PROCEEDINGS

OF THE

CALIFORNIA ACADEMY OF SCIENCES

FOURTH SERIES

Vol. XXIV, No. 11, pp. 375–484, pls. 20–21 June 11, 1948

CONTRIBUTIONS TOWARD A KNOWLEDGE OF THE INSECT FAUNA OF LOWER CALIFORNIA

No. 11

COLEOPTERA: HALIPLIDAE, DYTISCIDAE, GYRINIDAE, HYDROPHILIDAE, LIMNEBIIDAE[1]

BY

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INTRODUCTION

In spite of their name, water beetles are not completely aquatic. There are, however, a number of species belonging to several distinct groups, which spend much of their time in the water. As usually applied, the term "water beetle" refers to two of these groups. The Hydradephaga in our American fauna includes the families *Amphizoidae, Haliplidae, Dytiscidae,* and *Gyrinidae,* the first of which has not yet been recorded from Lower California. The Palpicornia contains the *Hydrophilidae* and *Limnebiidae* in many classifications, but recently the *Limnebiidae* has been removed from the Hydrophiloidea to the series Staphylinoidea.

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The original manuscript for this paper was submitted in July, 1942. The war having caused delays in printing, an opportunity was taken to make some corrections and additions, so that the literature is fairly complete up to 1947.

An excellent summary of the habits of the adult and immature stages of the *Dytiscidae, Gyrinidae,* and *Hydrophilidae* has been given by W. V. Balduf (1935).

There has been no systematic treatise on the water beetles (Hydradephaga and Palpicornia) of Lower California, and our published records consist of one long and some short lists of species, several isolated descriptions, and a few references in articles dealing with the species of adjacent regions.

In 1861 LeConte reported on some beetles collected in the peninsula by John Xantus de Vesey in 1859–1860 or earlier; according to Cockerell (1917 : 55), LeConte received specimens from Xantus as early as 1858. Five species of water beetles are mentioned : *Dineutus sublineatus* (Chevrolat) ; *Tropisternus californicus* (LeConte) ; *T. ellipticus* (LeConte) ; *T. limbalis* (LeConte) ; and *Hydrophilus triangularis* Say; this last species has never been recorded from Lower California again, and LeConte may have misidentified the larger *insularis* Laporte. Xantus' collecting is thought to have been done between San José del Cabo and La Paz (Horn 1894 : 302; Michelbacher and Ross 1942 : 2), and this suggests that LeConte's *T. californicus* record was also based on a misidentification. Horn (1871) named *Suphisellus lineatus* from specimens collected in the Cape region by Gabb. Crotch (1873) described *Deronectes addendus* and *D. funereus* from Lower California material in G. H. Horn's collection, and recorded another species. In his revisional studies on Hydrophilidae (1873 ; 1890) Horn cited the peninsula in the distribution of various species. In 1894 (with supplements in 1895 and 1896) the same author gave the first real list of species, describing *Thermonectus peninsularis* and *Cercyon rufescens* as new. Fall (1909) added one new dytiscid, *Suphisellus levis,* and Sharp (1882) described the hydrophilid *Berosus metalliceps* from the Tres Marias Islands. Grossbeck (1912) listed five species obtained by the U.S.S. "Albatross" Expedition of the American Museum of Natural History, 1911.

It is a pleasure to acknowledge the aid of the following persons, who have most generously lent material, compared specimens with the types, or helped me to obtain necessary literature : Drs. A. E. Michelbacher, Edward S. Ross, P. J. Darlington, Jr., E. T. Cresson, Jr., Mont A. Cazier, Clinton G. Abbott, Frank N. Young, A. d'Orchymont, and Messrs. Jack Balfour-Browne, C. F. Harbison, W. J. Brown, George R. Hopping, the late Ralph Hopping, and the late E. P. Van Duzee. I am equally indebted to Mrs. D. K. Campbell (*née* Rita Beckingham) for her careful typing of the manuscript.

DISTRIBUTION

The hydradephagid and palpicorn water beetles of Lower California have been so little collected—for instance a third of the species recorded in this paper have not previously been reported from the peninsula—that one can make only provisional remarks on the origin and distribution of the fauna. I feel confident that extensive collecting, during both the wet and dry seasons, would increase the list by fifty per cent and extend the ranges greatly. The

fauna of northwestern Mexico is virtually unreported, and explorations there would probably discover several of the species now thought to be endemic in the peninsula.

At the present time there is a lack of agreement amongst authors who have written on the biotic provinces of the Nearctic and Neotropical regions. Undoubtedly this is chiefly a result of the two methods of approach which have commonly been used. One viewpoint, familiar to entomologists, is exemplified in the several papers by Dr. E. C. Van Dyke; he makes use of ancient groups and relict species whose present distribution coincides closely with ancient physiography, in arriving at his basic conclusions. The opposite course, the use of groups now prolific and widespread in delimiting the present active biotic provinces, is seen in the work of Dr. Hobart M. Smith (1941. An analysis of the biotic provinces of Mexico, as indicated by the distribution of the lizards of the genus *Sceloporus*). In the following notes I have followed entomological usage, but admit that the other point of view is attractive.

The Vancouveran fauna is represented by five species: *Peltodytes callosus* (LeConte), *Laccophilus decipiens* LeConte, *Dytiscus marginicollis* LeConte, *Cercyon fimbriatum* Mannerheim, and *C. lunigerum* Mannerheim. Two other species, *Cymbiodyta dorsalis* (Motschulsky) and *Berosus punctatissimus* LeConte, probably belong in this division. None of these species has yet been found south of Rosario.

The California fauna is larger, containing at least fifteen species. Some typical examples are *Haliplus concolor* LeConte, *Desmopachria latissima* (LeConte), *Deronectes funereus* (Crotch), and *Tropisternus salsamentus* Fall.

The Sonoran and Neotropical faunas are much more difficult to separate, chiefly because of a lack of distributional records. There are approximately fifteen species of the former, and ten of the latter. Examples of the Sonoran are *Peltodytes simplex* (LeConte), *Bidessus amandus* (LeConte), and *Cybister explanatus* LeConte. The following probably belong to the Neotropical: *Macrovatellus mexicanus* Sharp, *Hemiosus maculatus* Sharp, *Hydrophilus insularis* Laporte, and *Cryptopleurum impressum* Sharp.

There are ten species which so far as is known at present, are endemic to Lower California; but collections from the east side of the Gulf of California will almost certainly shorten the list. Six of the species show affinities with the Neotropical fauna, three with the Sonoran, and one with the Californian.

The dytiscid *Eretes sticticus* (Linnaeus), recorded from Cape San Lucas, the Tres Marias Islands, and Clarion Island, is almost cosmopolitan in distribution.

It is interesting to note that as yet there are no genera of water beetles known to be endemic to Lower California. The fauna of the Cape Region is not nearly so sharply differentiated from that of the rest of the peninsula, as it is in many other families of beetles, perhaps because the aquatics are strong fliers.

PROCEDURE

This article is based chiefly on the fine collection made by Dr. and Mrs. A. E. Michelbacher and Dr. E. S. Ross during their expedition of 1938. Some interesting records are from the earlier California Academy of Sciences expeditions (C.A.S.). Dr. Mont Cazier of the American Museum of Natural History (A.M.N.H.) generously lent material from collections in his charge, while Dr. Clinton G. Abbott and Mr. C. F. Harbison sent specimens from the San Diego Museum of Natural History (S.D.M.N.H.). Mr. George R. Hopping and the late Ralph Hopping enabled me to see additional material, while a few records are based on specimens in my own collection which includes the *Gyrinidae, Hydrophilidae,* and *Limnebiidae* from the collection of the late Charles W. Leng.

This paper gives identification keys for sub-orders down to species. The main divisions of those categories above species are largely adapted from cited references, though the choice of characters and wording in individual couplets is often original. All keys to species are original.

It is obvious that the fauna of Lower California is imperfectly known. For that reason it seems best to offer keys indicating relationships for genera and higher categories, rather than purely artificial ones which might be quicker to use. The "phylogenetic" keys should enable one to reach a helpful placement for genera which may yet be found in the peninsula, but which are not included in the present work.

The holotype, allotype, or both, as well as some of the paratypes of each new species described in this paper, are deposited in the entomological collections of the California Academy of Sciences. The single exception is for *Anacaena sternalis,* the holotype of which is retained in my collection.

It would be helpful to state the present location of the types described by previous authors, but because of world conditions I have not been able to trace those in European museums. The LeConte types are in the Museums of Comparative Zoology at Harvard University, Cambridge, Mass., those of G. H. Horn chiefly in the Academy of Sciences at Philadelphia, Pa., a few in the California Academy of Sciences at San Francisco; G. R. Crotch's types have not been segregated, some being in the LeConte collection, some in G. H. Horn's, and perhaps a few in the Museum at Cambridge University, England. David Sharp's types are presumably all in the British Museum. A paper by G. Severin (1892) purports to list the Chevrolat, Aubé, Sharp, and Régimbart types of water beetles in the Musée d'Histoire Naturelle, Brussels; but the appended definition of "type" is so inclusive that I have been unable to use the list.

In the present paper an attempt has been made to cite the types of all genera of water beetles occurring in Lower California, and to give references to the original designations of these genotypes. This has been successful for the *Haliplidae, Dytiscidae,* and *Gyrinidae,* but for some *Hydrophilidae* I lack too

much of the early European literature. Genotypes for *Macrovatellus,* and *Suphisellus,* dytiscid genera, are established in this article.

Water beetles may be collected into 70 per cent alcohol, or into an ethyl acetate killing bottle (see Valentine, 1942). When preparing such material for study it is easy to extrude the genitalia, which will remain out and save one the trouble of later relaxing and dissecting the specimens. In a number of genera it is virtually impossible to distinguish the sexes on external characters, even with both males and females at hand. The male genitalia often show excellent specific differences, and may give the first indication that one's series of a species is actually composite. Separation of the sexes in the various families may be made on the basis of the following list of differences:

(1) HALIPLIDAE. The first 3 segments of the pro- and mesotarsi are slightly broader or pedunculate in the male, and clothed beneath with a dense pad of short fine hairs.

(2) DYTISCIDAE. Males usually have the first 3 segments of the pro- and mesotarsi wider than do the females, and clothed beneath with hairs which may be simple, dilated apically, or formed into adhesion disks. In males the inner protarsal claws may be shortened, strongly curved, sinuate, or otherwise unlike their fellows; the pro- and mesotibiae or femora, or the metatrochanters, may be curiously shaped or bearded; the metasternum or abdominal sternites may bear series of short rugae or be strigulose; the antennae may have a few segments unlike the rest. In females of certain species the pronotum and elytra may be opaque or more coarsely sculptured, or even fluted.

(3) GYRINIDAE. The protarsi are notably broadened in the male, and the first four, or all five segments, are clothed beneath with dense pads of short hairs. In some species of *Dineutus* the profemora of the males have a tooth on the anterior (inner) edge.

(4) HYDROPHILIDAE. In many genera the sexes appear to be indistinguishable on external characters. In other cases males may be recognized by their possessing one or more of the following: (a) dilated pro- and mesotarsal segments; (b) modified pro-, meso-, and metatarsal claws; (c) arched, sinuate, or notched protibiae ; (d) cristate or otherwise ornamented abdominal sternites; (e) modified mesosternal areas; (f) finer and more polished dorsal sculpture.

The descriptions of larger species have been made while using a binocular microscope giving a magnification of 20 ×; for those of species from 6 mm. to 3.5 mm. long, usually 30 ×; and for smaller beetles, 40 × to 55 ×.

LITERATURE

During the writing of this article, every paper referred to (with the exception of those in the bibliography which are preceded by an asterisk) has been seen. In most cases I have seen the originals, but sometimes I have had only microfilm negatives, photographic or photostatic copies, author's separates, or in a few instances typewritten copies.

The American literature on water beetles has been found full of incorrect citations. Each author seems to have copied the mistakes of his predecessors, rather than bother to verify the originals. In addition, not more than half a dozen short articles, and no large ones, have listed synonymies and references at all fully. Accordingly, special attention has been paid to such matters here,

and it is hoped that the references will be one of the most useful features of the present work.

The citations under each species (apart from those necessary to show synonymy) are selected, and are to papers containing descriptions, notes of interest, or illustrations. Almost all the published distributional records for water beetles in Lower California are contained in the references mentioned on a preceding page; Horn's three lists are the fullest. Moore's San Diego County, California, list indicates some additional species which are to be expected in the northern part of the peninsula.

When referring to David Sharp's works, it is hard to know which generic name to list under. He believed that one should always cite a species with the generic name under which it had been described originally. In his monograph of the Dytiscidae of the world for instance, though one finds the generic name at the beginning of the treatment of its species, the species themselves may be coupled with as many different genera. In the present paper each is listed under the genus in which he placed it.

TAXONOMY

KEY TO THE SUBORDERS AND FAMILIES OF WATER BEETLES OF LOWER CALIFORNIA

1. First visible abdominal sternite divided by metacoxal cavities, so that its lateral portions are separated from the usually very small median part (fig. 1); first three visible sternites immovably united (less obviously so in the Gyrinidae, which have both a dorsal and a ventral pair of eyes, and short irregular antennae); antennae usually filiform or nearly so. Larvae thysanuriform, the tarsi with one or two claws. (Suborder **Adephaga**) ..... **Hydradephaga.** 2

—First visible abdominal sternite extending for its entire breadth behind the metacoxal cavities. Larvae variable, the tarsi and claws fused. (Suborder **Polyphaga**) 5

2. Eyes divided, appearing as four: a dorsal and a ventral pair; antennae very short, stout and irregular, usually only outer segments readily visible; meso- and metalegs greatly modified for swimming, short and flattened, tarsal segments folding fan-like ..... **Gyrinidae**

—Eyes two; antennae elongate, slender; meso- and metalegs never very short and flattened, tarsi never lamelliform and folding fan-wise 3

3. Metalegs modified for swimming; at least metatarsi flattened or fringed with long hairs 4

—Metalegs not fitted for swimming; metatarsi not flattened or fringed with hairs, but simple and carabid-like. (Slow-moving blackish beetles 12 to 14 mm. long, found clinging to stones, logs and debris in streams and rivers; not recorded from Lower California, though known from San Diego Co., Calif.) ..... **Amphizoidae**

4. Metasternum with a transverse, triangular antecoxal sclerite, separated by a well-marked suture (fig. 2). Metacoxae forming large plates covering bases of hind femora; legs hardly modified for swimming, metatarsi slightly flattened, and fringed with long hairs. Small beetles, 4.5 mm. or less in length ..... **Haliplidae**

—Metasternum without an antecoxal sclerite. Metacoxae not forming plates over bases of metafemora; metalegs distinctly modified for swimming, tarsal segments flattened and margined with long golden hairs (which, as in the Haliplidae, are usually closely applied to the tarsi in dry specimens) ..... **Dytiscidae**

5. Metacoxae widely separated, laminate; tarsi three-segmented; antennae with eight segments. (Very tiny black or brown beetles, 0.5 mm. or less in length; elytra truncate apically, abdomen conical and protruding beyond tips of elytra; maxillary palpi less than half as long as antennae. Not yet reported from Lower California) **Hydroscaphidae**

—Metacoxae not laminate; at least one pair of tarsi with more than three segments; larger beetles, over 1 mm. long.....6

6. Maxillary palpi relatively long and slender, almost always as long as or longer than the short antennae; antennae six- to ten-segmented, outer segments forming a distinct, pubescent, sometimes asymmetric club. (**Palpicornia**).....7

—Maxillary palpi much shorter than antennae; if rarely comparable to antennae in length, the elytral alula is absent and the last tarsal segment abnormally long.....8

7. Antennal club of five pubescent segments. First four tarsal segments on all legs short, subequal, fifth nearly as long as or longer than four preceding together. Transverse suture of head (fig. 14) not joined at middle by a posterior median suture. Venation of flying wings staphylinidiform. Tiny beetles not over 2.5 mm. in length. **Limnebiidae**

—Antennal club of fewer than five segments. Abdomen with only five visible sternites; if a sixth is present, it is membraneous (*Hydrochus*) or more or less retracted under fifth (*Berosus, Laccobius,* etc.). Transverse suture of head, when present, directed angularly backward at middle, where it meets median coronal suture, the whole forming a Y (fig. 13). Venation of flying wings cantharidiform.....**Hydrophilidae**

8. Procoxae transverse, more or less cylindrical.....(not treated here). **Dryopidae**

—Procoxae globular.....(not treated here). **Elmidae**

FAMILY **HALIPLIDAE**

KEY TO GENERA OF HALIPLIDAE OF LOWER CALIFORNIA

1. Apical segment of maxillary and labial palpi cone-shaped, longer than penultimate; metacoxal plates concealing all but last of abdominal sternites.....**Peltodytes**

—Apical segment of maxillary and labial palpi subulate, small, shorter than penultimate; metacoxal plates concealing only first three abdominal sternites.....**Haliplus**

Genus **Peltodytes** Régimbart

Peltodytes RÉGIMBART, 1878, Soc. Ent. France, Ann. (5)8:457.
Cnemidotus ERICHSON, 1832, Genera Dyticeorum, p. 19 (not *Cnemidotus* Illiger, 1802).[2]

Genotype: *Dytiscus caesus* Duftschmid 1805 (= *Dytiscus impressus* Panzer, 1794); the only species mentioned by Erichson.

Two fairly recent keys to the Nearctic species are by Matheson, 1912, and Roberts, 1913. There are also keys in Zimmermann's papers of 1919 and 1924.

