Equals **Psilocurus** LOEW, 1874.

Orthonevra MACQUART, Rec. Trav. Soc. Sci. Lille for 1829, p. 188, 1829. 1 species. Type, *Chrysogaster elegans* MEIGEN. Equals **Chrysogaster** MEIGEN, 1800.

Ortochile LATREILLE, Gen. Crust. Ins., vol. 4, p. 289, 1809. 1 species. Type *Ortochile nigrocœruleus* LATREILLE.

Osca WALKER, Ins. Saund., Dipt., p. 10, 1850. 2 species. Type, *Pangonius depressus* MACQUART, the first species, by present designation. Equals **Pangonius** LATREILLE, 1802.

Oscinimorpha LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 1126, 1864. 1 species. Type, *Oscinis obliqua* MACQUART. Equals **Botanobia** LIOY, 1864.

Oscinis LATREILLE, Hist. Nat. Crust. et Ins., vol. 14, p. 383, 1805. 2 species. Type, *Musca lineata* FABRICIUS, the first species, by present designation. Equals **Titania** MEIGEN, 1800. (*Oscinis* of authors equals *Botanobia* LIOY.)

Oscinisoma LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 1125, 1864. 2 species. Type, *Chlorops citripennis* MEIGEN, the first species, by present designation. Equals **Botanobia** LIOY, 1864.

Osmæa DESVOIDY, Essai Myod., p. 84, 1830. 1 species. Type, *Osmæa grisea* DESVOIDY. Equals **Actia** DESVOIDY, 1830.

Ospriocerus LOEW, Berliner Ent. Zeitschr., vol. 10, p. 29, 1866. 2 species. Type, *Dasypogon æacus* WIEDEMANN (as *æacides*, new species), the first species, by designation of BACK, Trans. Amer. Ent. Soc., vol. 35, p. 184, 1909.

Ostracocœlia GIGLIO-TOS, Boll. Mus. Zool. Univ. Torino, vol. 8, no. 158, p. 10, 1893. 1 species. Type, *Ostracocœlia mirabilis* GIGLIO-TOS.

Oxycephala MACQUART, Dipt. Exot., vol. 2, pt. 3, p. 197, 1843. 1 species. Type, *Pyrgota undata* WIEDEMANN (as *fuscipennis*, new species). Equals **Pyrgota** WIEDEMANN, 1830.

Oxycera MEIGEN, Illiger's Mag., vol. 2, p. 265, 1803. 2 species. Type, *Musca hypoleon* LINNÆUS (as *trilineata* FABRICIUS), the second species, by designation of CURTIS, Brit. Ent., 1833, p. 441. Equals **Hermione** MEIGEN, 1800.

Oxyrhina MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 7, p. 366, 1838. Change of name for *Trigonometopus* MACQUART, 1835, on the false ground that this name is not appropriate. Type, *Tetanocera frontalis* MEIGEN. Equals **Trigonometopus** MACQUART, 1835.

Ozodiceromyia BIGOT, Ann. Soc. Ent. France for 1889, p. 321, 1889. 1 species. Type, *Ozodiceromyia mexicana* BIGOT.

Pachycephala LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 1343, 1864. 1 species. Type, *Tachina goniæformis* MEIGEN. Equals **Baumhaueria** MEIGEN, 1838.

Pachycerina MACQUART, Hist. Nat., Dipt., vol. 2, p. 511, 1835. 1 species. Type, *Lauxania seticornis* FALLEN.

Pachygaster MEIGEN, Illiger's Mag., vol. 2, p. 266, 1803. 1 species. Type, *Nemotelus ater* PANZER. Syn., *Vappo* LATREILLE, 1805; *Neopachygaster* AUSTEN, 1901.

Pachymeria STEPHENS, Syst. Cat. Brit. Ins., vol. 2, p. 262, 1829. 1 species. Type, *Empis femorata* FABRICIUS (as *ruralis* MEIGEN). Equals **Empis** LINNÆUS, 1758.

Pachymerina MACQUART, Hist. Nat., Dipt., vol. 1, p. 333, 1834. 4 species. Type, *Empis femorata* FABRICIUS, the first species, by designation of COQUILLETT, Proc. Ent. Soc. Washington, vol. 5, 1903, p. 254. Equals **Empis** LINNÆUS, 1758.

Pachyneurella BRUES, Trans. Amer. Ent. Soc., vol. 29, p. 382, 1903. 1 species. Type, *Phora venata* ALDRICH. Equals **Puliciphora** DAHL, 1897.

Pachyophthalmus BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 56, p. 117, 1889. 1 species. Type, *Tachina signata* MEIGEN. Syn., *Sarcomacronychia* TOWNSEND, 1892.

Pachyrhina MACQUART, Hist. Nat., Dipt., vol. 1, p. 88, 1834. 8 species. Type, *Tipula crocata* LINNÆUS, the first species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 128.

Pachystoma LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 910, 1864. 1 species. Type, *Musca flavipennis* FALLEN (as *crassirostris* MEIGEN). Equals **Hylemya** DESVOIDY, 1830.

Pachystomus LATREILLE, Gen. Crust. Ins., vol. 4, p. 286, 1809. 1 species. Type, *Nemotelus cinctus* DE GEER (as *Rhagio syrphoides* PANZER). Equals **Erinna** MEIGEN, 1800.

Pales DESVOIDY, Essai Myod., p. 154, 1830. 2 species (as 6). Type, *Tachina processionea* RATZEBURG (as *florea*, new species), the first species, by designation of DESVOIDY, Hist. Nat. Dipt., vol. 1, 1863, p. 519 (as *strenua* DESVOIDY). Not *Pales* MEIGEN, 1800. Equals **Neopales**, new name.

Pallasia DESVOIDY, Essai Myod., p. 239, 1830. 1 species (as 2). Type, *Musca globosa* FABRICIUS. Equals **Cistogaster** LATREILLE, 1829.

Palioptera FALLEN, Ortal. Sveciæ, p. 23, 1820. 4 species. Type, *Musca umbellatarum* FABRICIUS, the first species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 150. Syn., *Toxonevra* MACQUART, 1835; *Oncros* COSTA, 1844.

Palpibraca RONDANI, Ann. Nat. Napoli for 1845, p. 22, 1846.* 1 species. Type, *Micropalpus ruficornis* MACQUART (as *hæmorrhoa*, new species). Equals **Cuphocera** MACQUART, 1845.

Palpomyia MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 1, p. 82, 1818. 1 species. Type, *Ceratopogon flavipes* MEIGEN. Equals **Helea** MEIGEN, 1800.

Paltostoma SCHINER, Verh. Zool.-Bot. Ges. Wien, vol. 16, p. 951, 1866. 1 species. Type, *Paltostoma superbiens* SCHINER.

Palusia DESVOIDY, Essai Myod., p. 542, 1830. 10 species. Type, *Palusia testacea* DESVOIDY, the eighth species, by designation of COQUILLETT, Journ. N. Y. Ent. Soc., vol. 9, 1901, p. 139. Equals **Cœnosia** MEIGEN, 1826.

Panacris GERSTÆCKER, Linn. Ent., vol. 11, p. 346, 1857. 1 species. Type, *Panacris lucida* GERSTÆCKER.

Paneryma WULP, Biol. Centr.-Amer., Dipt., vol. 2, p. 387, 1899. 1 species. Type, *Paneryma elongata* WULP.

Pangonius LATREILLE, Hist. Nat. Crust. et Ins., vol. 3, p. 437, 1802. 3 species. Type, *Tabanus proboscideus* FABRICIUS, the third species, by designation of LATREILLE, Consider. Général., 1810, p. 443. Syn., *Tanyglossa* MEIGEN, 1803; *Philoliche* WIEDEMANN, 1828; *Nuceria* WALKER, 1850; *Fidena* WALKER, 1850; *Melpia* WALKER, 1850; *Scaptia* WALKER, 1850; *Tacina* WALKER, 1850; *Phara* WALKER, 1850; *Clanis* WALKER, 1850; *Osca* WALKER, 1850; *Plinthina* WALKER, 1850; *Scarphia* WALKER, 1850; *Lilæa* WALKER, 1850; *Diatomineura* RONDANI, 1864; *Erephopsis* RONDANI, 1864; *Corizoneura* RONDANI, 1864.

Panoplites THEOBALD, Rep. Coll. Mosq. Brit. Mus., p. 5, 1900. 2 species (as 3). Type, *Culex titillans* WALKER (as *Tæniorhynchus tæniorhynchus* ARRIBALZAGA), the third species, by designation of NEVEU-LEMAIRE, Mem. Soc. Zool. France, vol. 15, 1902, p. 214. Not *Panoplites* GOULD, 1853. Equals **Tæniorhynchus** ARRIBALZAGA, 1891.

Pantarbes OSTEN SACKEN, Bull. 3, U. S. Geol. Surv., p. 254, 1877. 1 species. Type, *Pantarbes capito* OSTEN SACKEN.

Pantophthalmus THUNBERG, Mem. Soc. Sci. Goth., vol. 3, p. 7, 1819.* 1 species. Type, *Pantophthalmus tabaninus* THUNBERG. Syn., *Acanthomera* WIEDEMANN, 1821; *Megalomyia* BIGOT, 1880.

Panzeria DESVOIDY, Essai Myod., p. 68, 1830. 1 species. Type, *Tachina rudis* FALLEN (as *lateralis*, new species). Equals **Ernestia** DESVOIDY, 1830.

Parabombylius WILLISTON, Journ. N. Y. Ent. Soc., vol. 15, p. 1, 1907. 4 species. Type, *Thlipsogaster ater* COQUILLETT, the first species, by present designation.

Paracantha COQUILLETT, Journ. N. Y. Ent. Soc., vol. 7, p. 264, 1899. 1 species. Type, *Trypeta culta* WIEDEMANN.

Parachæta COQUILLETT, Rev. Tach., p. 37, 1897. 1 species. Type, *Blepharipeza inermis* BIGOT.

Paraclius LOEW, Monogr. Dipt. N. Amer., vol. 2, p. 97, 1864. 2 species. Type, *Pelastoneurus arcuatus* LOEW, the first species, by present designation.

[*Paracompsomyia* HOUGH, Proc. Acad. Nat. Sci. Phila. for 1898, p. 184, 1898. 1 species. Type, *Chrysomya regalis* DESVOIDY (as *nigripennis*, new species). Equals **Chrysomya** DESVOIDY, 1830. Not American.]

Paracosmus OSTEN SACKEN, Bull. 3, U. S. Geol. Surv., p. 262, 1877. Change of name for *Allocotus* LOEW, 1872, not of MAYR, 1864. Type, *Allocotus edwardsii* LOEW. Syn., *Allocotus* LOEW, 1872, preoccupied.

Paracrocera MIK, Wien. Ent. Zeit., vol. 5, p. 276, 1886. 2 species. Type, *Acrocera tumida* ERICHSON, the second species, by present designation. Equals **Acrocera** MEIGEN, 1803.

Paradejeania BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 60, p. 147, 1893. 1 species. Type, *Dejeania rutilioides* JÆNNICKE.

Paradexodes TOWNSEND, Smiths. Misc. Coll., vol. 51, p. 101, 1908. 2 species. Type, *Paradexodes aurifrons* TOWNSEND, the first species, by original designation. Equals **Lydella** DESVOIDY, 1830.

Paradidyma BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 58, p. 382, 1891. 1 species. Type, *Didyma validinervis* WULP. Syn., *Atrophopoda* TOWNSEND, 1891; *Ceratomyiella* TOWNSEND, 1891; *Lachnomma* TOWNSEND, 1892; *Microchira* BRAUER and BERGENSTAMM, 1893; *Œdemapeza* TOWNSEND, 1908; *Diaphoropeza* TOWNSEND, 1908.

Paradiplosis FELT, 23d Rep. State Ent. N. Y., p. 410, 1908. 1 species. Type, *Cecidomyia obesa* FELT.

Paradmontia COQUILLETT, Proc. U. S. Nat. Mus., vol. 25, p. 106, 1902. 1 species. Type, *Paradmontia brevis* COQUILLETT.

Paraëxorista BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 56, p. 87, 1889. 1 species. Type, *Exorista chelonix* RONDANI. Equals **Carcelia** DESVOIDY, 1830.

Parafabricia BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 61, p. 612, 1894. 2 species. Type, *Tachina bicolor* WIEDEMANN, the second species, by present designation. Equals **Archytas** JÆNNICKE, 1867.

Parafischeria TOWNSEND, Smiths. Misc. Coll., vol. 51, p. 74, 1908. 1 species. Type, *Demoticus venatoris* COQUILLETT. Equals **Demoticus** MACQUART, 1854.

Parafrontina BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 60, p. 115, 1893. 1 species. Type, *Parafrontina apicalis* BRAUER and BERGENSTAMM. Equals **Frontina** MEIGEN, 1838.

Paragædia BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 58, p. 350, 1891. 1 species. Type, *Blepharipeza cyaneiventris* MACQUART (as *hedemanni*, new species).

Paragorgopis GIGLIO-TOS, Boll. Mus. Zool. Univ. Torino, vol. 8, No. 158, p. 12, 1893. 1 species. Type, *Paragorgopis maculata* GIGLIO-TOS.

Paragus LATREILLE, Hist. Nat. Crust. et Ins., vol. 14, p. 359, 1805. 1 species. Type, *Syrphus bicolor* FABRICIUS.

Paragymnomma BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 58, p. 384, 1891. 2 species. Type, *Trichophora nigra* MACQUART (as *hystrix*, new species), the first species, by present designation. Equals **Trichophora** MACQUART, 1847.

Parahypochæta BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 58, p. 337, 1891. 1 species. Type, *Parahypochæta heteroneura* BRAUER and BERGENSTAMM.

Paralimna LOEW, Monogr. Dipt. N. Amer., vol. 2, p. 138, 1862. 1 species. Type, *Paralimna appendiculata* LOEW.

Parallelomma BECKER, Berliner Ent. Zeitschr., vol. 39, p. 94, 1894. 5 species. Type, *Cordilura albipes* FALLEN, the second species, by original designation. Equals **Mosina** DESVOIDY, 1830.

Paralucilia BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 58, p. 391, 1891. 1 species. Type, *Musca macellaria* FABRICIUS (as *fulvipes* MACQUART).

Paramesia MACQUART, Hist. Nat., Dipt., vol. 2, p. 656, 1835. 2 species. Type, *Paramesia wesmælii* MACQUART, the first species, by designation of COQUILLETT, Proc. Ent. Soc. Washington, vol. 5, 1903, p. 255. Equals **Atalanta** MEIGEN, 1800.

Paramintho BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 58, p. 366, 1891. No species. WULP, in Biol. Centr.-Amer., Dipt., vol. 2, 1895, p. 266, referred one species to it, as new. Type, *Paramintho modulata* WULP.

Paramyia WILLISTON, Kansas Univ. Quart., vol. 6, p. 1, 1897. 1 species. Type, *Paramyia nigra* WILLISTON.

Paranaphora TOWNSEND, Smiths. Misc. Coll., vol. 51, p. 72, 1908. 1 species. Type, *Ocyptera triquetra* OLIVIER (as *diademoides*, new species). Equals **Ervia** DESVOIDY, 1830.

Paraphyto COQUILLETT, Journ. N. Y. Ent. Soc., vol. 3, p. 105, 1895. 1 species. Type, *Paraphyto chittendeni* COQUILLETT.

Paraplagia BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 58, p. 354, 1891. 1 species. Type, *Tachina trepida* MEIGEN. Equals **Voria** DESVOIDY, 1830.

Paraprosena BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 56, p. 127, 1889. 1 species. Type, *Paraprosena waltlii* BRAUER and BERGENSTAMM.

Pararchytas BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 61, p. 614, 1894. 1 species. Type, *Tachina decisa* Walker. Equals **Larvævora** MEIGEN, 1800.

Pararicia BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 58, p. 391, 1891. 6 species. Type, *Musca pascuorum* MEIGEN, the first species, by designation of BRAUER, Verh. Zool.–Bot. Ges. Wien, vol. 43, 1893, p. 508. Equals **Muscina** DESVOIDY, 1830.

Parasetigena BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 58, p. 339, 1891. 1 species. Type, *Chetogena segregata* RONDANI. Syn., *Duponchelia* DESVOIDY, 1863, preoccupied.

Parasymmictus BIGOT, Bull. Soc. Ent. France for 1879, p. 67, 1879. 1 species. Type, *Hirmoneura clausa* OSTEN SACKEN. Equals **Hirmoneura** MEIGEN, 1820.

Parasyntormon WHEELER, Prol. Cal. Acad. Sci., vol. 2, p. 41, 1899. 6 species. Type, *Parasyntormon asellus* WHEELER, the first species, by present designation.

Parathalassius Mik, Wien. Ent. Zeit., vol. 10, p. 217, 1891. 1 species. Type, *Parathalassius blasigii* MIK.

Paratissa COQUILLETT, Can. Ent., vol. 32, p. 36, 1900. 1 species. Type, *Drosophila pollinosa* WILLISTON.

Paratropesa SCHINER, Verh. Zool.-Bot. Ges. Wien, vol. 16, p. 932, 1866. 1 species. Type, *Paratropesa singularis* SCHINER.

Parepalpus COQUILLETT, Proc. U. S. Nat. Mus., vol. 25, p. 120, 1902. 1 species. Type, *Parepalpus flavidus* COQUILLETT.

Parephydra COQUILLETT, Journ. N. Y. Ent. Soc., vol. 10, p. 183, 1902. 1 species. Type, *Parephydra humilis* COQUILLETT.

Pareudora WACHTL, Wien. Ent. Zeit., vol. 13, p. 141, 1894. 1 species. Type, *Tachina præceps* MEIGEN. Equals **Larvævora** MEIGEN, 1800.

Parhydrophorus WHEELER, Ent. News, vol. 7, p. 185, 1896. 1 species. Type, *Parhydrophorus canescens* WHEELER. Equals **Aphrozeta** PERRIS, 1847.

Parodinia COQUILLETT, Journ. N. Y. Ent. Soc., vol. 10, p. 186, 1902. 2 species. Type, *Parodinia cinerea* COQUILLETT, the first species, by original designation.

Parœdopa COQUILLETT, Journ. N. Y. Ent. Soc., vol. 8, p. 22, 1900. 1 species. Type, *Parœdopa punctigera* COQUILLETT.

Parthenia DESVOIDY, Essai Myod., p. 231, 1830. 2 species (as 3). Type, *Parthenia boscii* DESVOIDY, the last species, by present designation. Equals **Cylindromyia** MEIGEN, 1803.

Parydra STENHAMMER, Kongl. Vet. Akad. Handl. for 1843, p. 144, 1844. 2 species. Type, *Ephydra aquila* FALLEN, the second species, by present designation. Equals **Napæa** DESVOIDY, 1830.

Paykullia DESVOIDY, Essai Myod., p. 270, 1830. 1 species (as 3). Type, *Paykullia rubricornis* DESVOIDY. Equals **Melanophora** MEIGEN, 1803.

Peckia DESVOIDY, Essai Myod., p. 335, 1830. 5 species. Type, *Peckia imperialis* DESVOIDY, the first species, by present designation. Syn., *Phrissopodia* MACQUART, 1835.

Pedicella BIGOT, Ann. Soc. Ent. France for 1856, p. 85, 1856. No species. In 1879, 6 species. Type, *Macrosargus tenuiventris* BIGOT, the first of the new species, by

designation of BRAUER, Denkschr. Kais. Akad. Wiss. Wien, vol. 44, 1882, p. 88. Syn., *Macrosargus* BIGOT, 1879.

Pedicia LATREILLE, Hist. Nat. Crust. et Ins., vol. 4, p. 255, 1809. 1 species. Type, *Tipula rivosa* LINNÆUS.

Pegomya DESVOIDY, Essai Myod., p. 598, 1830. 6 species. Type, *Musca hyoscyami* PANZER, the first species, by designation of COQUILLETT, Journ. N. Y. Ent. Soc., vol. 9, 1901, p. 140. Syn., *Nerina* DESVOIDY, 1830; *Adia* DESVOIDY, 1830; *Phorbia* DESVOIDY, 1830; *Egle* DESVOIDY, 1830; *Phorxa* DESVOIDY, 1830; *Chlorina* DESVOIDY, 1830; *Chortophila* MACQUART, 1835; *Gymnogaster* LIOY, 1864; *Botanophila* LIOY, 1864; *Trigonostoma* LIOY, 1864; *Psilometopia* LIOY, 1864; *Erioischia* LIOY, 1864; *Stenogaster* LIOY, 1864.

Pelagomyia WILLISTON, Man. N. Amer. Dipt., p. 48, Aug., 1896. No species. In Trans. Ent. Soc. Lond. for 1896 (Sept.), p. 299, 1 species. Type, *Pelagomyia albitalus* WILLISTON.

Pelastoneurus LOEW, Neue Beitr., vol. 8, p. 36, 1861. 10 species. Type, *Pelastoneurus ragans* LOEW, the fifth new species, by present designation. Syn., *Metapelastoneurus* ALDRICH, 1894.

Pelatachina MEADE, Ent. Monthly Mag., vol. 30, p. 109, 1894. Change of name for *Hyria* DESVOIDY, preoccupied. Type, *Tachina tibialis* FALLEN. Syn., *Hyria* DESVOIDY, 1863, preoccupied.

Pelecocera MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 3, p. 340, 1822. 1 species. Type, *Pelecocera tricincta* MEIGEN. Syn., *Euceratomyia* WILLISTON, 1884.

Peleteria DESVOIDY, Essai Myod., p. 39, 1830. 4 species. Type, *Peleteria abdominalis* DESVOIDY, the last species, by present designation. Syn., *Faurilla* DESVOIDY, 1830; *Echinogaster* LIOY, 1864; *Sphyricera* LIOY, 1864; *Sphyromyia* BIGOT, 1883; *Tetrachaeta* BRAUER and BERGENSTAMM, 1894; *Chætopeleteria* MIK, 1894; *Popelia* BEZZI, 1894; *Tessarochæta* BEZZI, 1906.

Pelethophila HAGENBACH, Sym. Faunæ Inst. Helvetiæ, p. 48, 1822.* 1 species. Type, *Musca fimetaria* LINNÆUS (as *flava* SCHELLENBERG). Equals **Psila** MEIGEN, 1803.

Pelina HALIDAY, Ann. Nat. Hist., vol. 3, p. 407, 1839. 1 species. Type, *Notiphila ænea* FALLEN. Syn., *Telmatobia* STENHAMMER, 1844.

Pelomyia WILLISTON, N. Amer. Fauna, No. 7, p. 256, 1893. 1 species. Type, *Pelomyia occidentalis* WILLISTON.

Pelopia MEIGEN, Nouv. Class. Mouch., p. 18, 1800.* No species. *Tanypus* MEIGEN, 1803, is a change of name. Type, *Tipula cincta* FABRICIUS. Syn., *Tanypus* MEIGEN, 1803; *Protenthes* JOHANNSEN, 1907.

Pelorempis JOHANNSEN, Bull. 295, N. Y. State Mus., p. 402, Aug. 11, 1903. 1 species. Type, *Eucorethra underwoodi* UNDERWOOD (as *americana*, new species). Equals **Eucorethra** UNDERWOOD, August 7, 1903.

Peloropeodes WHEELER, Psyche, vol. 5, p. 373, 1890. 1 species. Type, *Peloropeodes salax* WHEELER.

Penicillidia KOLENATI, Hor. Soc. Ent. Ross., vol. 2, p. 69, 1863. 2 species (as 3). Type, *Nycteribia westwoodi* GUERIN-MENEVILLE (as *dufourii* WESTWOOD), the second species, by present designation.

Pennapoda TOWNSEND, Ann. Mag. Nat. Hist., vol. 20, p. 282, 1897. 1 species. Type, *Trichiopoda phasiana* TOWNSEND. Equals **Trichiopoda** LATREILLE, 1829.

Pentacricia STEIN, Berliner Ent. Zeitschr., vol. 42, p. 249, 1898. 1 species. Type, *Pentacricia aldrichii* STEIN.

Penthesilia MEIGEN, Nouv. Class. Mouch., p. 35, 1800.* No species. *Criorhina* MEIGEN, 1822, is a change of name. Type, *Syrphus asilicus* FALLEN. Syn., *Criorhina* MEIGEN, 1822; *Somula* MACQUART, 1847; *Eriophora* PHILIPPI, 1865; *Brachymyia* WILLISTON, 1882; *Eurhinomallota* BIGOT, 1882; *Cynorhina* WILLISTON, 1886.

Penthoptera SCHINER, Wien. Ent. Monatschr., vol. 7, p. 220, 1863. 1 species. Type, *Tipula chirothecata* SCOPOLI.

Penthosia WULP, Tijdschr. Ent., vol. 35, p. 189, 1892. 1 species. Type, *Scopolia satanica* BIGOT.

Peratochetus RONDANI, Dipt. Ital. Prodr., vol. 1, p. 119, 1856. 1 species. Type, *Heteromyza flava* MEIGEN (as *lutescens*, new species). Equals **Clusia** HALIDAY, 1838.

Peribæa DESVOIDY, Hist. Nat. Dipt., vol. 1, p. 720, 1863. 1 species (as 3). Type, *Peribæa apicalis* DESVOIDY. Equals **Actia** DESVOIDY, 1830.

Pericoma HALIDAY, in Walker's Ins. Britt., Dipt., vol. 3, p. 256, 1856. 11 species. Type, *Trichoptera trifasciata* MEIGEN, the seventh species, by present designation.

Perithinus HALIDAY, Zool. Journ., vol. 5, p. 353, 1831. 4 species. Type, *Porphyrops riparius* MEIGEN, the first species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 134. Syn., *Hydrochus* FALLEN, 1823, preoccupied; *Anglearia* CARLIER, 1835.

Peronyma LOEW, Monogr. Dipt. N. Amer., vol. 3, p. 250, 1873. 1 species. Type, *Trypeta sarcinata* LOEW.

Perrisia RONDANI, Nuovi Ann. Sci. Nat. (Bologna), ser. 2, vol. 6, p. 371, 1846. 1 species. Type, *Cecidomyia urticæ* PERRIS. Equals **Dasineura** RONDANI, 1840.

Petalophora MACQUART, Hist. Nat., Dipt., vol. 2, p. 454, 1835. 1 species. Type, *Trypeta capitata* WIEDEMANN. Equals **Ceratitis** MAC LEAY, 1829.

Petaurista MEIGEN, Nouv. Class. Mouch., p. 15, 1800.* No species. *Trichocera* MEIGEN, 1803, is a change of name. Type, *Tipula hiemalis* DE GEER. Syn., *Trichocera* MEIGEN, 1803.

Peteina MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 7, p. 214, 1838. 1 species. Type, *Musca erinacea* FABRICIUS.

Petinops BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 58, p. 356, 1891. 1 species. Type, *Petinops schnablii* BRAUER and BERGENSTAMM. Equals **Wagneria** DESVOIDY, 1830.

Phalacrocera SCHINER, Wien. Ent. Monatschr., vol. 7, p. 224, 1863. 1 species. Type, *Tipula replicata* LINNÆUS (as *nudicornis* SCHUMMEL).

Phalacromya RONDANI, Studi Ent., vol. 1, p. 67, 1848. 2 species. Type, *Phalacromya submetallica* RONDANI, the first species, by present designation. Syn., *Glaurotricha* THOMSON, 1868.

Phalænula MEIGEN, Nouv. Class. Mouch., p. 18, 1800.* No species. *Trichoptera* MEIGEN, 1803, is a change of name. Type, *Trichoptera ocellaris* MEIGEN. Equals **Psychoda** LATREILLE, 1796.

Phalangus MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 3, p. 253, 1822. 1 species. Type, *Mulio virens* FABRICIUS. Equals **Pipiza** FALLEN, 1810.

Phanigaster LIOY, Atti Inst. Veneto, ser. 3, vol. 10, p. 61, 1864. 1 species. Type, *Musca helluo* FABRICIUS. Equals **Eliozeta** RONDANI, 1856.

Phantasma DESVOIDY, Essai Myod., p. 739, 1830. 2 species. Type, *Musca corrigiolata* LINNÆUS (as *filiformis* FABRICIUS), the first species, by present designation. Equals **Tylos** MEIGEN, 1800.

Phaonia DESVOIDY, Essai Myod., p. 482, 1830. 5 species. Type, *Musca erratica* FALLEN (as *viarum*, new species), the first species, by designation of COQUILLETT, Journ. N. Y. Ent. Soc., vol. 9, 1901, p. 140. Syn., *Fallæa* DESVOIDY, 1830; *Trennia* DESVOIDY, 1830; *Euphemia* DESVOIDY, 1830; *Rohrella* DESVOIDY, 1830; *Quadrula* PANDELLE, 1898.

Phaôa WALKER, Ins. Saund., Dipt., p. 9, 1850. 18 species. Type, *Pangonius melanopyga* WIEDEMANN, the first species, by present designation. Equals **Pangonius** LATREILLE, 1802.

Phasia LATREILLE, Hist. Nat. Crust. et Ins., vol. 14, p. 379, 1805. 1 species. Type, *Syrphus hemipterus* FABRICIUS (as *Therera coleoptrata* FABRICIUS). Syn., *Alophora* DESVOIDY, 1830; *Hyalomya* DESVOIDY, 1830; *Phorantha* RONDANI, 1862.

Phasioclista TOWNSEND, Trans. Amer. Ent. Soc., vol. 18, p. 369, 1891. 1 species. Type, *Clytia atra* DESVOIDY (as *metallica*, new species). Equals **Myiophasia** BRAUER and BERGENSTAMM, 1891.

Phasiops COQUILLETT, Journ. N. Y. Ent. Soc., vol. 7, p. 219, 1899. 1 species. Type, *Phasiops flava* COQUILLETT.

Phasiopteryx BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 56, p. 146, 1889. 2 species. Type, *Phasiopteryx bilimekii* BRAUER and BERGENSTAMM, the first species, by present designation. Equals **Ormia** DESVOIDY, 1830.

Pheneus WALKER, Ins. Saund., Dipt., p. 155, 1851. 1 species. Type, *Pheneus tibialis* WALKER. Syn., *Arthrostylum* WILLISTON, 1895.

Phenicia DESVOIDY, Hist. Nat. Dipt., vol. 2, p. 750, 1863. 1 species (as 87). Type, *Musca sericata* MEIGEN. Equals **Lucilia** DESVOIDY, 1830.

Pherbina DESVOIDY, Essai Myod., p. 687, 1830. 11 species. Type, *Musca coryleti* SCOPOLI (as *Tetanocera reticulata* DUMERIL), the third species, by present designation. Equals **Tetanocera** LATREILLE, 1805.

Pherecida DESVOIDY, Hist. Nat. Dipt., vol. 1, p. 1118, 1863. 1 species (as 2). Type, *Tachina grisea* FALLEN. Equals **Macquartia** DESVOIDY, 1830.