As in *Haliplus*, the two parameres of the male genitalia are dissimilar. The left paramere is more elongate, tipped with hairs, and in its modifications offers some characters for specific separations. The right paramere is shorter, broad, and varies but little in shape.

The two following species are each about 3.5 mm. long.

KEY TO THE SPECIES OF PELTODYTES OF LOWER CALIFORNIA

1. Each elytron with a median black callosity on third stria; head usually reddish-brown at base; pronotum with a small black spot on each side of middle, at base; elytra with a

[2] F. Balfour-Browne, 1940: 202, cites this as: "Erichson, 1832, *Mon. Dytisc.:* 189 (*Cnemidotus*)," but I have been unable to find any such reference.

few small black spots posterior to callosities; prosternal process narrowed and grooved between front coxae; metasternum depressed between mesocoxae; metafemora reddish-brown, paler towards apices; metacoxal plates broadly rounded posteriorly; elytra not dentate near apex.....(1) **callosus**

—Elytra without callosities; head not darker basally; pronotum with a large black spot on each side of middle, at base; each elytron with seven rather small black spots; prosternal process only slightly narrowed, but not grooved, between front coxae; metasternum nearly flat between mesocoxae, not depressed; metafemora dark reddish-brown, not paler apically; metacoxal plates subangulate posteriorly; each elytron with a small tooth at apical four-fifths.....(2) **simplex**

(1) **Peltodytes callosus** (LeConte)

Cnemidotus callosus LECONTE, 1852, Lyceum Nat. Hist. N. Y., Ann. 5:201; CROTCH, 1873, Am. Ent. Soc., Trans. 4:385.

Peltodytes callosus, MATHESON, 1912, N. Y. Ent. Soc., Jour. 20:173; ROBERTS, 1913, N. Y Ent. Soc., Jour. 21:111; ZIMMERMANN, 1919, Archiv f. Naturg. (1917), 83(A.12):69. ZIMMERMANN, 1924, Ent. Blatter 20(1):11.

Readily distinguished by the black callosity on the third stria at the middle of each elytron. Not previously reported from Lower California.

Type locality: "San Francisco et San Diego," California.

Recorded distribution: British Columbia; Washington; Oregon; California; Utah; New Mexico.

New records: Lower California: Seventeen miles south of Ensenada, June 14 (stream); Hamilton Ranch, August 2 (irrigation ditch). Two males and a female collected by Michelbacher and Ross.

(2) **Peltodytes simplex** (LeConte)

(Figure 11)

Cnemidotus simplex LECONTE, 1852. Lyceum Nat. Hist. N.Y., Ann. 5:201.

Peltodytes simplex, MATHESON, 1912, N. Y. Ent. Soc., Jour. 20:174; ROBERTS, 1913, N. Y. Ent. Soc., Jour. 21:112; ZIMMERMANN, 1924, Ent. Blatter 20(1):12.

The two black pronotal spots are larger in specimens from the more southern parts of Lower California, and may even have a narrow basal extension reaching almost to the posterior angles. I have not found any constant difference between this material and a series from California.

Type locality: San Diego, California.

Recorded distribution: California; Lower California; San José del Cabo. Sharp gives Mexico: Jalapa, Oaxaca, Guanajuato, though noting that specimens from the first two localities are narrower and less coarsely sculptured than Californian examples; they later proved to be *P. ovalis* Zimmermann.

New records: Seventeen miles south of Ensenada, June 14; Twenty miles south of Santo Tomas, August 3; Hamilton Ranch, August 2. Triunfo, July 13. Twenty-three specimens collected by Michelbacher and Ross.

Genus **Haliplus** Latreille

Haliplus LATREILLE, 1802, Hist. Nat. . . . des crustacés et des insectes, 3:77
Cnemidotus ILLIGER, 1802, Mag. f. insecktenkunde, 1(3 & 4):297. (not *Cnemidotus* Erichson, 1832, which is *Peltodytes* Régimbart).

Genotype: *Dytiscus impressus* Fabricius, 1787 (= *Dytiscus ruficollis* Degeer, 1774); designated by Latreille, 1810: 426.

Recent literature on the species of North America north of Mexico includes Matheson, 1912; Roberts, 1913; Zimmermann, 1924; and the fine revision by Wallis, 1933.

KEY TO THE SPECIES OF HALIPLUS OF LOWER CALIFORNIA

1. Mid-metasternum (the raised area between and behind mesocoxae) with a round fovea one each side, just behind inner hind margin of mesocoxae; prosternal process virtually parallel-sided, acutely margined. . . . . (3) **concolor**

—Mid-metasternum without a large fovea on each side of middle, though usually with a longitudinal impression within the margin; prosternal process wider at base than at apex, sides with heavy thick margins. . . . . (4) **rugosus**

(3) **Haliplus concolor** LeConte

Haliplus concolor LECONTE, 1852, Lyceum Nat. Hist. N. Y., Ann. 5:201; CROTCH, 1873, Am. Ent. Soc., Trans. 4:384; MATHESON, 1912, N.Y. Ent. Soc., Jour. 20:164; ROBERTS, 1913, N. Y. Ent. Soc., Jour. 21:105.
Haliplus (*Liaphlus*) *concolor*, WALLIS, 1933, Roy. Canad. Inst., Trans. 19(1):72, and fig. 38.

Length 2.5 to 3 mm. Dark ferrugineous, occasionally with indistinct maculations. *Elytral* margins feebly serrulate, humeri not in the least asperate, shining and almost smooth, with only a few punctures; basal punctures of lateral rows not conspicuously enlarged, though evidently larger than those near suture. *Prosternal* process with sides scarcely divergent apically, nearly parallel, apex acutely margined; very feebly convex throughout, not hollowed out apically. Mid-metasternum with a deep pit on each side, margins fine but long.

Type locality: "Specimen unicum ad flumen Colorado," California.

Recorded distribution: California.

New records: Lower California: Seventeen miles south of Ensenada, June 14 (stream). One female collected by Michelbacher and Ross.

(4) **Haliplus rugosus** Roberts

Haliplus rugosus ROBERTS, 1913, New York Ent. Soc., Jour. 21(2):103; WALLIS, 1933, Roy. Canad. Inst., Trans. 19(1):45.

This species is unknown to me except by description. Mr. J. Balfour-Browne reports it as present in the British Museum collections, labelled as follows: "Lower California, N. Boundary, Godman-Salvin coll."

H. rugosus is said to be 4 mm. long, and to have the elytra uniformly rufous except for a small central patch of testaceous extending from the sixth stria to the lateral margin. The elytral humeri are smooth, not asperate.

Type locality: "California."

(5) **Haliplus** sp.

Mr. Balfour-Browne mentions also a male of another species, as yet unidentified, which carries the same locality data as their *rugosus*.

FAMILY DYTISCIDAE

There is at present no unanimity among authors as to the higher categories in the Dytiscidae. The two best-known systems proposed are those of Sharp (1882) and Zimmermann (1919, and 1930–35). Bertrand (1927, 1928) has given a classification based on the immature stages.

The most recent opinion is that of F. Balfour-Browne (1940), who reviews the subject, though he does not mention Zimmermann's papers. Balfour-Browne's work is based largely on the fauna of the British Isles. He gives his conclusions in a chart of relationships, which stresses the distinctness of the Noterinae. Unfortunately his treatment is not satisfactory for the Nearctic fauna. Thus, though I am not in agreement with all of Zimmermann's groupings, most of the following key has been adapted from the Bradley translation and rearrangement of his 1919 tables.

Brues and Melander (1932) have given another key to the subfamilies. It differs from Zimmermann's chiefly in the recognition of Vatellinae and Methlinae as subfamilies, rather than as tribes of Hydroporinae; and in the raising of the Cybistrini from a tribe of the Dytiscinae to a subfamily, Cybistrinae.

The key to the genera has been worded in part to suit the known fauna of Lower California, and hence cannot always be used to identify material from adjacent territories. The genera *Colymbetes* and *Acilius* have been included, in the expectation that one or more of their species will be found.

KEY TO THE GENERA OF DYTISCIDAE OF LOWER CALIFORNIA

1. Mesoscutellum covered by hind margin of pronotum, or rarely a small tip visible (in *Celina* fully visible, but in that case the prosternum and its process are not in same plane), (figs. 7, 12) 2

—Mesoscutellum entirely visible; middle of prosternum and its postcoxal process in nearly the same plane, (figs. 3, 6) 12

2. Prosternum before the front coxae, and its process between and posterior to the coxae, in same plane. Pro- and mesotarsi distinctly five-segmented, segment four approximately as long as three 10

—Prosternum and its process not in same plane. Pro- and mesotarsi four-segmented, or five-segmented with fourth very small and almost concealed between lobes of third. **(Hydroporinae)** 3

3. Episternum of metathorax not reaching mesocoxal cavity, being excluded by mesepimeron; (fig. 1). **(Vatellini)**. Pronotum much narrower than elytral base; eyes large, prominent. Length about 6 mm. ..... **Macrovatellus**

—Episternum of metathorax reaching mesocoxal cavity (though very narrowly and inconspicuously in *Celina*, which has elytral apices and apex of last visible abdominal sternite acuminate) 4

4. The broad apex of metacoxal process divided into three parts, namely two widely separated narrow lateral lobes, and a broad depressed middle area. Small, broadly ovate beetles, about 2.5 mm. long. **(Hydrovatini)** ....**Hydrovatus**

—Metacoxal process not divided into three parts as above, either without lateral lobes, or with these lobes covering bases of trochanters....5

5. Metacoxal process short, flat, almost in a plane with abdominal sternites, without lateral lobes, bases of the trochanters entirely free....6

—Metacoxal process not on a level with first sternite, but somewhat raised, its sides divergent, more or less produced into lobes which cover bases of trochanters....7

6. Metatibia straight, of almost uniform width from near base to apex; metatarsal claws unequal. Prosternal process rhomboid. Epipleuron with a diagonal carina near its base. Small, glabrous, ovate and ventrally convex beetles, about 2 mm. long. **(Hyphydrini)** .... **Desmopachria**

—Metatibia slightly arcuate, narrow at base, gradually widening to apex; metatarsal claws equal. Prosternal process oblong. Epipleuron without a diagonal carina near base. Small beetles, 1.5 to 2.5 mm. long, elytra often with short hairs. **(Bidessini) Bidessus**

7. Apices of elytra rounded, subtruncate or acute. **(Hydroporini)** 8

—Apices of elytra and last visible abdominal sternite produced, acuminate. **(Methlini) Celina**

8. Epipleuron with a pit at extreme base, pit marked off by a diagonal carina crossing epipleuron. Pro- and mesotarsi four-segmented ....**Hygrotus**

—Epipleuron without a pit or transverse carina at base. Pro- and mesotarsi five-segmented, though fourth is usually very small and hidden between lobes of third....9

9. Mesial line between lateral lobes of metacoxal process not abbreviated behind, the apex either truncate or more or less angularly prominent at middle....**Hydroporus**

—Mesial line between lateral lobes of metacoxal process triangularly excised at middle, the lobes more produced posteriorly....**Deronectes**

10. Metatarsi with two slender curved claws of equal length; metatarsal segments progressively narrower, each segment nearly parallel-sided. Body form broader in front, tapering behind **(Noterinae)**....11

—Metatarsi with a single straight claw; metatarsal segments not parallel-sided, each produced into a lobe behind on the outer side. Body more nearly evenly oval; (fig. 1). **(Laccophilinae)** ....**Laccophilus**

11. Metacoxal process in the form of two large flat plates, which have a common broad angular or semicircular median excision apically. **(Hydrocanthini.)** Tip of prosternal process narrower, at least twice as wide as its breadth between the front coxae; metatibia rather slender. Smaller species, 2.5 to 3 mm. long....**Suphisellus**

—Metacoxal process as above. Apex of prosternal process broader, two and one-half to three times its breadth between procoxae; metatibia broad. Larger species, 4 to 5 mm. long ....**Hydrocanthus**

12. Eyes emarginate above base of antennae; first three segments of protarsi of male often widened, but not forming a round adhesion disk. **(Colymbetinae)**....13

—Margin of eyes complete in front, not incised above base of antennae; first three segments of protarsi of male enlarged to form a round or oval adhesion disk. **(Dytiscinae)**..16

13. Metacoxal lines very narrowly separated (in fact almost contiguous with the median or discriminal line) just before they diverge posteriorly onto the metacoxal lobes. Metatarsal claws equal in length and form; pronotum deeply but very narrowly margined laterally. **(Copelatini)**....**Copelatus**

—Metacoxal lines not almost contiguous with median line, but each well separated from it, usually by at least half the width of a metatrochanter. Metatarsal claws equal or not; pronotum variously or not at all margined laterally.....14

14. Metafemora with a linear group of cilia near the posterior apical angle; pleurites of second abdominal segment not strongly sclerotised, without transverse rugae; metatarsal claws equal or not. **(Agabini)**.....**Agabus**

—Metafemora without a linear group of cilia near posterior apical angle; pleurites of second abdominal segment strongly sclerotised, and with coarse transverse rugae; metafemoral claws equal or not **(Colymbetini)**.....15

15. Anterior point of metasternum, between mesocoxae, channeled to receive tip of prosternal process; the excavation usually deep, narrowing posteriorly where it reaches a point adjacent to hind borders of mesocoxae. Elytral sculpture various, but not consisting of numerous parallel transverse grooves. Species of from 10 to 15 mm. long..... **Rantus**

—Anterior point of metasternum sloped or beveled to receive tip of prosternal process, not deeply triangularly channeled. Elytral sculpture consisting of numerous parallel transverse grooves. Species of from 15 to 18 mm. long. Expected but not yet recorded from Lower California.....**Colymbetes**

16. Inferior spur at apex of metatibiae dilated, *much* broader than the other large spur. **(Cybistrini)**.....17

—Inferior metatibial spur not or but little broader than the other.....18

17. Apex of hind legs of male with two claws, of female with a long outer and a small rudimentary inner claw.....**Megadytes**

—Apex of hind legs of male always, of female usually, with only one claw.....**Cybister**

18. Hind margins of first four metatarsal segments beset with a dense fringe of flat golden cilia.....19

—Hind margins of metatarsal segments naked, without such a fringe; adhesion disks of male protarsi round, with two large basal cups in front of which are numerous little disks. **(Dytiscini)**. Large beetles, 25 to 30 mm. long.....**Dytiscus**

19. Apex of prosternal process sharply pointed, pronotum margined laterally; external edge of each elytron margined with short spines, from behind the middle to about apical fifth; eyes prominent; hind margin of pro- and mesofemora and tibia set with long golden hairs; upper surface of metatarsi punctate, and with fine appressed hairs. **(Eretini)**.....**Eretes**

—Apex of prosternal process rounded; pronotum not margined laterally; elytra without marginal spines; upper surface of metatarsal segments naked except for marginal cilia.....20

20. Outer margin of metasternal wings arcuate; outer (shorter) spur at apex of metatibiae blunt, more or less emarginate **(Thermonectini)**.....21

—Outer margin of metasternal wings straight; outer spur at apex of metatibiae acute. **(Hydaticini.)** Body smooth, finely punctate, or with a secondary sculpture on pronotum and elytra of female; elytra usually with a lateral pale stripe in basal two-thirds.....**Hydaticus**

21. Elytra densely and rather coarsely punctate, smooth in males, usually fluted and hairy in females. Elytra yellowish to brown, finely irrorate with black, usually with a subapical arcuate pale fascia. Not yet recorded from Lower California; occurs at San Diego, Calif.....**Acilius**

—Elytral punctation of male very fine or absent, except for the three longitudinal series of coarse punctures; of female, either fine like the male, or with a superimposed sexual sculpture of elongate impressions. Elytra black with yellow maculae or transverse bands, or yellow with black spots, or irrorate.....**Thermonectus**

Genus **Macrovatellus** Sharp

Macrovatellus SHARP, 1882, Sci. Trans. Roy. Dublin Soc., (2)2:282, 840; ZIMMERMANN, 1919, Archiv f. Naturg. (1917), 83(12):124.

Genotype: I have been unable to find any citation of a genotype in the literature, and hereby designate *Macrovatellus mexicanus* Sharp 1882, as the type of the genus *Macrovatellus* Sharp.

These beetles resemble large *Hydroporus* or *Hygrotus,* but the small pronotum results in a characteristic discontinuity of outline. The species of *Macrovatellus* may be separated from all other Dytiscidae in the Nearctic fauna, except *Derovatellus floridanus Fall,* by the fact that the mesocoxae are contiguous; thus the prosternal process does not attain the metasternum. The pro- and mesotarsi are five-segmented, the fourth segment very small and almost hidden in the apex of the third.

(6) **Macrovatellus mexicanus** Sharp

Macrovatellus mexicanus SHARP, 1882, Sci. Trans. Roy. Dublin Soc., (2)2:284; SHARP, 1882, Biol. Centr.-Amer., Coleopt. 1(2):8.

Length 5.5 to 6.5 mm.; oblong-oval, elytra finely pubescent, punctures asperate; pronotum not margined; eyes large and protuberant. *Head* yellowish-brown; pronotum black, with indistinct brownish vitta at each side just within edge; *elytra* black, obscurely maculate with brown as follows: two small basal spots, a subhumeral lunule connected with a lateral stripe which gives rise to four broader inward extensions. First three segments of *pro-* and *mesotarsi* of both sexes broadened, and clothed beneath with dense pads of short hairs; tarsal segments narrower and more elongate in the female; tarsal claws small and simple in both sexes; mesotrochanter and basal one-third of lower margin of mesofemur of male with a series of short golden hairs, which are less obvious in the female.