Philia MEIGEN, Nouv. Class. Mouch., p. 20, 1800.* No species. *Dilophus* MEIGEN, 1803, is a change of name. Type, *Tipula febrilis* LINNÆUS. Syn., *Dilophus* MEIGEN, 1803.

Philinta DESVOIDY, Essai Myod., p. 568, 1830. 3 species (as 4). Type, *Musca canicularis* LINNÆUS, the first species, by designation of COQUILLETT, Journ. N. Y. Ent. Soc., vol. 9, 1901, p. 140. Equals **Fannia** DESVOIDY, 1830.

Philodendria RONDANI, Dipt. Ital. Prodr., vol. 1, p. 136, 1856. 1 species. Type, *Musca aterrima* FABRICIUS. Equals **Phora** LATREILLE, 1796.

Philoliche WIEDEMANN, Auss. Zweifl. Ins., vol. 1, p. 95, 1828. 14 species. Type, *Tabanus rostratus* LINNÆUS, the second species, by present designation. Equals **Pangonius** LATREILLE, 1802.

Philonicus LOEW, Linn. Ent., vol. 4, p. 144, 1849. 1 species. Type, *Philonicus albiceps* MEIGEN.

Philophylla RONDANI, Bull. Soc. Ent. Ital., vol. 2, p. 9, 1870. 1 species. Type, *Musca cæsio* HARRIS. Equals **Acidia** DESVOIDY, 1830.

Philopota WIEDEMANN, Auss. Zweifl., Ins. vol. 2, p. 17, 1830. 1 species. Type, *Philopota conica* WIEDEMANN.

Philorus KELLOGG, Proc. Cal. Acad. Sci., ser. 3, vol. 3, p. 199, 1903. 3 species. Type, *Blepharicera yosemite* OSTEN SACKEN, the second species, by present designation.

Philygria STENHAMMAR, Kongl. Vet. Akad. Handl. for 1843, p. 154, 1844. 3 species. Type, *Notiphila flavipes* FALLEN, the second species, by present designation.

Pholeomyia BILIMEK, Verh. Zool.-Bot. Ges. Wien, vol. 17, p. 903, 1867. 1 species. Type, *Pholeomyia leucozona* BILIMEK.

Phoneus MACQUART, Dipt. Exot., vol. 1, pt. 2, p. 79, 1838. 1 species. Type, *Phoneus serrillei* MACQUART. Not *Phoneus* KAUP, 1829. Equals **Neophoneus** WILLISTON, 1889.

Phoneutisca LOEW, Berliner Ent. Zeitschr., vol. 7, p. 19, 1863. 1 species. Type, *Tachydromia maculipennis* WALKER (as *bimaculata*, new species.)

Phoniomyia THEOBALD, Monogr. Culic., vol. 3, p. 311, 1903. 2 species. Type, *Wyeomyia longirostris* THEOBALD, the first species, by designation of DYAR, Proc. Ent. Soc. Washington, vol. 7, 1905, p. 49.

Phora LATREILLE, Précis, p. 169, 1796. No species. In his Hist. Nat. Crust. et Ins., vol. 3, 1802, p. 464, 1 species. Type, *Musca aterrima* FABRICIUS. Syn., *Trineura* MEIGEN, 1803; *Noda* SCHELLENBERG, 1803; *Philodendria* RONDANI, 1856. (*Phora* of authors equals *Anevrina* LIOY.)

Phoræa DESVOIDY, Essai Myod., p. 600, 1830. 4 species. Type, *Phoræa flavescens* DESVOIDY, the first species, by present designation. Equals **Pegomya** DESVOIDY, 1830.

Phorantha RONDANI, Dipt. Ital. Prodr., vol. 5, p. 21, 1862. 1 species. Type, *Conops subcoleoptrata* LINNÆUS (as *musciformis*, new species). Equals **Phasia** LATREILLE, 1805.

Phorbia DESVOIDY, Essai Myod., p. 559, 1830. 5 species. Type, *Phorbia musca* DESVOIDY, the first species, by present designation. Equals **Pegomya** DESVOIDY, 1830.

Phorella DESVOIDY, Essai Myod., p. 362, 1830. 2 species (as 6). Type, *Musca carnaria* LINNÆUS (as *arvensis*, new species), the first species, by designation of DESVOIDY, Hist. Nat. Dipt., vol. 2, 1863, p. 530. Equals **Sarcophaga** MEIGEN, 1826.

Phoricheta RONDANI, Dipt. Ital. Prodr., vol. 4, p. 8, 1861. Change of name for *Scopolia* DESVOIDY, 1830, not of HÜBNER, 1816. Type, *Ocyptera costata* FALLEN. Equals **Wagneria** DESVOIDY, 1830.

Phormia DESVOIDY, Essai Myod., p. 465, 1830. 3 species (as 8). Type, *Musca regina* MEIGEN, the second species, by designation of DESVOIDY, Bull. Soc. Ent. France for 1849, p. 5. Syn., *Protophormia* TOWNSEND, 1908.

Phorocera DESVOIDY, Essai Myod., p. 131, 1830. 4 species (as 22). Type, *Tachina assimilis* FALLEN (equaling the supposed species 1, 2, 3, 5, and 17 to 20), by designation of DESVOIDY, Hist. Nat. Dipt., vol. 1, 1863, p. 509. Syn., *Salia* DESVOIDY, 1830; *Chetogena* RONDANI, 1856; *Spoggosia* RONDANI, 1859; *Eggeria* SCHINER, 1861; *Euphorocera* TOWNSEND, 1892.

Phoroctenia, new genus. Type, *Ctenophora angustipennis* LOEW. (This is *Ctenophora* of authors, not of MEIGEN.)

Phorodonta, new name. For *Odontonyx* RUBSAAMEN, 1894, not of STEPHENS, 1828. Type, *Sciara nigra* WIEDEMANN. Syn., *Odontonyx* RUBSAAMEN, 1894, preoccupied.

Phorosia DESVOIDY, Dipt. Env. Paris, Myop., p. 29, 1853.* 1 species. Type, *Conops testacea* LINNÆUS. Equals **Stomoxoides** SCHÆFFER, 1766.

Phorostoma DESVOIDY, Essai Myod. p. 326, 1830. 1 species. Type, *Musca ferina* FALLEN (as *subrotunda*, new species). Syn., *Myocera* DESVOIDY, 1830; *Amyclæa* DESVOIDY, 1863; *Rhamphinina* BIGOT, 1885; *Clinoneura* BRAUER and BERGENSTAMM, 1889; *Ptilodexia* BRAUER and BERGENSTAMM, 1889.

Phortica SCHINER, Wien. Ent. Monatschr., vol. 6, p. 433, December, 1862. 1 species. Type, *Drosophila variegata* FALLEN. Equals **Amiota** LOEW, May, 1862.

Phosocephala TOWNSEND, Smiths. Misc. Coll., vol. 51, p. 69, 1908. 1 species. Type, *Phosocephala metallica* TOWNSEND.

Phrissopodia MACQUART, Hist. Nat., Dipt., vol. 2, p. 222, 1835. 2 species. Type, *Peckia imperialis* DESVOIDY, the first species, by original designation. Equals **Peckia** DESVOIDY, 1830.

Phrissopolia TOWNSEND, Smiths. Misc. Coll., vol. 51, p. 93, 1908. 1 species (as 2). Type, *Prospherysa crebra* WULP. Equals **Chætogædia** BRAUER and BERGENSTAMM, 1891.

Phronia WINNERTZ, Verh. Zool.-Bot. Ges. Wien, vol. 13, p. 857, 1863. 28 species. Type, *Phronia rustica* WINNERTZ, the 22d species, by designation of JOHANNSEN, Gen. Ins., Dipt., Mycet., 1909, p. 96.

Phryne MEIGEN, Nouv. Class. Mouch., p. 16, 1800.* No species. *Anisopus* MEIGEN, 1803, is a change of name. Type, *Tipula fuscata* FABRICIUS. Equals **Sylvicolæ** HARRIS, 1776.

Phryxe DESVOIDY, Essai Myod., p. 158, 1830. 8 species (as 36). Type, *Tachina vulgaris* FALLEN (equaling 22 of the supposed species), by designation of DESVOIDY, Hist. Nat. Dipt., vol. 1, 1863, p. 329. Syn., *Blepharidea* RONDANI, 1856; *Hemithæa* DESVOIDY, 1863; *Erinia* DESVOIDY, 1863; *Blumia*, DESVOIDY, 1863; *Eurigastrina* LIOY, 1864; *Anoxycampta* BIGOT, 1880; *Ceratochæta* BRAUER and BERGENSTAMM, 1889; *Pseudophorocera* BRAUER and BERGENSTAMM, 1889; *Pseudoperichæta* BRAUER and BERGENSTAMM, 1889; *Blepharidopsis* BRAUER and BERGENSTAMM, 1891. *Catachæta* BRAUER and BERGENSTAMM, 1891.

Phthinia WINNERTZ, Verh. Zool.-Bot. Ges. Wien, vol. 13, p. 779, 1863. 3 species. Type, *Phthinia humilis* WINNERTZ, the first species, by designation of JOHANNSEN, Gen. Ins., Dipt., Mycet., 1909, p. 83.

Phthiria MEIGEN, Illiger's Mag., vol. 2, p. 268, 1803. 1 species. Type, *Bombylius pulicarius* MIKAN. Syn., *Cyclorhynchus* MACQUART, 1840; *Pœcilognathus* JENNICKE, 1867.

Phthiridium HERMANN, Mem. Apter., pp. 12 and 15, 1804. 2 species. Type, *Phthiridium biarticulatum* HERMANN, the second species, by present designation. Equals **Nycteribia** LATREILLE, 1796.

Phylarchus ALDRICH, Biol. Centr.-Amer., Dipt., vol. 1, p. 342, 1901. 1 species. Type, *Phylarchus tripartitus* ALDRICH.

Phylidorea BIGOT, Ann. Soc. Ent. France for 1854, p. 456, 1854. 19 species. Type, *Limnobia ferruginea* MEIGEN, the ninth species, by present designation. Syn., *Pilaria* SINTENSIS, 1889; *Lasiomastix* OSTEN SACKEN, 1860; *Prionolabis* OSTEN SACKEN, 1860; *Dactylolabis* OSTEN SACKEN, 1860; *Dicranophragma* OSTEN SACKEN, 1860.

Phyllodromia ZETTERSTEDT, Isis von Oken for 1837, p. 31, 1837. 3 species. Type, *Empis melanocephala* FABRICIUS, the first species, by designation of RONDANI, Dipt. Ital. Prodr., vol. 1, 1856, p. 148. Equals **Hemerodromia** MEIGEN, 1822.

Phyllogaster STEIN, Berliner Ent. Zeitschr., vol. 42, p. 256, 1898. 1 species. Type, *Phyllogaster cordyluroides* STEIN.

Phyllolabis OSTEN SACKEN, Bull. 3, U. S. Geol. Surv., p. 202, 1877. 2 species. Type, *Phyllolabis claviger* OSTEN SACKEN, the first species, by present designation.

Phyllomydas BIGOT, Bull. Soc. Ent. France for 1880, p. 46, 1880. 1 species. Type, *Phyllomydas phyllocerus* BIGOT. Equals **Mydas** FABRICIUS, 1794.

Phyllomyza FALLEN, Spec. Ent. Meth. Exh., p. 20, 1810. No species. In his Phytom. et Ocht. Sveciæ, 1823, p. 8, 1 species. Type, *Phyllomyza securicornis* FALLEN.

Phyllophaga RONDANI, Dipt. Ital. Prodr., vol. 1, p. 199, 1856. 1 species. Type, *Cecidomyia fusca* MEIGEN. Equals **Asphondylia** LOEW, 1850.

Phyllophila LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 1313, 1864. 1 species. Type, *Agromyza pallipes* MACQUART. Equals **Agromyza** FALLEN, 1810.

Physecrania BIGOT, Ann. Soc. Ent. France for 1859, p. 123, 1859. 1 species. Type, *Physecrania obscura* BIGOT. Equals **Caloptera** GUERIN, 1829.

Physegenua MACQUART, Dipt. Exot., Suppl. 3, p. 60, 1848. 1 species. Type, *Physegenua vittata* MACQUART.

Physiphora FALLEN, Spec. Ent. Meth. Exh., p. 11, 1810. No species. In his Scen. et Con. Sveciæ, 1817, p. 3, 1 species. Type, *Musca demandata* FABRICIUS (as *splendida*, new species). Syn., *Chrysomyza* FALLEN, 1817; *Ulidia* MEIGEN, 1826; *Chloria* SCHINER, 1862.

Physocephala SCHINER, Wien. Ent. Monatschr., vol. 5, p. 137, 1861. 1 species. Type, *Conops rufipes* FABRICIUS.

Phyto DESVOIDY, Essai Myod., p. 218, 1830. 1 species (as 4). Type, *Tachina melanocephala* MEIGEN. Syn., *Novia* DESVOIDY, 1830; *Savia* RONDANI, 1861; *Kockia* DESVOIDY, 1863.

Phytobia LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 1313, 1864. 1 species. Type, *Agromyza errans* MEIGEN. Equals **Agromyza** FALLEN, 1810.

Phytomyza FALLEN, Spec. Ent. Meth. Exh., p. 21, 1810. 1 species. Type, *Phytomyza flaveola* FALLEN. Syn., *Chromatomyia* HARDY, 1849.

Phytophaga RONDANI, Sopra Nuov. Gen. Ins. Dipt., p. 12, 1840.* 1 species. Type, *Cecidomyia destructor* SAY (as *cerealis*, new species). Syn., *Mayetia* KIEFFER, 1896.

Pialoidea WESTWOOD, Trans. Ent. Soc. Lond. for 1876, p. 514, 1876. 1 species. Type, *Cyrtus magnus* WALKER.

Picconia DESVOIDY, Hist. Nat. Dipt., vol. 2, p. 33, 1863. 1 species. Type, *Tachina nigripes* FALLEN (as *bipartita*, new species). Equals **Lydella** DESVOIDY, 1830.

Pictinia DESVOIDY, Dipt. Env. Paris, Myop., p. 15, 1853.* 1 species. Type, *Pictinia fulvipalpis* DESVOIDY. Equals **Stomoxoides** SCHÆFFER, 1766.

Pierretia DESVOIDY, Hist. Nat. Dipt., vol. 2, p. 422, 1863. 14 supposed species. Type, *Sarcophaga nigriventris* MEIGEN, equaling supposed species 2, 3, 4, 5, 6, and 12, by present designation. Equals **Sarcophaga** MEIGEN, 1826.

Pilaria SINTENSIS, Sitzb. Nat.-Ges. Dorpat, vol. 8, p. 398, 1889. 2 species. Type, *Limnobia pilicornis* ZETTERSTEDT, the second species, by present designation. Equals **Phylidorea** BIGOT, 1854.

Piophila FALLEN, Spec. Ent. Meth. Exh., p. 20, 1810. 1 species. Type, *Musca casei* LINNÆUS. Syn., *Tyrophaga* KIRBY, 1817; *Stearibia* LIOY, 1864.

Pipiza FALLEN, Spec. Ent. Meth. Exh., p. 11, 1810. No species. In his Syrphici Sveciæ, 1817, pp. 58 to 61, 8 species. Type, *Musca noctiluca* LINNÆUS, the second species, by designation of CURTIS, Brit. Ent., 1837, p. 669. Syn., *Phalangus* MEIGEN, 1822; *Heringia* RONDANI, 1856; *Pipizella* RONDANI, 1856.

Pipizella RONDANI, Dipt. Ital. Prodr., vol. 1, p. 54, 1856. 1 species. Type, *Mulio virens* FABRICIUS. Equals **Pipiza** FALLEN, 1810.

Pipunculus, LATREILLE, Hist. Nat. Crust. et Ins., vol. 3, p. 463, 1802. 1 species. Type, *Pipunculus campestris* LATREILLE. Equals **Dorilas** MEIGEN, 1800.

Pissemya DESVOIDY, Ann. Soc. Ent. France for 1851, p. 318, 1851. 1 species. Type, *Gonia fasciata* WIEDEMANN (as *atra* MEIGEN). Equals **Spallanzania** DESVOIDY, 1830.

Pithogaster LOEW, Wien. Ent. Monatschr., vol. 1, p. 33, 1857. 1 species. Type, *Pithogaster inflatus* LOEW. Equals **Opsebius** COSTA, 1856.

Pityocera GIGLIO-TOS, Boll. Mus. Zool. Univ. Torino, vol. 11, No. 224, p. 3, 1896. 1 species. Type, *Pityocera festæ* GIGLIO-TOS.

Plagia MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 7, p. 201, 1838. 6 species. Type, *Tachina ruralis* FALLEN (as *verticalis* MEIGEN), the second species, by designation of RONDANI, Dipt. Ital. Prodr., vol. 1, 1856, p. 69. Equals **Voria** DESVOIDY, 1830. (*Plagia* of authors equals *Siphoplagia* TOWNSEND.)

Plagiocera MACQUART, Dipt. Exot., vol. 2, pt. 2, p. 59, 1842. 2 species. Type, *Milesia acuta* FABRICIUS (as *cruciger* WIEDEMANN), the first species, by present designation. Not *Plagiocera* KLUG, 1834. Equals **Meromacrus** RONDANI, 1848.

Plagiomima BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 58, p. 384, 1891. 1 species. Type, *Plagiomima disparata* BRAUER and BERGENSTAMM.

Plagioneurus LOEW, Wien. Ent. Monatschr, vol. 1, p. 43, 1857. 1 species. Type, *Plagioneurus univittatus* LOEW.

Plagiotoma LOEW, Monogr. Dipt. N. Amer., vol. 3, p. 252, 1873. 3 species. Type, *Trypeta obliqua* SAY, the second species, by present designation. Not *Plagiotoma* CLAPARÈDE and LACHMANN, 1858. Equals **Tomoplagia**, new name.

Plagiprospherysa TOWNSEND, Trans. Amer. Ent. Soc., vol. 19, p. 113, 1892. 2 species. Type, *Prospherysa parripalpis* WULP (as *valida*, new species), the first species, by original designation.

Planes RONDANI, Arch. Zool., vol. 3, p. 9, 1864. 1 species. Type, *Xylota vagans* WIEDEMANN. Equals **Syritta** ST. FARGEAU and SERVILLE, 1828.

Planetolestes ARRIBALZAGA, Anal. Soc. Cient. Argentina, vol. 8, p. 145, 1879.* 1 species. Type, *Laphria coarctata* PERTY. Equals **Blepharepium** RONDANI, 1848.

Platophryma WILLISTON, Trans. Ent. Soc. Lond. for 1896, p. 426, 1896. 1 species. Type, *Platophryma nigra* WILLISTON.

Platycheirus ST. FARGEAU and SERVILLE, Encycl. Meth., vol. 10, pt. 2, p. 513, 1828. 6 species. Type, *Syrphus scutatus* MEIGEN, the first species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 137.

Platychira RONDANI, Dipt. Ital. Prodr., vol. 1, p. 64, 1856. 1 species. Type, *Musca puparum* FABRICIUS. Equals **Meriania** DESVOIDY, 1830.

Platycnema ZETTERSTEDT, Ins. Lapp., p. 334, 1838. 1 species. Type, *Empis pulicaria* FALLEN. Equals **Atelestus** WALKER, 1837.

Platycœnosia STROBL, Wien. Ent. Zeit., vol. 13, p. 72, 1894. 1 species. Type, *Platycœnosia mikii* STROBL. Syn., *Choristomma* STEIN, 1895.

Platynochætus WIEDEMANN, Auss. Zweifl. Ins., vol. 2, p. 147, 1830. 1 species. Type, *Syrphus setosus* FABRICIUS.

Platypalpus MACQUART, Ins. Dipt. Nord France, Separata, p. 92, 1827. 18 species. Type, *Musca cursitans* FABRICIUS, the fourteenth species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 132.

Platypeza MEIGEN, Illiger's Mag., vol. 2, p. 272, 1803. No species. In his Klass. Beschr. Zweifl. Ins., 1804, p. 310, 3 species. Type, *Platypeza fasciata* MEIGEN, the first species, by designation of RONDANI, Dipt. Ital. Prodr., vol. 1, 1856, p. 139. Equals **Clythia** MEIGEN, 1800.

Platyptera MEIGEN, Illiger's Mag., vol. 2, p. 269, 1803. 2 species. Type, *Empis platyptera* PANZER, the second species, by tautonymy. Equals **Dionnæa** MEIGEN, 1800.

Platypterygia STEPHENS, Syst. Cat. Brit. Ins., vol. 2, p. 263, 1829. 1 species. Type, *Empis borealis* LINNÆUS. Equals **Empis** LINNÆUS, 1758.

Platystoma MEIGEN, Illiger's Mag., vol. 2, p. 277, 1803. 1 species. Type, *Musca seminationis* LINNÆUS. Syn., *Hesyquillia* DESVOIDY, 1830; *Megaloglossa* RONDANI, 1869.

Platyura MEIGEN, Illiger's Mag., vol. 2, p. 264, 1803. No species. In his Klass. Beschr. Zweifl. Ins., 1804, pp. 101, 102, 5 species. Type, *Platyura fasciata* MEIGEN, the second species, by designation of ZETTERSTEDT, Dipt. Scand., vol. 10, 1851, p. 4077. Equals **Zelmira** MEIGEN, 1800.

Plaxemya DESVOIDY, Essai Myod., p. 392, 1830. 1 species. Type, *Musca vitripennis* MEIGEN (as *sugillatrix*, new species). Equals **Musca** LINNÆUS, 1758.

Plecia WIEDEMANN, Auss. Zweifl. Ins., vol. 1, p. 72, 1828. 6 species. Type, *Hirtea fulvicollis* FABRICIUS, the second species, by designation of BLANCHARD, Hist. Nat. Ins., vol. 3, 1840, p. 576. Syn., *Rhinoplecia* BELLARDI, 1859.

Plectops COQUILLETT, Rev. Tach., p. 57, 1897. 1 species. Type, *Plectops melissopodis* COQUILLETT.

Plectromyia OSTEN SACKEN, Monogr. Dipt. N. Amer., vol. 4, p. 282, 1869. 1 species. Type, *Plectromyia modesta* OSTEN SACKEN.

Plectropus HALIDAY, Zool. Journ., vol. 5, p. 353, 1831. 3 species. Type, *Musca pallipes* FABRICIUS, the first species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 134 (as *pallidus* MEIGEN). Not *Plectropus* KIRBY, 1826. Equals **Syntormon** LOEW, 1857.

Plesiastina WINNERTZ, Ent. Zeit. Stettin, vol. 13, p. 55, 1852. 1 species (as 2). Type, *Mycetobia annulata* MEIGEN. Equals **Symmerus** WALKER, 1848.

Plesiomma MACQUART, Dipt. Exot., vol. 1, pt. 2, p. 54; 1838. 2 species. Type, *Plesiomma testacea* MACQUART, the first species, by designation of BACK, Trans. Amer. Ent. Soc., vol. 35, p. 306, 1909.

Plethochæta COQUILLETT, Proc. U. S. Nat. Mus., vol. 23, p. 613, 1901. 1 species. Type, *Plethochæta varicolor* COQUILLETT.

Plettusa PHILIPPI, Verh. Zool.-Bot. Ges. Wien, vol. 15, p. 597, 1865. 4 species. Type, *Plettusa virescens* PHILIPPI, the first species, by present designation. Equals **Geranomyia** HALIDAY, 1833.

Plinthina WALKER, Ins. Saund., Dipt., p. 10, 1850. 1 species. Type, *Pangonius macroporum* MACQUART. Equals **Pangonius** LATREILLE, 1802.

Ploas LATREILLE, Hist. Nat. Crust. et Ins., vol. 14, p. 299, 1805. 1 species. Type, *Bombylius virescens* FABRICIUS (as *hirticornis*, new species). Equals **Conophorus** MEIGEN, 1803.

Pneumaculex DYAR, Proc. Ent. Soc. Washington, vol. 7, p. 45, 1905. 1 species. Type, *Culex signifer* COQUILLETT.

Pocota ST. FARGEAU and SERVILLE, Encycl. Meth., vol. 10, pt. 2, p. 518, 1828. 1 species. Type, *Musca apiformis* SCHRANK (as *Milesia apicata* MEIGEN). Syn., *Dasymyia* EGGER, 1858; *Hadromyia* WILLISTON, 1882.[a]

Pœcilanthrax OSTEN SACKEN, Biol. Centr.-Amer., Dipt., vol. 1, p. 119, 1886. 7 species. Type, *Anthrax alcyon* SAY, the first species, by present designation. Equals **Villa** LIOY, 1864.

Pœcilognathus JÆNNICKE, Neue Exot. Dipt., p. 42, 1867. 1 species. Type, *Pœcilognathus thlipsomyzoides* JÆNNICKE. Equals **Phthiria** MEIGEN, 1803.

Pogonomyia RONDANI, Bull. Soc. Ent. Ital., vol. 2, p. 336, 1870. 1 species. Type, *Pogonomyia alpicola* RONDANI.

Pogonosoma RONDANI, Dipt. Ital. Prodr., vol. 1, p. 160, 1856. 1 species. Type, *Asilus maroccanus* FABRICIUS.

Polidea MACQUART, Ann. Soc. Ent. France for 1848, p. 92, 1848. 2 species. Type, *Tachina ænea* MEIGEN, the first species, by present designation. Equals **Lydina** DESVOIDY, 1830.

Polionoma RONDANI, Dipt. Ital. Prodr., vol. 1, p. 107, 1856. No species. In Atti Soc. Ital. Sci. Nat., vol. 11, 1868, p. 36, he placed it as a synonym of *Sapromyza* FALLEN, 1810. Type, *Sapromyza obsoleta* FALLEN. Equals **Sapromyza** FALLEN, 1810.

Polionota WULP, Biol. Centr.-Amer., vol. 2, p. 409, 1899. 2 species. Type, *Acrotoxa mucida* GIGLIO-TOS, the first species, by original designation.

Poliophrys TOWNSEND, Smiths. Misc. Coll., vol. 51, p. 90, 1908. 1 species (as 2). Type, *Gaediopsis mexicana* BRAUER and BERGENSTAMM. Equals **Gædiopsis** BRAUER and BERGENSTAMM, 1891.

Polistomyia TOWNSEND, Smiths. Misc. Coll., vol. 51, p. 132, 1908. 1 species (as 6). Type, *Thereva plumipes* FABRICIUS. Equals **Trichiopoda** LATREILLE, 1829.

Pollenia DESVOIDY, Essai Myod., p. 412, 1830. 5 species (as 16). Type, *Musca rudis* FABRICIUS, the fourth species, by orignal designation. Syn., *Nitellia* DESVOIDY, 1830; *Cephysa* DESVOIDY, 1863; *Orizia* DESVOIDY, 1863.

Polyangæus DOANE, Journ. N. Y. Ent. Soc., vol. 8, p. 196, 1900. 1 species. Type, *Polyangæus maculatus* DOANE.

Polydonta MACQUART, Dipt. Exot., Suppl. 4, p. 144, 1850. 1 species. Type, *Merodon curvipes* WIEDEMANN (as *bicolor*, new species). Not *Polydonta* FISCHER, 1807. Equals **Polydontomyia** WILLISTON, 1896.

Polydontomyia WILLISTON, Man. N. Amer. Dipt., p. 89, 1896. Change of name for *Polydonta* MACQUART, 1850, not of FISCHER, 1807. Type, *Merodon curvipes* WIEDEMANN. Syn., *Polydonta* MACQUART, 1850, preoccupied; *Triodonta* WILLISTON, 1885, preoccupied.

Polydromya BIGOT, Ann. Soc. Ent. France for 1857, p. 557, 1857. No species. The characters assigned this genus were evidently taken from Meigen's imperfect figure of *Tachydromia præcatoria* FALLEN (Syst. Beschr. Zweifl. Ins., vol. 3, pl. 23, fig. 13). Type, *Tachydromia præcatoria* FALLEN. Equals **Chelifera** MACQUART, 1823.

Polygaster WULP, Biol. Centr.-Amer., Dipt., vol. 2, p. 139, 1890. 1 species. Type, *Polygaster egregia* WULP.

Polylepta WINNERTZ, Verh. Zool.-Bot. Ges. Wien, vol. 13, p. 745, 1863. 2 species. Type, *Polylepta undulata* WINNERTZ, the first species, by designation of JOHANNSEN, Gen. Ins., Dipt., Mycet., 1909, p. 43.

Polymeda MEIGEN, Nouv. Class. Mouch., p. 14, 1800.* No species. *Erioptera* MEIGEN, 1803, is a change of name. Type, *Erioptera lutea* MEIGEN. Syn., *Erioptera* MEIGEN,

[a] **Podoctria** MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 2, p. 279, 1820. 5 species. Type, *Dasypogon vitripennis* MEIGEN, the first species, by present designation. Syn., *Isopogon* LOEW, 1847. European.

1803; *Polygraphia* MEIGEN, 1818; *Octavia* BIGOT, 1854; *Chemalida* RONDANI, 1856; *Limnœa* RONDANI, 1856; *Limnoica* RONDANI, 1861.

Polymedon OSTEN SACKEN, Bull. 3, U. S. Geol. Surv., p. 317, 1877. 1 species. Type, *Polymedon flabellifer* OSTEN SACKEN.

Polymera WIEDEMANN, Dipt. Exot., p. 40, 1821. 1 species. Type, *Chironomus hirticornis* FABRICIUS.

Polymorphomyia SNOW, Kansas Univ. Quart., vol. 2, p. 165, 1894. 1 species. Type, *Polymorphomyia basilica* SNOW.

Polyraphia MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 1, p. 111, 1818. 1 species. Type, *Erioptera tænionota* MEIGEN. Equals **Polymeda** MEIGEN, 1800.

Pomacera MACQUART, Dipt. Exot., Suppl. 2, p. 47, 1847. 1 species. Type, *Pomacera bigoti* MACQUART. Equals **Apiocera** WESTWOOD, 1835.

Popelia BEZZI, Bull. Soc. Ent. Ital., vol. 26, p. 256, 1894. 1 species. Type, *Echinomyia popelii* PORTSCHINSKY. Equals **Peleteria** DESVOIDY, 1830.

Porphyrops MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 4, p. 45, 1824. 29 species. Type, *Musca diaphana* FABRICIUS, the first species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 134. Syn., *Argyra* MACQUART, 1834; *Lasiargyra* MIK, 1878. (*Porphyrops* of authors equals *Perithinus* HALIDAY.)

Porricondyla RONDANI, Mem. 2a. Serv. Ditt. Ital., p. 14, 1840.* No species. In his Dipt. Ital. Prodr., vol. 1, 1856, p. 199, 1 species. Type, *Cecidomyia albitarsis* MEIGEN.

Porsenus DARLINGTON, Trans. Amer. Ent. Soc., vol. 34, p. 69, 1908. 1 species. Type, *Porsenus johnsoni* DARLINGTON.

Prionella DESVOIDY, Essai Myod., p. 759, 1830. 2 species. Type, *Prionella beauvoisii* DESVOIDY, the first species, by present designation.

Prionimera RONDANI, Dipt. Ital. Prodr., vol. 4, p. 10, 1861. Change of name for *Epidesmia* RONDANI, 1856, not of WESTWOOD, 1841. Type, *Tephritis cognatus* WIEDEMANN. Equals **Acidia** DESVOIDY, 1830.

Prionocera LOEW, Ent. Zeit. Stettin, vol. 5, p. 170, 1844. 1 species. Type, *Prionocera pubescens* LOEW. Syn., *Stygeropis* LOEW, 1863.

Prionolabis OSTEN SACKEN, Proc. Acad. Nat. Sci. Phila. for 1859, p. 239, 1860. 1 species. Type, *Limnophila rufibasis* OSTEN SACKEN. Equals **Phylidorea** BIGOT, 1854.

Prionomyia STEPHENS, Syst. Cat. Brit. Ins., vol. 2, p. 237, 1829. 6 species. Type, *Ceratopogon femoratus* MEIGEN, the first species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 126. Equals **Serromyia** MEIGEN, 1818.

Priophora DESVOIDY, Hist. Nat. Dipt., vol. 2, p. 611, 1863. 1 species. Type, *Conops irritans* LINNÆUS (as *Hæmatobia serrata* DESVOIDY). Equals **Hæmatobia** ST. FARGEAU and SERVILLE, 1828.

Probezzia KIEFFER, Gen. Ins., Dipt., Chir., p. 57, 1906. Described as a subgenus of *Bezzia*, under which genus 44 species were listed without any reference as to which subgenus each belonged. The forty-third species, agreeing with the characters of this subgenus, may be taken as the type. Type, *Ceratopogon venusta* MEIGEN. Equals **Bezzia** KIEFFER, 1899.

Probolæus WILLISTON, Trans. Ent. Soc. Lond. for 1896, p. 261, 1896. 1 species. Type, *Probolæus singularis* WILLISTON.

Proboscimyia BIGOT, Bull. Soc. Ent. France for 1883, p. 30, 1883. 1 species. Type, *Proboscimyia siphonina* BIGOT. Syn., *Dolichoglossa* STEIN, 1898.

Prochyliza WALKER, List Dipt. Brit. Mus., vol. 4, p. 1045, 1849. 1 species. Type, *Prochyliza xanthostoma* WALKER.

Procladius SKUSE, Proc. Linn. Soc. N. S. Wales, ser. 2, vol. 4, p. 283, 1889. 2 species. Type, *Procladius paludicola* SKUSE, the first species, by present designation.

Procrita Hendel, Gen. Ins., Dipt., Laux., p. 59, 1908. 1 species. Type, *Procrita pectinata* HENDEL.

Proctacanthus MACQUART, Dipt. Exot., vol. 1, pt. 2, p. 120, 1838. 9 species. Type, *Proctacanthus philadelphicus* MACQUART, the seventh species, by present designation.

Prodiplosis FELT, 23d Rep. State Ent. N. Y., p. 403, 1908. 1 species. Type, *Cecidomyia floricola* FELT.

Promachus LOEW, Linn. Ent., vol. 3, p. 390, 1848. 5 species. Type, *Asilus maculatus* FABRICIUS, the second species, by present designation. Equals **Bactria** MEIGEN, 1820.

Prorates MELANDER, Ent. News, vol. 17, p. 372, 1906. 1 species. Type, *Prorates claripennis* MELANDER.

Prorhynchops BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 58, p. 364, 1891. 1 species. Type, *Prorhynchops bilimeki* BRAUER and BERGENSTAMM.

Prosalpia POKORNY, Wien. Ent. Zeit., vol. 12, p. 54, 1893. 3 species. Type, *Anthomyza bilbergi* ZETTERSTEDT (as *styriaca*, new species), the first species, by designation of COQUILLETT, Journ. N. Y. Ent. Soc., vol. 9, 1901, p. 140.

Prosena St. FARGEAU and SERVILLE, Encycl. Meth., vol. 10, pt. 2, p. 500, 1828. 1 species. Type, *Stomoxys siberita* FABRICIUS. Equals **Calirrhoe** MEIGEN, 1800.

Prospherysa WULP, Biol. Centr.-Amer. Dipt., vol. 2, p. 116, 1890. 18 species. Type, *Prospherysa æmulans* WULP, the first species, by present designation.

Protenthes JOHANNSEN, Ent. News, vol. 18, p. 400, 1907. 1 species. Type, *Tipula cincta* FABRICIUS (as *punctipennis* MEIGEN). Equals **Pelopia** MEIGEN, 1800.

Prothecus RONDANI, Dipt. Ital. Prodr., vol. 1, p. 139, 1856. 1 species. Type, *Pipunculus furcatus* EGGER (as *Cephalops aucta* FALLEN). Equals **Dorilas** MEIGEN, 1800.

Protocalliphora HOUGH, Ent. News, vol. 10, p. 66, 1899. 1 species. Type, *Musca azurea* FALLEN. Syn., *Avihospita* HENDEL, 1901.

Protoculex FELT, Mosq. Culic. N. Y. State, p. 391d, 1904. 1 species. Type, *Culex serratus* THEOBALD. Equals **Ochlerotatus** ARRIBALZAGA, 1891.

Protomacleaya THEOBALD, Monogr. Culic., vol. 4, p. 253, 1907. 1 species. Type, *Culex triseriatus* SAY. Equals **Ochlerotatus** ARRIBALZAGA, 1891.

Protophormia TOWNSEND, Smiths. Misc. Coll., vol. 51, p. 123, 1908. 1 species. Type, *Phormia terræ-novæ* DESVOIDY. Equals **Phormia** DESVOIDY, 1830.

Protoplasa OSTEN SACKEN, Proc. Acad. Nat. Sci. Phila. for 1859, p. 251, 1860. 1 species. Type, *Protoplasa fitchii* OSTEN SACKEN. Syn., *Idioplasta* OSTEN SACKEN, 1878.

Psairoptera WAHLBERG, Kongl. Vet. Akad. Handl. for 1838, p. 18, 1839. 4 species. Type, *Homalocephala albitarsis* ZETTERSTEDT (as *biumbrata*, new species), the second species, by designation of ZETTERSTEDT, Dipt. Scand., vol. 6, 1847, p. 2264. Equals **Homalocephala** ZETTERSTEDT, 1838.

Psalida RONDANI, Dipt. Ital. Prodr., vol. 1, p. 76, 1856. 1 species (in error). In vol. 4, 1861, pp. 91, 92, 2 species (as 3). Type, *Ocyptera simplex* FALLEN, the last species, by designation of BRAUER, Verh. Zool.-Bot. Ges. Wien, vol. 43, 1893, p. 495. Equals **Leucostoma** MEIGEN, 1803

Psectrocladius KIEFFER, Mem. Soc. Sci. Bruxelles, vol. 30, p. 356, 1906. 1 species. Type, *Orthocladius psilopterus* KIEFFER. Equals **Orthocladius** WULP, 1874.

Pselaphephila BECKER, Berliner Ent. Zeitschr., vol. 39, p. 122, 1894. 1 species. Type, *Pselaphephila loëwi* BECKER.

Pseudacteon COQUILLETT, Can. Ent., vol. 39, p. 208, 1907. 1 species. Type, *Pseudacteon crawfordii* COQUILLETT.

Pseudapinops COQUILLETT, Proc. U. S. Nat. Mus., vol. 25, p. 108, 1902. 1 species. Type, *Pseudapinops nigra* COQUILLETT.

Pseudatractocera TOWNSEND, Trans. Amer. Ent. Soc., vol. 19, p. 107, 1892. 1 species. Type, *Pseudatractocera neomexicana* TOWNSEND.

Pseudatrichia OSTEN SACKEN, Bull. 3, U. S. Geol. Surv., p. 276, 1877. Change of name for *Atrichia* LOEW, 1866, not of SCHRANK, 1803. Type, *Atrichia longurio* LOEW. Syn., *Atrichia* LOEW, preoccupied.

Pseudiastata COQUILLETT, Proc. Ent. Soc. Washington, vol. 9, p. 148, 1908. 1 species. Type, *Pseudiastata nebulosa* COQUILLETT.

Pseudochæta COQUILLETT, Proc. Acad. Nat. Sci. Phila. for 1895, p. 309, 1895. 1 species. Type, *Pseudochæta argentifrons* COQUILLETT. Syn., *Trepophrys* TOWNSEND, 1908.

Pseudoculex DYAR, Proc. Ent. Soc. Washington, vol. 7, p. 45, 1905. 1 species. Type, *Culex aurifer* COQUILLETT. Equals **Ochlerotatus** ARRIBALZAGA, 1891.

Pseudodexia BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 58, p. 372, 1891. 1 species. Type, *Dexia eques* WIEDEMANN.

Pseudodinia COQUILLETT, Journ. N. Y. Ent. Soc., vol. 10, p. 187, 1902. 1 species. Type, *Pseudodinia varipes* COQUILLETT.

Pseudogermaria BRAUER and BERGENSTAMM, Denkschr. Kais. Acad. Wiss. Wien, vol. 58, p. 352, 1891. 1 species. Type, *Pseudogermaria georgia* BRAUER and BERGENSTAMM. Equals **Distichona** WULP, 1890.

Pseudogonia BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 56, p. 100, 1889. 1 species. Type, *Gonia cinerascens* RONDANI. Equals **Spallanzania** DESVOIDY, 1830.

Pseudohowardina THEOBALD, Monogr. Culic., vol. 4, p. 223, 1907. 1 species. Type, *Culex trivittata* COQUILLETT. Equals **Ochlerotatus** ARRIBALZAGA, 1891.

Pseudohystricia BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 56, p. 132, 1889. 1 species. Type, *Hystricia ambigua* MACQUART. Equals **Jurinella** BRAUER and BERGENSTAMM, 1889.

Pseudolfersia COQUILLETT, Can. Ent., vol. 31, p. 336, 1899. 1 species. Type, *Pseudolfersia maculata* COQUILLETT.

Pseudolimnophora STROBL, Verh. Zool.-Bot. Ges. Wien, vol. 43, p. 272, 1893. 6 species. Type, *Musca triangula* FALLEN, the first species, by designation of COQUILLETT, Journ. N. Y. Ent. Soc., vol. 9, 1901, p. 140. Equals **Limnophora** DESVOIDY, 1830.

Pseudomorinia WULP, Biol. Centr.-Amer. Dipt., vol. 2, p. 259, 1891. 1 species. Type, *Pseudomorinia pictipennis* WULP.

Pseudomyothyria TOWNSEND, Trans. Amer. Ent. Soc., vol. 19, p. 131, 1892. 1 species. Type, *Pseudomyothyria indecisa* TOWNSEND. Equals **Tachinophyto** TOWNSEND, 1892.

Pseudoperichæta BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 56, p. 92, 1889. 1 species. Type, *Anoxycampta hirta* BIGOT (as *major*, new species). Equals **Phryxe** DESVOIDY, 1830.

Pseudophorocera BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 56, p. 92, 1889. 1 species. Type, *Pseudophorocera setigera* BRAUER and BERGENSTAMM. Equals **Phryxe** DESVOIDY, 1830.

Pseudopyrellia GIRSCHNER, Berliner Ent. Zeitschr., vol. 38, p. 306, 1893. 1 species. Type, *Musca cornicina* FABRICIUS. Equals **Orthellia** DESVOIDY, 1863.

Pseudorus WALKER, Ins. Saund., Dipt., p. 103, 1851. 1 species. Type, *Pseudorus piceus* WALKER.

Pseudotephritis JOHNSON, Ent. News, vol. 13, p. 144, 1902. Change of name for *Stictocephala* LOEW, 1873, not of STAL, 1869. Type, *Ortalis vau* SAY. Syn., *Stictocephala* LOEW, 1873, preoccupied.

Psila MEIGEN, Illiger's Mag., vol. 2, p. 278, 1803. No species. In his Syst. Beschr. Zweifl. Ins., vol. 5, 1826, pp. 356 to 360, 12 species. Type, *Musca fimetaria* LINNÆUS, the first species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 146. Syn., *Pelethophila* HAGENBACH, 1822; *Psilomyia* LATREILLE, 1829; *Oblicia* DESVOIDY, 1830.

Psilocephala ZETTERSTEDT, Ins. Lapp., p. 525, 1838. 3 species. Type, *Bibio imberbis* FALLEN, the second species, by present designation.

Psilocurus LOEW, Berliner Ent. Zeitschr , vol. 18, p. 373, 1874. 1 species. Type, *Psilocurus nudiusculus* LOEW. Syn., *Orthoneuromyia* WILLISTON, 1893.

Psilometopia LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 990, 1864. 1 species. Type, *?Chortophila cæsia* MACQUART. Equals **Pegomya** DESVOIDY, 1830.

Psilomyia LATREILLE, in Cuvier's Regne Anim., new ed., vol. 5, p. 525, 1829. Change of name for *Psila* MEIGEN, 1803, on account of an alleged similar name in the Hemiptera. Type, *Musca fimetaria* LINNÆUS. Equals **Psila** MEIGEN, 1803.

Psilopa FALLEN, Hydrom. Sveciæ, p. 6, 1823. 4 species. Type, *Notiphila nitidula* FALLEN, the last species, by designation of RONDANI, Dipt. Ital. Prodr., vol. 1, 1856, p. 132. Syn., *Hygrella* HALIDAY, 1839; *Ephygrobia* SCHINER, 1862; *Diasemocera* BEZZI, 1895.

Psilopodinus BIGOT, Bull. Soc. Ent. France for 1888, p. 24, 1888. 1 species. Type, *Dolichopus platypterus* FABRICIUS. Equals **Sciapus** ZELLER, 1842. (*Psilopodinus* of authors equals *Megistostylus* BIGOT.)

Psilopodius RONDANI, Dipt. Ital. Prodr., vol. 4, p. 11, 1861. Change of name for *Psilopus* MEIGEN, 1824, not of POLI, 1795. Type, *Dolichopus platypterus* FABRICIUS. Equals **Sciapus** ZELLER, 1842.

Psiloptera LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 906, 1864. 1 species. Type, *Musca irritans* FALLEN. Equals **Hydrotæa** DESVOIDY, 1830.

Psilopus MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 4, p. 35, 1824. 7 species. Type, *Dolichopus platypterus* FABRICIUS, the second species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 134. Not *Psilopus* POLI, 1795. Equals **Sciapus** ZELLER, 1842.

Psilosoma LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 1118, 1864. 1 species. Type, *Anthomyza gracilis* FALLEN. Equals **Anthomyza** FALLEN, 1810.

Psilota MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 3, p. 256, 1822. 1 species. Type, *Psilota anthracina* MEIGEN.

Psilotanypus KIEFFER, Mem. Soc. Sci. Bruxelles, vol. 30, p. 318, 1906. No species. In Gen. Ins., Dipt., Chir., 1906, p. 38, 7 species. Type, *Tanypus bellus* LOEW, the first species, by present designation.

Psorophora DESVOIDY, Mem. Soc. Hist. Nat. Paris, vol. 3, p. 412, 1827. 2 species. Type, *Culex ciliatus* FABRICIUS, the first species, by designation of THEOBALD, Monogr. Culicidæ, vol. 1, 1901, p. 263..

Psychoda LATREILLE, Precis, p. 152, 1796. No species. In his Hist. Nat. Crust. et Ins., vol. 3, 1802, p. 424, 1 species. Type, *Tipula phalænoides* LINNÆUS. Syn., *Phalænula* MEIGEN, 1800; *Trichoptera* MEIGEN, 1803; *Tinearia* SCHELLENBERG, 1803.

Ptecticus LOEW, Verh. Zool.-Bot. Ges. Wien, vol. 5, p. 142, 1855. 5 species. Type, *Sargus testaceus* FABRICIUS, the last species, by original designation.

Pterallastes LOEW, Berliner Ent. Zeitschr., vol. 7, p. 317, 1863. 2 species. Type, *Pterallastes thoracicus* LOEW, the first species, by designation of OSTEN SACKEN, Cat. Dipt. N. Amer., 1878, p. 250.

Pterellipsis COQUILLETT, Can. Ent., vol. 31, p. 333, 1899. 1 species. Type, *Pterellipsis aranex* COQUILLETT.

Pterocalla RONDANI, Ins. Ditt. Brasil, p. 83, 1848. 1 species. Type, *Dictya ocellata* FABRICIUS.

Pterocera MEIGEN, Illiger's Mag., vol. 2, p. 275, 1803. 4 species. Type, *Musca pellucens* LINNÆUS, the second species, by present designation. Equals Volucella GEOFFROY, 1762.

Pterocosmus WALKER, List. Dipt. Brit. Mus., vol. 1, p. 78, 1848. 2 species. Type, *Pterocosmus hilpa* WALKER, the second species, by present designation. Equals **Caloptera** GUERIN, 1829.

Pterodontia GRAY, in Griffith's Anim. Kingd., vol. 15, Ins., pt. 2, p. 779, 1832. 1 species. Type, *Pterodontia flavipes* GRAY.

Pteroptila LOEW, Berliner Ent. Zeitschr., vol. 9, p. 165, 1865. 2 species. Type, *Pteroptila decora* LOEW, the first species, by present designation. Equals **Meromacrus** RONDANI, 1848.

Pterospilus RONDANI, Dipt. Ital. Prodr., vol. 1, p. 152, 1856. 1 species. Type, *Asilus muscarius* FABRICIUS. Equals **Acromyia** LATREILLE, 1809.

Ptilodegeeria BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 58, p. 375, 1891. 1 species. Type, *Hypostena obumbrata* WULP.

Ptilodexia BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 56, p. 119, 1889. 1 species. Type, *Estheria tibialis* DESVOIDY (as *carolinensis*, new species). Equals **Phorostoma** DESVOIDY, 1830.

Ptilomyia COQUILLETT, Proc. U. S. Nat. Mus., vol. 22, p. 261, 1900. 1 species. Type, *Ptilomyia enigma* COQUILLETT.

Ptiloparcia BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 56, p. 101, 1889. 1 species. Type, *Tachina marginata* MEIGEN. Equals **Voria** DESVOIDY, 1830.

Ptilotachina BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 58, p. 350, 1891. 1 species. Type, *Tachina civilis* RONDANI. Equals **Exorista** MEIGEN, 1803.

Ptiolina ZETTERSTEDT, Dipt. Scand., vol. 1, p. 226, 1842. 2 species. Type, *Leptis obscura* FALLEN, the first species, by designation of FRAUENFELD, Verh. Zool.-Bot. Ges. Wien, vol. 5, 1855, p. 497. Syn., *Eurytion* JENNICKE, 1867.

Ptychoproctus BIGOT, Rev. Mag. Zool. for 1859, p. 4, 1859. 1 species. Type, *Ptychoproctus complexus* BIGOT. Equals **Stylogaster** MACQUART, 1835.

Ptychoptera MEIGEN, Illiger's Mag., vol. 2, p. 262, 1803. 2 species. Type, *Tipula contaminata* LINNÆUS, the first species, by designation of LATREILLE, Consider. General., 1810, p. 442. Equals **Liriope** MEIGEN, 1800.

Puliciphora DAHL, Zool. Anzeiger, vol. 20, p. 409, 1897. 1 species. Type, *Puliciphora lucifera* DAHL. Syn., *Stethopathus* WANDOLLECK, 1898; *Pachyneurella* BRUES, 1903.

Pullata HARRIS, Exp. Engl. Ins., p. 76, 1776. 6 species. Type, *Tipula pomonæ* FABRICIUS (as *funestus*, new species), the second species, by present designation. Equals **Bibio** GEOFFROY, 1762.

Purpurella DESVOIDY, Dipt. Env. Paris, Myop., p. 37, 1853.* 1 species. Type, *Purpurella nobilis* DESVOIDY. Equals **Stomoxoides** SCHÆFFER, 1766.

Pycnoglossa COQUILLETT, Proc. U. S. Nat. Mus., vol. 23, p. 613, 1901. 1 species. Type, *Pycnoglossa flavipennis* COQUILLETT.

Pycnopogon LOEW, Linn. Ent., vol. 2, p. 526, 1847. 4 species. Type, *Dasypogon mixtus* LOEW, the third species, by designation of RONDANI, Dipt. Ital. Prodr., vol. 1, 1856, p. 157.

Pycnosoma BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 61, p. 623, 1894. 1 species. Type, *Chrysomya regalis* DESVOIDY (as *marginalis* WIEDEMANN). Equals **Chrysomya** DESVOIDY, 1830.

Pygostolus LOEW, Berliner Ent. Zeitschr., vol. 10, p. 16, 1866. 3 species. Type, *Dasypogon politus* SAY (as *argentifer*, new species). Not *Pygostolus* HALIDAY, 1833. Equals **Nicocles** JENNICKE, 1867.

Pyrellia DESVOIDY, Essai Myod., p. 462, 1830. 3 species (as 9). Type, *Musca cadaverina* LINNÆUS, the second to fourth supposed species, by designation of ZETTERSTEDT, Dipt. Scand., vol. 4, 1845, p. 1320.

Pyrgota WIEDEMANN, Auss. Zweifl. Ins., vol. 2, p. 580, 1830. 1 species. Type, *Pyrgota undata* WIEDEMANN. Syn., *Oxycephala* MACQUART, 1843.

Pyritis HUNTER, Can. Ent., vol. 29, p. 131, 1897. 1 species. Type, *Pyritis montigena* HUNTER.

Pyropa SAY, Journ. Acad. Nat. Sci. Phila., vol. 3, p. 98, 1823. 1 species. Type, *Pyropa furcata* SAY. Equals **Scopeuma** MEIGEN, 1800.

Pyrophæna SCHINER, Wien. Ent. Monatschr., vol. 4, p. 213, 1860. 1 species. Type, *Syrphus rosarum* FABRICIUS.

Pyrrosia RONDANI, Dipt. Ital. Prodr., vol. 1, p. 73, 1856. 1 species. Type, *Tachina aurea* FALLEN. Equals **Leskia** DESVOIDY, 1830.

Quadrula PANDELLE, Rev. Ent., vol. 17, p. 51, 1898. 27 species. Type, *Anthomyza annosa* ZETTERSTEDT, the first species, by designation of COQUILLETT, Journ. N. Y. Ent. Soc., vol. 9, 1901, p. 141. Equals **Phaonia** DESVOIDY, 1830.

Rabdophaga WESTWOOD, Gard. Chron. for 1847, p. 588, 1847. 1 species. Type, *Cecidomyia* (*Rabdophaga*) *viminalis* WESTWOOD. Syn., *Dichelomyia* RUBSAAMEN, 1892; *Bertieria* KIEFFER, 1896.

Rachicerus WALKER, List. Dipt. Brit. Mus., vol. 5, p. 103, 1854. 1 species. Type, *Rachicerus fulvicollis* WALKER.

Racodineura RONDANI, Dipt. Ital. Prodr., vol. 4, p. 31, 1861. Change of name for *Roeselia* DESVOIDY, 1830, not of HÜBNER, 1816. Type, *Tachina antiqua* MEIGEN. Syn., *Roeselia* DESVOIDY, 1830, preoccupied.

Ragheneura RONDANI, Dipt. Ital. Prodr., vol. 1, p. 144, 1856. 1 species. Type, *Dolichopus griseipennis* STANNIUS. Equals **Dolichopus** LATREILLE, 1796.

Rainieria RONDANI, Nuovi Ann. Sci. Nat. (Bologna), vol. 10, p. 40, 1843. 1 species. Type, *Calobata calceata* FALLEN. Equals **Trepidaria** MEIGEN, 1800.

Ramonda DESVOIDY, Hist. Nat. Dipt., vol. 1, p. 790, 1863. 1 species (as 3). Type, *Ramonda fasciata* DESVOIDY. Equals **Wagneria** DESVOIDY, 1830.

Ravinia DESVOIDY, Hist. Nat. Dipt., vol. 2, p. 434, 1863. 2 species (as 4). Type, *Sarcophaga hæmatodes* MEIGEN, the second species, by original designation. Equals **Sarcophaga** MEIGEN, 1826.

Reaumuria DESVOIDY, Essai Myod., p. 79, 1830. 5 species (as 7). Type, *Gonia ornata* MEIGEN (as *Musca capitata* DE GEER), the second species, by designation of DESVOIDY, Hist. Nat. Dipt., vol. 1, 1863, p. 733. Equals **Salmacia** MEIGEN, 1800.

Redia LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 1313, 1864. 4 species. Type, *Agromyza gyrans* FALLEN, the first species, by present designation. Equals **Agromyza** FALLEN, 1810.

Rhabdopselaphus BIGOT, Bull. Soc. Ent. France for 1886, p. 103, 1886. 1 species. Type, *Rhabdopselaphus mus* BIGOT.

Rhachoepalpus TOWNSEND, Smiths. Misc. Coll., vol 51, p. 114, 1908. 1 species (as 2). Type, *Saundersia testacea* WULP. Equals **Epalpus** RONDANI, 1850.

Rhadina KOWARZ, Wien. Ent. Zeit., vol. 12, p. 144, 1893. 1 species. Type, *Chirosia montana* POKORNY. Equals **Chirosia** RONDANI, 1856.

Rhadiurgus LOEW, Linn. Ent., vol. 4, p. 133, 1849. 1 species. Type, *Asilus variabilis* ZETTERSTEDT.

Rhagio FABRICIUS, Syst. Ent., p. 761, 1775. 4 species. Type, *Musca scolopacea* LINNÆUS, the first species, by designation of LATREILLE, Consider. Général., 1810, p. 443. Syn., *Leptis* FABRICIUS, 1805.

Rhagoletis LOEW, Monogr. Trypet., p. 44, 1862.* 1 species. Type, *Musca cerasi* LINNÆUS.

Rhamphidia MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 6, p. 281, 1830. 3 species. Type, *Limnobia longirostris* MEIGEN, the first species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 129. Equals **Megarhina** ST. FARGEAU and SERVILLE, 1828.

Rhamphinina BIGOT, Bull. Soc. Ent. France for 1885, p. 11, 1885. 1 species. Type, *Rhamphinina dubia* BIGOT. Equals **Phorostoma** DESVOIDY, 1830.

Rhamphomyia MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 3, p. 42, 1822. 37 species. Type, *Empis sulcata* MEIGEN, the ninth species, by designation of CURTIS, Brit. Ent., 1834, p. 517. Equals **Dionnæa** MEIGEN, 1800.

Rhaphidolabis OSTEN SACKEN, Monogr. Dipt. N. Amer., vol. 4, p. 284, 1869. 2 species. Type, *Rhaphidolabis tenuipes* OSTEN SACKEN, the first species, by original designation.

Rhaphiocera MACQUART, Hist. Nat., Dipt., vol. 1, p. 253, 1834. 1 species. Type, *Sargus armatus* WIEDEMANN.

Rhaphiomidas OSTEN SACKEN, Bull. 3, U. S. Geol. Surv., p. 281, 1877. 1 species. Type, *Rhaphiomidas episcopus* OSTEN SACKEN.

Rhaphiorhynchus WIEDEMANN, Dipt. Exot., p. 59, 1821. 1 species. Type, *Rhaphiorhynchus planiventris* WIEDEMANN.

[Rhaphium MEIGEN, Illiger's Mag., vol. 2, p. 272, 1803. No species. In his Syst. Beschr. Zweifl. Ins., vol. 4, 1824, pp. 28 to 31, 9 species. Type, *Rhaphium macrocerum* MEIGEN, the third species, by designation of CURTIS, Brit. Ent., 1835, p. 568. Syn., *Xiphandrium* LOEW, 1857. Not American.]

Rhedia DESVOIDY, Essai Myod., p. 74, 1830. 5 species (as 9). Type, *Gonia atra* MEIGEN (as *vicina*, new species), the third species, by present designation. Equals Salmacia MEIGEN, 1800.

Rhicnœssa LOEW, Wien. Ent. Monatschr., vol. 6, p. 174, 1862. 1 species. Type, *Rhicnœssa cinerea* LOEW.

Rhingia SCOPOLI, Ent. Carn., p. 358, 1763. 1 species. Type, *Rhingia austriaca* MEIGEN (as *Conops rostrata* LINNÆUS).

Rhinomya DESVOIDY, Essai Myod., p. 123, 1830. 1 species. Type, *Rhinomya gagatea* DESVOIDY. Equals Rhinophora DESVOIDY, 1830.

Rhinophora DESVOIDY, Essai Myod., p. 258, 1830. 2 species (as 6). Type, *Tachina gagatina* MEIGEN (equaling the supposed species 2 to 6), by designation of DESVOIDY, Hist. Nat. Dipt., vol. 2, 1863, p. 5. Syn., *Kirbya* DESVOIDY, 1830; *Rhinomya* DESVOIDY, 1830; *Cassidæmyia* MACQUART, 1835; *Clista* MEIGEN, 1838; *Microcheilosia* MACQUART, 1855.

Rhinoplecia BELLARDI, Mem. Reale Accad. Sci. Torino, ser. 2, vol. 19, p. 16, 1859. 1 species. Type, *Plecia rostellata* LOEW (as *rostrata*, new species). Equals Plecia WIEDEMANN, 1828.

Rhinotora SCHINER, Reise *Novara*, Zool., vol. 2, Dipt., p. 233, 1868. 2 species. Type, *Rhinotora pluricellata* SCHINER, the first species, by original designation.

Rhipidia MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 1, p. 153, 1818. 1 species. Type, *Rhipidia maculata* MEIGEN.

Rhodogyne MEIGEN, Nouv. Class. Mouch., p. 39, 1800.* No species. *Gymnosoma* MEIGEN, 1803, is a change of name. Type, *Musca rotundata* LINNÆUS. Syn., *Gymnosoma* MEIGEN, 1803.

Rhombothyria WULP, Biol. Centr.-Amer. Dipt., vol. 2, p. 259, 1891. 1 species. Type, *Rhombothyria flavicosta* WULP.

Rhopalomyia RUBSAAMEN, Berliner Ent. Zeitschr., vol. 37, p. 370, 1892. 8 species. Type, *Oligotrophus tanaceticola* KARSCH, the first species, by designation of KIEFFER, Wien. Ent. Zeit., vol. 15, 1896, p. 89.

Rhopalomyia WILLISTON, Psyche, vol. 7, p. 184, 1895. 1 species. Type, *Ropalomera pleuropunctata* WIEDEMANN. Not *Rhopalomyia* RÜBSAAMEN, 1892. Equals Willistoniella MIK, 1895.

Rhopalosyrphus GIGLIO-TOS, Boll. Mus. Zool. Univ. Torino, vol. 6, No. 108, p. 3, September 20, 1891. No species. In vol. 7, No. 118, March 24, 1892, p. 1, 1 species. Type, *Holmbergia guntheri* Arribalzaga. Syn., *Holmbergia* ARRIBALZAGA, October, 1891.