Type locality: Mexico. In the Biologia, Sharp cites Puebla, Mexico, for some additional specimens.

Recorded distribution: Mexico and Lower California.

New records: Lower California: Twenty miles north of Comondu, July 23, 1938 (in tinaja). Twenty-six specimens collected by Michelbacher and Ross. Mexico: Apatzingan, Michoacan, alt. 1,200 ft., August 11, 1941 (Harry Hoogstraal), 1 female.

Genus **Hydrovatus** Motschulsky

Hydrovatus MOTSCHULSKY, 1855, Etudes Ent. 4:82. **Note:** Neave, 1939, in Nomenclator Zoologicus 2:717, credits *Hydrovatus* to Motschulsky, 1853, Hydrocanthares de la Russie, p. 4. I have not seen this publication, and do not know whether or not its use will affect Balfour-Browne's designation of a genotype.

Genotype: *Hydrovatus castaneus* Motschulsky, 1855; fixed by F. Balfour-Browne, 1936: 28.

(7) **Hydrovatus** sp.

Horn (1894:313) listed a species which he thought might be *H. major* Sharp, from Santa Anita, Lower California. However, this species is definitely established as occurring in Guatemala, so Horn's examples were presumably distinct. I have not seen any specimens of *Hydrovatus* from Lower California.

Genus **Desmopachria** Babington

Desmopachria BABINGTON, 1841, Ent. Soc. Lond., Trans. 3:16, and pl. 1, fig. 5, *a* to *f*.

Genotype: *Desmopachria nitida* Babington 1841, the only species mentioned by him.

Small broad water beetles, convex both above and beneath. The epipleura have a narrow oblique plica basally, as in *Hygrotus* and *Hydrovatus*.

KEY TO THE SPECIES OF DESMOPACHRIA OF LOWER CALIFORNIA

1. Elytra yellow, marked with black or piceous, metacoxal plates punctate. Larger species, 2 to 2.3 mm. long 2
—Elytra uniformly reddish-brown. Metacoxal plates almost impunctate. Smaller species, 1.5 to 1.7 mm. long ..... (8) **sp.**
2. Each elytron with an antemedian longitudinal impression in a marginal reddish spot. Head and pronotum piceous at base; pronotum with a short basal longitudinal plica near each side, and with a small depressed area adjacent to each plica; punctation of disk of pronotum as coarse and sparse as that of elytra. Elytra yellow, an elongate black spot slightly posterior and mesad of lateral reddish spot; suture broadly and sinuately black, the band widest at middle and posteriorly, narrowed apically, its whole shape campanulate. Length 2 to 2.3 mm. ..... (10) **latissima**
—Elytra without antemedian lateral impressions and reddish spots. Head yellow to base; pronotum piceous basally, with a short basal longitudinal plica near each side, the adjacent (mesal) area only slightly depressed; punctures of disk of pronotum much finer and denser than those of elytra. Elytra yellow, with suture narrowly black, a discal and somewhat hamate black stripe, and an elongate median black spot. Length 2 to 2.2 mm. ..... (9) **dispersa**

(8) **Desmopachria** sp.

Horn (1896:368) doubtfully referred a teneral specimen of *Desmopachria* from San José del Cabo, to *granum* LeConte. The latter occurs in the southeastern United States, and is hardly to be expected in the Cape region of Lower California. I have seen only the following two species from the peninsula.

(9) **Desmopachria dispersa** (Crotch)

(Figure 7)

Hydroporus dispersus CROTCH, 1873, Am. Ent. Soc., Trans. 4:388.
Desmopachria dispersa, SHARP, 1882, Sci. Trans. Roy. Dublin Soc. (2)2:343; ZIMMERMANN, 1919, Archiv f. Naturg. (1917), 83(A.12):130.

Not so broad as *latissima*, and easily recognized by the form of the elytral maculation. The sutural striae vary from deeply impressed to obsolete. Dr.

P. J. Darlington, has compared one of my specimens with the type in the LeConte Collection.

Type locality: Lower California.

Recorded distribution: Lower California; "Baja Calif."; Arizona; Texas.

New records: Twenty miles north of Comondu, July 23 (tinaja); Twenty-five miles south of Santa Rosalia, July 25. Seventy-four specimens collected by Michelbacher and Ross, all but one from near Comondu.

(10) **Desmopachria latissima** (LeConte)

Hydroporus latissimus, LeConte, 1852, Lyceum Nat. Hist. N. Y., Ann. 5:205; Crotch, 1873, Am. Ent. Soc., Trans. 4:388.

Desmopachria latissima, Sharp, 1882, Sci. Trans. Roy. Dublin Soc. (2)2:343.

Dr. Darlington has been so kind as to compare one of my specimens with the type. In the series at hand there is a slight variation in the extent of the black markings.

Type locality: San Diego, Calif.

Recorded distribution: Southern California. The species has also been recorded from British Columbia; all such specimens known to me were collected a long time ago, and bear no locality other than "Br. Col." This, coupled with the absence of records from intervening territory, suggests a mistake in labelling.

New records: Lower California: 3, Rosario, June 17 (in pool); 2, Hamilton Ranch, August 2 (in irrigation ditch); Twenty miles south of Santo Tomas, August 3 (small stream). Collected by Michelbacher and Ross.

Genus **Bidessus** Sharp

Bidessus Sharp, 1882, Sci. Trans. Roy. Dublin Soc. (2)2:344, 852.

Genotype: *Dytiscus unistriatus* Schrank, 1781; designated by F. Balfour-Browne, 1936: 29. (Both in 1936: 29 and 1938: 22, he erroneously cited the species as *B. unistriatus* Fab., but corrected this in 1940: 204.)

Tiny beetles, most of the American species being between 1.5 mm. and 2.5 mm. in length; many are prettily marked with yellow on a dark ground color. Hatch (1929: 217–220) has compiled a key to include most of the species of North America north of Mexico; his title "Key to the Nearctic species of *Bidessus* Sharp" is too inclusive.

The species are in need of a revisional study, and preliminary work had been done by Dr. F. N. Young of the University of Florida, before he received his army call. Dr. Young has examined the Lower Californian specimens reported upon here.

Several subgenera have been described. The latest revision is by Guignot (1939), who gives a key to the genera of the tribe Bidessini, and keys to the subgenera when they occur; he does not recognize any subgenera of *Bidessus*. According to his treatment, the genus *Bidessonotus* Régimbart is separated from *Bidessus* by the absence of a sutural stria. *Bidessonotus* is then divided

into three subgenera: *Liodessus* Guignot, with type *Hydroporus affinis* Say; *Bidessonotus* s. str., type *Hydroporus adumbratus* Clark; and *Brachyvatus* Zimmermann, type not designated. He remarks that the genus forms a very homogeneous grouping; but as there is no mention of the fact that in *adumbratus* and allies the metacoxal lines are continued anteriorly by two similar striae on the mid-metasternum, a most remarkable character used by previous authors to distinguish *Bidessonotus,* I am not following Guignot here.

KEY TO THE SPECIES OF BIDESSUS OF LOWER CALIFORNIA

1. Clypeus finely but distinctly margined anteriorly; elytra coarsely closely punctate, metasternum and metacoxal plates more coarsely but less closely punctate.....2
—Clypeus not margined in front; elytra finely or moderately coarsely punctate, metasternum and metacoxal plates finely sparsely punctate.....4

2. Elytra with distinct sutural striae, though they may be defined chiefly by an area of abruptly finer punctation between them and the suture.....3
—Elytra without sutural striae. Form broadly ovate. Pale spots of elytra occupying much less than half the entire area.....(11) **quadripustulatus**

3. Form more elongate-oval; each elytron with a shallow longitudinal discal sulcus beginning just on sutural side of basal plica. Anterior yellow band of elytra narrow, antemedian, lunate; posterior yellow mark longitudinal, enlarged suturally at apex; first two basal segments of pro- and mesotarsi of male fully half again as broad as in female, and with a dense pad of short hairs beneath.....(12) **cinctellus**
—Form more broadly oval; elytra without longitudinal sulci. Anterior yellow spots on elytra nearly basal, large, subquadrate; posterior spots rounded. First two basal segments of male pro- and mesotarsi hardly broader than those of the female, ventral hairs longer and sparser.....(13) species near **decoratus**

4. Elytra with distinct sutural striae. Elytra dark, each elytron with a lunate post-humeral, and a small post-median and pre-apical pale spot.....(14) **subtilis**
—Elytra without sutural striae.....5

5. Elytral markings definitely vittate or fractilineal (fig. 12).....6
—Elytral markings transverse, large and conspicuous. (This species may belong in couplet 2; see notes on it).....(15) **amandus**

6. Each elytron with a discal longitudinal shallow punctate sulcus. Elytral punctation fine and sparse discally near base, punctures separated by about two and one-half times their own diameters, but finer and much more numerous near apex; pronotal plica much broader than corresponding elytral plica; metacoxal lines deeply impressed, delimited area finely punctate (both sexes), process posterior to ends of metacoxal lines gradually sloped to first visible abdominal sternite. Metatrochanters of male not aligned and in a plane with metafemora, but produced inward and downward, coming to a conical point at inner apical angle.....(16) **youngi**
—Elytra without discal sulci. Elytral punctation coarse discally near base, punctures separated by about their own widths, finer but not more numerous apically; pronotal and elytral plicae about equally broad; median metacoxal area coarsely punctate in male, finely in female, process abruptly truncated in a line with ends of metacoxal lines. Metatrochanters simple in both sexes.....(17) **affinis** complex

(11) Bidessus quadripustulatus Fall

Bidessus quadripustulatus FALL, 1917, New York Ent. Soc., Jour. 25(3):166; HATCH, 1929, Brooklyn Ent. Soc., Bul. 23(5):219.

This species is known to me only by the description. Fall (p. 167) gives a key to separate it from *pictodes* Sharp and *decoratus* Fall, the species he thought most similar; in Hatch's key, *quadripustulatus* is widely separated from the other two, because it lacks sutural striae.

Type locality: San Bernardino Mts., California.

Recorded distribution: California.

New records: "Lower California, N. Boundary, Godman-Salvin coll.," in the British Museum.

(12) **Bidessus cinctellus** (LeConte)

Hydroporus cinctellus LECONTE, 1852, Lyceum Nat. Hist. N. Y., Ann. 5:206; LECONTE, 1855, Acad. Nat. Sci. Phila., Proc. 7:290.

Bidessus (s. str.) *cinctellus*, HATCH, 1929, Brook. Ent. Soc., Bul. 23(5):218.

LeConte described this species as from the Gila River in Arizona. Fall (1901: 52) recorded it from "'So. Cal.' (*teste* Horn)," and Horn (1894: 313) gave "Baja California (Gabb.)." I have not seen specimens from Lower California. The characters given in the key are based on a specimen in my collection; it is from Nogales, Sta. Cruz Co., Arizona, collected by F. W. Nunenmacher, and has been compared with the LeConte's type by F. N. Young.

(13) **Bidessus** sp., near **decoratus** Fall?

Several closely allied species are included under *decoratus* in collections.

Two specimens collected in Lower California by Michelbacher and Ross, a male from Rosario, June 17 (in a pool), and a female from Hamilton Ranch, August 2 (irrigation ditch), seem to be conspecific and will almost certainly prove to be undescribed. Dr. Young placed them as "near *decoratus* Fall?"

These two differ from the Arizona *decoratus* as follows: Form less evenly ovate, widest just before middle, tapering anteriorly and posteriorly; elytra much more coarsely punctate, especially beside sutural stria anteriorly; sutural stria defined chiefly by the fine punctation between it and suture. Metasternum, metacoxal plates and first two visible abdominal sternites more coarsely and sparsely punctate than elytra; first sternite of male semicircularly impressed adjacent to metacoxal processes, last visible sternite embossed medially with a Y-shaped figure; epipleura more coarsely punctate.

(14) **Bidessus subtilis** (LeConte)

Hydroporus subtilis LECONTE, 1852, Lyceum Nat. Hist. New York, Ann. 5:206; LECONTE, 1855, Acad. Nat. Sci. Philadelphia, Proc. 7:290.

Bidessus subtilis, SHARP, 1882, Roy. Dublin Soc., Sci. Trans. (2)2:811; FALL, 1901, Calif. Acad. Sci., Occ. Papers, 8:52; HATCH, 1929, Brooklyn Ent. Soc., Bul. 23(5):218.

Length 1.75 to 2 mm. Area between suture and sutural striae raised on elytral disk, the punctures distinctly finer than those of the adjacent parts of the elytra. Last abdominal sternite with a median depression, which is obscured by golden vestiture in the male.

Type locality: "Sta. Isabel," California.

Recorded distribution: California.

New record: According to Mr. J. Balfour-Browne there are specimens apparently of this species in the British Museum, labelled "Lower California, N. Boundary, Godman-Salvin coll."

(15) **Bidessus amandus** (LeConte)

Hydroporus amandus LECONTE, 1852, Lyceum Nat. Hist. N. Y., Ann. 5:207; LECONTE, 1855, Acad. Nat. Sci. Phila., Proc. 7:290; SHARP, 1882, Sci. Trans. Roy. Dublin Soc., (2)2:787.

Bidessus amandus, FALL, 1901, Calif. Acad. Sci., Occ. Papers 8:52; HATCH, 1929, Brook. Ent. Soc., Bul. 23(5):218.

This species was recorded from San Esteban, Lower California, and also from southern California by Horn (1894: 313).

Hatch (1929: 218) says it has no sutural stria, but Fall (1901: 52) says "in the type the sutural stria is very feeble, but I suspect this may be merely an individual variation." The type was from the Gila River, Arizona. If I have correctly identified the species in material from Utah and Texas, it should be placed near *cinctellus,* and distinguished by the inner ends of the anterior fascia on each elytron having a narrow backward projection paralleling the suture.

(16) **Bidessus youngi** Leech, new species

(Figure 12)

An elongate yellow species, the elytra vittate with dark brown; closely resembles *B. pullus* (LeConte).

Male. Length 2.26 mm., width 1.13 mm. Elongate-oval, moderately convex. Head and pronotum yellowish-brown, head slightly darker medially near eyes, pronotum narrowly piceous at base between striae, except directly over covered mesoscutellum. Elytra clear yellow showing folded wings beneath, bases, suture and an irregular discal area from middle to posterior fourth, dark brown; this brown area has on each side a short anteriorly produced vitta near suture, another twice as long on and within the shallow elytral sulcus, a trace of another laterally, and a backward and outward projection posteriorly, while narrowly separated from the posterior half of the blotch there is a smaller oval patch. Underparts including legs, yellow or yellowish-brown, abdominal sternites piceous laterally.

Head faintly reticulated, sparsely finely punctate. *Pronotum* polished, sparsely rather finely punctate, more coarsely so near anterior and posterior margins; slightly beyond middle of each half of base there is a plica from base to slightly beyond middle anteriorly, its outer margin arcuate, well marked, its inner broad with a pit at basal third, thence narrow and shallow to base. Continuing *elytral* plica straight, shorter than pronotal plica; elytra sparsely punctate in basal half of disk, punctures about size of largest of these found on pronotum, and mostly separated by a little more than twice their own

diameters; in posterior half punctures are a little smaller and much denser, while laterally they are finer still; each puncture gives rise to a fine short recumbent hair; each elytron has a discal longitudinal shallow sulcus, and a poorly defined sutural stria. *Prosternum* carinate at middle, pubescent, prosternal process with a median longitudinal groove; *metasternum* and metacoxal plates finely sparsely punctate; a median series of coarse punctures on first and second visible abdominal sternites, and a third series along suture between segments two and three, sternites otherwise very finely punctate. *Metacoxal* processes produced beyond posterior ends of metacoxal lines, gradually and evenly sloped to first abdominal sternite. *Metatrochanters* not in a plane with metafemora, but produced inward and downward in apical half, ending in a conical point at inner apical angle. Pro- and mesotarsi very slightly wider than in female. Metacalcaria simple, alike. *Epipleura* distinctly inflated, finely sparsely punctate. Apex of each *paramere* of genitalia broad, shallowly emarginate, hairy; aedeagus irregularly shaped, complicated in apical half.

Female. Differs from the male only in sexual characters (metatrochanters simple), and in lacking any trace of a sutural stria.

Holotype, ♂ (C.A.S. No. 5463), *allotype,* ♀ (C.A.S. No. 5464), and four female paratypes, from **twenty miles north of Comondu,** Lower California, July 23 (lagoon); collected by Michelbacher and Ross. This locality is presumably the one mentioned by the collectors (1942: 9) in their account of the region: "High in the mountains north of Comondu several lagoons of fresh water were present. . . ."

This species was identified by Dr. Young as "n. sp. near *pullus,*" and it would run to the latter in Hatch's key. Amongst specimens of *pullus* before me is a male collected by Young in Georgia, and compared by him in 1940 with LeConte's type. Males of *youngi* can be recognized by the modified metatrochanters, and the form of the aedeagus and parameres; in *pullus* the metatrochanters are simple, the parameres are dissimilar, and the aedeagus has a large preapical lateral spike. Females of the two species are harder to separate; in *youngi* the pronotal striae are broader, and less regular on the inner sides, and the metacoxal lines are more divergent anteriorly. *B. obtusus* Sharp 1882, from Paso Antonio, Guatemala, was described as near *pullus,* but by description it is almost completely impunctate dorsally, and cannot be the same as *youngi.*

The holotype and one paratype show a faint sutural stria, but the sparsely and very finely punctate metasternum and metacoxal plates will prevent them from being keyed into the *cinctellus-decoratus* couplet.