[Rhynchiodexia BIGOT, Bull. Soc. Ent. France for 1885, p. 11, 1885. 1 species. Type, *Rhynchiodexia tenuipes* BIGOT. Not American.] (*Rhynchiodexia* of authors equals *Phorostoma* DESVOIDY.)

Rhynchocephalus FISCHER, Mem. Soc. Imper. Moscow, vol. 1, p. 217, 1806.* 3 species (as 4). Type, *Rhynchocephalus tauscheri* FISCHER, the last species, by desig-

nation of SCHINER, Reise *Novara*, Zool., vol. 2, 1868, p. 107. Syn., *Andrenomya* RONDANI, 1850.

Rhynchogonia BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 60, p. 125, 1893. 1 species. Type, *Rhynchogonia algerica* BRAUER and BERGENSTAMM. Equals **Salmacia** MEIGEN, 1800.

Rhynchomilichia HENDEL, Wien. Ent. Zeit., vol. 22, p. 250, 1903. 1 species. Type, *Lobioptera argyrophenga* SCHINER.

Rhynchosciara RUBSAAMEN, Berliner Ent. Zeitschr., vol. 39, p. 29, 1894. 2 species. Type, *Rhynchosciara villosa* RUBSAAMEN, the first species, by present designation.

Rhynchosia MACQUART, Ann. Soc. Ent. France for 1848, p. 87, 1848. Change of name for *Olivieria* MEIGEN, 1838, not of DESVOIDY, 1830. Type, *Tachina longirostris* MEIGEN. Equals **Aphria** DESVOIDY, 1830.

Rhynchotrichops SCHNABL, Hor. Soc. Ent. Ross., vol. 23, p. 344, 1889. 4 species. Type, *Anthomyza aculeipes* ZETTERSTEDT, the first species, by designation of COQUILLETT, Journ. N. Y. Ent. Soc., vol. 9, 1901, p. 141.

Rhyphus LATREILLE, Hist. Nat. Crust. et Ins., vol. 14, p. 291, 1805. 1 species. Type, *Tipula fenestralis* SCOPOLI (as *fenestrarum* SCOPOLI). Equals **Sylvicolæ** HARRIS, 1776.

Rhysops WILLISTON, Journ. N. Y. Ent. Soc., vol. 15, p. 2, 1907. 3 species. Type, *Melanostoma rugonasus* WILLISTON, the second species, by present designation.

Richardia DESVOIDY, Essai Myod., p. 728, 1830. 1 species. Type, *Dacus podagrica* FABRICIUS (as *saltatoria*, new species). Syn., *Merodina* MACQUART, 1835.

Rileya BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 60, p. 121, 1893. 1 species. Type, *Blepharipeza adusta* LOEW (as *americana*, new species). Equals **Blepharipeza** MACQUART, 1843.

Rileymyia TOWNSEND, Ent. News, vol. 4, p. 277, 1893. Change of name for *Rileya* BRAUER and BERGENSTAMM, 1893, preoccupied. Type, *Blepharipeza adusta* LOEW. Equals **Blepharipeza** MACQUART, 1843.

Rivellia DESVOIDY, Essai Myod., p. 729, 1830. 3 species. Type, *Musca syngenesiæ* FABRICIUS (as *herbarum*, new species), the first species, by designation of RONDANI, Dipt. Ital. Prodr., vol. 1, 1856, p. 111.

Rœderiodes COQUILLETT, Bull. 47, N. Y. State Mus., p. 585, 1901. 1 species. Type, *Rœderiodes juncta* COQUILLETT.

Roselia DESVOIDY, Essai Myod., p. 145, 1830. 1 species (as 4). Type, *Tachina antiqua* MEIGEN. Not *Roselia* HÜBNER, 1816. Equals **Racodineura** RONDANI, 1861.

Rohrella DESVOIDY, Essai Myod., p. 489, 1830. 9 species. Type, *Musca pallida* FABRICIUS (as *fragilis*, new species), the seventh species, by designation of COQUILLETT, Journ. N. Y. Ent. Soc., vol. 9, 1901, p. 141. Equals **Phaonia** DESVOIDY, 1830.

Romaleosyrphus BIGOT, Bull. Soc. Ent. France for 1882, p. 129, 1882. 1 species. Type, *Romaleosyrphus villosus* BIGOT. Equals **Crioprora** OSTEN SACKEN, 1878.

Rondania JÆNNICKE, Abh. Senckenb. Ges., vol. 6, p. 324, 1867. 1 species. Type, *Rondania obscura* JÆNNICKE. Not *Rondania* DESVOIDY, 1850. Equals **Neorondania** OSTEN SACKEN, 1878.

Rondaniella JOHANNSEN, Gen. Ins., Dipt., Mycet., p. 66, 1909. 9 species. Type, *Leia variegata* WINNERTZ, the last species, by original designation.

Rondanimyia TOWNSEND, Smiths. Misc. Coll., vol. 51, p. 67, 1908. Change of name for *Gymnopsis* RONDANI, 1859, not of RAFINESQUE, 1815. Type, *Tachina chalconota* MEIGEN. Equals **Macquartia** DESVOIDY, 1830.

Ropalocera MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 2, p. 302, 1820. 1 species. Type, *Laphria nigripennis* MEIGEN. Equals **Laphria** MEIGEN, 1800.

Ropalomera WIEDEMANN, Anal. Ent., p. 17, 1824.* 4 species. Type, *Dictya clavipes* FABRICIUS, the first species, by designation of MACQUART, Dipt. Exot., vol. 2, pt. 3, 1843, p. 359.

Rymosia WINNERTZ, Verh. Zool.-Bot. Ges. Wien, vol. 13, p. 810, 1863. 13 species. Type, *Mycetophila fasciata* MEIGEN, the first species, by designation of JOHANNSEN, Gen. Ins., Dipt., Mycet., 1909, p. 102.

Rypholophus KOLENATI, Wien. Ent. Monatschr., vol. 4, p. 393, 1860. 1 species. Type, *Rypholophus phryganopterus* KOLENATI. Equals **Ormosia** RONDANI, 1856.

Sabethes DESVOIDY, Mem. Soc. Hist. Nat. Paris, vol. 3, p. 411, 1827. 1 species. Type, *Culex cyaneus* FABRICIUS (as *locuples*, new species).

Sabethoides THEOBALD, Monogr. Culic., vol. 3, p. 328, 1903. 1 species. Type, *Sabethoides confusus* THEOBALD.

Sackenomyia FELT, 23d Rep. State Ent. N. Y., p. 361, 1908. 1 species. Type, *Oligotrophus acerifolius* FELT.

Sagaris DESVOIDY, Hist. Nat. Dipt., vol. 1, p. 486, 1863. 1 species (as 3). Type, *Musca libatrix* PANZER. Equals **Zenilla** DESVOIDY, 1830.

Salia DESVOIDY, Essai Myod., p. 108, 1830. 3 species (as 8). Type, *Salia echinura* DESVOIDY, the third species, by designation of DESVOIDY, Hist. Nat. Dipt., vol. 1, 1863, p. 553. Equals **Phorocera** DESVOIDY, 1830.

Salmacia MEIGEN, Nouv. Class. Mouch., p. 38, 1800.* No species. *Gonia* MEIGEN, 1803, is a change of name. Type, *Musca capitata* DE GEER. Syn., *Gonia* MEIGEN, 1803; *Rhedia* DESVOIDY, 1830; *Reaumuria* DESVOIDY, 1830; *Isomera* DESVOIDY, 1851; *Onychogonia* BRAUER and BERGENSTAMM, 1889; *Rhynchogonia* BRAUER and BERGENSTAMM, 1893.

Salpingogaster SCHINER, Reise *Novara*, Zool., vol. 2, Dipt., p. 344, 1868. 3 species. Type, *Salpingogaster pygophora* SCHINER, the first species, by original designation.

Sapromyza FALLEN, Spec. Ent. Meth. Exh., p. 18, 1810. 1 species. Type, *Sapromyza obsoleta* FALLEN (as *Tephritis flava* FABRICIUS). Syn., *Sylvia* DESVOIDY, 1830; *Lycia* DESVOIDY, 1830; *Terenia* DESVOIDY, 1830; *Minettia* DESVOIDY, 1830; *Cnemacantha* MACQUART, 1835; *Polionoma* RONDANI, 1856; *Sapromyzosoma* LIOY, 1864; *Stylocoma* LIOY, 1864.

Sapromyzosoma LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 1009, 1864. 1 species. Type, *Musca quadripunctata* LINNÆUS (as *Sapromyza tibialis* MACQUART). Equals **Sapromyza** FALLEN, 1810.

Sarcionus ALDRICH, Biol. Centr.-Amer. Dipt., vol. 1, p. 341, 1901. 2 species. Type, *Pelastoneurus lineatus* ALDRICH, the first species, by original designation.

Sarcoclista TOWNSEND, Trans. Amer. Ent. Soc., vol. 19, p. 122, 1892. 1 species. Type, *Sarcoclista dakotensis* TOWNSEND.

Sarcodexia TOWNSEND, Journ. Inst. Jamaica, vol. 1, p. 105, 1892. 1 species. Type, *Sarcodexia sternodontis* TOWNSEND.

Sarcomacronychia TOWNSEND, Trans. Amer. Ent. Soc., vol. 19, p. 100, 1892. 1 species. Type, *Pachyophthalmus floridensis* TOWNSEND (as *unica*, new species). Equals **Pachyophthalmus** BRAUER and BERGENSTAMM, 1889.

Sarcophaga MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 5, p. 14, 1826. 30 species. Type, *Musca carnaria* LINNÆUS, the sixth species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 140. Syn., *Myophora* DESVOIDY, 1830; *Phorella* DESVOIDY, 1830; *Agria* DESVOIDY, 1830; *Pierretia* DESVOIDY, 1863; *Servaisia* DESVOIDY, 1863; *Bellieria* DESVOIDY, 1863; *Ravinia* DESVOIDY, 1863; *Scaligeria* DESVOIDY, 1863; *Bercæa* DESVOIDY, 1863; *Calyptia* DESVOIDY, 1863; *Listeria* DESVOIDY, 1863; *Sfarogaster* LIOY, 1864.

Sarcophagula WULP, Tijdschr. Ent., vol. 30, p. 173, 1887. 6 species. Type, *Musca occidua* FABRICIUS, the first species, by present designation.

Sarcophila RONDANI, Dipt. Ital. Prodr., vol. 1, p. 86, 1856. 1 species. Type, *Musca latifrons* FALLEN. Syn., *Wohlfahrtia* BRAUER and BERGENSTAMM, 1889.

Sarcophiloides BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 56, p. 164, 1889. 1 species. Type, *Tachina pusilla* WIEDEMANN.

Sarcotachinella TOWNSEND, Trans. Amer. Ent. Soc., vol. 19, p. 110, 1892. 1 species. Type, *Sarcotachinella intermedia* TOWNSEND. Equals **Brachicoma** RONDANI, 1856.

Sardiocera BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 56, p. 119, 1889. 1 species. Type, *Theresia tandrec* DESVOIDY (as *valida*, new species). Equals **Theresia** DESVOIDY, 1830.

Sargus FABRICIUS, Ent. Syst., Suppl., p. 566, 1798. 5 species. Type, *Musca cuprarius* LINNÆUS, the first species, by designation of LATREILLE, Consider. Général., 1810, p. 442. Not *Sargus* WALB, 1792. Equals **Geosargus** BEZZI, 1907.

Saropogon LOEW, Linn. Ent., vol. 2, p. 439, 1847. 4 species. Type, *Dasypogon luctuosus* MEIGEN, the last species, by present designation.

Sarothromyia BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 58, p. 365, 1891. 1 species. Type, *Sarcophila femoralis* SCHINER.

Satyra MEIGEN, Illiger's Mag., vol. 2, p. 272, 1803. 1 species. Type, *Musca ungulata* LINNÆUS. Equals **Dolichopus** LATREILLE, 1796.

Saucropus LOEW, Neue Beitr., vol. 5, p. 41, 1857. 4 species. Type, *Dolichopus suturalis* FALLEN, the third species, by present designation. Equals **Neurigona** RONDANI, 1856.

Saundersia SCHINER, Reise *Novara*, Zool., vol. 2, Dipt., p. 333, 1868. 1 species. Type, *Micropalpus ornatus* MACQUART. Equals **Epalpus** RONDANI, 1850.

Savia RONDANI, Dipt. Ital. Prodr., vol. 4, p. 140, 1861. 1 species. Type, *Tachina melanocephala* MEIGEN. Equals **Phyto** DESVOIDY, 1830.

Sayomyia COQUILLETT, Can. Ent., vol. 35, p. 190, 1903. 1 species. Type, *Corethra punctipennis* SAY. Equals **Chaoborus** LICHTENSTEIN, 1800.

Scæva FABRICIUS, Syst. Antliatorum, p. 248, 1805. 25 species. Type, *Musca pyrastri* LINNÆUS, the third species, by designation of CURTIS, Brit. Ent., 1834, p. 509. Syn., *Lasiophthicus* RONDANI, 1844; *Catabomba* OSTEN SACKEN, 1877.

Scaligeria DESVOIDY, Hist. Nat. Dipt., vol. 2, p. 476, 1863. 2 species (as 9). Type, *Sarcophaga melanura* MEIGEN, the second species, by original designation. Equals **Sarcophaga** MEIGEN, 1826.

Scaptia WALKER, Ins. Saund., Dipt., p. 8, 1850. 5 species. Type, *Pangonius auratus* MACQUART, the first species, by present designation. Equals **Pangonius** LATREILLE, 1802.

Scaptomyza HARDY, Proc. Berwick Nat. Club, p. 349, 1849.* 2 species. Type, *Drosophila graminum* FALLEN, the first species, by present designation.

Scarphia WALKER, Ins. Saund., Dipt., p. 10, 1850. 1 species. Type, *Pangonius directa* WALKER. Equals **Pangonius** LATREILLE, 1802.

Scatella DESVOIDY, Essai Myod., p. 801, 1830. 2 species. Type, *Ephydra stagnalis* FALLEN (as *buccata*, new species), the first species, by designation of BECKER, Berliner Ent. Zeitschr., vol. 41, 1896, p. 224. Syn., *Trixostomus* RONDANI, 1856.

Scathophaga MEIGEN, Illiger's Mag., vol. 2, p. 277, 1803. 1 species. Type, *Musca merdaria* FABRICIUS. Equals **Scopeuma** MEIGEN, 1800.

Scathopse GEOFFROY, Hist. Abrégée Ins., vol. 2, p. 544, 1762. 2 species (without names). Type, *Tipula notata* LINNÆUS, the first species, by designation of LATREILLE, Consider. General., 1810, p. 442 (as *albipennis* FABRICIUS). Syn., *Ceria* SCOPOLI, 1763.

Scatina DESVOIDY, Essai Myod., p. 629, 1830. 1 species. Type, *Scatina claripennis* DESVOIDY. Equals **Scopeuma** MEIGEN, 1800.

Scatomyza FALLEN, Spec. Ent. Meth. Exh., p. 15, 1810. 2 species. Type, *Musca scybalaria* LINNÆUS, the first species, by present designation. Equals **Scopeuma** MEIGEN, 1800.

Scellus LOEW, Neue Beitr., vol. 5, p. 22, 1857. 2 species. Type, *Hydrophorus spinimanus* ZETTERSTEDT, the second species, by present designation. Syn., *Anoplomerus* RONDANI, 1856, preoccupied.

Scenopinus LATREILLE, Hist. Nat. Crust. et Ins., vol. 3, p. 463, 1802. 1 species. Type, *Musca fenestralis* LINNÆUS. Equals **Omphrale** MEIGEN, 1800.

Schaumia DESVOIDY, Hist. Nat. Dipt., vol. 2, p. 43, 1863. 1 species. Type, *Tachina bimaculata* HARTIG. Equals **Sturmia** DESVOIDY, 1830.

Schizomyia KIEFFER, Ent. Nachr., vol. 15, p. 183, 1889. 1 species. Type, *Schizomyia galiorum* KIEFFER.

Schizotachina WALKER, Ins. Saund., Dipt., p. 264, 1852. 1 species (as 2). Type, *Tachina convecta* WALKER.

Schœnomyza HALIDAY, Ent. Mag., vol. 1, p. 166, 1833. 1 species (as 2). Type, *Ochtiphila litorella* FALLEN. Syn., *Litorella* RONDANI, 1856.

Sciapus ZELLER, Isis von Oken for 1842, p. 831, 1842. Change of name for *Psilopus* MEIGEN, 1824, under the erroneous impression that it is preoccupied by *Psilopa* FALLEN, 1823. Type, *Dolichopus platypterus* FABRICIUS. Syn., *Leptopus* FALLEN, 1823, preoccupied; *Psilopus* MEIGEN, 1824, preoccupied; *Psilopodius* RONDANI, 1861; *Psilopodinus* BIGOT, 1888; *Gnamptopsilopus* ALDRICH, 1893.

Sciara MEIGEN, Illiger's Mag., vol. 2, p. 263, 1803. 1 species. Type, *Tipula thomæ* LINNÆUS. Equals **Lycoria** MEIGEN, 1800.

Sciasma COQUILLETT, Rev. Tach., p. 69, 1897. 1 species. Type, *Sciasma nebulosa* COQUILLETT.

Sciodromia HALIDAY, in Westwood's Intr., vol. 2, Synops., p. 132, 1840. 1 species. Type, *Heleodromia immaculata* HALIDAY. Equals **Heleodromia** HALIDAY, 1833.

Sciomyza FALLEN, Sciomyzides Sveciæ, p. 11, 1820. 12 species. Type, *Sciomyza simplex* FALLEN, the first species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 145. Syn., *Bischofia* HENDEL, 1902. (*Sciomyza* of authors equals *Chetocera* DESVOIDY.)

Scione WALKER, Ins. Saund., Dipt., p. 10, 1850. 1 species. Type, *Pangonius incompletus* MACQUART. Syn., *Diclisa* SCHINER, 1867.

Sciophila MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 1, p. 245, 1818. 13 species. Type, *Sciophila hirta* MEIGEN, the twelfth species, by designation of CURTIS, Brit. Ent., 1837, p. 641. Syn., *Lasiosoma* WINNERTZ, 1863. (*Sciophila* of authors equals *Mycomya* RONDANI.)

Scleropogon LOEW, Berliner Ent. Zeitschr., vol. 10, p. 26, 1866. 1 species. Type, *Scleropogon picticornis* LOEW. Equals **Stenopogon** LOEW, 1847.

Scoliocentra LOEW, Zeitschr. Ent. Breslau, vol. 13, p. 43, 1862. 1 species. Type, *Heleomyza villosa* MEIGEN.

Scoliopelta WILLISTON, Ent. Amer., vol. 1, p. 154, 1885. 1 species. Type, *Scoliopelta luteipes* WILLISTON.

Scopeuma MEIGEN, Nouv. Class. Mouch., p. 36, 1800.* No species. *Scathophaga* MEIGEN, 1803, is a change of name. Type, *Musca merdaria* FABRICIUS. Syn., *Scathophaga* MEIGEN, 1803; *Scatomyza* FALLEN, 1810; *Pyropa* SAY, 1823; *Limina* DESVOIDY, 1830; *Scatina* DESVOIDY, 1830.

Scopolia DESVOIDY, Essai Myod., p. 268, 1830. 3 species (as 5). Type, *Musca carbonaria* PANZER, the second species, by designation of ZETTERSTEDT, Dipt. Scand., vol. 3, 1844, p. 1239. Equals **Wagneria** DESVOIDY, 1830.

Scotia DESVOIDY, Hist. Nat. Dipt., vol. 1, p. 255, 1863. 1 species (as 2). Type, *Tachina grandis* ZETTERSTEDT. Equals **Thrycolyga** RONDANI, 1856.

Scotiptera MACQUART, Hist. Nat., Dipt., vol. 2, p. 215, 1835. 2 species. Type, *Sophia punctata* DESVOIDY, the second species, by designation of MACQUART, Dipt. Exot., vol. 2, pt. 3, 1843, p. 240 (as *Dexia melaleuca* WIEDEMANN).

Scutops COQUILLETT, Proc. Ent. Soc. Washington, vol. 6, p. 97, 1904. 1 species. Type, *Scutops fascipennis* COQUILLETT.

Scyphella DESVOIDY, Essai Myod., p. 650, 1830. 2 species. Type, *Musca flava* LINNÆUS (as *flavicornis*, new species), the first species, by designation of BEZZI, Atti Soc. Ital. Sci., vol. 43, 1904, p. 178. Equals **Chyromya** DESVOIDY, 1830.

Seilopogon COSTA, Ann. Sci. Napoli, vol. 1, p. 74, 1854.* 1 species. Type, *Asilus diadema* FABRICIUS (as *sicanus*, new species). Equals **Dasypogon** MEIGEN, 1803.

Scioptera KIRBY, An Intr. Ent., vol. 2, p. 305, 1817. 1 species. Type, *Musca vibrans* LINNÆUS. Equals **Ortalis** FALLEN, 1810.

Semiomyia BREMI, Ann. Soc. Ent. France for 1848, pp. 102, 103, 1848. 1 species (as 3). Type, *Crameria œstroidea* DESVOIDY. Equals **Trixa** MEIGEN, 1824.

Senogaster MACQUART, Hist. Nat., Dipt., vol. 1, p. 519, 1834. 1 species. Type, *Senogaster cœrulescens* MACQUART. Syn., *Acrochordonodes* BIGOT, 1878.

Senopterina MACQUART, Hist. Nat., Dipt., vol. 2, p. 453, 1835. 1 species. Type, *Dacus brevipes* FABRICIUS.

Senotainia MACQUART, Dipt. Exot., Suppl. 1, p. 167, 1846. 1 species. Type, *Senotainia rubrirentris* MACQUART. Syn., *Arrenopus* BRAUER and BERGENSTAMM, 1891.

Sepedon LATREILLE, Hist. Nat. Crust. et Ins., vol. 14, p. 385, 1805. 1 species. Type, *Syrphus sphegeus* FABRICIUS.

Sepsis FALLEN, Spec. Ent. Meth. Exh., p. 17, 1810. 2 species. Type, *Musca cynipsea* LINNÆUS, the second species, by designation of CURTIS, Brit. Ent., 1829, p. 245. Syn., *Acrometopia* LIOY, 1864; *Beggiatia* LIOY, 1864.

Sepsisoma JOHNSON, Ent. News, vol. 11, p. 327, 1900. 1 species. Type, *Sepsisoma flavescens* JOHNSON.

Sericomyia MEIGEN, Illiger's Mag., vol. 2, p. 274, 1803. 2 species. Type, *Musca lappona* LINNÆUS, the second species, by designation of LATREILLE, Consider. Général., 1810, p. 443. Equals **Cinxia** MEIGEN, 1800.

Serromyia MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 1, p. 83, 1818. 1 species. Type, *Ceratopogon femoratus* MEIGEN. Syn., *Prionomyia* STEPHENS, 1829; *Ceratolophus* KIEFFER, 1899; *Johannseniella* WILLISTON, 1907.

Servaisia DESVOIDY, Hist. Nat. Dipt., vol. 2, p. 429, 1863. 1 species (as 5). Type, *Sarcophaga erythrura* MEIGEN. Equals **Sarcophaga** MEIGEN, 1826.

Sfærogaster LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 889, 1864. 1 species. Type, *Sarcophaga laticornis* MEIGEN. Equals **Sarcophaga** MEIGEN, 1826.

Siagona MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 6, pl. 65, figs. 5, 6, and 7, 1830. 1 species. Type, *Glochina sericata* MEIGEN. Equals **Furcomyia** MEIGEN, 1818.

Sicus SCOPOLI, Ent. Carn., p. 369, 1763. 2 species. Type, *Conops ferruginea* LINNÆUS, the first species, by present designation. Syn., *Cylindrogaster* LIOY, 1864.

Sicus LATREILLE, Precis, p. 158, 1796. No species. In his Hist. Nat. Crust. et Ins., vol. 14, 1805, p. 312, 1 species. Type, *Musca arrogans* LINNÆUS (as *cimicoides* FABRICIUS). Not *Sicus* SCOPOLI, 1763. Equals **Coryneta** MEIGEN, 1800.

Sigaloëssa LOEW, Berliner Ent. Zeitschr., vol. 9, p. 186, 1865. 1 species. Type, *Sigaloëssa bicolor* LOEW.

Sigmatomera OSTEN SACKEN, Monogr. Dipt. N. Amer., vol. 4, p. 137, 1869. No species. In 1873, 1 species. Type, *Sigmatomera flavipennis* OSTEN SACKEN.

Siligo ALDRICH, Trans. Amer. Ent. Soc., vol. 34, p. 98, 1908. 2 species. Type, *Siligo oregona* ALDRICH, the first species, by original designation. Equals **Zagonia** COQUILLETT, 1904.

Silvius MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 2, p. 27, 1820. 1 species. Type, *Tabanus vituli* FABRICIUS.

Simondella LAVERAN, Compt. Rend. Soc. Biol. for 1902, p. 1160, 1902. 1 species. Type, *Simondella curvirostris* LAVERAN. Equals **Limatus** THEOBALD, 1901.

Simulium LATREILLE, Hist. Nat. Crust. et Ins., vol. 3, p, 426, 1802. 1 species. Type, *Rhagio colombaschensis* FABRICIUS. Equals **Molusina** MEIGEN, 1800.

Sinophthalmus COQUILLETT, Proc. Ent. Soc. Washington, vol. 6, p. 190, 1904. 1 species. Type, *Sinophthalmus pictus* COQUILLETT.

Siphoclytia TOWNSEND, Trans. Amer. Ent. Soc., vol. 19, p. 116, 1892. 1 species. Type, *Siphoclytia robertsonii* TOWNSEND. Equals **Epigrimyia** TOWNSEND, 1891.

Siphomyia WILLISTON, Trans. Ent. Soc. Lond. for 1896, p. 418, 1896. 2 species. Type, *Hippolates proboscideus* WILLISTON, the first species, by present designation.

Siphona MEIGEN, Illiger's Mag., vol. 2, p. 281, 1803. 1 species. Type, *Musca geniculata* DE GEER (as *Stomoxys irritans* FABRICIUS, an error for *minuta* FABRICIUS). Equals **Crocuta** MEIGEN, 1800.

Siphonella MACQUART, Hist. Nat., Dipt., vol. 2, p. 584, 1835. 4 species. Type, *Oscinis oscinina* FALLEN, the first species, by original designation. Equals **Madiza** FALLEN, 1810.

Siphoniomyia BIGOT, Bull. Soc. Ent. France for 1885, p. 12, 1885. 1 species. Type, *Trichophora analis* SCHINER (as *melas*, new species). Equals **Trichophora** MACQUART, 1847.

Siphophyto TOWNSEND, Trans. Amer. Ent. Soc., vol. 19, p. 127, 1892. 1 species. Type, *Siphophyto floridensis* TOWNSEND. Equals **Epigrimyia** TOWNSEND, 1891.

Siphoplagia TOWNSEND, Trans. Amer. Ent. Soc., vol. 18, p. 349, 1891. 1 species. Type, *Siphoplagia anomala* TOWNSEND.

Siphosturmia COQUILLETT, Rev. Tach., p. 37, 1897. 1 species. Type, *Argyrophylax rostrata* COQUILLETT.

Siphunculina RONDANI, Dipt. Ital. Prodr., vol. 1, p. 128, 1856. 1 species. Type, *Siphunculina brevinervis* RONDANI. Equals **Madiza** FALLEN, 1810.

Sisyropa BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 56, p. 163, 1889. 1 species. Type, *Tachina thermophila* WIEDEMANN. Equals **Carcelia** DESVOIDY, 1830.

Sitarea DESVOIDY, Essai Myod., p. 763, 1830. 2 species. Type, *Sitarea scorzoneræ* DESVOIDY, the first species, by present designation. Equals **Terellia** DESVOIDY, 1830.

Snowiellus HINE, Ohio Nat., vol. 5, p. 230, 1904. 1 species. Type, *Snowiellus atratus* HINE.

Solieria DESVOIDY, Ann. Soc. Ent. France for 1848, p. 461, 1848. 5 species (as 21). Type, *Tachina inanis* FALLEN (equaling 9 of the supposed species), by present designation. Equals **Leskia** DESVOIDY, 1830.

Solva WALKER, Journ. Proc. Linn. Soc., Zool., vol. 4, p. 98, 1860. 1 species. Type, *Solva inamæna* WALKER. Syn., *Subula* MEIGEN, 1820, preoccupied; *Xylomya* RONDANI, 1861; *Macroceromys* BIGOT, 1877.

Somoleja RONDANI, Atti Soc. Ital. Sci. Nat., vol. 8, p. 207, 1865. 1 species. Type, *Tachina ænea* MEIGEN (as *Harrisia rebaptizata* RONDANI). Equals **Lydina** DESVOIDY, 1830.

Somomya RONDANI, Dipt. Ital. Prodr., vol. 4, p. 9, 1861. Change of name for *Mya* RONDANI, 1850, not of LINNÆUS, 1758. Type, *Musca segmentaria* FABRICIUS. Equals **Lucilia** DESVOIDY, 1830.

Somula MACQUART, Dipt. Exot., Suppl. 2, p. 57, 1847. 1 species. Type, *Somula decora* MACQUART. Equals **Penthesilia** MEIGEN, 1800.

Spallanzania DESVOIDY, Essai Myod., p. 78, 1830. 2 species. Type, *Tachina hebes* FALLEN (as *gallica*, new species), the second species, by present designation. Syn., *Pissemya* DESVOIDY, 1851; *Cnephalia* RONDANI, 1856; *Pseudogonia* BRAUER and BERGENSTAMM, 1889; *Acroglossa* WILLISTON, 1889.

[**Spania** MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 6, p. 335, 1830. 1 species. Type, *Spania nigra* MEIGEN. Not American.]

Spanipalpis TOWNSEND, Smiths. Misc. Coll., vol. 51, p. 110, 1908. 1 species. Type, *Trichophora miscella* COQUILLETT.

Sparnopolius LOEW, Neue Beitr., vol. 3, p. 43, 1855. 4 species. Type, *Bombylius brevirostris* MACQUART (as *fulvus* WIEDEMANN, preoccupied), the first species, by present designation.

Spathichira BIGOT, Bull. Soc. Ent. France for 1888, p. 24, 1888. 1 species. Type, *Dolichopus funditor* LOEW. Equals **Dolichopus** LATREILLE, 1796.

Spathulina RONDANI, Dipt. Ital. Prodr., vol. 1, p. 113, 1856. 1 species. Type, *Spathulina sicula* RONDANI. Syn., *Campiglossa* RONDANI, 1870.

Spaziphora RONDANI, Dipt. Ital. Prodr., vol. 1. p. 99, 1856. 1 species. Type, *Cordilura hydromyzina* FALLEN.

Sphærina WULP, Biol. Centr.-Amer., Dipt., vol. 2, p. 205, 1890. 1 species. Type, *Sphærina nitidula* WULP.

Sphærocera LATREILLE, Hist. Nat. Crust. et Ins., vol. 14, p. 394, 1805. 1 species. Type, *Musca subsultans* FABRICIUS (as *curripes*, new species). Equals **Cypsela** MEIGEN, 1800.

Sphæromias CURTIS, Brit. Ent., p. 285, 1829. 1 species. Type, *Ceratopogon fasciatus* MEIGEN (as *albomarginatus*, new species). Syn., *Xylocrypta* KIEFFER, 1899.

Sphærophoria ST. FARGEAU and SERVILLE, Encycl. Meth., vol. 10, pt. 2, p. 513, 1828. 7 species. Type, *Musca scripta* LINNÆUS, the third species, by designation of RONDANI, Nuovi Ann. Sci. Nat. (Bologna), 1844, p. 458. Syn., *Melithreptus* LOEW, 1840; *Melitrophus* WALKER, 1856.

Sphageus LOEW, Berliner Ent. Zeitschr., vol. 10, p. 32, 1866. 1 species. Type, *Sphageus chalcoproctus* LOEW.

Sphecomyia LATREILLE, Dict. Class. Hist. Nat., vol. 15, p. 545, 1829. 1 species, without name. Type, *Chrysotoxum vittatum* WIEDEMANN. Syn., *Tyzenhausia* GORSKI, 1852.

Sphegina MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 3, p. 193, 1822. 1 species (as 2). Type, *Milesia clunipes* FALLEN.

Sphenoidoptera WILLISTON, Biol. Centr.-Amer., Dipt., vol. 1, p. 295, 1901. 1 species. Type, *Sphenoidoptera varipennis* WILLISTON.

Sphenometopa TOWNSEND, Smiths. Misc. Coll., vol. 51, p. 64, 1908. 1 species. Type, *Araba nebulosa* COQUILLETT. Syn., *Eumetopia* BRAUER and BERGENSTAMM, 1889, preoccupied.

Sphixea RONDANI, Nuovi Ann. Sci. Nat. (Bologna) for 1844, p. 455, 1844. 1 species. Type, *Musca semiluctifera* VILLIERS (as *Eristalis fulminans* FABRICIUS).

Sphiximorpha RONDANI, Ann. Soc. Ent. France for 1850, p. 212, 1850. 1 species. Type, *Ceria subsessilis* ILLIGER. Equals **Cerioides** RONDANI, 1850.

Sphyracephala SAY, Amer. Ent., p. 116, 1828. 1 species. Type, *Diopsis brevicornis* SAY.

Sphyricera LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 1336, 1864. 2 species. Type, *Echinomyia sphyricera* MACQUART, the second species, by tautonymy. Equals **Peleteria** DESVOIDY, 1830.

Sphyromyia BIGOT, Bull. Soc. Ent. France for 1883, p. 108, 1883. 1 species. Type, *Tachina robusta* WIEDEMANN (as *malleola*, new species). Equals **Peleteria** DESVOIDY, 1830.

Sphyxosoma RONDANI, Dipt. Ital. Prodr., vol. 1, p. 56, 1856. 1 species. Type, *Conops quadrifasciata* DE GEER. Equals **Conops** LINNÆUS, 1758.

Spilochroa WILLISTON, Journ. N. Y. Ent. Soc., vol. 15, p. 2, 1907. 1 species. Type, *Heterochroa ornata* JOHNSON.

Spilogaster MACQUART, Hist. Nat., Dipt., vol. 2, p. 293, 1835. 13 species. Type, *Musca quadrum* FABRICIUS, the seventh species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 143. Equals **Mydæa** DESVOIDY, 1830.

Spilographa LOEW, Monogr. Trypet., p. 39, 1862.* 3 species. Type, *Trypeta hamifera* LOEW, the second species, by present designation. Equals **Euribia** MEIGEN, 1800.

Spilomyia MEIGEN, Illiger's Mag., vol. 2, p. 273, 1803. 2 species. Type, *Syrphus saltuum* FABRICIUS (as *diophthalmus* FABRICIUS), the first pecies, by present designation. Syn., *Milesia* LATREILLE, 1805; *Mixtemyia* MACQUART, 1834.

Spodius LOEW, Berliner Ent. Zeitschr., vol. 2, p. 101, 1858. 1 species. Type, *Spodius imbecillus* LOEW. Equals **Hesperinus** WALKER, 1848.

Spoggosia RONDANI, Dipt. Ital. Prodr., vol. 3, p. 182, 1859. 1 species. Type, *Salia echinura* DESVOIDY (as *occlusa*, new species). Equals **Phorocera** DESVOIDY, 1830.

Spogostylum MACQUART, Dipt. Exot., vol. 2, pt. 1, p. 53, 1840. 1 species. Type, *Spogostylum mystaceum* MACQUART. Equals **Anthrax** SCOPOLI, 1763.

Spylosia RONDANI, Dipt. Ital. Prodr., vol. 1, p. 66, 1856. 1 species. Type, *Tachina bisignata* MEIGEN. Equals **Meigenia** DESVOIDY, 1830.

Stachynia MACQUART, Recueil Trav. Soc. Sci. Lille for 1834, p. 340, 1834. 1 species. Type, *Myopa punctata* FABRICIUS. Equals **Dalmannia** DESVOIDY, 1830.

Stægeria DESVOIDY, Hist. Nat. Dipt., vol. 1, p. 972, 1863. 1 species (as 22). Type, *Guerinia festiva* DESVOIDY. Equals **Exorista** MEIGEN, 1803.

Stannia RONDANI, Dipt. Ital. Prodr., vol. 2, p. 14, 1857. Change of name for *Ammobates* STANNIUS, 1831, not of LATREILLE, 1809. Type, *Ammobates notatus* STANNIUS. Equals **Tachytrechus** HALIDAY, 1851.

Stearibia LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 1105, 1864. 1 species. Type, *Piophila foveolata* MEIGEN. Equals **Piophila** FALLEN, 1810.

Stegana MEIGEN, Syst. Beschr. Zweifl. Ins., vol 6, p. 79, 1830. 2 species. Type, *Musca coleoptrata* SCOPOLI (as *hypoleuca*, new species), the second species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 153 (as *S. annulata* HALIDAY).

Stegomyia THEOBALD, in Howard's Mosquitoes, p. 234, June 1, 1901. 1 species. Type, *Culex calopus* MEIGEN (as *fasciatus* FABRICIUS).

Stelocheta BECKER, Berliner Ent. Zeitschr., vol. 31, p. 129, 1887. 1 species. Type, *Iteaphila macquarti* ZETTERSTEDT, (as *setacea*, new species). Equals **Iteaphila** ZETTERSTEDT, 1838.

Steneretma LOEW, Monogr. Dipt. N. Amer., vol. 3, p. 186, 1873. 1 species. Type, *Steneretma laticauda* LOEW.

Stenodexia WULP, Biol. Centr.-Amer., Dipt., vol. 2, p. 246, 1891. 1 species. Type, *Stenodexia albicincta* WULP.

Stenogaster LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 991, 1864. 1 species. Type, *Chortophila angusta* MACQUART. Equals **Pegomya** DESVOIDY, 1830.

Stenomacra LOEW, Monogr. Dipt. N. Amer., vol. 3, p. 180, 1873. 1 species. Type, *Sepsis guerini* BIGOT. Not *Stenomacra* STAL, 1870. Equals **Macrostenomyia** HENDEL, 1907.

Stenomicra COQUILLETT, Proc. U. S. Nat. Mus., vol. 22, p. 262, 1900. 1 species. Type, *Stenomicra angustata* COQUILLETT.

Stenomyia LOEW, Berliner Ent. Zeitschr., vol. 11, p. 320, 1868. 1 species. Type, *Stenomyia tenuis* LOEW.

Stenopa LOEW, Monogr. Dipt. N. Amer., vol. 3, p. 234, 1873. 1 species. Type, *Trypeta vulnerata* LOEW.

Stenopogon LOEW, Linn. Ent., vol. 2, p. 453, 1847. 6 species. Type, *Asilus sabaudus* FABRICIUS, the last species, by designation of COQUILLETT, Proc. Ent. Soc. Washington, vol. 6, 1904, p. 179. Syn., *Gonioscelis* SCHINER, 1866; *Scleropogon* LOEW, 1866.

Stenoporomyia HENDEL, Wien. Ent. Zeit., vol. 10, p. 250, 1903. 1 species. Type, *Milichia argyragastra* PERRIS (as *Lobioptera tiefi* MIK). Equals **Milichiella** GIGLIO-TOS, 1895.

Stenoxenus COQUILLETT, Ent. News, vol. 10, p. 60, 1899. 1 species. Type, *Stenoxenus johnsoni* COQUILLETT.

Stephania DESVOIDY, Hist. Nat. Dipt., vol. 1, p. 807, 1863. 1 species. Type, *Stephania meridionalis* DESVOIDY. Equals **Wagneria** DESVOIDY, 1830.

Stethopathus WANDOLLECK, Zool. Jahrb. for 1898, p. 424, 1898. 1 species. Type, *Puliciphora lucifera* DAHL. Equals **Puliciphora** DAHL, 1897.

Stevenia DESVOIDY, Essai Myod., p. 220, 1830. 2 species (as 4). Type, *Stevenia tomentosa* DESVOIDY, the first species, by designation of DESVOIDY, Hist. Nat. Dipt., vol. 2, 1863, p. 378. Syn., *Hyperæa* DESVOIDY, 1863; *Trisonevra* LIOY, 1864.

Stibasoma SCHINER, Verh. Zool.-Bot. Ges. Wien, vol. 17, p. 310, 1867. 1 species. Type, *Tabanus theotænia* WIEDEMANN.

Stichopogon LOEW, Linn. Ent., vol. 2, p. 499, 1847. 4 species. Type, *Dasypogon elegantulus* WIEDEMANN, the third species, by designation of BACK, Trans. Amer. Ent. Soc., vol. 35, p. 332, 1909.

Stictocephala LOEW, Monogr. Dipt. N. Amer., vol. 3, p. 134, 1873. 4 species. Type, *Ortalis vau* SAY, the first species, by original designation. Not *Stictocephala* STAL, 1869. Equals **Pseudotephritis** JOHNSON, 1902.

Stictodiplosis KIEFFER, Bull. Soc. Ent. France for 1894, p. 28, 1894. 2 manuscript species, only the second ever described. Type, *Stictodiplosis pieridis* KIEFFER.

Stictomyia BIGOT, Bull. Soc. Ent. France for 1885, p. 166, 1885. 1 species. Type, *Stictomyia longicornis* BIGOT.

Stilbometopa COQUILLETT, Can. Ent., vol. 31, p. 336, 1899. 1 species. Type, *Ornithomyia fulvifrons* WALKER.

Stilpnogaster LOEW, Linn. Ent., vol. 4, p. 82, 1849. 1 species. Type, *Asilus æmulus* MEIGEN.

Stilpon LOEW, Neue Beitr., vol. 6, p. 34, 1859. 2 species. Type, *Tachydromia graminum* FALLEN, the first species, by designation of COQUILLETT, Proc. Ent. Soc. Washington, vol. 5, p. 257, 1903. Equals **Agatachys** MEIGEN, 1830.

Stomatodexia BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 56, p. 125, 1889. 1 species. Type, *Stomoxys cothurnata* WIEDEMANN.

Stomoxoides SCHLEFFER, Elementa Ent., pl. 120, 1766. 1 species, without name. Type, *Conops testacea* LINNÆUS. Syn., *Myopa* FABRICIUS, 1775; *Pictinia* DESVOIDY, 1853; *Myopella* DESVOIDY, 1853, *Phorosia* DESVOIDY, 1853; *Fairmairia* DESVOIDY, 1853; *Lonchopalpus* DESVOIDY, 1853; *Purpurella* DESVOIDY, 1853; *Myopina* DESVOIDY, 1853; *Gonirhyncus* RONDANI, 1856; *Ischiodonta* LIOY, 1864.

Stomoxys GEOFFROY, Hist. Abrégée Ins., vol. 2, p. 538, 1762. 1 species, without name. Type, *Conops calcitrans* LINNÆUS.

Stomphastica LOEW, Berliner Ent. Zeitschr., vol. 8, p. 336, 1864. Change of name for *Clusia* HALIDAY, 1838, under the erroneous impression that the latter name is preoccupied in Botany. Type, *Heteromyza flava* MEIGEN. Equals **Clusia** HALIDAY, 1838.

Stonyx OSTEN SACKEN, Biol. Centr.-Amer., Dipt., vol. 1, p. 94, 1886. 2 species. Type, *Stonyx clelia* OSTEN SACKEN, the second species, by present designation. Equals **Villa** LIOY, 1864.

Stratiomys GEOFFROY, Hist. Abrégée Ins., vol. 2, p. 475, 1762. 8 species, without names. Type, *Musca chamæleon* LINNÆUS, the first species, by designation of LATREILLE, Consider. Général., 1810, p. 442. Syn., *Hoplomyia* ZELLER, 1842.

Strauzia DESVOIDY, Essai Myod., p. 718, 1830. 1 species (as 2). Type, *Trypeta longipennis* WIEDEMANN.

Strebla WIEDEMANN, Anal. Ent., p. 19, 1824.* 1 species. Type, *Strebla avium* MACQUART (as *Hippobosca vespertilionis* FABRICIUS).

Stroblia POKORNY, Verh. Zool.-Bot. Ges. Wien, vol. 43, p. 541, 1893. Arbitrary change of name for *Pseudolimnophora* STROBL, 1893. Type, *Musca triangula* FALLEN. Equals **Limnophora** DESVOIDY, 1830.

Sturmia DESVOIDY, Essai Myod., p. 171, 1830. 2 species (as 4). Type, *Sturmia vanessæ* DESVOIDY, the second species, by designation of DESVOIDY, Hist. Nat. Dipt., vol. 1, 1863, p. 888. Syn., *Blepharipa* RONDANI, 1856; *Lambertia* DESVOIDY, 1863; *Schaumia* DESVOIDY, 1863; *Belida* DESVOIDY, 1863; *Ugimyia* RONDANI, 1870; *Ctenocnemis* KOWARZ, 1873; *Argyrophylax* BRAUER and BERGENSTAMM, 1889; *Crossocosmia* MIK, 1890; *Zygobothria* MIK, 1891; *Xylotachina* BRAUER and BERGENSTAMM, 1891.

Stygeropis LOEW, Berliner Ent. Zeitschr., vol. 7, p. 298, 1863. Arbitrary change of name for *Prionocera* LOEW, 1844. Type, *Prionocera pubescens* LOEW. Equals **Prionocera** LOEW, 1844.

Stylidia WESTWOOD, Intr., vol. 2, Synops., p. 154, 1840. 1 species. Type, *Phthiridium biarticulatum* HERMANN. Equals **Nycteribia** LATREILLE, 1796.

Stylocoma LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 1009, 1864. 1 species. Type, *Sapromyza tubifer* MEIGEN? Equals **Sapromyza** FALLEN, 1810.

Stylogaster MACQUART, Hist. Nat., Dipt., vol. 2, p. 38, 1835. 1 species. Type, *Conops stylata* FABRICIUS. Syn., *Stylomyia* WESTWOOD, 1850; *Ptychoproctus* BIGOT, 1859.

Stylomyia WESTWOOD, Proc. Zool. Soc. Lond., vol. 18, p. 268, 1850. 2 species. Type, *Stylomyia leonina* WESTWOOD, the first species, by present designation. Equals **Stylogaster** MACQUART, 1835.

Styrex SCOPOLI, Ent. Carn., p. 367, 1763. 1 species. Type, *Styrex holosericeus* SCOPOLI. Syn., *Chrysopilus* MACQUART, 1826.

Subclytia PANDELLE, Rev. Ent., vol. 13, p. 96, 1894. 1 species. Type, *Tachina rotundiventris* FALLEN. Equals **Eliozeta** RONDANI, 1856.

Subula MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 2, p. 14, 1820. 1 species. Type, *Xylophagus maculatus* MEIGEN. Not *Subula* SCHUMACHER, 1817. Equals **Solva** WALKER, 1860.

Suillia DESVOIDY, Essai Myod., p. 642, 1830. 12 species. Type, *Heleomyza rufa* FALLEN (as *fungorum*, new species), the second species, by present designation. Syn., *Herbina* DESVOIDY, 1830.

Sylvia DESVOIDY, Essai Myod., p. 636, 1830. 5 species. Type, *Sylvia apicalis* DESVOIDY, the first species, by present designation. Equals **Sapromyza** FALLEN, 1810.

Sylvicolæ HARRIS, Exp. Engl. Ins., p. 100, 1776. 16 species. Type, *Tipula fenestralis* SCOPOLI (as *brevis*, new species), the thirteenth species, by present designation. Syn., *Phryne* MEIGEN, 1800; *Anisopus* MEIGEN, 1803; *Rhyphus* LATREILLE, 1805.

Symmerus WALKER, List Dipt. Brit. Mus., vol. 1, p. 88, 1848. 1 species. Type, *Mycetobia annulata* MEIGEN (as *ferrugineus*, new species). Syn., *Plesiastina* WINNERTZ, 1852.

Symphoromyia FRAUENFELD, Verh. Zool.-Bot. Ges. Wien, vol. 17, p. 496, 1867. 1 species. Type, *Atherix melæna* MEIGEN.

Symplecta MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 6, p. 282, 1830. 2 species. Type, *Limonia hybrida* MEIGEN, the first species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 128. Syn., *Helobia* ST. FARGEAU and SERVILLE, 1828, preoccupied; *Idioneura* PHILIPPI, 1865; *Symplectomorpha* MIK, 1886.

Symplectomorpha MIK, Wien. Ent. Zeit., vol. 5, p. 318, 1886. 2 species. Type, *Limnobia stictica* MEIGEN, the first species, by original designation. Equals **Symplecta** MEIGEN, 1830.

Sympycnus LOEW, Neue Beitr., vol. 5, p. 42, 1857. 5 species. Type, *Porphyrops annulipes* MEIGEN, the first species, by present designation.

Synarthrus LOEW, Neue Beitr., vol. 5, p. 35, 1857. 1 species. Type, *Hydrochus tarsatus* FALLEN. Equals **Syntormon** LOEW, 1857.

Syndyas LOEW, Öfv. Kongl. Vet. Akad. Förh., vol. 14, p. 369, 1857. 2 species. Type, *Syndyas opaca* LOEW, the first species, by designation of COQUILLETT, Proc. Ent. Soc. Washington, vol. 5, 1903, p. 257.

Syneches WALKER, Ins. Saund., Dipt., p. 165, 1852. 1 species. Type, *Syneches simplex* WALKER. Equals **Acromyia** LATREILLE, 1809.

Syneura BRUES, Trans. Amer. Ent. Soc., vol. 29, p. 383, 1903. 1 species. Type, *Phora cocciphila* COQUILLETT.

Syntemna WINNERTZ, Verh. Zool.-Bot. Ges. Wien, vol. 13, p. 767, 1863. 1 species. Type, *Syntemna morosa* WINNERTZ.

Synthesiomyia BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 60, p 96, 1893. 1 species. Type, *Synthesiomyia brasiliana* BRAUER and BERGENSTAMM.

Syntormon LOEW, Neue Beitr., vol. 5, p. 35, 1857. 5 species. Type, *Rhaphium metathesis* LOEW, the first species, by present designation. Syn., *Plectropus* HALIDAY, 1831, preoccupied; *Synarthrus* LOEW, 1857.

Syritta ST. FARGEAU and SERVILLE, Encycl. Meth., vol. 10, pt. 2, p. 808, 1828. 1 species. Type, *Musca pipiens* LINNÆUS. Syn., *Coprina* ZETTERSTEDT, 1837; *Planes* RONDANI, 1864.

Syrphus FABRICIUS, Syst. Ent., p. 762, 1775. 49 species. Type, *Musca lucorum* LINNÆUS, the nineteenth species, by designation of CURTIS, Brit. Ent., 1839, p. 753. Syn., *Leucozona* SCHINER, 1860. (*Syrphus* of authors equals *Epistrophe* WALKER.)

Systœchus LOEW, Neue Beitr., vol. 3, p. 34, 1855. 14 species (as 15). Type, *Bombylius sulphureus* MIKAN, the sixth species, by present designation.

Systropus WIEDEMANN, Nova Dipt. Gen., p. 18, 1820.* 1 species. Type, *Systropus macilentus* WIEDEMANN. Syn., *Cephenus* BERTHOLD, 1827.

Tabanus LINNÆUS, Syst. Natur., 10th ed., p. 601, 1758. 12 species. Type, *Tabanus bovinus* LINNÆUS, the first species, by designation of LATREILLE, Consider. Général., 1810, p. 443. Syn., *Therioplectes* ZELLER, 1842; *Brachystomus* COSTA, 1857; *Agelanius* RONDANI, 1864; *Atylotus* OSTEN SACKEN, 1876.

Tabuda WALKER, Ins. Saund., Dipt., p. 197, 1852. 1 species. Type, *Tabuda fulripes* WALKER.

Tachina MEIGEN, Illiger's Mag., vol. 2, p. 280, 1803. 3 species. Type, *Musca grossa* LINNÆUS, the first species, by designation of WACHTL, Wien. Ent. Zeit., vol. 13, 1894, p. 142. Equals **Larvævora** MEIGEN, 1800. (*Tachina* of authors equals *Exorista* MEIGEN.)

Tachinodes BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 56, p. 133, 1889. 1 species. Type, *Musca hystrix* FABRICIUS. Equals **Archytas** JENNICKE, 1867.

Tachinomyia TOWNSEND, Trans. Amer. Ent. Soc., vol. 19, p. 96, 1892. 1 species. Type, *Tachinomyia robusta* TOWNSEND. Equals **Exorista** MEIGEN, 1803.

Tachinophyto TOWNSEND, Trans. Amer. Ent. Soc., vol. 19, p. 130, 1892. 1 species. Type, *Tachinophyto floridensis* TOWNSEND. Syn., *Pseudomyothyria* TOWNSEND, 1892; *Methypostena* TOWNSEND, 1908; *Lixophaga* TOWNSEND, 1908.

Tachinopsis COQUILLETT, Rev. Tach., p. 38, 1897. 1 species. Type, *Tachinopsis mentalis* COQUILLETT.

Tachista LOEW, Zeitschr. Ent. Breslau, vol. 14, p. 7, 1860. 11 species. Type, *Tachydromia connexa* MEIGEN, the sixth species, by designation of COQUILLETT, Proc. Ent. Soc. Washington, vol., 5, 1903, p. 258. Equals **Coryneta** MEIGEN, 1800.

Tachydromia MEIGEN, Illiger's Mag., vol. 2, p. 269, 1803. 2 species. Type, *Tachydromyia connexa* MEIGEN (as *cimicoides* FABRICIUS), the second species, by designation of COQUILLETT, Proc. Ent. Soc. Washington, vol. 5, 1903, p. 258. Equals **Coryneta** MEIGEN, 1800.

Tachypeza MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 6, p. 341, 1830. 10 species. Type, *Tachydromia nubila* MEIGEN, the eighth species, by designation of RONDANI, Dipt. Ital. Prodr., vol. 1, 1856, p. 147.

Tachytrechus HALIDAY, in Walker's Ins. Britt., Dipt., vol. 1, p. 173, 1851. Change of name for *Ammobates* STANNIUS, 1831, not of LATREILLE, 1809. Type, *Ammobates notatus* STANNIUS. Syn., *Ammobates* STANNIUS, 1831, preoccupied; *Stannia* RONDANI, 1857; *Macellocerus* MIK, 1878.

Tacina WALKER, Ins. Saund., Dipt., p. 9, 1850. 3 species. Type, *Pangonius micans* MEIGEN, the first species, by present designation. Equals **Pangonius** LATREILLE, 1802.

Tæchobates HALIDAY, Zool. Journ., vol. 5, p. 358, 1831. 2 species (as 3). Type, *Hydrophorus jaculus* FALLEN, the first species, by present designation. Equals **Medetera** FISCHER, 1819.

Tæniorhynchus ARRIBALZAGA, Rev. Mus. La Plata, vol. 1, p. 389, 1891. 3 species. Type, *Culex titillans* WALKER (as *tæniorhynchus* WIEDEMANN), the first species, by tautonymy. Syn., *Panoplites* THEOBALD, 1900; *Mansonia* BLANCHARD, 1901.

Talmonia DESVOIDY, Hist. Nat. Dipt., vol. 1, p. 704, 1863. 1 species. Type, *Talmonia tibialis* DESVOIDY. Equals **Ceranthia** DESVOIDY, 1830.

Tanipoda RONDANI, Dipt. Ital. Prodr., vol. 1, p. 116, 1856. 1 species. Type, *Calobata calceata* FALLEN. Equals **Trepidaria** MEIGEN, 1800.

Tanyglossa MEIGEN, Illiger's Mag., vol. 2, p. 267, 1803. 1 species. Type, *Tabanus mauritanus* LINNÆUS (as *haustellatus* FABRICIUS). Equals **Pangonius** LATREILLE, 1802.

Tanypeza FALLEN, Opom. Suecic., p. 4, 1820. 1 species. Type, *Tanypeza longimana* FALLEN.

Tanypremna OSTEN SACKEN, Biol. Centr.-Amer., Dipt., vol. 1, p. 19, 1886. 1 species. Type, *Tanypremna opilio* OSTEN SACKEN.

Tanyptera LATREILLE, Hist. Nat. Crust. et Ins., vol. 14, p. 286, 1805. 1 species. Type, *Tipula atrata* LINNÆUS. Equals **Flabellifera** MEIGEN, 1800.

Tanypus MEIGEN, Illiger's Mag., vol. 2, p. 261, 1803. 2 species. Type, *Tipula cincta* FABRICIUS, the first species, by designation of LATREILLE, Consider. Général., 1810, p. 442. Equals **Pelopia** MEIGEN, 1800.

Tanytarsus WULP, Tijdschr. Ent., vol. 17, p. 134, 1874. 12 species. Type, *Chironomus punctipes* WIEDEMANN, the first species, by present designation.

Taphrosia RONDANI, Dipt. Ital. Prodr., vol. 1, p. 182, 1856. 1 species. Type, *Limnobia tenella* MEIGEN. Equals **Gonomyia** MEIGEN, 1818.

Tapinocera MACQUART, Dipt. Exot., vol. 1, pt. 2, p. 78, 1838. 1 species. Type, *Laphria brevicornis* WIEDEMANN. Equals **Apiocera** WESTWOOD, 1835.

Taracticus LOEW, Berliner Ent. Zeitschr., vol. 16, p. 240, 1872. 1 species. Type, *Dioctria octopunctata* SAY.

Tauromyia GIGLIO-TOS, Boll. Mus. Zool. Univ. Torino., vol. 8, no. 158, p. 8, 1893. 1 species. Type, *Tauromyia pachyneura* GIGLIO-TOS.

Taxigramma PERRIS, Ann. Soc. Linn. Lyons for 1850, p. 209, 1852. 1 species. Type, *Miltogramma heteroneura* MEIGEN (as *pipiens*, new species). Syn., *Heteropterina* MACQUART, 1854; *Metopilla* RONDANI, 1859; *Elpigia* DESVOIDY, 1863.

Telejoneura RONDANI, Arch. Zool. Modena, vol. 3, p. 48, 1864. Change of name for *Trupanea* MACQUART, 1838, not of SCHRANK, 1803. Type, *Asilus maculatus* FABRICIUS. Equals **Bactria** MEIGEN, 1820.

Telmatobia STENHAMMAR, Kongl. Vet. Akad. Handl. for 1843, p. 149, 1844. 1 species. Type, *Notiphila ænea* FALLEN. Equals **Pelina** HALIDAY, 1839.

Telmatogeton SCHINER, Verh. Zool.-Bot. Ges. Wien, vol. 16, p. 931, 1866. 1 species. Type, *Telmatogeton sanctipauli* SCHINER.

Telothyria WULP, Biol. Centr.-Amer., Dipt., vol. 2, p. 167, 1890. 38 species. Type, *Telothyria cupreiventris* WULP, the thirtieth species, by designation of BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 60, 1893, p. 132.

Temnocera ST. FARGEAU and SERVILLE, Encycl. Meth., vol. 10, pt. 2, p. 786, 1828. 1 species. Type, *Temnocera violacea* ST. FARGEAU and SERVILLE. Equals **Volucella** GEOFFROY, 1762.

Temnostoma ST. FARGEAU and SERVILLE, Encycl. Meth., vol. 10, pt. 2, p. 518, 1828. 4 species. Type, *Milesia bombylans* FABRICIUS, the second species, by present designation.

Tendipes MEIGEN, Nouv. Class. Mouch., p. 17, 1800.* No species. *Chironomus* MEIGEN, 1803, is a change of name. Type, *Tipula plumosa* LINNÆUS. Syn., *Chironomus* MEIGEN, 1803.

Tenuicera PANDELLE, Rev. Ent., vol. 15, p. 32, 1896. 1 species. Type, *Tachina incana* FALLEN (as *oxyrhina*, new species). Equals **Meigenia** DESVOIDY, 1830.

Tephritis LATREILLE, Hist. Nat. Crust. et Ins., vol. 14, p. 389, 1805. 1 species. Type, *Musca solstitialis* LINNÆUS. Syn., *Urophora* DESVOIDY, 1830. (*Tephritis* of authors equals *Spathulina* RONDANI.)

Tephrochlamys LOEW, Zeitschr. Ent. Breslau, vol. 13, p. 72, 1862. 5 species. Type, *Heleomyza canescens* MEIGEN (as *rufiventris* MEIGEN), the fourth species, by present designation. Equals **Lentiphora** DESVOIDY, 1830.

Tephronota LOEW, Zeitschr. Ges. Nat., vol. 32, p. 6, 1868. 3 species. Type, *Ortalis gyrans* LOEW, the second species, by designation of LOEW, Monogr. Dipt. N. Amer., vol. 3, 1873, p. 57.

Terellia DESVOIDY, Essai Myod., p. 758, 1830. 1 species (as 2). Type, *Musca serratulæ* LINNÆUS. Syn., *Sitarea* DESVOIDY, 1830; *Carpomya* RONDANI, 1856; *Cerajocera* RONDANI, 1856.

Terelliosoma RONDANI, Dipt. Ital. Prodr., vol. 1, p. 109, 1856. 1 species. Type, *Tetanops impunctata* LOEW (as *heryngii*, new species). Equals **Tetanops** FALLEN, 1820.

Teremyia MACQUART, Hist. Nat., Dipt., vol. 2, p. 514, 1835. 1 species. Type, *Lonchæa laticornis* MEIGEN. Equals **Lonchæa** FALLEN, 1820.