(17) **Bidessus affinis** (Say) complex

Under the name *"affinis* (Say)" are at present included specimens from Alaska to far into South America. Examination of a good series from various points within the United States, Canada and Mexico, shows that *affinis* is

composite. Until a careful study has been made, and a neotype fixed, the various names now standing as synonyms or "varieties" cannot be used with confidence.

As already mentioned, Guignot (1939 : 53) has made *affinis* the type of his subgenus *Liodessus* in his treatment of the genus *Bidessonotus*.

Horn (1894 : 314) recorded *affinis* from Baja California, without a more specific locality.

New records : Lower California : a pair from Nineteen miles east of Rosario, June 17 (in a spring). Collected by Michelbacher and Ross. Examined by Dr. Young.

Genus **Celina** Aubé

Celina AUBÉ, 1837–38, Iconographie et Hist. Nat. Coleopt. d'Europe, 5:219, and pl. 26, fig. 1.

Genotype : *Hydroporus latipes* Brullé, 1836, the only species cited by Aubé.

Small reddish beetles, 4 to 6 mm. long, of rather narrow and parallel form ; apices of elytra and apparent last abdominal sternite produced behind, acuminate.

(18) **Celina angustata** Aubé ?

A single teneral male specimen is at hand, collected by Michelbacher and Ross at Five miles south of Miraflores, Lower California, June 10, 1938. This may be *C. angustata* Aubé, but differs in being a little smaller (3.5 mm.), and more shining dorsally ; the mesotibiae are not shaped quite as in *angustata,* but this may be the result of distortion due to immaturity.

Horn (1895 : 226) has recorded *Celina angustat* from San José del Cabo.

Genus **Hygrotus** Stephens

Hygrotus STEPHENS, 1828, Illust. British Ent., Mandib., 2:46.

Genotype : *Dytiscus inaequalis* Fabricius, 1777 ; fixed by Curtis, 1835.

American authors have referred the species of *Hygrotus* to the genus *Coelambus* Thomson, 1860, following Sharp, 1882, who united the two genera and wrongly gave *Coelambus* priority. The matter has been discussed, with illustrations, by F. Balfour-Browne (1934, 1938, 1940) who concludes that *Coelambus* may be used as a subgenus of *Hygrotus,* to include those species in which the clypeus lacks a raised anterior margin. As Fall pointed out in 1919, a division on this character applied to the North American species, does not always agree with their apparent natural affinities.

The species of *Hygrotus* may be separated from those of *Hydroporus* and *Deronectes,* which they resemble, by the possession of an oblique raised line across the base of each humerus. This character is found also in *Hydrovatus* and *Desmopachria* of the Nearctic fauna.

KEY TO THE SPECIES OF HYGROTUS OF LOWER CALIFORNIA

1. Smaller, more elongate species, length 3.2 to 3.5 mm. Elytra more finely punctured, the sutural, discal and prehumeral longitudinal series of coarser punctures clearly evi-

dent. Head infuscate or black at sides, near eyes. Elytra with broad suffused fuscous markings which usually do not attain the base, and may be faint. Pro- and mesotarsi of males but little wider than those of females, not nearly as wide as apex of tibia. Elytra shining in male, and usually in female.....(19) **medialis**

—Larger, more robust species, length 3.4 to 4 mm. Elytra more coarsely and evenly punctured, the longitudinal series of larger punctures scarcely evident. Head not marked with fuscous or black at sides. Elytra with small irregular discal markings, mostly behind the middle. Pro- and mesotarsi of males almost twice as wide as those of females, nearly as wide as apex of tibia. Elytra shining in male, alutaceous in female.....(20) **fraternus**

(19) **Hygrotus (Coelambus) medialis** (LeConte)

Hydroporus medialis LECONTE, 1852, Lyceum Nat. Hist. N.Y., Ann. 5:209; LECONTE, 1855, Acad. Nat. Sci. Phila., Proc. 7:293.

Coelambus medialis, SHARP, 1882, Sci. Trans. Roy. Dublin Soc., (2)2:401; SHARP, 1882, Biol. Centr.-Amer., Coleopt., 1(2):26; FALL, 1919, N. Am. spp. Coelambus, p. 3, 12.

Type locality: San Diego, California.

Recorded distribution: Middle and southern California to Texas and Mexico. Lower California: San Ignacio; Comondu; La Joya.

I have not seen any specimens from Lower California, though the species is to be expected in the northern part. Some of Horn's records may have been based on examples of *fraternus*.

(20) **Hygrotus (Coelambus) fraternus** (LeConte)

Hydroporus fraternus LECONTE, 1852, Lyceum Nat. Hist. N.Y., Ann. 5:209; LECONTE, 1855, Acad. Nat. Sci. Phila., Proc. 7:293.

Coelambus fraternus, SHARP, 1882, Sci. Trans. Roy. Dublin Soc., (2)2:402; FALL, 1919, N. Am. spp. Coelambus, p. 4, 16.

Type locality: "Ad flumen Novum in deserta Colorado," California.

Recorded distribution: California; Arizona; Lower California: San José del Cabo.

New records: Lower California: 32, Twenty miles north of Comondu, July 23 (in tinaja); 2, Triunfo, July 7 and 13; 1, Five miles west of San Bartolo, July 13. All collected by Michelbacher and Ross.

Genus **Hydroporus** Schellenberg

Hydroporus SCHELLENBERG, 1806, Entom. helvetique, 2:182. (For a note on this publication, see its author under "Literature Cited.")

Genotype: F. Balfour-Browne (1940: 204) writes as follows:

"*Type* (fixed by Thomson) = *Dytiscus palustris* Linn., 1761. *Note.*—In 1831, Curtis cited *Dyt. depressus* Fab. as the type and in 1838 and 1839, Westwood and Hope respectively cited *Dyt. 12-pustulatus* Fab. As neither of these species was in the original genus, both citations are invalid."

Unfortunately, however, neither was *Dytiscus palustris* Linnaeus, 1761, listed in the genus by Schellenberg; his inclusion of *Dytiscus sexpustulatus* Fab., now recognized as a synonym of *palustris* Linn., does not validate the

latter as a genotype. Hope (1839:132) cited *Dyt. 12-pustulatus* Fab. Duponchel (1845 (6):761) gave *"Hydrop. duodecim pustulatus* Fab.," which is the same thing, and as already noted, cannot be the genotype.

Crotch (1870:219) referring to Schellenberg's Ent. Helv., vol. 2, cites "p. 132. HYDROPORUS · *D. parvulus* (= inæqualis)." This is the first designation known to me for *Hydroporus,* of a species actually included by the describer of the genus. But Schellenberg gave it as *"Fig. a. A.* HYDROPORUS *parvulus? Dytiscus* Fabr.," and although figure A leaves little doubt as to what he had, the fact that he placed a question mark after *parvulus* at the head of his description, might disqualify the designation under Article 30, II, e, *β*, of the International Rules of Zoological Nomenclature. It is there stated that species are excluded from consideration in determining the types of genera, if they are "Species which were *species inquirendae* from the standpoint of the author of the generic name at the time of its publication."

Should Crotch's designation prove to be the only valid one, there will result a conflict with *Hygrotus* Stephens, 1828, the type of which is *Dytiscus inaequalis* Fab. Samouelle (1819. The Entomologist's Useful Compendium) does not designate types for any genera of water beetles, but there may be something relevant in the following references which are not available to me: Latreille, 1817, in the Nouv. Dict. Hist. Nat.; the Disciples' Edition of Cuvier's Regne Animal; Chenu, 1851–1861, in Encyclop. d'Histoire Naturelle, Coleoptera.

A genus containing a great number of small beetles, few species of which occur as far south in our fauna as Mexico. There has been much controversy in recent European literature as to the constitution of the genera and subgenera to be removed from *Hydroporus* s. lat.

An excellent revision of the species of North America north of Mexico has been given by Fall, 1923, though of course, some recently described species must be interpolated into his keys.

(21) **Hydroporus vilis** LeConte

Hydroporus vilis LECONTE, 1852, Lyceum Nat. Hist. N. Y., Ann. 5:208; LECONTE, 1855, Acad. Nat. Sci. Phila., Proc. 7:292; CROTCH, 1873, Am. Ent. Soc., Trans. 4:395; SHARP, 1882, Sci. Trans. Roy. Dublin Soc., (2)2:484; FALL, 1923, Revis. N. Am. spp. Hydroporus and Agaporus, p. 55, 57.

Length 3 to 3.5 mm.; form subovate, moderately convex. Head reddish-brown, pronotum black or piceous, rufous laterally; elytra yellowish-brown or reddish-brown, palest basally; undersurface black or piceous, legs and antennae rufous. Dorsal surface finely alutaceous, punctation fine, even but not close, punctation of underside finer and sparser; elytral pubescence hardly evident. Lateral marginal bead of pronotum hardly half as wide as median antennal segment.

Type locality: "San Jose et San Diego," California. I do not think that a single specimen has been selected as the type, though Fall (*supra*) has re-

marked that the specimen bearing the name label in the LeConte Collection is from San Jose.

Recorded distribution: California; Nevada; Arizona; South Dakota; New Jersey (this last locality probably based on specimens which are now known as *brumalis* Brown); Lower California: La Joya (Horn, 1894: 313).

H. vilis occurs in running water; where the water is shallow and the current slow it may be in midstream, but in faster, deeper water it stays near the edges of pools and backwaters. There are several closely allied species of similar appearance.

Genus **Deronectes** Sharp

Deronectes SHARP, 1882, Sci. Trans. Roy. Dublin Soc., (2)2:390 (in key), 418 (species), 865 (synthesis).

Genotype: *Hydroporus latus* Stephens 1828, designated by F. Balfour-Browne, 1934.

KEY TO THE SPECIES OF DERONECTES OF LOWER CALIFORNIA

1. More broadly oval and convex species; elytral striae (sutural, discal, subhumeral) but slightly impressed, consisting of punctures of irregular sizes.....2
—More elongate species, less strongly convex; elytra densely covered with fine golden pubescence; elytral striae impressed, especially the sutural.....3
2. Elytra virtually glabrous; form less obese; elytra black with a yellow fascia near base, an indistinct median fascia, and vague yellow markings laterally near apex.....(22) **addendus**
—Elytra finely pubescent; form more strongly convex; elytra yellowish, with ante- and postmedian interrupted black fasciae.....**corpulentus**
3. Outer discal striae feeble, more or less indistinct and incomplete; prosternal intercoxal carina terminating anteriorly in a distinct prominence; side margins of pronotum evidently widened posteriorly; male pro- and mesotarsi greatly enlarged; larger and more robust species, 5 to 6 mm. long.....(23) **funereus**
—Outer discal striae nearly as distinct and complete as inner ones; prosternal intercoxal carina not terminating in a distinct prominence anteriorly; side margins of pronotum not widened posteriorly; male pro- and mesotarsi but little wider than those of female; smaller species, 4.25 to 5 mm. long.....(24) **striatellus**

(22) **Deronectes addendus** (Crotch)

Hydroporus addendus CROTCH, 1873, Am. Ent. Soc., Trans. 4:393; SHARP, 1882, Sci. Trans. Roy. Dublin Soc., (2)2:446.

Hydroporus (*Deronectes*) *pinguis* var. *confluentus* FALL, 1923, Revis. N. Am. spp. Hydroporus and Agaporus, p. 99 (key), 102 (description). *New synonym.*

There has been a mix-up in the synonymy of this species. Crotch described *addendus* from specimens in the Horn collection, and his type is in the Academy of Natural Sciences at Philadelphia, Pa. Dr. E. T. Cresson, Jr., compared a water-color sketch of mine with the type, and wrote as follows (letter of January 21, 1942): "I made comparisons with our type of *Hydroporus addendus* of which we have two specimens, labelled 'Cal.' beneath which there is a square orange label denoting Lower California. They agree very well with your figure of *confluentus*."

Fall (1923), misled by a specimen in the LeConte Collection, identified by LeConte as *H. addendus* Crotch, redescribed the true *addendus* as a new variety *confluentus* of his new species *pinguis*. Later he discovered the error, and published a note on it (1932: 145). But unfortunately he made his *H. pinguis*, rather than the variety, a synonym of *addendus*. If *pinguis* and *confluentus* were not separable Fall's synonymy would be correct; but the two are readily distinguished by color, and thus we have *Deronectes addendus addendus* (Crotch) with synonym *Hydroporus pinguis* var. *confluentus* Fall), and *D. addendus pinguis* (Fall), separable as follows:

1. Color of elytra predominantly black, the fasciae wide and confluent, usually leaving a rather broad posteriorly indented basal band, a transverse median series of spots and some small apical marginal spots, orange-yellow. (Lower California, Arizona)
addendus addendus*

—Color of elytra predominantly yellow, elytral markings indefinite, brokenly fasciate, sometimes very much reduced (Texas, Arizona, southern California)
addendus pinguis

I have not seen examples of the subspecies *addendus* from Arizona, nor of the subspecies *pinguis* from southern California. The illustration of *D. addendus* in Sharp (1882, pl. 13, fig. 160) appears to be of a well-marked example of the subsp. *pinguis*, but in describing that form Fall records two specimens labelled "Unknown to me, D.S." in Sharp's handwriting.

Type locality: of *addendus addendus* (Crotch), Lower California; of its synonym, *confluentus* (Fall), San Felipe, Lower Calif. (Gustav Beyer); of *addendus pinguis* (Fall), Davis Mts., Texas.

Recorded distribution of *addendus addendus*, Lower California: San Felipe. Twelve males and 10 females seen, A.M.N.H. Collection.

New records: Lower California: 3, Triunfo, July 13 (pools in arroyo); collected by Michelbacher and Ross. Dr. P. J. Darlington, has compared one of these specimens with the type of *confluentus* Fall.

Deronectes corpulentus (Fall)

Hydroporus (*Deronectes*) *corpulentus* FALL, 1923, Revis. N. Am. sp. Hydroporus and Agaporus, p. 99, 100.

This Arizona species is not represented in the Lower California material before me, but is included on the basis of Fall's remark (*op. cit.*, p. 101), "The LeConte Collection contains examples from either Southern California or Lower California."

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* In a letter dater December 15, 1947, Mr. J. Balfour-Browne wrote as follows. "A new synonymy which I have just noted: *Deronectes addendus* Crotch (non Fall) is the same thing as *Hydroporus roffi* Clark from Mexico. It also follows that *Deronectes pinguis* Fall is a synonym of *nebulosus* Sharp which is a variety (or *forma coloris*) of *roffi*. I have just compared Arizona specimens (from Grace Pickford) with the type of *nebulosus* and also with Fall's description of *pinguis*. The agreement is absolute. The specimens differ from *corpulentus* (two specimens received from you some time ago from Rice, Ariz., D. K. Duncan, coll.) in exactly the manner which Fall describes for *pinguis*."
It may be noted that according to the table given by Blackwelder (1941. The gender of scientific names in zoology. Wash. Acad. Sci., Jour **31** (4) :135–140), the name *Deronectes* is feminine.

(23) **Deronectes funereus** (Crotch)

Hydroporus funereus CROTCH, 1873, Am. Ent. Soc., Trans. 4:392.
Deronectes funereus, SHARP, 1882, Sci. Trans. Roy. Dublin Soc., (2)2:446.
Hydroporus (Deronectes) funereus, FALL, 1923, Revis. N. Am. sp. Hydroporus and Agaporus, p. 105.

D. funereus is one of the largest species in the genus. The dorsal surface is black, with a reddish spot on the vertex of the head, and one of variable extent on the disk of the pronotum; the elytra are usually entirely black, but may have a basal, postmedian and apical transverse series of longitudinal reddish streaks. *D. funereus* may be separated from *addendus* by its greater size, more elongate and less convex form, pubescent elytra, and deeply impressed scutellar and sutural striae. Distinguished from the smaller *striatellus* by the indistinct outer elytral striae, prosternal prominence, posteriorly widened pronotal side margins, and enlarged pro- and mesotarsi of male.

Type locality: Lower California. Fall (1923:105) says "Probably the upper part of the Peninsula."

Recorded distribution: Lower California: San Esteban, San Felipe; California: Palm Springs, and San Diego Co.

New records: Lower California: Seventeen miles south of Ensenada, June 14 (stream); Hamilton Ranch, August 2 (irrigation ditch). Seven specimens collected by Michelbacher and Ross.

Two of the above specimens were compared with Crotch's type in June 1940, by Dr. P. J. Darlington.

(24) **Deronectes striatellus** (LeConte)

Hydroporus striatellus LECONTE, 1852, Lyceum Nat. Hist. N.Y., Ann. 5:207; LECONTE, 1855, Acad. Nat. Sci. Phila., Proc. 7:295; CROTCH, 1873, Am. Ent. Soc., Trans. 4:392.
Deronectes striatellus, SHARP, 1882, Sci. Trans. Roy. Dublin Soc. (2)2:435, pl. 13, fig. 155; SHARP, 1882, Biol. Centr.-Amer., Coleopt. 1(2):27.
Deronectes (Potamodytes) striatellus, ZIMMERMANN, 1919, Arch. f. Naturg. (1917), 83(A.12):187.
Hydroporus (Deronectes) striatellus, FALL, 1923, Revis. N. Am. sp. Hydroporus and Agaporus, p. 106.
Hydroporus corvinus NEEDHAM and CHRISTENSON, 1927, Utah Agric. Expt. Sta., Bul. 201 p. 33, figs. 41, 42. (not *Hydroporus corvinus* Sharp, 1887). *New synonym.*
Hydroporus pulcher MOTSCHULSKY, 1859, Soc. Imp. Nat. Moscou. Bul. 32(3):163, pl. 4, fig. 13 (not *H. pulcher* LeConte, 1855; not *H. pulcher* Sharp, 1882:438); SHARP, 1882, Sci. Trans. Roy. Dublin Soc. (2)2:808; HORN, 1883, Am. Ent. Soc., Trans. 10:281.

This little species varies greatly in color, and a good deal in form. Typically the elytra are black, with a few yellowish markings basally, but in many examples are completely black; at the other extreme one finds non-teneral specimens in which the elytra are of a dull yellow, without indication of black markings. The vestiture is fine and short, and does not show if the beetle is greasy. *D. striatellus* is a stream and lake species, found in company with *funereus* where the latter occurs.

Type locality: "San Francisco et San Diego," California.

Recorded distribution: British Columbia to South Dakota and south to Lower California, Texas, and Mexico. Lower California: San Francisquito.

New records: Lower California: 5, Seventeen miles south of Ensenada, June 14 (stream); collected by Michelbacher and Ross.

The above specimens have been compared with a homoeotype in my collection.

Genus **Laccophilus** Leach

Laccophilus LEACH, 1817, Zool. Misc. 3:69.

Genotype: *Dytiscus minutus* Linnaeus, 1758, (= *obscurus* Panzer 1794), fixed by Westwood in 1838.

A genus of world-wide occurrence. The species are usually difficult to separate, but the aedeagus of the male genitalia offers good specific differences in most cases; the parameres are unlike, the left being larger but less strongly sclerotized than the right.

KEY TO THE SPECIES OF LACCOPHILUS OF LOWER CALIFORNIA

1. Elytra spotted, each elytron narrowly yellow along anterior two-thirds of lateral margins, and marked with eleven yellow spots, two or more of which are usually connected to the lateral band; epipleura largely piceous; pronotum yellow, with narrow antescutellar piceous area; underparts yellow or brownish-yellow; male with a metacoxal file, which is faint or absent in female ..... (25) **pictus**

—Elytra predominantly yellow or brownish, variously maculate with brown, never black and spotted with yellow; pronotum without median basal piceous mark 2

2. Metasternum and metacoxal plates black, abdominal sternites largely piceous; elytra densely and nearly uniformly irrorated with small elongate brown spots, paler laterally and at apex; epipleura yellow; male with a metacoxal file which is entirely lacking in female; average length slightly less than 5 mm. ..... (26) **atristernalis**

—Underparts yellow or brownish yellow 3

3. Larger and broader species, average length slightly more than 5 mm.; elytra finely irrorated with brown dots, narrowly yellow along anterior two-thirds of lateral margins, each elytron marked with clear yellow spots as follows: a sub-basal transverse series, a median lateral spot joined to lateral band, one postmedian at suture, a series at apical three-quarters, and a transverse sub-apical series, the sub-basal series usually obsolescent in the female; epipleura yellow; male with a long metacoxal file, which is faintly indicated in female ..... (27) **decipiens**

—Smaller and narrower species, average length 4.75 mm.; elytra predominantly yellow in anterior half laterally, basally, and at apex, and with a dark brown area at lateral two-thirds, irrorated sections of elytra sharply outlined with darker brown; epipleura yellow; male with metacoxal file, which is apparent though faint in female (28) **terminalis**

(25) **Laccophilus pictus** Laporte

Laccophilus pictus LAPORTE, 1835, Étud. ent., p. 104; AUBÉ, 1838, Sp. gén. des Hydrocanthares, p. 441; HORN, 1871, Am. Ent. Soc., Trans. 3:330; CROTCH, 1873, Am. Ent. Soc., Trans. 4:400; SHARP, 1882, Sci. Trans. Roy. Dublin Soc. (2)2:290; SHARP, 1882, Biol. Centr.-Amer., Coleopt. 1(2):11; HORN, 1883, Am. Ent. Soc., Trans. 10:277, 283, and pl. 9, fig. 2.

Zimmermann (1919: 122) has suggested that *insignis* Sharp is but a "geographische Rasse" of *pictus*. This is certainly wrong; the two species are readily separated on several characters, including the median lobe of the male genitalia.

Type locality: Mexico.

Recorded distribution: Arizona; Mexico: Puebla, Teapa, Oaxaca, Paso del Macho; Guatemala; Lower California: "Baja California (Gabb)," and from between San José del Cabo and Triunfo.

New records: Lower California: 8, Twenty miles north of Comondu, July 23, (lagoon; tinaja); 150, Triunfo, July 13, (pools in arroyo). Seventy-three males and eighty-five females collected by Michelbacher and Ross. Also seven males and thirteen females collected at San Felipe, by G. W. Beyer (A.M.N. H.); two males, Escondido Bay; June 14, 1921, collected by J. C. Chamberlin (C.A.S.); two males, eight females, Espíritu Santo Island, June 9, 1921, collected by E. P. Van Duzee, (C.A.S.); four males, San Marcos Island, June 19, 1921, collected by E. P. Van Duzee, (C.A.S.).

Laccophilus insignis Sharp

Laccophilus insignis SHARP, 1882, Sci. Trans. Roy. Dublin Soc. (2)2:290; HORN, 1883, Am. Ent. Soc., Trans. 10:277, 283, and pl. 9, fig. 1.

In describing *insignis*, Sharp recorded it from "North America, Texas; (Lower California fide Crotch)." Horn pointed out that it had been confused with *pictus* by Crotch, and actually occurred only in Texas. I have seen only Texas specimens, and believe that *insignis* should be removed from the Lower California list.

(26) Laccophilus atristernalis Crotch

Laccophilus atristernalis CROTCH, 1873, Am. Ent. Soc., Trans. 4:400; SHARP, 1882, Sci. Trans. Roy. Dublin Soc. (2)2:292; SHARP, 1882, Biol. Centr.-Amer., Coleopt. 1(2):9; HORN, 1883, Am. Ent. Soc., Trans. 10:277.

Crotch described his species from "California." Sharp (1882: 293) suggested that it might be *mexicanus* Aubé, and gave a definite synonymy in another paper (1882: 9). Horn announced the same synonymy.

Aubé (1838: 420) described *mexicanus* from a single specimen from Mexico. Sharp had not seen the type, but in his paper for the Biologia he said: "This appears to be the most abundant species of Mexican Dytiscidae.... There can, I think, be no doubt now that Aubé's description (*loc. cit.*) refers to this insect; and I have therefore adopted his name for it." He recorded it from Oaxaca, Jalapa, Guanajuato and Cordova.

I have six specimens from Oaxaca, Oax., Mexico, 5,000 ft. elev., July 20, 1937 (Mel Embury), which are quite surely the *mexicanus* Aubé of Sharp; the elytral apices are pale, as given by Sharp, though not mentioned by Aubé. However, these examples are separable by the male genitalia from California and Lower California specimens.

Recorded distribution (*atristernalis*): California.

New records. Lower California: Triunfo, July 13 (pools in arroyo). Three males and two females collected by Michelbacher and Ross.

(27) **Laccophilus decipiens** LeConte

Laccophilus decipiens LECONTE, 1852, Lyceum Nat. Hist. N. Y., Ann. 5:205; CROTCH, 1873, Am. Ent. Soc., Trans. 4:400; SHARP, 1882, Sci. Trans. Roy. Dublin Soc. (2)2:289; SHARP, 1882, Biol. Centr.-Amer., Coleopt. 1(2):10; SHARP, 1887, Biol. Centr.-Amer., Coleopt. 1(2):749; HORN, 1894, Calif. Acad. Sci., Proc. (2)4:313.

Laccophilus truncatus MANNERHEIM, 1853, Soc. Imp. Nat. Moscou, Bul. 26(3):160.

Laccophilus californicus MOTSCHULSKY, 1859, Soc. Imp. Nat. Moscou, Bul. 32(3):172.

Laecophilus [sic !] *maculosus* WALKER, 1866, *in:* Lord's Nat. in Vanc. Isl. and B. C., 2 (Appendix):317. (not *Laccophilus maculosus* (Germar) 1824).

? *Laccophilus fusculus* SHARP, 1882, Sci. Trans. Roy. Dublin Soc. (2)2:290; HORN, 1883, Am. Ent. Soc., Trans. 10:277.

This is the commonest species of *Laccophilus* in western Canada and the United States. It occurs from sea level on the coast, to at least 8,000 feet elevation in the mountains of Colorado.

The synonymy given above is that found in the literature. I have not been able to verify *truncatus* or *californicus* other than by description, but there seem no reasons for doubting these placements. Mr. J. Balfour-Browne has examined Walker's type of *maculosus* for me, and confirms the reported synonymy.

Type locality of *decipiens* LeConte: "In California, et in Territorio Oregonensi abundat,"

of *truncatus* Mannerheim: "in peninsula Kenae et in insula St. Georgii," Alaska,

of *californicus* Motschulsky: "St. Francisco," California,

of *maculosus* (Walker): British Columbia, and

of *fusculus* Sharp: "Nevada."

Recorded distribution: Alaska to California, eastward to Alberta and Arizona, Mexico: Guanajuato; Chihuahua City; Lower California: "Baja California (Gabb)."

New records: Lower California: Rosario, June 17. One female, collected by Michelbacher and Ross. Mr. J. Balfour-Browne says that the British Museum has three females labelled "L. California, N. Boundary, Godman-Salvin coll."

I have reason to suspect that the records of *decipiens* from Arizona and Mexico refer to another species, *L. shermani* Leech, 1944: 4.

(28) **Laccophilus terminalis** Sharp

(Figure 1)

Laccophilus terminalis SHARP, 1882, Sci. Trans. Roy. Dublin Soc. (2)2:292; HORN, 1883, Am. Ent. Soc., Trans. 10:277.

Varies in length from 4 to 5 mm. The elytral markings may be obscure, and such specimens resemble teneral *atristernalis*. With males at hand, the metacoxal file and aedeagus are diagnostic; I have not seen any females of *atrister-*

nalis in which there is any trace of a metacoxal file, but it is always apparent, though faint, in *terminalis*.

Type locality: Texas.

Recorded distribution: Texas; Arizona; California; Mexico; Guanajuato; Lower California: "Baja California (Gabb)."

New records: Lower California: Fourteen miles south-east of Santonio, June 7; Twenty miles north of Comondu, July 23 (lagoon; tinaga); Triunfo, July 13 (pools in arroyo). Ninety-one males and seventy-eight females collected by Michelbacher and Ross.

Dr. F. N. Young reports two males from Las Parras, December 23, collected by W. M. Mann. These are in the U. S. National Museum collection.

Genus **Suphisellus** Crotch

Suphisellus CROTCH, 1873, Amer. Ent. Soc., Trans. 4(3 & 4):397; SHARP, 1882, Sci. Trans. Roy. Dublin Soc. (2)2:839.
Suphisellus ZIMMERMANN, 1921, Archiv f. Naturg. 87(3):187.

Genotype: There is no indication in the literature at hand that a genotype has been assigned. I hereby designate *Noterus bicolor* Say, 1831: 5, as the type of *Suphisellus* Crotch.

The species of this genus occur in the New World, and previous to Zimmermann's paper on the South American forms, were included in *Canthydrus* Sharp. However, the name chosen by Zimmermann had already been proposed, albeit obscurely, by Crotch. In discussing *Colpius* LeConte, he wrote "This genus appears to me very near *Suphis,* the type of which is a globose and similarly marked species (*S. cimicoides*), but which I have not seen. If these two were shown to be congeneric, the species above under *Suphis* might receive the name *Suphisellus.*" The species he placed under *Suphis* were *Noterus bicolor* Say, *Suphis lineatus* Horn and *Suphis puncticollis* Crotch. I am grateful to Dr. Frank Young and Mr. J. Balfour-Browne for drawing my attention to Zimmermann's and Crotch's uses of the name *Suphisellus.* Both uses are listed in "Nomenclator Zoologicus," vol. 4, p. 353.

In Blackwelder's Checklist (1944: 73) *Suphisellus* Zimm. is by error put in the tribe Suphisini, instead of in the Hydrocanthini.

It is usual to date *Noterus bicolor* Say as of 1834 (Amer. Philos. Soc., Trans., 4: 446). I believe the 1831 publication to be valid; I have before me a photographic reproduction of the title page and p. 5–7 of a copy in the library of the U. S. Department of Agriculture.

KEY TO THE SPECIES OF SUPHISELLUS OF LOWER CALIFORNIA

1. Oval, length 3 mm.; pronotum reddish-yellow, piceous or black discally; elytra reddish-yellow, each elytron with a sutural, a discal, a humeral and a submarginal black vitta.....(29) **lineatus**
—Rather broadly oval, length 2 mm.; pronotum and elytra yellowish-testaceous, elytra darker.....(30) **levis**

(29) **Suphisellus lineatus** (Horn)

Suphis lineatus HORN, 1871, Am. Ent. Soc., Trans. 3:329; CROTCH, 1873, Am. Ent. Soc., Trans. 4:397.
Canthydrus lineatus, SHARP, 1882, Sci. Trans. Roy. Dublin Soc. (2)2:273.

A pretty little species, readily distinguished by the black vittae; closely allied to *S. mexicanus* Sharp (=*lineatus* Wehncke, 1876, not *lineatus* Horn, 1871).

Pronotum shining, impunctate except for an anterior transverse series, a longitudinal lateral series, and a few scattered punctures at base. *Elytral* punctation variable, but usually distinct, especially along the black vittae; discal vitta sinuate, extending to apical five-sixths where it may join sutural; humeral vitta terminating a little behind middle of elytra, usually with a subhumeral fork at base; sublateral vitta beginning at basal third and extending almost or quite to apex. *Prosternum,* metasternum and metacoxal processes with elongate setal-bearing punctures; last three or four visible abdominal sternites with a median transverse row of setal-bearing punctures.

Type locality: "Cape San Lucas, Lower California, and were collected by Mr. Wm. W. Gabb." But note that in 1894: 313, Horn says "Collected by Mr. Gabb in Baja California. Special locality unknown."

Recorded distribution: Baja California.

New records: Lower California; Five miles south of Miraflores, July 10; Twenty miles north of Comondu, July 23 (lagoon); four males and one female collected by Michelbacher and Ross. The female is less strongly punctate than the males, and has narrower elytral vittae.

(30) **Suphisellus levis** Fall

Canthydrus levis FALL, 1909, Canad. Ent. 41(5):161

I have not seen examples of this species; the following notes are taken from Fall's original description of the unique type.

Pronotum subimpunctate, except for a line of rather fine punctures along the front margin, and a group of somewhat numerous coarser but feebly impressed punctures irregularly placed in the median basal region. *Elytra* with intermixed fine and somewhat coarser, feebly impressed punctures, which are slightly better defined in two discal lines bearing fine short hairs. *Undersurface* almost impunctate, except the sternal plates [metacoxal processes?], which are strongly, rather coarsely punctate, each puncture bearing a posteriorly-directed bristle-like hair. The transverse lines of punctures of the abdominal sternites are almost lacking.

Type locality: San José del Cabo.

Genus **Hydrocanthus** Say

Hydrocanthus SAY, 1823, Am. Philos. Soc., Trans. (N.S.) 2(1):105.

Genotype: *Hydrocanthus iricolor* Say 1823, the only species mentioned by Say.

(31) **Hydrocanthus** sp.

Horn (1894:313) listed *H. iricolor* as occurring at Santa Anita, Lower California. However, he was inclined to recognize only one species of *Hydrocanthus* from America north of Mexico (see Horn, 1883:277) so it is hard to say just what he had at hand.

Although the American species were reviewed by Zimmermann in 1928, the disposition of our forms is still unsatisfactory. It is improbable that the true *iricolor* occurs in Lower California; Zimmermann's *similator* was described from Massachusetts and California.

Genus **Copelatus** Erichson

Copelatus ERICHSON, 1832, Genera Dyticeorum, p. 18 (synopsis of genera), 38 (description).

Genotype: *Dytiscus posticatus* Fabricius, 1801, the only named species cited by Erichson.

Small to medium sized beetles, usually rather flat, and (in our species) with impressed longitudinal elytral striae, a short posterior submarginal stria not being counted when enumerating those present.

KEY TO THE SPECIES OF COPELATUS OF LOWER CALIFORNIA

1. Elytra clearly ten-striate; protibiae of males a little curved basally and notched on the inner margin; smaller species, 4 mm. long.....(32) **fragilis**
—Elytra eight-striate, often with one or two short striae near the suture, posteriorly; protibiae simple in both sexes; larger species, 5.5 to 6.5 mm. long.....(33) **chevrolati**

(32) **Copelatus fragilis** Sharp

Copelatus fragilis SHARP, 1882, Biol. Centr.-Amer., Coleopt. 1(2):40.

This species was listed from San José del Cabo by Horn (1896:367). It was described as from Guatemala, and later recorded from the State of Tobasco, Mexico. I have not seen any specimens from Lower California, and am unable to verify its occurrence.