Terenia DESVOIDY, Essai Myod., p. 640, 1830. 4 species. Type, *Terenia suillorum* DESVOIDY, the first species, by present designation. Equals **Sapromyza** FALLEN, 1810.

Tersesthes TOWNSEND, Psyche, vol. 6, p. 370, 1893. 1 species. Type, *Tersesthes torrens* TOWNSEND.

Tessarochæta BEZZI, Zeitschr. Hymen. Dipt., vol. 6, p. 50, 1906. Change of name for *Tetrachæta* BRAUER and BERGENSTAMM, 1894, preoccupied. Type, *Tetrachæta obscura* BRAUER and BERGENSTAMM. Equals **Peleteria** DESVOIDY, 1830.

Tetanocera LATREILLE, Hist. Nat. Crust. et Ins., vol. 14, p. 385, 1805. 2 species. Type, *Musca corvleti* SCOPOLI, the first species, by present designation. Syn., *Pherbina* DESVOIDY, 1830.

Tetanops FALLEN, Ortal. Sveciæ, p. 2, 1820. 1 species. Type, *Tetanops myopina* FALLEN. Syn., *Terelliosoma* RONDANI, 1856.

Tetrachæta BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 61, p. 611, 1894. 1 species. Type, *Tetrachæta obscura* BRAUER and BERGENSTAMM. Equals **Peleteria** DESVOIDY, 1830.

Tetrachæta STEIN, Berliner Ent. Zeitschr., vol. 42, p. 254, 1898. 1 species. Type, *Tetrachæta unica* STEIN. Not *Tetrachæta* EHRENBERG, 1844. Equals **Tetramerinx** BERG, 1898.

Tetradiscus BIGOT, Ann. Soc. Ent. France for 1886, p. 370, 1886. 2 species. Type, *Tetradiscus pictus* BIGOT, the first species, by present designation.

Tetragoneura WINNERTZ, Ent. Zeit. Stettin, vol. 7, p. 18, 1846. 2 species. Type, *Sciophila sylvatica* CURTIS (as *distincta*, new species), the second species, by designation of JOHANNSEN, Gen. Ins., Dipt., Mycet., 1909, p. 34.

Tetragrapha BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 58, p. 351, 1891. 1 species. Type, *Tetragrapha tessellata* BRAUER and BERGENSTAMM.

Tetramerinx BERG, Com. Mus. Nac. Buenos Aires, vol. 1, p. 17, 1898. Change of name for *Tetrachæta* STEIN, 1898, not of EHRENBERG, 1844. Type, *Tetrachæta unica* STEIN. Syn., *Tetrachæta* STEIN, 1898, preoccupied.

Tetropismenus LOEW, Zeitschr. Ges. Nat., vol. 48, p. 333, 1876. 1 species. Type, *Tetropismenus hirtus* LOEW.

Teuchocnemus OSTEN SACKEN, Bull. Buff. Soc. Nat. Sci., vol. 3, p. 58, 1876. 2 species. Type, *Pterallastes lituratus* LOEW, the second species, by designation of WILLISTON, Synops. N. Amer. Syrph., 1886, p. 199.

Teucholabis OSTEN SACKEN, Proc. Acad. Nat. Sci. Phila. for 1859, p. 222, 1860. 1 species. Type, *Teucholabis complexa* OSTEN SACKEN.

Teuchophorus LOEW, Neue Beitr., vol. 5, p. 44, 1857. 2 species. Type, *Dolichopus spinigerellus* ZETTERSTEDT, the first species, by present designation.

Thalassomya SCHINER, Verh. Zool.-Bot. Ges. Wien, vol. 6, p. 219, 1856. 1 species. Type, *Thalassomya frauenfeldi* SCHINER.

Thamnodromia MIK, Wien. Ent. Zeit., vol. 5, p. 278, 1886. Change of name for *Phyllodromia* ZETTERSTEDT, 1837, not of SERVILLE, 1839. Type, *Empis melanocephala* FABRICIUS. Equals **Hemerodromia** MEIGEN, 1822.

Thapsia DESVOIDY, Hist. Nat. Dipt., vol. 1, p. 689, 1863. 1 species. Type, *Tachina albicollis* MEIGEN. Equals **Neæra** DESVOIDY, 1830.

Thaumalea RUTHE, Isis von Oken for 1831, p. 1211, Nov., 1831. 1 species. Type, *Orphnephila deria* HALIDAY (as *testacea*, new species). Equals **Orphnephila** HALIDAY, September, 1831.

Thecophora RONDANI, Nuovi Ann. Sci. Nat. (Bologna) for 1845, p. 15, 1845. 1 species. Type, *Myopa atra* FABRICIUS. Syn., *Occemya* DESVOIDY, 1853.

Thelairia DESVOIDY, Essai Myod., p. 214, 1830. 1 species (as 2). Type, *Musca nigripes* FABRICIUS.

Thelairodes WULP, Biol. Centr.-Amer., Dipt., vol. 2, p. 254, 1891. 3 species. Type, *Homodexia vittigera* BIGOT, the first species, by designation of BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 58, 1891, p. 377.

Themira DESVOIDY, Essai Myod., p. 745, 1830. 2 species. Type, *Themira pilosa* DESVOIDY, the first species, by present designation. Syn., *Cheligaster* MACQUART, 1835; *Halidaya* RONDANI, 1856.

Theobaldia NEVEU-LEMAIRE, Compt. Rend. Soc. Biol., vol. 54, p. 1331, 1902. 1 species. Type, *Culex annulatus* SCHRANK. Syn., *Theobaldinella* BLANCHARD, 1905.

Theobaldinella BLANCHARD, Les Moust., p. 390, 1905. Change of name for *Theobaldia* NEVEU-LEMAIRE, 1902, under the mistaken impression that it interferes with *Theobaldius* NEVILLE. Type, *Culex annulatus* SCHRANK. Equals **Theobaldia** NEVEU-LEMAIRE, 1902.

Theone DESVOIDY, Hist. Nat. Dipt., vol. 2, p. 401, 1863. 1 species (as 2). Type, *Tachina polyodon* MEIGEN. Equals **Amobia** DESVOIDY, 1830.

Theresia DESVOIDY, Essai Myod., p. 325, 1830. 1 species. Type, *Theresia tandrec* DESVOIDY. Syn., *Sardiocera* BRAUER and BERGENSTAMM, 1889.

Thereva LATREILLE, Precis, p. 167, 1796. No species. In his Hist. Nat. Crust. et Ins., vol. 3, 1802, p. 441, 1 species. Type, *Musca plebeja* LINNÆUS. Syn., *Dialineura* RONDANI, 1856.

Therioplectes ZELLER, Isis von Oken for 1842, p. 819, 1842. 8 species. Type, *Tabanus tricolor* ZELLER, the first species, by present designation. Equals **Tabanus** LINNÆUS, 1758.

Thevenemyia BIGOT, Bull. Soc. Ent. France for 1875, p. 174, 1875. 1 species. Type, *Thevenemyia californica* BIGOT. Equals **Eclimus** LOEW, 1844.

Thinodromia MELANDER, Ent. News, vol. 17, p. 370, 1906. 1 species. Type, *Thinodromia inchoata* MELANDER.

Thinophilus WAHLBERG, Öfv. Kongl. Vet. Akad. Förh., vol. 1, p. 37, 1844. 2 species. Type, *Rhaphium flavipalpe* ZETTERSTEDT, the first species, by designation of ZETTERSTEDT, Dipt. Scand., vol. 8, 1849, p. 3101.

Thricops RONDANI, Dipt. Ital. Prodr., vol. 1, p. 96, 1856. 1 species. Type, *Aricia hirtula* ZETTERSTEDT. Syn., *Tricophthicus* RONDANI, 1861; *Rhynchotrichops* SCHNABL, 1889.

Thrycolyga RONDANI, Dipt. Ital. Prodr., vol. 1, p. 68, 1856. 1 species. Type, *Thrycolyga nova* RONDANI. Syn., *Scotia* DESVOIDY, 1863.

Thrypticus GERSTÆCKER, Ent. Zeit. Stettin, vol. 24, p. 43, 1864. 1 species. Type, *Thrypticus smaragdinus* GERSTÆCKER. Syn., *Aphantotimus* WHEELER, 1890; *Xanthotricha* ALDRICH, 1896.

Thryptocera MACQUART, Recueil Trav. Soc. Sci. Lille for 1834, p. 310, 1834. 9 species. Type, *Tachina pilipennis* FALLEN, the ninth species, by designation of RON-

DANI, Dipt. Ital. Prodr., vol. 1, 1856, p. 60. Equals **Actia** DESVOIDY, 1830. (*Thryptocera* of authors equals *Ceranthia* DESVOIDY.)

Thyridanthrax OSTEN SACKEN, Biol. Centr.-Amer., Dipt., vol. 1, p. 123, 1886. 4 species Type, *Anthrax selene* OSTEN SACKEN, the first species, by present designation. Equals **Villa** LIOY, 1864.

Thyrimyza ZETTERSTEDT, Dipt. Scand., vol. 6, p. 2336, 1847. 9 species. Type, *Musca flava* LINNÆUS, the first species, by designation of RONDANI, Bull. Soc. Ent. Ital., vol. 6, 1874, p. 244. Equals **Chyromya** DESVOIDY, 1830.

Thysanomyia BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 58, p. 340, 1891. 1 species. Type, *Brachicoma fimbriata* WULP.

Tinearia SCHELLENBERG, Genres Mouches Dipt., pl. 40, figs. 1, a, b, c, and 2, b, d, 1803. 2 species. Type, *Psychoda alternata* SAY, the first species, by present designation. Equals **Psychoda** LATREILLE, 1796.

Tinolestes COQUILLETT, Proc. Ent. Soc. Washington, vol. 7, p. 185, 1906. 1 species. Type, *Tinolestes latisquama* COQUILLETT.

Tipula LINNÆUS, Syst. Nat., 10th ed., p. 585, 1758. 37 species. Type, *Tipula oleracea* LINNÆUS, the fourth species, by designation of LATREILLE, Consider. Général., 1810, p. 442. Syn., *Anomaloptera* LIOY, 1864; *Oreomyza* POKORNY, 1887.

Titania MEIGEN, Nouv. Class. Mouch., p. 35, 1800.* No species. *Chlorops* MEIGEN, 1803, is a change of name. Type, *Chlorops læta* MEIGEN. Syn., *Chlorops* MEIGEN, 1803; *Oscinis* LATREILLE, 1804; *Cotilea* LIOY, 1864.

Tolmerus LOEW, Linn. Ent., vol. 4, p. 94, 1849. 4 species. Type, *Asilus pyragra* ZELLER, the fourth species, by present designation.

Tomoplagia, new name. Type, *Trypeta obliqua* SAY. Syn., *Plagiotoma* LOEW, preoccupied.

Toreus MELANDER, Ent. News, vol. 17, p. 376, 1906. 1 species. Type, *Empis neomexicana* MELANDER.

Townsendia WILLISTON, Kansas Univ. Quart., vol. 4, p. 107, 1895. 1 species. Type, *Townsendia minuta* WILLISTON.

Toxomerus MACQUART, Dipt. Exot., Suppl. 5, p. 93, 1855. 1 species. Type, *Scæva geminata* SAY (as *notatus*, new species). Syn., *Mesogramma* LOEW, 1865; *Mesograpta* LOEW, 1872.

Toxonevra MACQUART, Hist. Nat., Dipt., vol. 2, p. 404, 1835. 1 species. Type, *Musca pulchella* ROSSI (as *fasciata*, new species). Equals **Palloptera** FALLEN, 1820.

Toxophora MEIGEN, Illiger's Mag., vol. 2, p. 270, 1803. No species. In his Klass. Beschr. Zweifl. Ins., 1804, p. 273, 1 species. Type, *Asilus maculatus* ROSSI.

Toxorhina LOEW, Linn. Ent., vol. 5, p. 400, 1851. 3 fossil and 1 recent species. Type, *Toxorhina fragilis* LOEW, the recent species, by designation of OSTEN SACKEN, Proc. Acad. Nat. Sci. Phila. for 1861, p. 230.

Toxotrypana GERSTÆCKER, Ent. Zeit. Stettin, vol. 21, p. 191, 1860. 1 species. Type, *Toxotrypana curvicauda* GERSTÆCKER. Syn., *Mikimyia* BIGOT, 1884.

Traginops COQUILLETT, Ent. News, vol. 11, p. 429, 1900. 1 species. Type, *Traginops irrorata* COQUILLETT.

Trennia DESVOIDY, Essai Myod., p. 484, 1830. 1 species. Type, *Anthomyia errans* MEIGEN (as *nigricornis*, new species). Equals **Phaonia** DESVOIDY, 1830.

Trepidaria MEIGEN, Nouv. Class. Mouches, p. 35, 1800.* No species. *Calobata* MEIGEN, 1803, is a change of name. Type, *Musca petronella* LINNÆUS. Syn., *Calobata* MEIGEN, 1803; *Neria* DESVOIDY, 1830; *Rainieria* RONDANI, 1843; *Tanipoda* RONDANI, 1856.

Trepophrys TOWNSEND, Smiths. Misc. Coll., vol. 51, p. 95, 1908. 1 species. Type, *Trepophrys cinerea* TOWNSEND. Equals **Pseudochæta** COQUILLETT, 1895.

Triachora TOWNSEND, Smiths. Misc. Coll., vol. 51, p. 105, 1908. 1 species. Type, *Latreillia unifasciata* DESVOIDY. Equals **Goniomima** TOWNSEND, 1908.

Trichiopoda LATREILLE, in Cuvier's Regne Anim., new ed., vol. 5, p. 512, 1829. 2 species. Type, *Thereva plumipes* FABRICIUS, the first species, by present designation. Syn., *Homogenia* WULP, 1892; *Trichopododes* TOWNSEND, 1893; *Pennapoda* TOWNSEND, 1897; *Eutrichopoda* TOWNSEND, 1908; *Galactomyia* TOWNSEND, 1908; *Polistomyia* TOWNSEND, 1908; *Euomogenia* TOWNSEND, 1908.

Trichobius GERVAIS, Atlas Zool., p. 14, 1844. 1 species. Type, *Trichobius parasiticus* GERVAIS.

Trichocera MEIGEN, Illiger's Mag., vol. 2, p. 262, 1803. 1 species. Type, *Tipula hiemalis* DE GEER. Equals **Petaurista** MEIGEN, 1800.

Trichomyia CURTIS, Brit. Ent., p. 745, 1839. 1 species. Type, *Trichomyia urbica* CURTIS.

Trichonta WINNERTZ, Verh. Zool.-Bot. Ges. Wien, vol. 13, p. 798, 1863. 7 species. Type, *Mycetophila melanura* STEGER, the first species, by designation of JOHANNSEN, Gen. Ins., Dipt., Mycet., 1909. p. 94.

Trichophora MACQUART, Dipt. Exot., Suppl. 2, p. 62, 1847. 1 species. Type, *Trichophora nigra* MACQUART. Syn., *Siphoniomyia* BIGOT, 1885; *Paragymnomma* BRAUER and BERGENSTAMM, 1891.

Trichopododes TOWNSEND, Can. Ent., vol. 25, p. 166, 1893. Change of name for *Homogenia* WULP, under the mistaken impression that it is preoccupied by *Homogenes* THOMSON. Type, *Homogenia rufipes* WULP. Equals **Trichiopoda** LATREILLE, 1829.

Trichoprosopon THEOBALD, Journ. Trop. Med., vol. 4, p. 235, July 15, 1901. No species. In his Monogr. Culic., vol. 2, November 23, 1901, p. 285, 1 species. Type, *Trichoprosopon nivipes* THEOBALD. Syn., *Joblotia* BLANCHARD, December 6, 1901.

Trichoptera MEIGEN, Illiger's Mag., vol. 2, p. 261, 1803. 2 species. Type, *Psychoda alternata* SAY (as *Tipula phalænoides* FABRICIUS), the first species, by present designation. Equals **Psychoda** LATREILLE, 1796.

Trichoptera LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 1109, 1864. 2 species. Type, *Diastata adusta* MEIGEN, the first species, by present designation. Not *Trichoptera* MEIGEN, 1803. Equals **Calopterella**, new name.

Trichopteromyia WILLISTON, Trans. Ent. Soc. Lond. for 1896, p. 255, 1896. 1 species. Type *Trichopteromyia modesta* WILLISTON.

Trichosia WINNERTZ, Beitr. Monogr. Sciarinen, p. 173, 1867. 3 species. Type, *Trichosia splendens* WINNERTZ, the first species, by present designation.

Trichotanypus KIEFFER, Ann. Soc. Sci. Bruxelles, vol. 30, p. 319, 1906. No species. In 1906, 1 species. Type, *Tanypus posticalis* LUNDBECK.

Triclis LOEW, Bemerk. Asiliden, p. 17, 1851. 1 species. Type, *Dasypogon olivaceus* LOEW. Syn., *Gastrichelius* RONDANI, 1856.

Tricogena RONDANI, Dipt. Ital. Prodr., vol. 1, p. 88, 1856. 1 species. Type, *Tachina rubricosa* MEIGEN (as *truquii*, new species). Syn., *Frauenfeldia* EGGER, 1865.

Tricophthicus RONDANI, Dipt. Ital. Prodr., vol. 4, p. 9, 1861. Change of name for *Thricops* RONDANI, 1856, under the mistaken impression that it is preoccupied by *Trichops* MANNERHEIM, 1846 (?). Type, *Aricia hirtula* ZETTERSTEDT. Equals **Thricops** RONDANI, 1856.

Tricyphona ZETTERSTEDT, Isis von Oken for 1837, p. 65, 1837. 1 species. Type, *Limonia immaculata* MEIGEN. Syn., *Amalopis* HALIDAY, 1856; *Bophrosia* RONDANI, 1856; *Crunobia* KOLENATI, 1860.

Trigonometopus MACQUART, Hist. Nat., Dipt., vol. 2, p. 419, 1835. 1 species. Type, *Tetanocera frontalis* MEIGEN. Syn., *Oxyrhina* MEIGEN, 1838.

Trigonostoma LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 990, 1864. 1 species. Type, *Chortophila frontalis* MACQUART. Equals **Pegomya** DESVOIDY, 1830.

Trimicra OSTEN SACKEN, Proc. Acad. Nat. Sci. Phila. for 1861, p. 290, 1862. 1 species. Type, *Trimicra anomala* OSTEN SACKEN.

Trinaria MULSANT, Mem. Acad. Lyons for 1852, p. 18, 1852.* 2 species. Type, *Anthrax rutila* WIEDEMANN, the first species (as *interrupta*, new species), by present designation. Equals **Mima** MEIGEN, 1820.

Trineura MEIGEN, Illiger's Mag., vol. 2, p. 276, 1803. No species. In his Klass. Beschr. Zweifl. Ins., 1804, pp. 313, 314, 4 species. Type, *Musca aterrima* FABRICIUS, the first species (as *atra*, new species), by designation of BRUES, Genera Insect., Dipt., Phoridæ, p. 8, 1906. Equals **Phora** LATREILLE, 1796.

Triodites OSTEN SACKEN, Bull. 3, U. S. Geol. Surv., p. 245, 1877. 1 species. Type, *Triodites mus* OSTEN SACKEN. Equals **Aphœbantus** LOEW, 1872.

Triodonta WILLISTON, Bull. Brooklyn Ent. Soc., vol. 7, p. 136, 1885. Change of name for *Polydonta* MACQUART, 1850, not of FISCHER, 1807. Type, *Merodon curripes* WIEDEMANN. Not *Triodonta* BORY, 1824. Equals **Polydontomyia** WILLISTON, 1896.

Triogma SCHINER, Wien. Ent. Monatschr., vol. 7, p. 223, 1863. 1 species. Type, *Limnobia trisulcata* SCHUMMEL.

Triplasius LOEW, Neue Beitr., vol. 3, p. 7, 1855. 1 species. Type, *Bombylius bivittatus* LOEW.

Triptotricha LOEW, Berliner Ent. Zeitschr., vol. 16, p. 235, 1872. 1 species. Type, *Triptotricha lauta* LOEW.

Trisometopia LIOY, Atti Inst. Veneto, ser. 3, vol. 10, p. 77, 1864. 1 species. Type, *Trisometopia thoracica* LIOY. Equals **Megaselia** RONDANI, 1856.

Trisonevra LIOY, Atti Inst. Veneto, ser. 3, vol. 10, p. 68, 1864. 1 species. Type, *Dexia melania* MEIGEN (as *Ptilocera cilipennis* MACQUART). Equals **Stevenia** DESVOIDY, 1830.

Tritochæta BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 56, p. 92, 1889. 1 species. Type, *Tachina pullata* MEIGEN (as *prosopoides*, new species). Equals **Zenilla** DESVOIDY, 1830.

Tritonia MEIGEN, Nouv. Class. Mouches, p. 33, 1800.* No species. *Spilomyia* MEIGEN, 1803, is a change of name. Type, *Musca vespiformis* LINNÆUS. Not *Tritonia* CUVIER, 1798. Equals **Spilomyia** MEIGEN, 1803.

Tritoxa LOEW, Monogr. Dipt. N. Amer., vol. 3, p. 102, 1873. 3 species. Type, *Trypeta flexa* WIEDEMANN, the first species, by present designation.

Trixa MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 4, p. 222, 1824. 6 species. Type, *Trixa dorsalis* MEIGEN, the fifth species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 138. Syn., *Murana* MEIGEN, 1824; *Crameria* DESVOIDY, 1830; *Semiomyia* MACQUART, 1848; *Amsteinia* AM STEIN, 1858.

Trixoclista TOWNSEND, Trans. Amer. Ent. Soc., vol. 19, p. 102, 1892. 1 species. Type, *Trixoclista distincta* TOWNSEND. Equals **Amobia** DESVOIDY, 1830.

Trixodes COQUILLETT, Can. Ent., vol. 34, p. 201, 1902. 1 species. Type, *Trixodes obesa* COQUILLETT.

Trixostomus RONDANI, Dipt. Ital. Prodr., vol. 1, p. 130, 1856. 1 species. Type, *Ephydra stagnalis* FALLEN. Equals **Scatella** DESVOIDY, 1830.

Trochilodes COQUILLETT, Trans. Amer. Ent. Soc., vol. 29, p. 102, 1903. 1 species. Type, *Trochilodes skinneri* COQUILLETT.

Trochobola OSTEN SACKEN, Monogr. Dipt. N. Amer., vol. 4, p. 97, 1869. Change of name for *Discobola* OSTEN SACKEN, 1862, under the mistaken impression that the latter is preoccupied by *Discoboli*. Type, *Limnobia argus* SAY. Equals **Discobola** OSTEN SACKEN, 1862.

Tropidia MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 3, p. 346, 1822. 2 species. Type, *Musca scita* HARRIS (as *Eristalis milesiformis* FALLEN), the second species, by designation of CURTIS, Brit. Ent., 1832, p. 401. Syn., *Milesiformis* RONDANI, 1844.

Tropidomyia WILLISTON, Can. Ent., vol. 20, p. 11, 1888. 1 species. Type, *Tropidomyia bimaculata* WILLISTON.

Tropidopsis BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 56, p. 132, 1889. 1 species. Type, *Tachina pyrrhaspis* WIEDEMANN.

Trupanea SCHRANK, Brief Donaumoor, p. 147, 1795.* 1 species. Type, *Musca stellata* FUESSLY (as *radiata*, new species). Syn., *Urellia* DESVOIDY, 1830; *Actinoptera* RONDANI, 1871.

Trupanea MACQUART, Dipt. Exot., vol. 1, pt. 2, p. 91, 1838. 39 species. Type, *Asilus maculatus* FABRICIUS, the seventeenth species, by original designation. Equals **Bactria** MEIGEN, 1820.

Trypeta MEIGEN, Illiger's Mag., vol. 2, p. 277, 1803. 4 species. Type, *Musca artemisiæ* FABRICIUS, the fourth species, by present designation. Equals **Euribia** MEIGEN, 1800. (*Trypeta* of authors equals *Terellia* DESVOIDY).

Trypoderma WIEDEMANN, Auss. Zweifl. Ins., vol. 2, p. 256, 1830. 3 species. Type, *Musca americana* FABRICIUS, the first species, by present designation. Equals **Cuterebra** CLARK, 1815.

Tubifera MEIGEN, Nouv. Class. Mouches, p. 34, 1800.* No species. *Elophilus* MEIGEN, 1803, is a change of name. Type, *Musca tenax* LINNÆUS. Syn., *Elophilus* MEIGEN, 1803; *Eristalis* LATREILLE, 1804; *Eristaloides* RONDANI, 1844; *Eristalinus* RONDANI, 1844; *Eristalomya* RONDANI, 1857; *Lathyrophthalmus* MIK, 1897.

Tylemyia GIGLIO-TOS, Boll. Mus. Univ. Torino, vol. 8, no. 158, p. 14, 1893. Change of name for *Omalocephala* MACQUART, 1843, not of SPINOLA, 1839. Type, *Omalocephala fusca* MACQUART. Syn., *Omalocephala* MACQUART, 1843, preoccupied.

Tylos MEIGEN, Nouv. Class. Mouches, p. 31, 1800.* No species. *Micropeza* MEIGEN, 1803, is a change of name. Type, *Musca corrigiolata* LINNÆUS. Syn., *Micropeza* MEIGEN, 1803; *Phantasma* DESVOIDY, 1830.

Tyreomma BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 58, p. 381, 1891. No species. In Biol. Centr.-Amer., Dipt., vol. 2, 1896, p. 293, WULP referred 1 species to it. Type, *Tyreomma muscinum* WULP.

Tyrophaga KIRBY, An Intr. Ent., vol. 2, p. 283, 1817. 1 species. Type, *Musca casei* LINNÆUS. Equals **Piophila** FALLEN, 1810.

Tyzenhausia GORSKI, An. Ent. Imp. Ross., vol. 1, p. 170, 1852.* 1 species. Type, *Chrysotoxum vittatum* WIEDEMANN (as *vespiformis*, new species). Equals **Sphecomyia** LATREILLE, 1829.

Ubristes WALKER, Ins. Saund., Dipt., p. 217, 1852. 1 species. Type, *Ubristes flavitibia* WALKER. Equals **Microdon** MEIGEN, 1803.

Ugimyia RONDANI, Bull. Soc. Ent. Ital., vol. 2, p. 137, 1870. 1 species. Type, *Ugimyia sericariæ* RONDANI. Equals **Sturmia** DESVOIDY, 1830.

Ula HALIDAY, Ent. Mag., vol. 1, p. 153, 1833. 1 species. Type, *Limnobia macroptera* MACQUART (as *mollissima*, new species). Syn., *Macroptera* LIOY, 1864.

Ulidia MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 5, p. 385, 1826. Change of name for *Chrysomyza* FALLEN, 1817, on the ground that the latter name is not applicable to all the species. Type, *Musca demandata* FABRICIUS. Equals **Physiphora** FALLEN, 1810.

Ulomorpha OSTEN SACKEN, Monogr. Dipt. N. Amer., vol. 4, p. 232, 1869. 1 species. Type, *Limnophila pilosella* OSTEN SACKEN.

Unomyia MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 1, p. 135, 1818. 4 species (as 5). Type, *Tipula tripunctata* FABRICIUS, the second species, by present designation. Equals **Amphinome** MEIGEN, 1800.

Uramya DESVOIDY, Essai Myod., p. 215, 1830. 1 species. Type, *Uramya producta* DESVOIDY.

Uranotænia ARRIBALZAGA, Rev. Mus. La Plata, vol. 1, p. 405, 1891. 2 species Type, *Uranotænia pulcherrima* ARRIBALZAGA, the second species, by designation of NEVEU-LEMAIRE, Mem. Soc. Zool. France, vol. 15, 1902, p. 227.

Urellia DESVOIDY, Essai Myod., p. 774, 1830. 1 species (as 2). Type, *Musca stellata* FUESSLY. Equals **Trupanea** SCHRANK, 1795.

Urophora DESVOIDY, Essai Myod., p. 769, 1830. 8 species. Type, *Musca cardui* LINNÆUS (as *sonchi*, new species), the sixth species, by designation of WESTWOOD, Intr., vol. 2, Synops., 1840, p. 149. Equals **Tephritis** LATREILLE, 1805.

Vafrellia DESVOIDY, Hist. Nat. Dipt., vol. 1, p. 674, 1863. 1 species. Type, *Ceranthia fulvipes* DESVOIDY (as *podacina* DESVOIDY). Equals **Ceranthia** DESVOIDY, 1830.

Vanderwulpia TOWNSEND, Trans. Amer. Ent. Soc., vol. 18, p. 381, 1891. 1 species. Type, *Vanderwulpia atrophopodoides* TOWNSEND. Syn., *Wulpia* BRAUER and BERGENSTAMM, 1893; *Brauerimyia* TOWNSEND, 1908; *Catemophrys* TOWNSEND, 1908.

Vappo LATREILLE, Hist. Nat. Crust. et Ins., vol. 14, p. 343, 1805. 1 species. Type, *Nemotelus ater* PANZER. Equals **Pachygaster** MEIGEN, 1803.

Varichæta SPEISER, Berliner Ent. Zeitschr., vol. 48, p. 69, 1903. Change of name for *Erigone* DESVOIDY, 1830, not of SAVIGNY, 1827. Type, *Musca radicum* FABRICIUS. Equals **Ernestia** DESVOIDY, 1830.

Velocia COQUILLETT, Can. Ent., vol. 18, p. 158, 1886. 1 species. Type, *Anthrax cerberus* FABRICIUS. Equals **Hyperalonia** RONDANI, 1864.

Verrallia MIK, Wien. Ent. Zeit., vol. 18, p. 137, 1899. 1 species. Type, *Cephalops aucta* FALLEN.

Verrallina THEOBALD, Monogr. Culic., vol. 3, p. 295, 1903. 3 species. Type, *Aëdes butleri* THEOBALD, the first species, by present designation.

Villa LIOY, Atti Inst. Veneto, ser. 3, vol. 9, p. 732, 1864. 7 species (as 8). Type, *Anthrax abbadon* FABRICIUS (as *concinnus* MEIGEN), the second species, by present designation. Syn., *Hemipenthes* LOEW, 1869; *Stonyx* OSTEN SACKEN, 1886; *Isopenthes* OSTEN SACKEN, 1886; *Pœcilanthrax* OSTEN SACKEN, 1886; *Chrysanthrax* OSTEN SACKEN, 1886; *Thyridanthrax* OSTEN SACKEN, 1886; *Hyalanthrax* OSTEN SACKEN, 1887.

Viviania RONDANI, Dipt. Ital. Prodr., vol. 4, p. 53, 1861. Change of name for *Fabricia* MEIGEN, 1838, preoccupied. Type, *Tachina cinerea* FALLEN. Equals **Biomya** RONDANI, 1856.