Copelatus impressicollis Sharp

Copelatus impressicollis SHARP, 1882, Sci. Trans. Roy. Dublin Soc. (2)2:589; SHARP, 1882, Biol. Centr.-Amer., Coleopt. 1(2):40, and pl. 1, fig. 10; SHARP, 1887, Biol. Centr.-Amer., Coleopt. (Suppl.) 1(2):757; DUGÈS, 1901, Cat. Coll. Coleopt. Mex. (Ed. 2), pl. 6, fig. 47; SCHAEFFER, 1908, New York Ent. Soc., Jour. 16(1):16–17.

This species has not been reported from Lower California, but is common in parts of southern Arizona, and in Mexico. Sharp's discussions suggest that his series were composite. *C. impressicollis* resembles *chevrolati* in size, but each elytron has ten discal striae.

(33) **Copelatus chevrolati** Aubé

Copelatus chevrolati AUBÉ, 1838, Sp. gen. des Hydrocanthares, p. 389; SHARP, 1882, Sci. Trans. Roy. Dublin Soc. (2)2:584; LENG and MUTCHLER, 1918, Am. Mus. Nat. Hist., Bul. 38:87.

Copelatus chevrolatii [sic], CROTCH, 1873, Amer. Ent. Soc., Trans. 4(3–4):413; SCHAEFFER, 1908, New York Ent. Soc., Jour. 16(1):17.

In 1908, Schaeffer pointed out that material under the name *chevrolati* appeared to be composite; he described as new a variety *australis* from Texas, New Mexico, Arizona, and California, restricting typical *chevrolati* to Florida and Georgia, and gave the following key:

"Each elytron with eight entire striae and an additional short sutural stria, which latter never extends over apical half; elytra piceous.....**chevrolatii** Aubé
Each elytron with eight entire striae; but without short sutural stria; elytra pale castaneous.....var. **australis**"

This separation holds for most specimens seen from the United States, though examples are known from Arizona in which the sutural stria is present. There are six specimens at hand from Lower California, all collected at the same time and place; three males and two females agree with the variety *australis* as to striation, but the elytra are darker except basally. One male has the sutural stria of typical *chevrolati,* and in addition, indications of another between it and the first discal.

Recorded distribution: Florida, Georgia, South Carolina for typical *chevrolati.* Texas, New Mexico, Arizona, California, for the var. *australis.* Lower California: Baja Calif.

New records. Lower California: Twenty miles north of Comondu, July 23 (lagoon). Four males and two females collected by Michelbacher and Ross.

Genus **Agabus** Leach

Agabus LEACH, 1817, Zool. Misc., 3:68, 72.

Genotype: *Dytiscus serricornis* Paykull, 1799, the only species cited by Leach.

A large Holarctic genus, few species of which occur as far south as Mexico, in our fauna. The majority of Nearctic species are dull in color, and about 8.5 mm. long; they are found in many habitats, from brackish pools to clear streams.

(34) **Agabus regularis** (LeConte)

Ilybius regularis LECONTE, 1852, Lyceum Nat. Hist. N.Y., Ann. 5:203.

Ilyobius oblongus MOTSCHULSKY, 1859, Soc. Imp. Nat. Moscou, Bul. 32:169; CROTCH, 1873, Am. Ent. Soc., Trans. 4:414.

Ilybiosoma regularis, CROTCH, 1873, Am. Ent. Soc., Trans. 4:413, 414; SHARP, 1882, Sci. Trans. Roy. Dublin Soc. (2)2:538, and pl. 14, fig. 174; ZIMMERMANN, 1919, Arch. f. Naturg. 83(A.12):195, and pl. 3, fig. 3.

Agabus regularis, LEECH, 1942, Ent. Soc. Am., Ann. 35(3):357, 358, and pl. 1, fig. 1.

Length 10 to 11.5 mm.; form oblong ovate, strongly convex; piceous dorsally, faintly aenescent, head, sides of pronotum and elytra in basal half rufescent; elytra with a short sublateral pale dash usually clearly defined; underparts rufous to rufo-piceous. Meshes of *elytral* sculpture small, of irregular sizes and shapes. *Prosternal* process lanceolate, acuminate, evenly rounded or slightly flattened along middle. *Metasternal* side-wings very narrow, tongue-like. Metatibia short, broad, reaching its greatest width at basal third, where it is about as wide as apex of femur; punctures paralleling inner lower margin elongate, close-set, usually forming a continuous groove. Pro- and mesotarsi of male not much wider than in female, first three segments clothed beneath with golden hairs, some of which are dilated apically into small round palettes; inner protarsal claws of male hardly modified, slightly broadened in basal half.

Type locality: San Diego, California.

Recorded distribution: California; Lower California: La Chuparosa Horn, 1894: 314).

A. regularis occurs in streams, usually in the deeper pools of those having sandy or clayey beds.

There are several other species of *Agabus* to be expected in the northern parts of Lower California. *A. lugens* (LeConte) is black, 8.25 to 9.75 mm. long, much flatter and more coarsely sculptured than *regularis;* its metasternal wings are broad, triangular, prosternal process broader, pointed but not acuminate; punctures paralleling inner lower margin of metatibiae more rounded, more widely spaced, never forming a continuous groove.

A. lutosus (LeConte) is about 8 mm. long, having head and pronotum largely black with a greenish sheen, elytra brown or yellowish-brown, paler basally; prosternal process narrow, acuminate; no series of punctures paralleling inner lower margin of metatibiae; elytral sculpture of male very fine, consisting of small rounded or irregularly shaped meshes; in the female, the elytral meshes are much coarser and more deeply impressed, often strongly elongated basally on disc; inner protarsal claws of male with a large median tooth. Both *lugens* and *lutosus* occur in streams.

Genus **Rantus**[3] Dejean[4]

Rantus Dejean 1833, Cat. Coleopt. coll. Dejean, p. 54.

Genotype: *Colymbetes pulverosus* Stephens, 1828: 69, and pl. 12, fig. 2; designated in 1839 by Hope, who attributed the species to Knoch, as did Dejean. Crotch apparently did not know of Hope's citation, and in 1873 desig-

[3] In a correct transliteration from the Greek, this should be *Rhantus*, as was pointed out by Agassiz in 1846. Blackwelder (1939:17, footnote 18) prefers the emended spelling.

[4] The present writer accepts the validity of Dejean's 1833 and 1837 Catalogues in establishing generic names, in cases where described species were listed under those names. By persons who do not accept Dejean's Catalogues, *Rantus* is to be accredited to Stephens, 1835, Illustr. British Ent., Mandib., 5:393, rather than to Boisduval and Lacordaire, 1835. According to F. Balfour-Browne (1940:205), Stephens published in March, Boisduval not until September.

nated *collaris* (Paykull), 1798 (= *Rantus exsoletus* (Forster), 1771). Thomson (1859:13) designated *R. notatus* (Fab.), now known as *R. frontalis* (Marsham).

Beetles of medium size, resembling some species of *Agabus,* but at once distinguished by the unequal metatarsal claws, and the absence of a linear group of cilia at the postero-external angle of the metafemora.

KEY TO THE SPECIES OF RANTUS SAID TO OCCUR IN LOWER CALIFORNIA

1. Larger species, 14 to 16 mm. long; black above and below, mouthparts and legs slightly paler, antennae and two median spots on head rufous; inner and outer claws of pro- and mesotarsi of equal length in male, in which anterior protarsal claws are more sharply bent at base than their fellows, and sinuate along lower margin. (35) **atricolor**
—Smaller species, 10 to 13 mm. long; elytra yellowish finely irrorated with black, or black except at apex and around margins, pronotum yellowish usually marked with black spots, ventral surface largely piceous; at least mesotarsal claws of male unequal...2
2. Metafemora largely or entirely black.....3
—Metafemora yellow; protarsal claws of male short, rather evenly arcuate, anterior ones a little broader than their fellows.....(36) **gutticollis?**
3. Protarsal claws of male not as long as claw-bearing segment; female without roughened area on elytra; prosternal carina pale.....4
—Protarsal claws of male elongate, anterior ones a third longer than their fellows and longer than claw-bearing segment; female with an elongate-oval area of rough sculpture on each elytron, from humerus to beyond middle; prosternal carina usually black.....(37) **anisonychus**
4. Elytra black, except narrowly around lateral margins which are yellowish-brown; the basal and scutellar margins are also usually pale, and the elytra irrorated apically. Male protarsal claws subequal, the anterior ones a little straighter, broader, slightly sinuate along the lower margin, the inner ones evenly arcuate.....(38) **mexicanus**
—Elytra irrorated throughout. Male protarsal claws both nearly straight except at tip, both sinuate along lower margins.....(39) **flavogriseus**

(35) **Rantus atricolor** (Aubé)

Colymbetes atricolor AUBÉ, 1838, Sp. gén. des Hydrocanthares, p. 265.
Rhantus atricolor, CROTCH, 1873, Am. Ent. Soc., Trans. 4:410; SHARP, 1882, Sci. Trans. Roy. Dublin Soc. (2)2:615; SHARP, 1882, Biol. Centr.-Amer., Coleopt. 1(2):42, and pl. 1, fig. 11; HATCH, 1929, Brook. Ent. Soc., Bul. 23(5):224.

A fine black species, separable at once by the color, and the almost equal inner and outer claws of the male pro- and mesotarsi.

Type locality: Mexico.

Recorded distribution: The northern half of Mexico; southern United States; Arizona, New Mexico; Lower California: El Taste; San Francisquito.

New records: Lower California: Escondido Bay, June 14, 1921 (C.A.S.). Cedros Island, April 29, 1931, a teneral specimen collected by Chapman Grant (S.D.N.H.M.).

(36) **Rantus gutticollis** (Say) ?

Colymbetes gutticollis SAY, 1834, Am. Philos. Soc., Trans. 4:442; LECONTE edition of SAY'S works, 1859, 2:556; SHARP, 1882, Sci. Trans. Roy. Dublin Soc. (2)2:761.
Rhantus gutticollis, WALLIS, 1933, Canad. Ent. 65(12):273.

Say's *gutticollis* has never been satisfactorily identified, though the name is usually included in the synonymy under *binotatus* (Harris). Wallis suggested that *gutticollis* is probably a valid species, closely allied to his *hoppingi*. I have a series of 125 of the latter before me, including specimens from British Columbia, Oregon, Nevada, Utah, Colorado, and the northern two-thirds of California. The males of *hoppingi* are in every case separable from an allied species, represented by examples from Mexico, southern Arizona, San Diego Co., Calif., and Lower California; this second species fits Say's description of *gutticollis* excellently.

Typically, *R. gutticollis* as here recognized has four black spots on the pronotum, but as in *hoppingi* these may vary in distinctness, the laterals often disappearing entirely. It may be separated from *hoppingi* as follows: the anterior protarsal claws of the male *gutticollis* are straighter, not abruptly sinuate along the inner edge, not appreciably broader at middle than at base; the aedeagus (in a ventral view) has the apical quarter thicker, twisted only about half as much to the side; the general color is more definitely rufous.

Type locality: Mexico. "Taken in the river beyond Vera Cruz."

Recorded distribution: Mexico; southern Arizona. (Lower California: San Esteban, if we presume the *binotatus* Harris of Horn's list to be *gutticollis*.)

New records: Mexico: Pachucha, 8,000 ft., July 6, 1937 (M. Embury); Tancitaro, Michoacan, 6,580 ft., July 17, 1940 (H. Hoogstraal). Arizona: Baboquivar Mts. (F. H. Snow); Douglas, August (F. H. Snow); Rice, June 1930 (D. K. Duncan); Alamo Canyon, Ajo Mts., Organ Pipe Cactus Nat. Monument, Pima Co., December 12, 1939 (C. F. Harbison). California: San Diego, August 26, 1921 (F. E. Blaisdell); Potrero, La Puerta and Mission Dam, all in San Diego Co. Lower California: 1 female, Hamilton Ranch, August 2, 1938 (irrigation ditch) (Michelbacher and Ross); 5 males, 3 females, Santa Inez near Catavina, July 15, 1941 (C. F. Harbison).

(37) **Rantus anisonychus** (Crotch)

Rhantus anisonychus CROTCH, 1873, Am. Ent. Soc., Trans. 4:409; SHARP, 1882, Sci. Trans. Roy. Dublin Soc. (2)2:615; HATCH, 1929, Brook. Ent. Soc., Bul. 23(5):223.

This species is easily recognized by the protarsal claws of the male, and by the dual elytral sculpture and produced anterior pronotal angles of the female. It occurs fairly commonly in brackish water in the San Francisco Bay region of California, but is rare further south. I doubt that it occurs in the southern part of Lower California.

Type locality: not stated in the original description. Dr. Darlington says "The first specimen in the LeConte Collection is probably Crotch's type. It .... is labelled S. Fr., standing, I suppose, for San Francisco." (Letter of June 23, 1941.)

Recorded distribution: California, as far south as San Diego. Lower California; "between San José del Cabo and Triunfo, near sea level." (Grossbeck 1912; identification given with a question mark.)

(38) **Rantus mexicanus** (Laporte)

Colymbetes mexicanus LAPORTE, 1835, Etudes ent... :101; AUBÉ, 1838, Sp. gen. des Hydrocanthares, p. 249.

Rhantus mexicanus CASTELNAU [= LAPORTE], SHARP, 1882, Roy. Dublin Soc., Sci. Trans. (2)2:614; SHARP, 1882, Biol. Centr.-Amer., Coleopt. 1(2):42.

With some doubt I so identify a damaged male from Comondu. It is most closely allied to the species I have identified in this paper as *gutticollis* (Say), and to *hoppingi* (Wallis), but is at once distinguished by the color of the elytra and underparts. The elytra of this specimen are black except for two spots near the scutellum and a narrow lateral margin yellowish-brown, and the irrorated apex.

Hatch (1929. Brooklyn Ent. Soc., Bul. 23(5) : 222) has included "*Rhantus mexicanus* Cast." in his key, and recorded it from Mexico and Oklahoma; the the present specimen will not run to *mexicanus* in Hatch's key, differing in the color of the metafemora which are black except at the extreme apex and narrowly along the hind margin.

Type locality: Mexique.

Recorded distribution: Mexico, Guatemala.

New records: (provisional identification) Lower California; Comondu, 26°2′–111°58′, 8. xi. 1941 (F. F. Gander).

(39) **Rantus flavogriseus** (Crotch)

Rhantus flavogriseus CROTCH, 1873, Am. Ent. Soc., Trans. 4:409; SHARP, 1882, Roy. Dublin Soc., Sci. Trans. (2)2:824; HATCH, 1929, Brook. Ent. Soc. Bul. 23(5):223.

This "lost" species was listed by Horn (1894: 314) as occurring in Lower California at Comondu, and on Guadeloupe Island. He also recorded *R. binotatus* (Harris) from San Esteban. These records require confirmation; the San Esteban record will be found credited to *gutticollis* in the present article.

The problem is complicated by the fact that earlier authors confused two or more species under the name *binotatus*. Recently Mr. J. Balfour-Browne has studied the Mexican species, and *in litteris* (March 12, 1940), makes the following comments: "The species from Mexico and the south-western United States which has long passed as *binotatus* (Harris), is the *maculicollis* of Aubé; but this latter is the same as *binotatus* Aubé (not of Harris) from San Domingo (re-named by Gemminger and Harold as *dominguensis*), which is merely an aberration of the previously described *mexicanus* Castelnau. *R. binotatus* (Harris) is a plastic species, and includes as color variants, some of which may be subspecific, such forms as *longipes* (Sharp), *obscurus* (Sharp), *assimilis* (Kirby), *plebejus* (Sharp), and probably *flavogriseus* (Crotch)."

The above remarks are not to be construed as Balfour-Browne's final conclusions, and no statement of synonymy should be drawn from them at present.

Type locality of *flavogriseus:* not given by Crotch in the original descrip-

tion. Dr. Darlington says that the two presumed cotypes in the LeConte Collection "bear discolored gold disks which probably signify California." (Letter of June 23, 1941.)

Genus **Megadytes** Sharp

Megadytes SHARP, 1882, Roy. Dublin Soc., Sci. Trans. (2)2:701 (key), 704, 917.

Genotype: *Dytiscus latus* Fabricius, 1801. Designated by Brinck, 1945: 7. Both the species here discussed belong in the typical subgenus.

The species of *Megadytes* resemble those of *Cybister* in a general way, but are separated by the presence of two metatarsal claws in both sexes. *Megadytes* is typically from South and Central America and the Antilles, but occurs as far west and north as Lower California; *Cybister* is found in both the Old and New World, but not in South America.

Only *M. fraternus* Sharp has been recorded from Lower California. There are two species in the material at hand; although they agree well with the descriptions of two of Sharp's species, they are not the same as specimens from Mexico proper, which also trace to Sharp's species. Since it is at present impossible to have examples compared with the types in the British Museum, it seems best to treat our material as follows:

KEY TO THE SPECIES OF MEGADYTES OF LOWER CALIFORNIA

1. Protarsi of male large, nearly 3 mm. in a transverse direction; female with elytra almost covered with a sexual sculpture of large elongate punctures, not smooth as in male (40) species near **fraternus**

—Protarsi of male small, only 2 mm. in a transverse direction; female elytra as in male, with the usual three longitudinal series of well-spaced round punctures, and an exceedingly fine micro-punctation, but no extra sexual sculpture. (41) species near **flohri**

(40) **Megadytes** sp., near **fraternus** Sharp

Megadytes fraternus SHARP, 1882, Roy. Dublin Soc., Sci. Trans. (2)2:708, and pl. 18, fig. 222.