Volucella GEOFFROY, Hist. Abrégée Ins., vol. 2, p. 540, 1762. 3 species (without names). Type, *Musca pellucens* LINNÆUS, the first species, by designation of CURTIS, Brit. Ent., 1833, p. 452. Syn., *Apivora* MEIGEN, 1800: *Pterocera* MEIGEN, 1803; *Ornidia* ST. FARGEAU and SERVILLE, 1828; *Temnocera* ST. FARGEAU and SERVILLE, 1828; *Atemnocera* BIGOT, 1882; *Camerania* GIGLIO-TOS, 1892.

Voria DESVOIDY, Essai Myod., p. 195, 1830. 1 species. Type, *Tachina ruralis* FALLEN. Syn., *Athrycia* DESVOIDY, 1830; *Plagia* MEIGEN, 1838; *Blepharigena* RONDANI, 1856; *Klugia* DESVOIDY, 1863; *Ptiloparcia* BRAUER and BERGENSTAMM, 1889; *Paraplagia* BRAUER and BERGENSTAMM, 1891.

Wagneria DESVOIDY, Essai Myod., p. 126, 1830. 1 species. Type, *Ocyptera costata* FALLEN (as *gagatea*, new species). Syn., *Scopolia* DESVOIDY, 1830, preoccupied; *Brachystylum* MACQUART, 1855; *Phoricheta* RONDANI, 1861; *Ramonda* DESVOIDY, 1863; *Carbonia* DESVOIDY, 1863; *Stephania* DESVOIDY, 1863; *Ateria*, DESVOIDY, 1863; *Ocalea* DESVOIDY, 1863.

Wahlbergia ZETTERSTEDT, Dipt. Scand., vol. 1, p. 51, 1842. No species. In 1844, 1 species. Type, *Ocyptera lateralis* FALLEN. Equals **Besseria** DESVOIDY, 1830.

Walkeria DESVOIDY, Hist. Nat. Dipt., vol. 1, p. 995, 1863. 1 species (as 50). Type, *Tachina simulans* MEIGEN. Equals **Exorista** MEIGEN, 1803.

Walshomyia FELT, 23d Rep. State Ent. N. Y., p. 359, 1908. 1 species. Type, *Walshomyia juniperina* FELT.

Willistonia BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 56, p. 97, 1889. 1 species. Type, *Musca esuriens* FABRICIUS. Equals **Belvosia** DESVOIDY, 1830.

Willistoniella MIK, Wien. Ent. Zeit., vol. 14, p. 136, 1895. Change of name for *Rhopalomyia* WILLISTON, 1895, not of RÜBSAAMEN, 1892. Type, *Ropalomera pleuropunctata* WIEDEMANN. Syn., *Rhopalomyia* WILLISTON, 1895, preoccupied.

Winnertzia RONDANI, Atti Soc. Ital. Sci. Nat. Milano, vol. 2, p. 287, 1860. 1 species. Type, *Asynapta lugubris* WINNERTZ.

Winthemia DESVOIDY, Essai Myod., p. 173, 1830. 3 species (as 8). Type, *Musca quadripustulata* FABRICIUS (as species 2 to 4 and 6 to 8), by designation of DESVOIDY, Hist. Nat. Dipt., vol. 1, 1863, p. 207. Syn., *Dorbina* DESVOIDY, 1847; *Masipoda* BRAUER and BERGENSTAMM, 1889; *Catagonia* BRAUER and BERGENSTAMM, 1891.

Wohlfahrtia BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 56, p. 123, 1889. 2 species. Type, *Sarcophila magnifica* SCHINER, the first species, by designation of BRAUER and BERGENSTAMM, Verh. Zool.-Bot. Ges. Wien, vol. 43, 1893, p. 501. Equals **Sarcophila** RONDANI, 1856.

Wulpia BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 60, p. 128, 1893. 1 species. Type, *Wulpia aperta* BRAUER and BERGENSTAMM. Not *Wulpia* BIGOT, 1886. Equals **Vanderwulpia** TOWNSEND, 1891.

Wyeomyia THEOBALD, Journ. Trop. Med., vol. 4, p. 235, July 15, 1901. No species. In his Monogr. Culic., vol. 2, November 23, 1901, p. 268, 6 species. Type, *Wyeomyia grayii* THEOBALD, the first species, by designation of NEVEU-LEMAIRE, Mem. Soc. Zool. France, vol. 15, 1902, p. 223.

Xanionotum BRUES, Amer. Nat., vol. 36, p. 376, 1902. 1 species. Type, *Xanionotum hystrix* BRUES.

Xanthandrus VERRALL, Brit. Flies, vol. 8, p. 316, 1901. 5 species. Type, *Musca comta* HARRIS, the first species, by present designation.

Xanthina ALDRICH, Kansas Univ. Sci. Bull., vol. 1, p. 92, 1902. 1 species. Type, *Xanthina plumicauda* ALDRICH.

Xanthochlorus LOEW, Neue Beitr., vol. 5, p. 42, 1857. 2 species. Type, *Porphyrops ornatus* HALIDAY, the first species, by present designation. Syn., *Leptopus* HALIDAY, 1831, preoccupied.

Xanthocrona WULP, Biol. Centr.-Amer., Dipt., vol. 2, p. 392, 1899. 1 species. Type, *Xanthocrona bipustulata* WULP.

Xanthodexia WULP, Biol. Centr.-Amer., Dipt., vol. 2, p. 256, 1891. 1 species. Type, *Tachina cinerea* WIEDEMANN.

Xanthogramma SCHINER, Wien. Ent. Monatschr., vol. 4, p. 215, 1860. No species. In his Fauna Austr., Dipt., vol. 1, 1862, p. 319, 3 species. Type, *Musca pedissequua* HARRIS (as *Syrphus ornatus* MEIGEN), the second species, by designation of WILLISTON, Synop. N. Amer. Syrph., 1886, p. 91.

Xanthomelana WULP, Tijdschr. Ent., vol. 35, p. 188, 1892. 6 species. Type, *Xanthomelana gracilenta* WULP, the fifth species, by present designation. Syn., *Xanthomelanodes* TOWNSEND, 1893.

Xanthomelanodes TOWNSEND, Can. Ent., vol. 25, p. 167, 1893. Change of name for *Xanthomelana* WULP, 1892, under the mistaken impression that the latter is preoccupied by *Xanthomelon* MARTENS, 1860, or by *Xanthomelana* BONAPARTE, 1850 (a descriptive term for a color-group in the genus *Euplectes*). Type, *Xanthomelana gracilenta* WULP. Equals **Xanthomelana** WULP, 1892.

Xanthotricha ALDRICH, Trans. Ent. Soc. Lond. for 1896, p. 339, 1896. 3 species. Type, *Xanthotricha cupulifera* ALDRICH, the first species, by present designation. Equals **Thrypticus** GERSTÆCKER, 1864.

Xenochæta SNOW, Kansas Univ. Quart., vol. 2, p. 166, 1894. 1 species. Type, *Xenochæta dichromata* SNOW.

Xenomyza WIEDEMANN, Zool. Mag., vol. 1, pt. 1, p. 60, 1817. 2 species. Type, *Damalis planiceps* FABRICIUS, the first species, by present designation. Syn., *Chalcidimorpha* WESTWOOD, 1835.

[*Xiphandrium* LOEW, Neue Beitr., vol. 5, p. 36, 1857. 9 species. Type, *Rhaphium quadrifilum* LOEW, the first species, by present designation. Equals Rhaphium MEIGEN, 1803. Not American.]

Xiphidicera MACQUART, Hist. Nat., Dipt., vol. 1, p. 356, 1834. 1 species. Type, *Xiphidicera rufipes* MACQUART. Equals Œdalea MEIGEN, 1820.

Xiphura BRULLE, Ann. Soc. Ent. France for 1832, p. 206, 1832. 1 species (as 2). Type, *Tipula atrata* LINNÆUS. Equals Flabellifera MEIGEN, 1800.

Xylocrypta KIEFFER, Bull. Soc. Ent. France for 1899, p. 69, 1899. 1 species. Type, *Ceratopogon fasciata* MEIGEN. Equals Sphæromias CURTIS, 1829.

Xylomya RONDANI, Dipt. Ital. Prodr., vol. 4, p. 11, 1861. Change of name for *Subula* MIEGEN, 1820, not of SCHUMACHER, 1817. Type, *Xylophagus maculatus* MEIGEN. Equals Solva WALKER, 1860.

Xylophagus MEIGEN, Illiger's Mag., vol. 2, p. 266, 1803. 1 species. Type, *Nemotelus cinctus* DE GEER. Equals Erinna MEIGEN, 1800.

Xylota MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 3, p. 211, 1822. 16 species. Type, *Musca segnis* LINNÆUS, the ninth species, by designation of CURTIS, Brit. Ent., 1832, p. 409. Equals Zelima MEIGEN, 1800.

Xylotachina BRAUER and BERGENSTAMM, Denkschr. Kais. Akad. Wiss. Wien, vol. 58, p. 342, 1891. 1 species. Type, *Xylotachina ligniperdæ* BRAUER and BERGENSTAMM. Equals Sturmia DESVOIDY, 1830.

Xylotaja RONDANI, Nuovi Ann. Sci. Nat. (Bologna) for 1844, p. 457, 1844. 1 species. Type, *Syrphus varus* PANZER. Equals Myolepta NEWMAN, 1838.

Yetodesia RONDANI, Dipt. Ital. Prodr., vol. 4, p. 9, 1861. Change of name for *Aricia* DESVOIDY, 1830, not of SAVIGNY, 1817. Type, *Musca impuncta* FALLEN. Equals Mydæa DESVOIDY, 1830. (*Yetodesia* of authors equals *Phaonia* DESVOIDY.)

Youngomyia FELT, 23d Rep. State Ent. N. Y., p. 398, 1908. 2 species. Type, *Dicrodiplosis podophyllæ* FELT, the first species, by original designation.

Yposatæa RONDANI, Dipt. Ital. Prodr., vol. 1, p. 198, 1856. No species. Genus formed of *Lestremia* MACQUART, *Zygoneura* MEIGEN, and *Mimosciara* RONDANI. Type, *Mimosciara molobrina* RONDANI (the type of *Mimosciara*), by present designation. Equals Lestremia MACQUART, 1826.

Zabrachia COQUILLETT, Bull. 47, N. Y. State Mus., p. 585, 1901. 1 species. Type, *Zabrachia polita* COQUILLETT.

Zacompsia COQUILLETT, Ent. News., vol. 12, p. 15, 1901. 1 species. Type, *Zacompsia fulva* COQUILLETT.

Zagonia COQUILLETT, Invert. Pacif., vol. 1, p. 27, 1904. 1 species. Type, *Zagonia flava* COQUILLETT. Syn., *Siligo* ALDRICH, 1908.

Zaphne DESVOIDY, Essai Myod., p. 527, 1830. 1 species (as 2). Type, *Anthomyia divisa* MEIGEN.

Zelia DESVOIDY, Essai Myod., p. 314, 1830. 5 species. Type, *Dexia vertebrata* SAY (as *rostrata*, new species), the first species, by present designation.

Zelima MEIGEN, Nouv. Class. Mouches, p. 34, 1800.* No species. *Eumeros* MEIGEN, 1803, is a change of name. Type, *Musca segnis* LINNÆUS. Syn., *Eumeros* MEIGEN, 1803; *Heliophilus* MEIGEN, 1803; *Xylota* MEIGEN, 1822; *Micraptoma* WESTWOOD, 1840.

Zelinda DESVOIDY, Hist. Nat. Dipt., vol. 1, p. 485, 1863. 1 species. Type, *Musca libatrix* PANZER (as *aurulenta*, new species). Equals Zenilla DESVOIDY, 1830.

Zelleria DESVOIDY, Hist. Nat. Dipt., vol. 1, p. 985, 1863. 1 species (as 19). Type, *Tachina simulans* MEIGEN. Equals Exorista MEIGEN, 1803.

Zelmira MEIGEN, Nouv. Class. Mouches, p. 16, 1800.* No species. *Platyura* MEIGEN, 1803, is a change of name. Type, *Platyura fasciata* MEIGEN. Syn., *Platyura* MEIGEN, 1803.

Zenillia DESVOIDY, Essai Myod., p. 152, 1830. 2 species (as 3). Type, *Musca libatrix* PANZER, the second species, by designation of DESVOIDY, Hist. Nat. Dipt., vol. 1, 1863, p. 471. Syn., *Nilea* DESVOIDY, 1863; *Atilia* DESVOIDY, 1863; *Clemelis* DESVOIDY,

1863; *Zelinda* DESVOIDY, 1863; *Sagaris* DESVOIDY, 1863; *Elpe* DESVOIDY, 1863; *Tritochaeta* BRAUER and BERGENSTAMM, 1889; *Myxexorista* BRAUER and BERGENSTAMM, 1891.

Zetterstedtia RONDANI, Nuovi Ann. Sci. Nat. (Bologna) for 1844, p. 452, 1844. 1 species. Type, *Syrphus cimbiciformis* FALLEN. Equals **Mallota** MEIGEN, 1822.

Zetterstedtia DESVOIDY, Hist. Nat. Dipt., vol. 1, p. 1024, 1863. 1 species (as 14). Type, *Tachina simulans* MEIGEN. Equals **Exorista** MEIGEN, 1803.

Zodion LATREILLE, Precis, p. 162, 1796. No species. In his Hist. Nat. Crust. et Ins., vol. 3, 1802, p. 444, 1 species. Type, *Myopa cinerea* FABRICIUS.

Zonosema LOEW, Monogr. Trypet., p. 39, 1862.* 1 species. Type, *Trypeta meigeni* LOEW.

Zygobothria MIK, Wien. Ent. Zeit., vol. 10, p. 193, 1891. 1 species. Type, *Sturmia atropivora* DESVOIDY. Equals **Sturmia** DESVOIDY, 1830.

Zygomyia WINNERTZ, Verh. Zool.-Bot. Ges. Wien, vol. 13, p. 901, 1863. 6 species. Type, *Mycetophila vara* STÆGER, the second species, by designation of JOHANNSEN, Gen. Ins., Dipt., Mycet., 1909, p. 112.

Zygoneura MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 6, p. 304, 1830. 1 species. Type, *Zygoneura sciarina* MEIGEN.

INDEX.

In this alphabetical list of the specific names which occur in the previous part of this paper the following style in regard to the generic names has been adopted: Where there are two generic names in the parentheses, the first is the genus in which the species was originally described and the second is the genus of which it is the type; the second generic is in italics if the genus is a synonym and in black face if it is a valid one. Where there is only one generic name within the parentheses it signifies that the species was originally described in, and is the type of, that genus; if the name is in italics it is a synomyn; if in black face the genus is valid.

DESCRIPTION OF A NEW ISOPOD OF THE GENUS NOTASELLUS FROM THE EAST COAST OF PATAGONIA.

By Harriet Richardson,
Collaborator, Division of Marine Invertebrates, U. S. National Museum.

Two specimens of a new species of *Notasellus* were collected by the U. S. Bureau of Fisheries steamer *Albatross* in 1888 off the east coast of Patagonia. The first species of this genus, *N. sarsii*, from South Georgia, was described by Pfeffer[a] in 1886. In 1902, Dr. T. V. Hodgson[b] described a second species, *N. australis*, from off Cape Adare. In 1905, Stebbing[c] referred *Stenetrium inerme* Haswell to the genus *Notasellus*.

NOTASELLUS TRILOBATUS, new species.

Body narrow, elongate; surface smooth. Color, in alcohol, yellow. Head wider than long, with the antero-lateral angles rounded, and the front produced in the middle in a long rostrum, rounded at the extremity. The rostrum extends to the end of the third article of the second pair of antennæ. The eyes are rather large, composite, and placed in the post-lateral angles of the head. The first antennæ have the first article of the peduncle dilated; the second article is narrower and shorter; the third is shorter than the second; the flagellum is short, is composed of eleven articles, and extends a little beyond the middle of the fifth article of the peduncle of the second antennæ. The second antennæ have the first four articles short; a scale is articulated to the third article; the fourth article is about one and a half times as long as the first four articles taken together; the sixth article is about one and a half times longer than the fifth; the flagellum is multi-articulate. The first segment of the thorax has the post-lateral angles acutely produced, the antero-lateral angles rounded, and the epimeron, which is bilobate, situated on the lateral margin anterior to the post-lateral angles. The three following segments have both the antero-lateral and post-lateral angles produced in a process, with the margin between them straight and occupied by the bilobate epimeron. The last three segments have only the antero-lateral angles produced, the post-lateral angles being rounded and occupied by the single-lobed epimeron.

[a] Jahrb. Hamburgischen Wiss. Anst., vol. 3, 1886, pp. 125–134, pl. 7, figs. 5–28.
[b] Crust. *Southern Cross* Coll., 1902, pp. 251–253, pl. 36.
[c] Ceylon Pearl Oyster Fisheries, pt. 4, p. 55.

The abdomen is composed of a single segment, the posterior margin of which is trilobate, the median lobe being the largest. The uropoda are missing in both specimens. The seven pairs of legs are similar in the female and terminate in bi-unguiculate dactyli. In the male, however, the first pair of legs is prehensile, with propodus and dactylus dilated, the propodus fringed with long hairs.

Only two specimens, a male and a female, were collected by the U. S. Bureau of Fisheries steamer *Albatross* at station 2770, off the

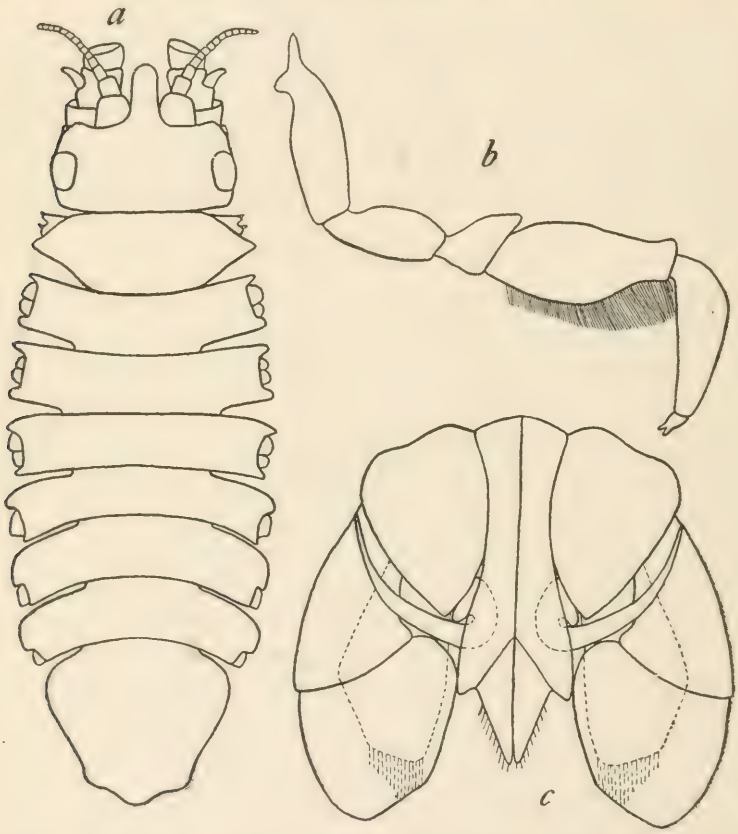


FIG. 1.—NOTASELLUS TRILOBATUS. *a*, FEMALE, × 19½; *b*, FIRST LEG OF MALE, × 19½; *c*, FIRST AND SECOND PLEOPODS OF MALE, × 30⅔.

east coast of Patagonia, lat. 48° 37′ S., long. 65° 46′ W., at a depth of 58 fathoms in gray sand with black specks.

This species is close to the two first-mentioned species of the genus, but differs in the shape of the abdomen, of the first pair of legs of the male and of the distal extremity of the outer branch of the second pleopoda of the male, in the more rounded antero-lateral angles of the head, and the less protruding eyes.

Type.—Cat. No. 40099, U.S.N.M.

THE PARADISE FLYCATCHERS OF JAPAN AND KOREA.

By Pierre Louis Jouy.

INTRODUCTION.

Shortly before his death in 1894 Mr. Jouy, believing that he would be unable to finish his report on the magnificent series of birds which he had collected in Korea during his residence there, requested me to work up the collection, placing his notebooks and memoranda in my hands for the purpose. Of finished manuscript he left very little, but the fragment here published shows how elaborate his plan for the work was and how great a loss the ornithology of the East suffered by his death. It had always been my intention to make good my promise to my lamented friend, but press of work in other branches of zoology has prevented me. The scope he had planned for the work has made it impossible for me to accomplish the task, and I have been unwilling to publish a hurried list of the species instead of the elaborate monograph I had planned as a memorial to him. Recent developments make it desirable to place on record the following notes on the paradise flycatchers of Japan and Korea, which were among the papers entrusted to my care. They are herewith presented in the shape he left them.—Leonhard Stejneger.

DESCRIPTION OF SPECIES.

In comparing a series of skins of the long-tailed flycatchers from Nagasaki, Tsushima, and Korea with specimens from the main island of Japan and Hongkong it was at once evident that there were two forms—one, the Kiushiu-Korean bird, being much darker and richer in color, with a black tail, while the specimens from Fuji Yama and Hongkong are of a different maroon on the back, the lower breast is distinctly ashy, and the tail is dark brown; the tail is, moreover, of a different form, being slightly and evenly graduated, while in the other bird the graduation is abrupt from the fourth to the fifth rectrix, the difference in length between the lateral feather and the fifth averaging 33 mm., while the corresponding difference in the Hondo bird is only 15 mm. Swinhoe in the Ibis for 1861 (p. 39), pointed out the differences, describing the back of the Hongkong form as "of a burnished pink-purple," which corresponds exactly with the color of the specimens from the main island of Japan. As the British Museum at that time had no Japanese specimens for comparison, Mr. Swinhoe's specimens from Hongkong and

Amoy were wrongly ascribed to be *princeps* (i. e., *atrocaudata*), and the new form was not given a name.

On examining the synonomy of the species it was found that *princeps* as a specific name had been applied by Vigors [a] in 1831 to a totally different bird, a *Pericrocotus*, which at that time was included in the genus *Muscipeta*. Schlegel on making this discovery proposed the name *principalis*, but meanwhile the bird had been described from "Malaya" by Eyton as *atrocaudata*, which name therefore takes precedence for the Kiushiu and Korean birds, while for the bird from the main island of Japan I propose the name *Terpsiphone owstoni*.

TERPSIPHONE [b] ATROCAUDATA (Eyton).

1835. *Muscipeta princeps* TEMMINCK, Pl. Col., vol. 3, livr. 99, pl. 584 (not of VIGORS, 1831).—*Terpsiphone princeps* SHARPE, Brit. Mus. Cat. Birds, 1879, vol. 4, p. 361 (part).—*Tchitrea princeps* BLAKISTON and PRYER, Proc. Asiatic Soc. Japan, 1882, p. 148 (part).

1839. *Muscipeta atrocaudata* EYTON, Proc. Zool. Soc. London, p. 102.

1847. *Muscipeta principalis* TEMMINCK and SCHLEGEL, Faun. Japon., p. 47, pl. 17 E.

Description.—Adult male.—Above glossy violet maroon distinctly violaceous in some lights; tail-coverts abruptly blue black, tail blue black; head and crest, throat and ear-coverts velvety violaceous black; chest, sides of breast, and hind neck blue black; flanks and sides of the body dusky purplish brown; rest of under surface and under tail-coverts pure white, the white of the belly sharply defined against the black of the breast; axillaries like the flanks, the terminal portion white-tipped; under wing-coverts pure white with dusky bases to the feathers, innermost wing-coverts uniform dusky; lesser and middle wing-coverts more violaceous than the back, greater wing-coverts dark maroon chestnut; wing blue black, the secondaries very slightly edged with maroon chestnut. Iris blue black; bill and soft ring around the eye cobalt blue; tarsi and toes bluish lead color.

Adult female.—Above clear chestnut with a decided violaceous tinge; middle wing-coverts lighter and less violaceous than the back, primary

[a] Proc. Zool. Soc. London, 1831, p. 22.

[b] The generic term *Terpsiphone* (Gloger, 1827) is here used in preference to *Tchitrea* (Lesson, 1831) for the following reason. *Terpsiphone*, as already stated by Oberholser (Proc. U. S. Nat. Mus., vol. 22, 1900, p. 245), is only a substitute for "*Muscipeta* Cuv.," and the type of the latter is of necessity also the type of the former. Cuvier instituted the genus *Muscipeta* in 1817 (Regne Animal, vol. 1, p. 344) for a number of "moucheroles," the first species enumerated being *Todus regius* Gmelin. This fact probably accounts for Oberholser's statement that this species is the type of *Muscipeta*. The first species rule not having been incorporated in the Rules of Nomenclature of the International Zoological Congress, the type has to be ascertained according to article 30 of this code. Dr. C. W. Richmond has kindly called my attention to the fact that Vigors, as early as 1830 (Mem. Raffles, p. 657), consequently even before Lesson's *Tchitrea* appeared, designated *Muscicapa paradisi* Linnæus as the type of *Muscipeta*. This species then becomes also the type of *Terpsiphone* (1827) which takes the place of *Muscipeta* Cuvier, because the latter is preoccupied by *Muscipeta* Koch, 1816.—L. STEJNEGER.

coverts dusky brown, very slightly edged with rufous; wing dusky brown, primaries slightly, the secondaries broadly edged with orange rufous; tail dusky brown, tail-coverts similar but rather deeper in color than the tail; axillaries white, the margin of the inner webs dusky, under wing-coverts white; head, crest, and ear-coverts glossy violet black; throat, chest, sides of the breast and neck dusky ash, the throat and hind neck darker and with a tinge of violet black; flanks dull rufous; middle of the breast, belly, and under tail-coverts white. Colors of the soft parts duller than in the male, and the fleshy ring around the eye smaller.

A young male, probably in the second year, without the elongated central tail feathers is scarcely distinguishable on the under parts from *T. owstoni*, but is much more deeply colored on the back and wings, being in fact darker on the upper parts than adult males of *T. owstoni*. The female of *T. atrocaudata* is a much clearer, brighter chestnut on the back, and the hind neck is much more broadly marked with dusky ash. The ash of the under parts is much more restricted, not extending to the middle of the breast as in *T. owstoni*.

This species, *T. atrocaudata*, is apparently restricted in its range in Japan to the southern islands. Specimens are under observation from Saga, in Kiushiu, and from the island of Tsushima. I have only met with this bird in Korea, in the southeastern part of the country, none being observed near Seoul, where other species of flycatchers were abundant.

In Fusan they make their appearance about the 1st of May, the males a few days in advance of the females, and remain about a fortnight.

These birds are rather slow and graceful in their movements and have a curious habit, especially the females, of opening and closing the tail-feathers like a fan.

List of specimens and measurements of Terpsiphone atrocaudata.

Museum No.	Collector's No.	Sex and age.	Locality.	Date.	Wing.	Tail.			Culmen.	Tarsus.
						First rectrix.	Fifth rectrix.	Sixth rectrix.		
					mm.	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*
114278	1416	Male ad...	Fusan, S. Korea.....	May 3,1884	92.5	77	114	292	17	15
114279	1417	...do.....	.....do.....	.....do.....	92.5	79	109	274	17	15
114282	1435	...do.....	.....do.....	May 11,1884	94	80	109	247	17	15
114640	1531	...do.....	Sasuna, Tsushima Island, Japan.	June 6,1885	91	78	112	253	17	15
114641	1534	...do.....	.....do.....	June 7,1885	91	76	110	273	17	15
114280	1418	Male, second year.	Fusan, S. Korea.....	May 3,1884	103	82	95	.....	.....	15
114281	1438	Female ad	.....do.....	May 11,1884	89	74	89	.....	17.5	15.5
114642	1533	...do.....	Sasuna, Tsushima Island, Japan.	June 7,1885	87	75	83	.....	16	15.5
Kristiania (Petersen, No.59).		Male ad...	Saga, Kiushiu, Japan..	Apr. 30,1886	92	78.5	117	311	16.5	15

No. 114,278.—This specimen has the outer web and the entire shaft of one of the central tail feathers white.

TERPSIPHONE OWSTONI, new species.

1860. *Tchitrea principalis* SWINHOE, Ibis, p. 57 (not TEMMINCK and SCHLEGEL); Ibis, 1861, pp. 39, 411; 1863, p. 260; Proc. Zool. Soc. London, 1863, p. 289; Ibis, 1865, p. 541.

1871. *Tchitrea princeps* SWINHOE, Proc. Zool. Soc. London, p. 381.—BLAKISTON and PRYER, Ibis, 1878, p. 234; Proc. Asiatic Soc. Japan, 1880, p. 216; 1882, p. 148 (part).—SHARPE, Brit. Mus. Cat. Birds, 1879, vol. 4, p. 361 (part).—JOUY, Proc. U. S. Nat. Mus., 1883, p. 304.

Diagnosis.—Similar to *T. atrocaudata* (Eyton), but much lighter in color: maroon purplish or "pinkish maroon" on the back; wings and tail brownish black; the lower breast with an ashy band; the black of the breast extending lower down and not sharply defined against the white of the belly; upper tail-coverts dark brownish; tail evenly graduated, the difference in length between the lateral feather and the next to the longest, or fifth, 15 mm.; male, wing, 90 mm.; tail, 93 mm.; middle tail-feathers, 281.5 mm.; culmen, 16 mm.

Type-specimen.—Cat. No. 88650, U.S.N.M.

Habitat.—Hondo Island, Japan; Amoy and Hongkong, China.

Description of the type (Cat. No. 88650, U.S.N.M.; Jouy, No. 497; Fuji Yama, Hondo, July 13, 1882; P. L. Jouy, collector).—*Adult male.*—Above glossy maroon purplish, with a strong rufous reflection; tail-coverts very dark chestnut brown, differing from the back and much lighter in color than the tail; tail brownish blue-black; head and crest, throat, ear-coverts, and breast violaceous black; sides of head and hind neck black; flanks and sides of the body dusky maroon chestnut; belly and under tail-coverts white; the feathers of the middle of the breast with ashy margins, blending the color of the breast with the belly; axillaries dusky, with white tips, under wing-coverts white, innermost under wing-coverts dusky brownish; lesser and middle wing-coverts like the back, the greater wing-coverts and secondaries broadly edged with bright maroon chestnut; wings very dark sepia brown; primaries slightly edged with dark maroon chestnut. Iris blue black; bill and soft ring around the eye bright cobalt blue; tarsi and toes bluish lead color.

Dimensions.—Wing, 90 mm; tail, lateral rectrix, 80 mm., fifth, 93 mm., middle, 281.5 mm.; exposed culmen, 16 mm.; tarsus, 15 mm.

Adult female.—Above dusky chestnut or burnt umber, with a slight trace of violaceous; middle wing-coverts dull cinnamon-rufous; primary coverts dusky brown edged with rufous; wing dusky olive brown, the primaries and secondaries broadly edged externally with dull cinnamon-rufous, the tertials broadly margined with dull cinnamon-rufous; tail-coverts and tail dull "Prout's brown;" head, crest,

and ear-coverts glossy violet-black; throat, breast, and neck dusky ash or slate gray, the throat and sides of the neck with a tinge of violaceous, sides of the breast and hind neck with a tinge of brownish; (one specimen has the jugulum margined with pale ash); axillaries and under wing-coverts white, with dusky bases to the feathers; belly and under tail-coverts pure white; flanks dusky brown.

Young in first plumage.—Whole upper surface dusky "Mars brown"; feathers of the back and head with pale buffy centers, but no distinct spots anywhere; primary coverts and wing dusky brown; lesser and greater wing-coverts broadly edged with ochraceous buff; primaries and secondaries edged with the color of the back; upper tail-coverts like the back, but with pale buff tips; tail uniform dusky brown; the crown and ear-coverts are changing to bluish black, thus showing that the change from the nesting plumage is directly into that of the female; throat and breast drab gray; belly glossy white; under tail-coverts white with a tinge of buff.

I take pleasure in dedicating this beautiful species to Mr. Alan Owston, of Yokohama, whose interest in Japanese ornithology has been of such value in elucidating the ornis of Japan.

List of specimens and measurements of Terpsiphone owstoni.

Museum No.	Collector's No.	Sex and age.	Locality.	Date.	Wing.	Tail.			Culmen.	Tarsus.	Remarks.
						First rectrix.	Fifth rectrix.	Sixth rectrix.			
					mm.	*mm.*	*mm.*	*mm.*	*mm.*	*mm.*	
88650	497	Male ad...	Fuji Yama, Hondo, Japan.	July 13, 1882	90	80	93	281.5	16	15	Type.
88651	439	...do.....	.....do.....	July 5, 1882	93	77	92	120	16	15	
88652	524	Female ad.	.....do.....	July 15, 1882	91	74	85	.....	16	15	
88653	357	...do.....	.....do.....	June 30, 1882	92	.....	.....	.....	.....	15.5	
88654	313	Young male.	.....do.....	June 27, 1882	91	78	87	.....	16	15.5	
88655	525	Pullus....	.....do.....	July 15, 1882	.....	.....	.....	.....	.....	.....	
91378	631	Young male.	Chiusenji, Hondo, Japan.	Aug. 28, 1882	90	78	87	.....	15.5	15.5	
86108	171	...do.....	Deep Bay, near Hongkong, China.	Oct. 9, 1881	87	73	83	.....	15	15.5	
86109	172	...do.....	.....do.....	.....do.....	.....	73	83	.....	16	15.5	

Nos. 86108 and 86109.—Two specimens only, seen in the pines. Iris blue-black. Bill dusky. Inside of mouth bright greenish yellow. Tarsi and toes dull bluish.

No. 88653.—In this specimen, a female, the central tail-feathers are abnormally developed, being 134 mm. in length.

SOME NEW HYMENOPTEROUS INSECTS FROM THE PHILIPPINE ISLANDS.

By S. A. Rohwer,

Of the Bureau of Entomology, Department of Agriculture, Washington, D. C.

The insects described below were, with the exception of *Pseudagena chrysosoma*, collected by Father Robert E. Brown, S. J., in the vicinity of Manila. From a brief study of the superfamilies Tenthredinoidea, Vespoidea, and Sphecoidea it seems that this fauna of the Philippine Islands, although related to, is distinct from the fauna of the neighboring mainland.

NESOSELANDRIA, new genus.

Small, habitus similar to the genera *Aneugmenus* Hartig and *Caliroa*. Clypeus small, subtruncate, with the lateral angles rounded; malar space wanting; eyes large, subparallel, lateral ocelli below superorbital line; postocellar area raised; pedicel cylindrical as long as scape, third antennal joint longer than fourth, but not as long as fourth and fifth combined; basitarsis as long as the following joints, apical joint long slender, as long as the second joint, the third and second joints somewhat flattened; tarsal claws with a large, erect, inner tooth; venation of the general type for Selandrinæ; third cubital much broader at the apex receiving the transverse radius beyond the middle; basal nervure strongly bent, as in some species of *Stromboceros;* transverse median its length from the apex of the first discoidal cell; hind radial cell not appendiculate; two hind discoidal cells; lanceolate cell shortly petiolate; sheath narrow; hypopygidium subquadrate at the apex rounded. The tarsi of male are more normal than in female. The first transverse cubitus in all the specimens before me is wanting, but this is a variable character.

Type-species.—Paraselandria imitatrix Ashmead.

Of the described genera this is most closely allied to *Aneugmenus* Hartig, but the absence of the pentagonal area, the longer pedicel, and the petiolate anal cell of the hind wings exclude it from that genus.

Proceedings U. S. National Museum, Vol. 37—No. 1722.

NESOSELANDRIA IMITATRIX Ashmead.

Paraselandria imitatrix ASHMEAD, Proc. U. S. Nat. Mus., vol. 28, 1905, p. 971.

The following notes may aid in the determination of this species: Frontal crest strongly produced in the middle, slightly broken; a circular fovea above each antenna; an elongate transverse fovea in front of middle ocellus, but these are not strong; postocular furrows wanting, or nearly; antennæ hairy; stigma angled near middle.

MUTILLA (sens. lat.) BROWNI, new species.

Female.—Length about 6 mm. Head slightly broader than the thorax; mandibles long and slender, with a tooth remote from the apex; antennal fovea large, shining, carinated above; head and thorax (including the posterior face) with large confluent punctures; thorax rectangular, constricted, and, when seen from above, dentate along the sides; pleuræ nearly smooth; lower part of the anterior face of first abdominal segment irregularly, confluently punctured, the upper part with fine striæ following around the margin; sculpture of the following segments hid by the dense pile; pygidium margined laterally, longitudinally striated, at the apex notched; legs normal. Head, legs, and abdomen black; thorax red; insect covered with loose, long hairs; the abdomen with close, dense, black pile; two lateral oval spots on the second segment and a broad band on the third dorsal segment white.

Type-locality.—Manila, Philippine Islands. Collected by Robt. Brown.

Type.—Cat. No. 12823, U.S.N.M.

Some of the paratypes are slightly smaller, but do not seem to differ otherwise.

The following species seem to form a group, but as the descriptions deal chiefly with color one can not feel certain. They may be separated as follows:

Third abdominal segment with the pale hair band reduced to lateral spots; (thorax dark red). Upper Burma ..... *vicinissma* Gribodo.
Third abdominal segment with a continuous pale hair band 1
1. Fifth abdominal segment with a pale hair band ..... *manillensis* Brown.
Fifth abdominal segment without a pale hair band ..... *browni* Rohwer.

PSEUDAGENIA CHRYSOSOMA, new species.

Female.—Length 11.5 mm. Clypeus large, subconvex, anterior margin rounded; head finely granular; third antennal joint almost as long as four and five combined; scutel more than half as long as dorsulum; area behind postscutel rather strongly transversely wrinkled, area at the sides of the postscutel obliquely wrinkled; legs feebly spined; pygidial area very finely granular; on cubitus the second and third cubital cells are subequal; transverse median a little more than its length beyond the basal. Black: mandibles, an-

tennæ, and legs entirely yellowish-ferruginous; body, except venter and most of pleuræ and the area behind and at the sides of postscutel, very densely clothed with bright golden pile. Wings to the stigma yellowish hyaline, below stigma is a transverse infuscate band, the apex subhyaline; venation yellowish or yellowish-brown.

Type-locality.—Grand Malindang Mountain, North Mindanao, Philippine Islands, June 3–8, 1906. Collected by Dr. E. A. Mearns, U. S. Army.

Type.—Cat. No. 12822, U.S.N.M.

This beautiful species may not belong to *Pseudagenia*, but it agrees with the characters of that genus better than any other known to the author, and until the genera are revised had best be left there.

DOLICHURUS STANTONI (Ashmead).

Thyreosphex ASHMEAD=*Dolichurus* LATREILLE.

This remarkable little wasp was described as a new genus, *Thyreosphex*,[a] by Dr. W. H. Ashmead and placed in the Larridæ, but it has nothing to do with that family, and there can be no doubt that *Thyreosphex* is the same as *Dolichurus*. The female of this species agrees in general with the male.

NOTOGONIA CRAWFORDI, new species.

Female.—Length 14 mm. Anterior margin of the clypeus rounded, without teeth, slightly notched; head closely, finely punctured; scape carinated ventrally; eyes at the vertex separated by about the length of second and third antennal joints; third and fourth antennal joints subequal; dorsulum and scutel finely, closely punctured; scutel not impressed; metanotum granular; pygidium at apex with a V-shaped notch. Black: tegulæ brownish; the usual silvery pubescence; pygidium with brownish pubescence. Wings hyaline, with a strong yellow tinge; venation reddish-yellow.

Type-locality.—Manila, Philippine Islands. Collected by R. E. Brown.

Type.—Cat. No. 12820, U.S.N.M.

Perhaps closest to *N. jaculatrix* (Smith), but distinct in the finely granular metapleuræ.

Named for Mr. J. C. Crawford, who had first determined it as new.

NOTOGONIA MANILENSIS, new species.

Male.—Length about 9 mm. Anterior margin of clypeus subtruncate, slightly notched in the middle; head, dorsulum, and scutel finely, closely punctured; scape carinated ventrally; antennal joints rounded out beneath; third and fourth joints subequal; scutel not impressed; metanotum with distinct, slightly oblique striæ, which

[a] Can. Ent., vol. 36, 1904, p. 283.

extend on to the upper part of the pleuræ; posterior face with transverse striæ, the longitudinal furrow deep, narrow; longer spur of hind tibiæ equal in length with basitarsis; last ventral segment with a U-shaped notch, the lobes broad rounded. Black: tegulæ brownish; wings fusco-hyaline; venation dark brown.

Type-locality.—Manila, Philippine Islands. Collected by R. E. Brown.

Type.—Cat. No. 12821, U.S.N.M.

This may be the male of *crawfordi*, but the following differences seem more than sexual: Legs weakly spined, longer spur of hind tibiæ equal to basitarsis, striæ of metanotum, and much darker wings.

PSENULUS (NEOFOXIA) XANTHOGNATHUS, new species.

Male.—Length about 6.5 mm. Anterior margin of the clypeus simple; a rectangular area bounded by carinæ below the antennæ; eyes strongly converging toward the clypeus; antennæ submoniliform; head shining, with distinct separate punctures; dorsulum punctured like the head, but duller; scutel and mesopleuræ shining almost impunctate; metathorax, except the finely granular pleuræ, strongly reticulate; petiole simple, longer than the hind femora. Black: mandibles, palpi, scape, pronotum, tubercles, scutels, four anterior legs below the trochanters, hind tibiæ except apices, and hind tarsi bright yellow; tegulæ brownish, wings hyaline, beautifully iridescent; venation dark brown.

One paratype, which has its cocoon on the pin, has the markings whitish, but was probably killed before it had time to harden.

Type-locality.—Manila, Philippine Islands. Collected by R. E. Brown.

Type.—Cat. No. 12819, U.S.N.M.

This species was recorded as *Psen algii* Ashmead in Brown's catalogue of Philippine Hymenoptera,[a] but this is a misspelled manuscript name, which has not been adopted.

[a] Philippine Journ. Sci., vol. 1.

NOTES ON ANTELIOCHIMÆRA AND RELATED GENERA OF CHIMÆROID FISHES.

By Barton A. Bean and Alfred C. Weed,
Of the Division of Fishes, U. S. National Museum.

In a paper by Mr. Shigeho Tanaka,[a] recently received, he proposes *Anteliochimæra* as a new genus of Chimæroid fishes, based on a single adult male which he describes as a new species, *Anteliochimæra chætirhamphus*. This specimen was taken at a depth of about 400 fathoms and bears a considerable external resemblance to *Rhinochimæra pacifica*, with which it was carefully compared, and from which it differs in many characters mentioned in the description. The genus *Harriotta* is not referred to by the author, although the points in which his proposed new genus differs from *Rhinochimæra* are precisely those in which *Harriotta* differs from *Rhinochimæra*. In *Harriotta*, if the dental plates are viewed by simply parting the lips instead of separating the jaws, the appearance is as described for *Anteliochimæra*, and the lack of armature of the supracaudal fin[b] is the same in both. There-

[a] Descriptions of one new genus and ten new species of Japanese fishes. Journ. College of Science, Imperial University, Tokyo, Japan, vol. 27, article 8, 1 plate, October 10, 1909.

[b] A review of the literature reveals the fact that there is a wide diversity of opinion as to the nomenclature of the two vertical fins that go to make up the functional tail of a chimæroid. Some authors refer to them as third dorsal and anal, thus conveying the impression that all fishes of this group entirely lack a caudal fin. Others refer to the fins, respectively, as upper and lower caudal lobe, and thus apparently homologize them with the two lobes of the tail of a shark. It seems to us that neither of these views is in entire accord with the facts and that a proper interpretation would make the ventral of the two fins the homologue of both lobes of a shark's tail and the dorsal one not represented in the adult condition of most living fishes, although present in the embryonic condition of many. Further, it does not seem to us that the mere fact that these fins are not developed to the extreme end of the caudal filament, and, presumably, of the notochord, should militate in any way against regarding them as truly caudal fins, for in the larval gar (*Lepidosteus*) the notochord extends to a considerable distance beyond the fin, which ultimately becomes the caudal fin of the adult. For these reasons we prefer the names *supracaudal* and *infracaudal* fins for the dorsal and ventral of these two, respectively, as indicating clearly not only their position, but also their true homology. See Notes on the North American Ganoids, by Prof. Burt G. Wilder in Proc. Amer. Ass. Adv. Sci., pt. 2, 1876, pp. 151–166; also, The development of Lepidosteus, by A. Agassiz in Proc. Amer. Acad. Arts Sci., vol. 14, 1878 (1879), p. 65.

fore, unless a further examination of specimens should bring out points of difference not indicated in the original description, it is evident that this fish must be assigned to the genus *Harriotta* and stand as the first record of an adult male. In the young males of *Harriotta raleighana* the claspers are very short and the frontal organ is not developed, although it is plainly indicated in the largest specimen. There are some minor differences in comparative measurements and in the number of tritors that go to make up the dental lamina which appear to separate the two forms.

The genus *Harriotta* therefore, as herein shown, is represented by the following species:

Harriotta raleighana Goode and Bean. Snout shorter, vomerine dental lamina with 8 or 9 tritors on its outer edge. North Atlantic. (See pl. 38.)

Harriotta chætirhamphus (Tanaka). Snout longer, vomerine dental lamina with 6 or 7 tritors on its outer edge. North Pacific, Japan. (See pl. 39.) The tritors in each case form a cutting edge.

So far as we are aware, the following is a complete bibliography of the known species of long-snouted chimæroids, which have been, or should be, referred to the genus *Harriotta*.

Immediately after returning galley proofs to the editor we received the report on the *Holocephali* or Chimæras of the Irish Atlantic Slope by E. W. L. Holt and L. W. Byrne,[a] and from their footnote on page 4 it will be seen that they agree with us in making *Anteliochimæra* a synonym of *Harriotta*. The note reads as follows: "The Pacific *Anteliochimæra chætirhamphus*, Tanaka (1909), the description of which reached us too late for discussion in the text, appears to us to be a *Harriotta* closely allied to its Atlantic congener, but probably distinguished at comparable sizes by a larger eye and longer second dorsal."

G. B. Goode and T. H. Bean.
On Harriotta, a new type of Chimæroid fish from the deeper waters of the northwestern Atlantic.
Proc. U. S. Nat. Mus., vol. 17, pp. 471–473, pl. 19. January 26, 1895.
In this publication the authors describe *Harriotta raleighana* as a new genus and species, from four specimens, an adult female and three young males, taken off the New England coast at depths ranging from 700 to 1,000 fathoms.

Anonymous (E. D. Cope, ?).
New deep-sea fishes.
Amer. Nat., p. 281. March, 1895.
This short note refers to the volume of the Proceedings of the U. S. National Museum containing the description of *Harriotta* and other deep sea forms, and criticizes the commemoration of such obscure writers as Harriott and Rondelet.

Anonymous (E. D. Cope, ?).
More deep-sea fishes.
Amer. Nat., p. 376. April, 1895.
Again refers to *Harriotta* and calls attention to the plate which is copied from the original figure.

[a] Fisheries, Ireland, Sci. Inv., 1908, vol. 4 (1910), pp. 1–26, pls. 1–4.

G. B. Goode and T. H. Bean.

Oceanic Ichthyology.

Spec. Bull. U. S. Nat. Mus., no. 2, p. 33, figs. 37–40. June, 1895.

Harriotta is here described as new and no mention made of any other place of publication.

K. Mitsukuri.

On a new genus of the Chimæroid group, Harriotta.

Zoological Magazine, organ of the Zoological Society of Tokyo, vol. 7, no. 80, p. 97. June, 1895.

A preliminary notice of *Harriotta pacifica* (*Rhinochimæra pacifica*). Two figures are published, one a very poor copy of the lateral view of *H. raleighana*, shown in the plate in the American Naturalist for April, 1895; the other an equally poor figure of *Rhinochimæra pacifica*. No description is published with the figures.

D. S. Jordan and B. W. Evermann.

Fishes of North and Middle America.

Bull. 47, U. S. Nat. Mus., p. 97, pl. 19, fig. 42. March, 1896.

Only one figure, that of the youngest specimen, is given and reference is made only to the place of publication in Oceanic Ichthyology.

S. Garman.

Genera and families of the Chimæroids.

Proc. New Engl. Zool. Club, vol. 2, pp. 75–77. November 2, 1901.

This is a preliminary note on dissections of *Rhinochimæra pacifica*. One new genus, *Rhinochimæra*, and two new families, *Rhinochimæridæ* and *Callorhynchidæ*, are proposed and preliminary diagnoses given.

D. S. Jordan and H. W. Fowler.

A review of the Elasmobranchiate fishes of Japan.

Proc. U. S. Nat. Mus., vol. 26, pp. 593–674. March 30, 1903.

On page 668, *Rhinochimæra pacifica* is mentioned as not yet satisfactorily described and Mitsukuri's original note is copied.

S. Garman.

The Chimæroids (Chismopnea Rafinesque, 1815; Holocephala, Müller, 1834), especially Rhinochimæra and its allies.

Bull. Mus. Comp. Zool., vol. 41, no. 2, 15 pls. March, 1904.

A report on a dissection of *Rhinochimæra pacifica* and a comparison of this species with other members of the group. This paper, mainly on the character of the teeth, classes *Rhinochimæra* as the most primitive of known living chimæroids.

Bashford Dean.

Notes on the long-snouted chimæroid of Japan, Rhinochimæra pacifica (Mitsukuri).

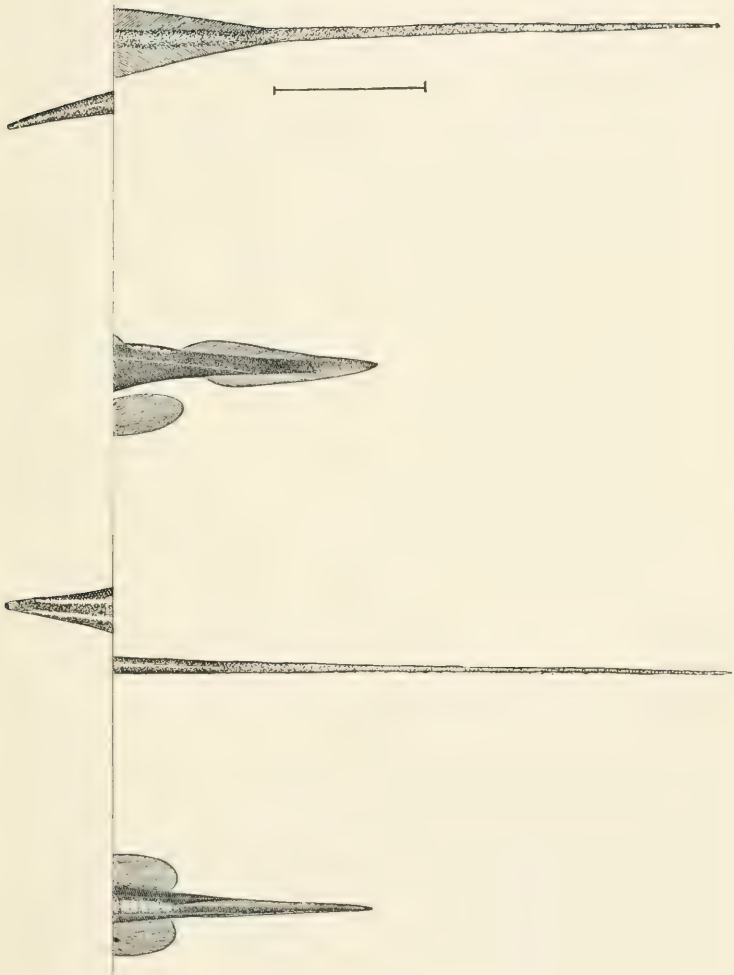
Journ. Coll. Sci., Imp. Univ., Tokyo, Japan, vol. 19, art. 4, 2 pls. May or June, 1904.

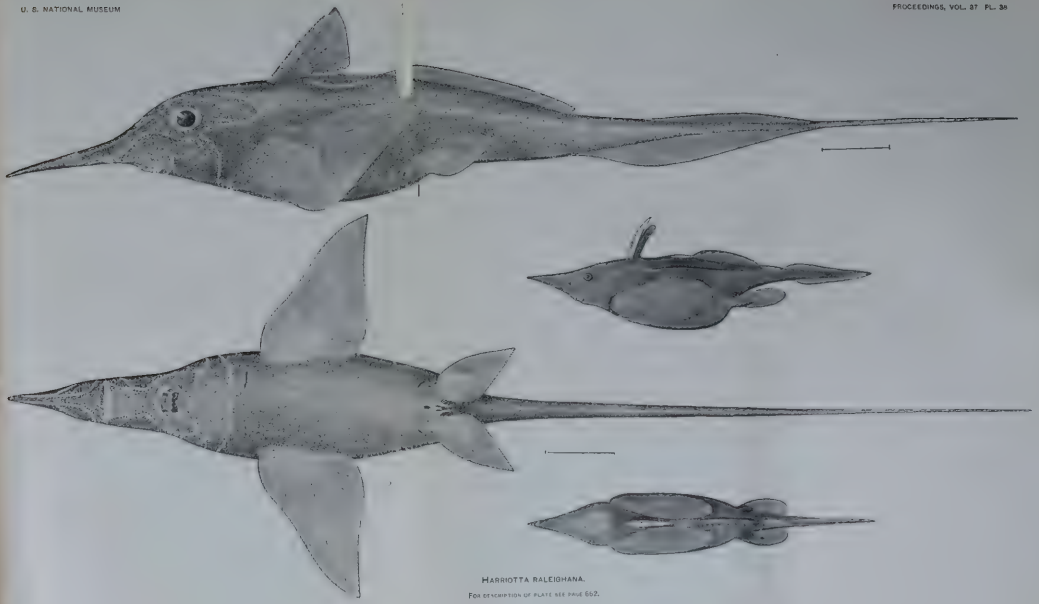
At the time of writing this paper, the author had not seen the works of Garman on the same subject, but before it was published he had received a copy of the preliminary notice in the Proceedings of the New England Zoological Club. He accepts Mr. Garman's conclusions as to the generic distinctness of *Harriotta* and *Rhinochimæra*, but takes exception to many of his other conclusions. Doctor Dean holds that there is no relation between the dental plates of *Harriotta* and those of *Rhinochimæra*, and that the two represent very different lines of descent. He therefore places them in different families, Rhinochimæridæ and Harriottidæ.

Shigeho Tanaka.

Journ. Coll. Sci., Imp. Univ. Tokyo, Japan, vol. 27, art. 8, 1 pl. October 10, 1909.

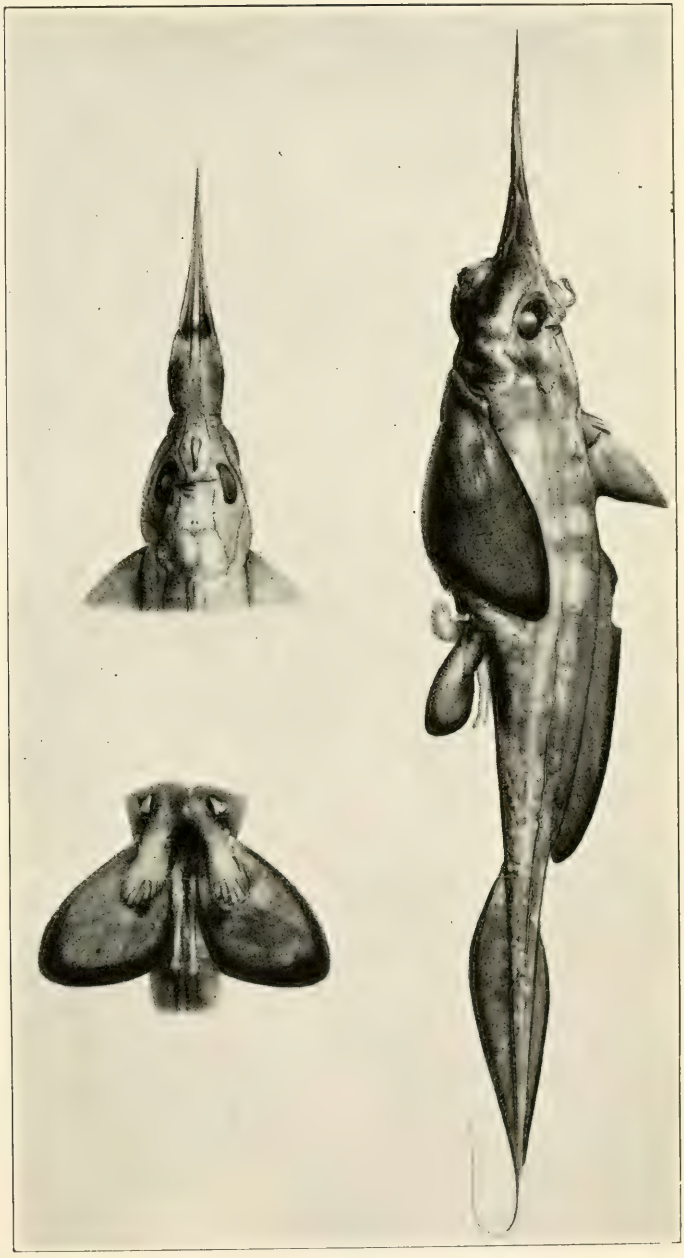
Description of one new genus and ten new species of Japanese fishes.





HARRIOTTA RALEIGHANA.

FOR DESCRIPTION OF PLATE SEE PAGE 662.



"ANTELIOCHIMÆRA CHÆTIRHAMPHUS."

FOR DESCRIPTION OF PLATE SEE PAGE 662.

A NEW OPHIURAN FROM THE WEST INDIES.

By Hubert Lyman Clark,
Of the Museum of Comparative Zoölogy, Cambridge, Massachusetts.

Among the ophiurans sent to me from the U. S. National Museum were two small specimens from the West Indies, collected by the U. S. Bureau of Fisheries steamer *Albatross* in 1887, which proved to belong to the curious genus *Ophiotholia*. As they represent a hitherto unknown species, figures and a description are given herewith.

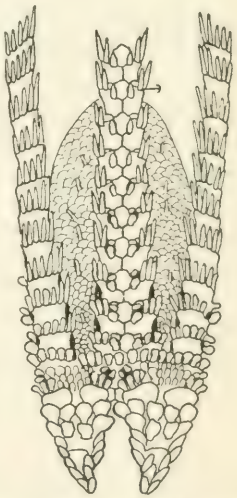


Fig. 1.—Side view of Ophiotholia mitrephora, showing the mitre-shaped disk, the upraised arms, and the numerous oral papillæ. × 5.

OPHIOTHOLIA MITREPHORA, new species.[a]

Disk (in the contracted condition) 4 mm. in diameter, 7 mm. high; arms about 15 mm. long, probably. Disk covered by numerous minute scales, and scattered here and there on the surface are a few short, cylindrical spinelets. Radial shields apparently wanting. (Fig. 1.) Upper arm plates small, triangular, widely separated. (Fig. 2.) Interbrachial spaces scaled like the disk. Genital slits moderate. Oral shields, adoral plates and oral plates concealed by spatulate or fan-shaped papillæ; of these the most distal are smallest, while the largest are next to them, and those near the apex of the jaw are intermediate; oral papillæ like those on the jaw surface but somewhat more pointed. Under arm plates small, somewhat pentagonal, but distinctly longer than broad, widely separated. Side arm plates large, meeting broadly below and above; each plate carries five arm spines, of which the uppermost is the longest and nearly equals the joint; in addition to ordinary arm spines, each plate beyond the ninth carries,

[a] From μιτροφόρος, signifying wearing a mitre, in reference to the peculiar mitre-like appearance of the disk (fig. 1).

proximal to them, a cluster of the peculiar umbrella-shaped spines, characteristic of the genus. Tentacle scales, two at each basal pore, one proximal and one distal, broadly spatulate; beyond the fifth or sixth pore only the proximal scale is present, and it becomes longer and more pointed. Color (dried from alcohol) dull yellowish.

Locality.—*Albatross* station 2750, east of the Danish West Indies; lat. 18° 30′ 00″ N.; long. 63° 31′ 00″ W.; 496 fathoms; temperature, 44.5° F.; fine gray sand: 2 specimens.

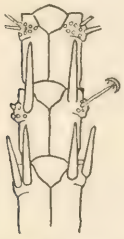


FIG. 2.—UPPER SURFACE OF THE NINTH, TENTH AND ELEVENTH ARM-JOINTS OF OPHIOTHOLIA MITREPHORA, SHOWING THE SMALL UPPER ARM-PLATES AND THE ARM-SPINES. × 10.

Type.—Cat. No. 25829, U.S.N.M., from station 2750.

It is a matter of some interest that this genus, hitherto known only from the Pacific Ocean, should be found in the Caribbean Sea. The Caribbean species resembles *multispina* Kœhler, in the larger number of arm spines and in the form and arrangement of the tentacle scales, more than it does *supplicans* Lyman. But it is easily distinguished from either of those species by the shape of the arm plates. Only a single unbroken umbrella spine was found, but the minute points of attachment, from which they had been knocked off, are evident on the side arm plates. It is obvious that in the living animal these little "umbrellas" are very numerous, and it would be most interesting to know whether they have any particular function, and if so, what it is.

INDEX.[a]

[a] A specially prepared index accompanies D. W. Coquillett's paper on The Type-species of the North American Genera of Diptera (this volume, pp. 499-647), and therefore the titles in that paper are omitted from this index.

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