Sharp stated that his type was from Panama, and that one or more additional species might be represented in the material which he studied from Guatemala, Guadeloupe, St. Domingo, and Demerara.

I have a male from Oaxaca, Oax., Mexico, which agrees well with Sharp's description; but the genitalia of this specimen are very distinct from those of a male from San José del Cabo, Lower California.

Lower California specimens examined: One male, 1 female, San José del Cabo; the female was identified by Ch. Fuchs, and labelled as comparing exactly with a specimen determined as *fraternus* by G. H. Horn. The male is in the collection of the late Ralph Hopping, the female in the C.A.S. Also 2 females from Triunfo, July 14, 1938, collected by Michelbacher and Ross.

Horn (1894: 314–315) cited specimens, which he considered to be *fraternus*, from Cabo San Lucas and San José del Cabo. Grossbeck (1912: 324) listed a specimen taken "between San José del Cabo and Triunfo, near sea-level."

(41) **Megadytes** sp., near **flohri** Sharp

Megadytes flohri SHARP, 1882, Roy. Dublin Soc., Sci. Trans. (2)2:709.

Sharp described this species from a single immature pair from Mexico. Later in the same year (Biol. Centr.-Amer., Coleopt. 1(2) : 47) he recorded it from "Mexico, city of Mexico (Flohr), Vera Cruz (Hoge), Cordova (Sallé)," the first locality referring presumably to the types.

I have specimens from the State of San Luis Potosi, Mexico, about 175 miles north of Mexico City; these agree well with Sharp's description, except that the elytra are not so clearly marked with reddish laterally. Two females from Twenty miles north of Comondu, Lower California, July 23, 1939 (Michelbacher and Ross), also agree well with the description; in the absence of males, it seems best to leave the final identification until a good series is available.

Genus **Cybister** Curtis

Cybister CURTIS, 1827, British Ent. 4:151.

Genotype: *Dytiscus lateralis* Fabricius, 1798 (= *Cybister tripunctatus* (Olivier), 1795), designated by Curtis, 1827. Crotch in 1873 cited *roeseli* (Füessly), 1775, which is *lateralimarginalis* (Degeer), 1774.

Brinck (1945 : 11, et seq.) has proposed six new subgenera of *Cybister*, but unfortunately he too seems to have overlooked Curtis' designation. He gives *Dytiscus lateralimarginalis* Degeer as the type of the typical subgenus, and designates *D. tripunctatus* Olivier (of which *lateralis* Fabricius is a synonym) as the type of his new subgenus *Gschwendtnerhydrus*. Both the species below recorded from Lower California he puts in his new subgenus *Nealocomerus*, with type *Dytiscus fimbriolatus* Say, 1823.

Large, active beetles, usually green or rufous dorsally, with (in our species) a yellowish border along each side, from the anterior angles of the pronotum to the elytral apices.

KEY TO THE SPECIES OF CYBISTER OF LOWER CALIFORNIA

1. Female with a rudimentary second claw on each metatarsus; sides of head and pronotum, and elytra except near suture, with a sexual sculpture of impressed lines in female; outer posterior angle of metafemur not produced, not acute. Length about 28 mm. (42) **ellipticus**

—Female with only a single claw on metatarsus, and without sexual sculpture on elytra; outer posterior angle of metafemur acute, produced posteriorly in both sexes. Length about 27 mm. ..... (43) **explanatus**

(42) **Cybister ellipticus** LeConte

Cybister ellipticus LECONTE, 1852, Lyceum Nat. Hist. N. Y., Ann. 5:202; CROTCH, 1873, Am. Ent. Soc., Trans. 4:399; SHARP, 1882, Roy. Dublin Soc., Sci. Trans. (2)2:716; FALL, 1901, Calif. Acad. Sci., Occ. Papers 8:54.

Horn (1894 : 315) recorded this species from Cabo San Lucas, on the authority of Henry Ulke. I suspect that the latter misidentified *explanatus;* the

two species are alike in general facies, though *ellipticus* is distinctly narrower and more elongate.

Type locality: "In vallem fluminis Colorado abundat." California.

(43) **Cybister explanatus** LeConte
(Figure 6)

Cybister explanatus LECONTE, 1852, Lyceum Nat. Hist. N.Y., Ann. 5:202; CROTCH, 1873, Am. Ent. Soc., Trans. 4:399; SHARP, 1882, Roy. Dublin Soc., Sci. Trans. (2)2:734; SHARP, 1887, Biol. Centr.-Amer., Coleopt. 1(2):759; WICKHAM, 1893, Iowa State Univ., Lab. Nat. Hist. Bul. 2:324, pl. 6, fig. 4; ZIMMERMANN, 1919, Arch. f. Naturg. (1917), 83(A.12):242.

A distinctive species, with the outer hind angles of the metafemora produced. The elytra are broadly margined with yellow, the pronotum less widely so, and often narrowly yellowish along the base and apex. In general appearance this species is very similar to *ellipticus* LeConte and *flavocinctus* Aubé.

Males of *explanatus* from Lower California have the apex of the aedeagus less deeply indented at the middle than is the case in California examples, but there is some variation shown in a large series from Woodland, Calif., so the difference may not be significant.

Zimmermann (1919) described a variety *fusculus* from Mexico; this form had been mentioned, but not described, by Sharp (1887: 759). It differs from typical *explanatus* in being brownish-black beneath, instead of yellowish-red, and in having a strong sexual elytral sculpture in the female. His variety *laevicollis,* also from Mexico, resembles *fusculus* in color, but lacks the sexual sculpture in the female. The Lower California specimens before me do not agree with either of Zimmermann's varieties.

Type locality: "ad San Diego, Colorado [River, Calif.] et Sacramento minus frequens."

Recorded distribution: California; Mexico; Essig (1931: 8, and fig. 13 on p. 9) records and illustrates specimens from the McKittrick, Calif., asphaltum pits.

New records: Lower California: Rosarito Beach, August 4; San Ignacio, June 26; Twenty miles north of Comondu, July 23. Five males and three females collected by Michelbacher and Ross. Also a female from San Ignacio, July 20, 1941, collected by C. F. Harbison (S.D.N.H.M.).

Genus **Dytiscus** Linnaeus[5]

Dytiscus LINNAEUS, 1758, Syst. Nat., Ed. 10, 1:411.

Genotype: *Dytiscus marginalis* Fabricius, 1775 (= *marginalis* Linnaeus, 1758), designated by Latreille. Curtis (1826: 99), Westwood (1838: 9), and

[5] *Dytiscus* is admittedly incorrectly transliterated from the Greek, though so written by Linnaeus. Geoffroy made the correction to *Dyticus* in 1762, and was followed by several authors, notably Bedel. Blackwelder (1939:17) prefers *Dyticus,* while F. Balfour-Browne (1940:206) uses *Dytiscus.* The matter cannot be finally settled until passed upon by the International Commission on Zoölogical Nomenclature, which apparently would have to choose amongst (1) an error in transcription, (2) a *lapsus calami,* or (3) acceptance by "common usage."

Crotch (1873:406) also cite *marginalis*. But Hope (1839:131 and 137), Duponchel (1845(5):154), and Thomson (1859:12) designate *D. latissimus* Linnaeus, 1758; Thomson's subgenus *Macrodytes,* of which he states the type to be *D. marginalis* Linnaeus, is thus a synonym of *Dytiscus* Linnaeus.

Kirby proposed the subgenus *Leionotus* for *D. conformis* Kunze, 1811 (= *marginalis* Linn.), and *D. circumcinctus* Ahrens, 1811, later adding his own *D.* (*L.*) *franklinii.* Hope (1839:131) designated *Dytiscus conformis* Kunze, 1811 (= *marginalis* Linn., 1758), as the type of *Leionotus* Kirby, attributing *conformis* to Stephens.

(44) **Dytiscus (Dytiscus) marginicollis** LeConte

Dytiscus marginicollis LECONTE, 1845, Boston Soc., Nat. Hist., Proc. 1:201; LECONTE, 1845, Boston Jour. Nat. Hist. 5:209, and pl. 18, fig. 10; CROTCH, 1873, Am. Ent. Soc., Trans. 4:408; SHARP, 1882, Roy. Dublin Soc., Sci. Trans. (2)2:638; ESSIG, 1926, Ins. west. N. America, p. 377; LEECH, 1941, Ent. News 52(10):290.
Dyticus (*Macrodytes*) *marginicollis,* HATCH, 1929, Brook. Ent. Soc., Bul. 23(5):226.

Length 27 to 30 mm. Head dark green with an inverted V-shaped yellow mark of variable extent, from anterior margin of frons to vertex; labrum and clypeus yellow. Pronotum dark green to rufo-piceous, broadly margined with yellow anteriorly, posteriorly, and at sides. Scutellum usually pale. Elytra dark green to distinctly rufous, margined almost to apices with yellow, irrorated apically. Ventral surface rufous to rufo-piceous. Apices of metacoxal processes pointed but not spinose. First three segments of male protarsi broadened to form a disk, which is provided beneath with a number of palettes and two cup-like suckers, the larger almost twice as big as the smaller.

Type locality: "In flumine Missouri," U.S.A.

Recorded distribution: Alaska to Alberta and California (Hatch 1929), Utah, Colorado, Nevada.

New records: Lower California: Hamilton Ranch, August 2, 1938, a male collected by Michelbacher and Ross; Laguna Hansen, May 7, 1939, a male collected by Roland Miller (S.D.N.H.M.).

Both these specimens are notably more parallel-sided than examples from further north, but I hesitate to propose a subspecific name on the basis of two males.

Genus **Eretes** Laporte

Eunectes ERICHSON, 1832, Gen. Dyt., p. 17, 23. (not *Eunectes* Wagler, 1830, Reptilia).
Eretes LAPORTE, 1833, Soc. Ent. France, Ann. 1(1832):397.

Genotype: *Dytiscus griseus* Fabricius, 1781 (=*Dytiscus sticticus* Linnaeus, 1767), designated by Laporte.

A genus containing two species, one almost cosmopolitan, the other confined to Australia, New Zealand, and Tasmania.

(45) **Eretes sticticus** (Linnaeus)

Dytiscus sticticus LINNAEUS, 1767, Syst. Nat., Ed. 12, p. 666.
Eretes sticticus, SHARP, 1882, Roy. Dublin Soc., Sci. Trans. (2)2:699; SHARP, 1882, Biol. Centr.-Amer., Coleopt. 1(2):46; WICKHAM, 1898, Ent. News 9(2):39; GUIGNOT, 1933, Hydroc. de France, p. 663–667, figs. 473–477; OMER-COOPER, 1931, Zool. Soc. Lond., Proc. (1931), p. 794.

Distinguishable at once from all other dytiscids in our fauna by the elytral margins, which from behind the middle to about the posterior fifth, are set with short flat spines and fine golden hairs. The synonymy for *sticticus* includes ten or more names, for which see Omer-Cooper's paper, cited above.

Length 14 to 17 mm.; yellowish-brown above and below; head black basally, with black spot between the eyes; pronotum often with vague piceous markings basally and at middle of disc; elytra, except laterally, with many small black dots, larger on each serial puncture, also a post-median lateral spot and an irregular transverse band at apical two-thirds black. Elytral apices slightly produced.

Type locality: "Barbaria."

Recorded distribution: This species is almost cosmopolitan; in the United States it has been listed from Kansas, Texas, New Mexico and California. Lower California: Cabo San Lucas. Tres Marias Islands.

New records: Four specimens collected by H. H. Keifer on Clarion Island.

Genus **Thermonectus** Dejean[6]

Thermonectus DEJEAN, 1833 (emend. 1837), Cat. Coleopt. coll. Dejean, p. 53.
Thermonectus MELSHEIMER, 1844, Acad. Nat. Sci. Phila., Proc. 2:26.
Thermonectes CROTCH, 1873, Am. Ent. Soc., Trans. 4:402 (and 398).

Genotype: of *Thermonectus* Dejean, *Dytiscus circumscriptus* Latreille, 1809, the only valid species in Dejean's 1833 list; of *Thermonectus* Melsheimer, *Thermonectus irroratus* Melsheimer, 1844 (= *Acilius* (*Thermonectus*) *ornaticollis* Aubé, 1838), designated by Leech, 1941; of *Thermonectes* Crotch, *Acilius ornaticollis* Aubé, designated by Crotch, 1873.

Beetles of from 8 to 14 mm. long, rather broadly oval and convex, usually prettily marked with black and yellow. Pronotum without lateral marginal beading; metatarsal claws unequal; metatibial spurs distinctly emarginate at apex. Elytra of females often partially or almost completely covered with elongate punctures.

KEY TO THE SPECIES OF THERMONECTUS OF LOWER CALIFORNIA

1. Elytra, at least in basal portion, yellowish with numerous black specks.....2
—Elytra black, spotted with yellow or with irregular longitudinal yellowish marks at sides 3

[6] If the validity of Dejean's Catalogues in establishing generic names is not acceptable to all students, then *Thermonectus* may be attributed to Melsheimer, 1844. See Leech, 1941:197.

2. Smaller species, 10 to 11 mm. long; pronotum yellow with a sub-basal compressed lenticular-shaped black marking on each side of median line; post-median blackish fascia of elytra discontinuous, lightly marked or virtually absent; basal disk on first segment of protarsi of male nearly twice as large as either of the other two large discs, which are subequal.....(46) **peninsularis**

—Larger species, 11 to 14 mm. in length; pronotum with an anterior and a sub-basal black band which may be connected at each side; post-median black fascia of elytra usually continuous, broad, well marked; three large disks on first segment of protarsi of male subequal.....(47) **nigrofasciatus**

3. Elytra black, with irregular marginal longitudinal yellowish marks, which may be divided by black lines or specks; length 9 to 11 mm.....(48) **basillaris**

—Elytra black, definitely marked with conspicuous yellow spots.....4

4. Each elytron with ten or eleven yellow spots of various sizes, lateral spots often connected along elytral margin; length 12 to 14 mm.....(49) **marmoratus**

—Each elytron marked with yellow as follows: a humeral spot, often extended basally towards scutellum and posteriorly along side; a spot at side, near middle; and one, which may be fasciform, near apex; length 8 to 10 mm.....(50) **margineguttatus**

(46) **Thermonectus peninsularis** (Horn)

Thermonectes peninsularis HORN, 1894, Calif. Acad. Sci., Proc. (2):4:362, and pl. 8, fig. 10.

Horn described this species from a single somewhat teneral male from San José del Cabo; this specimen is C.A.S. type No. 6.

I have seen the type and a topotypical male from Lower California, and two males from El Banito, Valles, San Luis Potosi, Mexico, June 29, 1940 (Harry Hoogstraal), from a small permanent pool; also a teneral male labelled Valles, San Luis Potosi, Mexico, (Mel Embury). Horn described the elytra as without trace of a black postmedian fascia, but there is one, though faint and irregular, in the type; it is perfectly distinct in the other specimens.

T. peninsularis is very similar to *succinctus* (Aubé), and a comparison with Aubé's type may prove them to be the same.

(47) **Thermonectus nigrofasciatus** (Aubé)

(Figure 3)

Acilius (*Thermonectus*) *nigrofasciatus* AUBÉ, 1938, Sp. gén. des Hydroc., p. 136.

Thermonectes ornaticollis var. *nigrofasciatus*, CROTCH, 1873, Am. Ent. Soc., Trans. 4:403; WICKHAM, 1893, Iowa State Univ., Lab. Nat. Hist., Bul. 2:325, and pl. 8, fig. 7.

Thermonectes nigrofasciatus, SHARP, 1882, Roy. Dublin Soc., Sci. Trans. (2)2:677; SHARP, 1882, Biol. Centr.-Amer., Coleopt. 1(2):44, and pl. 1, fig. 12; ZIMMERMANN, 1919, Arch. f. Naturg. (1917), 83(A.12):229.

In 1838 Aubé described *nigrofasciatus* and an allied species, *ornaticollis*, from Mexico. He said that the two were very similar, but that *ornaticollis* was darker in color, had a less conspicuous elytral band, and had the pronotum smooth in both sexes. *T. nigrofasciatus* was characterized by the contrasting black band across the elytra at apical third, and by the pronotal sculpture of small irregular and deeply engraved punctures in the female.

Subsequent authors have affirmed their belief in the specific distinctness of the two, without being able to add any characters for their separation. I find

myself in a similar position, except that an apparent slight difference in the parameres of the male genitalia has been noted.

In the United States the two species have different distributions, and are readily separated in the following manner:

1. Pronotum smooth in both sexes, except for a few punctures along base and in a longitudinal impression near each lateral margin. Form usually narrower, and more strongly arched in profile. Post-median black band of elytra indistinct or absent. Elytra of female with elongate punctures discally in basal half or less. Texas, Oklahoma, Kansas, Nebraska, eastward to Florida, Pennsylvania and the District of Columbia ..... **ornaticollis**

—Pronotum of males smooth, of females with numerous elongate punctures except at middle of disc. Form broader and less convex. Post-median black band strongly marked and usually continuous. Elytra of females with elongate punctures extending over entire basal two-thirds or more. Arizona ..... **nigrofasciatus**

A series of 16 specimens from Durango, Dgo., Mexico, May 30, 1937 (Mel Embury) trace to *nigrofasciatus* in the above key, and agree perfectly with Aubé's description of that species; Sharp's material (1882:44) was from further south, between San Luis Potosi and Oaxaca. *T. ornaticollis* occurs along the Gulf of Mexico, and so into Texas, etc.

With these distributions in mind one would expect to find only *nigrofasciatus* in Lower California. Such appears to be the case, but the specimens are most puzzling, and certainly not typical of the species as found in Mexico proper, and Arizona. They may represent a valid subspecies but in the absence of examples from adjacent parts of Mexico, it seems best not to propose a name at present. Of nineteen females from Lower California, four have a definite sexual sculpture on each side of the pronotum, about midway between the sides and the median line; these specimens also have a sexual sculpture on the median basal quarter of each elytron. Eleven other females have a slight roughening of the pronotum, where the punctation would be, and a dozen or so elongate punctures on the elytra; four females have no sexual sculpture on either the pronotum or elytra, and would trace to *ornaticollis* in the above couplet. However, the twelve males all agree best with *nigrofasciatus* as to the genitalia; and of the total of thirty-one specimens, all but five have the transverse elytral band strongly marked and entire.

Type locality: Mexico.

Recorded distribution: Oaxaca, Mexico, north to Arizona (and Texas acc. Zimmerman 1919:229).

New records (all Lower California): Triunfo, July 13, (pool in arroyo); Twenty miles north of Comondu, July 23 (in tinaja); Fourteen miles southeast of Santonio, July 7; twelve males and eighteen females collected by Michelbacher and Ross. Also one female, Escondido Bay, June 14, 1921 (J. C. Chamberlin) (C.A.S.).

(48) **Thermonectus basillaris** (Harris)

Dytiscus basillaris HARRIS, 1829, New England Farmer, 8(1):1; HARRIS in SCUDDER, 1869, Boston Soc. Nat. Hist., Occ. Papers 1:355.

Thermonectes basilaris [sic!], Crotch, 1873, Am. Ent. Soc., Trans. 4:402; Sharp, 1882, Roy. Dublin Soc., Sci. Trans. (2) 2:684, and pl. 17, fig. 212; Sharp, 1882, Biol. Centr.-Amer., Coleopt. 1(2):45; Wickham, 1895, Canad. Ent. 27(6):152; Blatchley, 1910, Coleopt...Indiana, p. 234; Leng and Mutchler, 1918, Am. Mus. Nat. Hist. Bul., 38(3):89; Zimmermann, 1919, Arch. f. Naturg. (1917), 83(A.12):230.

Acilius (*Thermonectus*) *incisus* Aubé, 1838, Sp. gén. des Hydroc., p. 147.

Acilius (*Thermonectus*) *cinctatus* Aubé, 1838, Sp. gén. des Hydroc., p. 151.

Thermonectus nimbatus Melsheimer, 1844, Aca. Nat. Sci. Phila., Proc. 2:26.

Acilius laticinctus LeConte, 1852, Lyceum Nat. Hist., N. Y., Ann. 5:203; Leng and Mutchler, 1918, Am. Mus. Nat. Hist., Bul. 38(3):90 (as *latecinctus*, sic!).

Thermonectes basilaris [sic!] var. *latecinctus* [sic!], Crotch, 1873, Am. Ent. Soc., Trans 4:402.

Thermonectes basilaris [sic!] var. *intermedius* Crotch, 1873, Am. Ent. Soc., Trans. 4:402

Thermonectus basilaris [sic!], Leech, 1941, Canad. Ent. 73(11):197.

This species is predominantly black dorsally; the lateral yellowish marks are normally present from base to apex of the elytra. Western specimens tend to lack the transverse yellow mark on the pronotum and across the elytral bases, and to be rufo-testaceous ventrally; these are the variety *intermedius* (Crotch), which may prove to be a valid subspecies. Some examples have the elytra more broadly yellow at middle and apex; LeConte described these as a distinct species, *laticinctus,* but they appear to be merely aberrations of *basillaris.*

Type locality: of *basillaris* Harris, none given, described from "Specimen a male in the cabinet of W. Oakes, Esq.," Mr. Oakes collected chiefly in Massachusetts I believe; of *incisus* (Aubé), Mexico; of *cinctatus* (Aubé), Mexico; of *laticinctus* (LeConte), the Colorado River, Calif.; of *intermedius* (Crotch), California; of *nimbatus* Melsheimer, Pennsylvania.

Recorded distribution: Southern United States; Mexico; Guatemala.

New records: Lower California: Twenty miles north of Comondu, July 23. A single female collected by Michelbacher and Ross. The pronotum is black except at the sides, as in the var. *intermedius,* but the ventral surface is rufo-piceous as in typical *basillaris.*

(49) **Thermonectus marmoratus** (Hope)

Hydaticus marmoratus Hope, 1832, *in:* Cuvier, Animal Kingdom, 14 (Class Insecta Vol. 1): 284, and pl. 32, fig. 1; Aubé, 1838, Sp. gen. des Hydrocanthares, p. 167; Heyne, 1893–1908, Die exot. Käfer, p. 29.

Thermonectes marmoratus, Crotch, 1873, Am. Ent. Soc., Trans. 4:403; Sharp, 1882, Roy Dublin Soc., Sci. Trans. (2)2:683, and pl. 17, fig. 211; Sharp, 1882, Biol. Centr.-Amer., Coleopt. 1(2):45; Zimmermann, 1919, Arch. f. Naturg. (1917), 83(A.12): 230.

Hydaticus flavomaculatus Chevrolat, 1833, Coleopt. Mexique, fasc. 1, Sp. No. 4.

Acilius maculatus LeConte, 1854, Acad. Nat. Sci. Phila., Proc. 7:221 (not *Acilius* (*Thermonectus*) *maculatus* Aubé, 1838).

This is the most colorful of the medium sized American Dytiscidae. The yellow spots on the elytra vary in size, though the two median sutural ones

are usually the largest. Zimmermann (1919 : 230) has described as ab. *latefasciatus* a form in which the discal spots are joined to those at the side, forming a broad transverse yellow band narrowly broken with black at the suture; he did not state the locality in which this aberration occurs, and the only specimen known to me which fits the description, belong to a distinct species. One example of *marmoratus* at hand (San José del Cabo) has the elytra suffused with piceous, the only yellow being four small basal spots and an arcuate median series of four large one.

I am not sure who first placed *maculatus* (LeConte) as a synonym, unless it was Van den Branden (1885 : 106).

Type locality: of *marmoratus* (Hope), Mexico; of *flavomaculatus* (Chevrolat), "Orixaba," Mexico; of *maculatus* (LeConte), "Copper mines" [? Arizona].

Recorded distribution: Mexico; Central America; southwestern United States: Arizona, Utah, California; Lower California: San José del Cabo; Cabo San Lucas; between San José del Cabo and Triunfo, near sea level.

New records: Lower California: Seventeen miles south of Ensenada, June 14; Twenty miles north of Comondu, July 23 (in tinaja). A male and two females collected by Michelbacher and Ross. Also specimens from Espíritu Santo Island, Gulf of California, June 9 (C.A.S.).

(50) **Thermonectus margineguttatus** (Aubé)

Acilius (*Thermonectus*) *margineguttatus* AUBÉ, 1838, Sp. gén. des. Hydroc., p. 149; CHEVROLAT, 1841, Mag. Zool. (2)3:12.

Thermonectes margineguttatus, SHARP, 1882, Roy. Dublin Soc., Sci. Trans. (2)2:683; SHARP, 1882, Biol. Centr.-Amer., Coleopt. 1(2):45.

A pretty little species resembling *basillaris* at first glance. The three larger palettes of the male protarsi are subequal in size in *margineguttatus*, while the basal palette is much larger than the other two in *basillaris*.

Type locality: Mexico.

Recorded distribution: From Mexico and the West Indies to Brazil. Horn (1896 : 368) recorded this species from the San José del Cabo; I have not seen Lower California examples.

Genus **Hydaticus** Leach

Hydaticus LEACH, 1817, Zool. Misc. 3:69, 72. (not *Hydaticus* Schoenherr, 1825, Curculionidae).

Genotype: *Dytiscus transversalis* Pontoppidian 1763; designated by Curtis, 1825 : 95 (attributing the species to Fabricius), and by Crotch, 1873 : 403. Hope (1839 : 131) cited *D. hybneri* Fabricius, 1787 (= *D. seminiger* Degeer, 1774). Duponchel (1845 (6) : 728) designated *D. fasciatus* Fabricius, 1775, a species not listed by Leach, but now placed in the genus *Sandracottus* Sharp, 1882.

A genus containing numerous species, many of which occur in Africa and the East Indies, and only a few in the Nearctic region. Our forms average 12 mm. in length.

(51) **Hydaticus** sp.

Horn (1894: 314) recorded *stagnalis* (Fabricius) from San José del Cabo. Wallis (1939) has shown that the *stagnalis* of American collections is not the European species, but is in fact *modestus* Sharp, of which *americanus* Sharp is a synonym. From the known distribution of *modestus*—British Columbia and Alberta eastward to the Atlantic coast, and southward at least to Wisconsin and Illinois—I am extremely doubtful that it occurs in the Cape region of Lower California. On the other hand, a species which occurs in the near-by state of Nayarit, Mexico, *rimosus* Aubé, is superficially like *modestus*, and could have been misidentified by Horn.

(52) **Hydaticus** sp.

Horn (1896: 368) recorded *H. bimarginatus* (Say) from San José del Cabo. *H. bimarginatus* is a species of the eastern half of the United States, and again I would be much surprised to know that it occurred at San José del Cabo. I cannot imagine what Horn had before him when he made the identification. I have not seen any species of *Hydaticus* from Lower California.

FAMILY **GYRINIDAE**

KEY TO THE GENERA OF GYRINIDAE OF CALIFORNIA AND LOWER CALIFORNIA

1. Last apparent abdominal sternite elongate, conical, pubescent along median line; scutellum not visible; small species, about 5 mm. long. (Not recorded from Lower California) ..... **Gyretes**
—Last sternite broader and flatter, not conical, not pubescent along median line; scutellum visible or not; size variable 2

2. Scutellum visible; elytra striae punctate; smaller species, length 4.5 to 8 mm. ... **Gyrinus**
—Scutellum invisible; elytral striae not punctate; larger, broader species, length 10 to 15 mm. ..... **Dineutus**

Genus **Gyrinus** Geoffroy

Gyrinus GEOFFROY, 1762, Hist. abreg. Ins. Paris, 1:193. (not *Gyrinus* Shaw, 1798, Reptilia).

Genotype: *Dytiscus natator* Linnaeus 1758, the only described species in Geoffroy's genus. According to F. Balfour-Browne (1940: 207), "As Geoffroy in his work did not adopt the binominal system, *Gyrinus* cannot rank for date until validated by Müller, 1764." However, as Goeffroy's publication of 1762 is recognized by Neave in his recent Nomenclator Zoologicus, I have so credited the genus here. Geoffroy has been accepted by W. E. China in his paper on the generic nomenclature of the British Hemiptera, he being influenced by Opinion 46 of the International Commission on Zoological Nomenclature.

Key to the Species of Gyrinus of Lower California

1. Elytral striae not impressed, but consisting of lineal series of punctures; intervals flat; area just within outer apical angle inflated to form an oblique rounded ridge. Undersurface chiefly rufous or rufo-piceous. Median lobe (aedeagus) of male genitalia constricted beyond middle, the apical third very narrow, parallel-sided, spine-like. Elytra shining, polished in both sexes. Larger species, 5 to 6 mm. long. (53) **plicifer.**
—Elytral striae, except those near suture and sides, impressed, the punctures of the impressed series coarser; intervals slightly rounded. No oblique plica across outer apical angles of elytra. Undersurface chiefly black or piceous. Aedeagus gradually narrowed to near apex, which is slightly broadened and flattened. Elytra of male shining, of female microreticulate and dull. Smaller species, 4 to 5 mm.. (54) **parcus?**

(53) **Gyrinus plicifer** LeConte

Gyrinus plicifer LeConte, 1852, Lyceum Nat. Hist. N.Y., Ann. 5:209; LeConte, 1868, Acad. Nat. Sci. Phila., Proc., 1868: 368, 371; Régimbart, 1883, Soc. Ent. France, Ann. (6)3:153, and pl. 6, fig. 84; Sharp, 1887, Biol. Centr.-Amer., Coleopt., (Suppl.), 1(2):761; Fall, 1922, Am. Ent. Soc., Trans. 47:287, and pl. 16, fig. 12.

This rather strongly convex species is quite easily recognized by the plica near the elytral margin, extending across the outer apical angle. The median lobe of the male genitalia is narrow and spine-like in the apical third.

Type locality: San Diego, California.

Recorded distribution: From the southern coast of British Columbia to California; Colorado; Arizona; Texas; Mexico: northern Sonora; Lower California: La Chuparosa.

New records: Lower California: Seventeen miles south of Ensenada, June 14 (stream; irrigation ditch); Rosario, June 17 (in pool); San Miguel, July 3; Hamilton Ranch, August 2: Twenty miles south of Santo Tomas, August 3 (in a brook). Fifteen males and twelve females collected by Michelbacher and Ross.

(54) **Gyrinus parcus** Say ?

Gyrinus parcus Say, 1834, Am. Philos. Soc., Trans. 4:448.
Gyrinus parcus (LeConte) [sic!], Horn, 1884, Calif. Acad. Sci., Proc. (2)4:315.

Horn there records *parcus* from La Chuparosa, Lower California. I have not seen any specimens from the peninsula. However, in 1939 Dr. George Ochs, authority on the Gyrinidae, examined my series under this name from the United States and Mexico; he placed those from Iowa, Texas, Nebraska and some from Oaxaca, Oax., Mexico, as true *parcus* Say, designating other Oaxaca examples as a new species. It is possible that Horn's specimens are closer to it than to true *parcus*.

Type locality of *parcus:* Mexico.

Recorded distribution: Mexico; Pennsylvania; Kansas; Texas; California; Lower California: La Chuparosa.

Genus **Dineutus** MacLeay

Dineutus MacLeay, 1825, Annulosa Javanica, 1:30.
Dineutes Auct.

Genotype: *Dineutus politus* MacLeay, 1825; the only species mentioned by MacLeay.

Only one species, *sublineatus* (Chevrolat), has been recorded from Lower California, but *solitarius* (Aubé) is to be expected there.

KEY TO THE SPECIES OF DINEUTUS OF CALIFORNIA AND LOWER CALIFORNIA

1. Length 12 to 15 mm. (Subgenus *Dineutus*); profemora of males with a small tooth at apical three-fourths, on lower anterior margin; apex of median lobe of male genitalia dorso-ventrally flattened, apices of parameres sub-acute....(55) **sublineatus**
—Length 9 to 10 mm. (Subgenus *Cyclinus* Kirby); profemora of males with small tooth at apical three-fourths on lower anterior margin; apex of median lobe of male genitalia distinctly arched, not flattened, apices of parameres broadly round...**solitarius**

(55) **Dineutus (Dineutus) sublineatus** (Chevrolat)

(Figure 5)

Gyrinus sublineatus CHEVROLAT, 1833, Coleopt. Mexique, Fasc. 1, Sp. No. 2.

Dineutes sublineatus, AUBÉ, 1838, Sp. gén. des Hydroc., p. 775; SHARP, 1882, Biol. Centr.-Amer., Coleopt. 1(2):49; RÉGIMBART, 1883, Soc. Ent. France, Ann. (6)2:411, also pl. 10, fig. 12, and pl. 11, fig. 33; ROBERTS, 1895, Am. Ent. Soc., Trans. 22:281, 283, also pl. 5, fig. 2, and pl. 6, fig. 2a, b.

Dineutus sublineatus (AUBÉ) [sic!], LECONTE, 1861, Acad. Nat. Sci. Phila., Proc., 1861: 335; LECONTE, 1878, Acad. Nat. Sci. Phila., Proc., 1868:366, 367. (LeConte attributed the species to Aubé, listing "Gyrinus subl. Chevr." as a synonym thereof.)

Dineutus (*Dineutus*) *sublineatus*, HATCH, 1930, Publ. Univ. Oklahoma Biol. Survey, 2(1):17.

Dineutes integer LECONTE, 1854, Acad. Nat. Sci. Phila., Proc. 7:221.

Dineutus integer, LECONTE, 1861, Acad. Nat. Sci. Phila., Proc. 1861, [13]:335; LECONTE, 1868, Acad. Nat. Sci. Phila., Proc., 1868:367.

A large, broad species, black dorsally with submetallic reflections, legs and undersurface tinged with rufous.

Type locality of *sublineatus* Chevrolat: "Mexica Bocadelmonte"; of *integer* LeConte: "Copper Mines" [? Arizona].

Recorded distribution: From Nicaragua to Arizona; Lower California: Cabo San Lucas.

New records: Lower California: Escondido Bay, June 14, 1921, collected by J. C. Chamberlin (C.A.S.); Sonora, March, 1939, collected by Roland Miller (S.D.N.H.M.).

Dineutus (Cyclinus) solitarius (Aubé)

Dineutes solitarius AUBÉ, 1838, Sp. gén. des Hydroc., p. 780; RÉGIMBART, 1883, Soc. Ent. France, Ann. (6)2:418, and pl. 12, fig. 40.

Dineutus (*Cyclinus*) *solitarius*, HATCH, 1930, Publ. Univ. Oklahoma Biol. Survey, 2(1):17.

Dineutus solitarius, LEECH, 1940, Pan-Pacific. Ent. 16(2):74.

A rather small, ovate species, color as in *sublineatus*.

Type locality: Mexico.

Recorded distribution: Nicaragua to Mexico; California.

No Lower California specimens have been seen, but the species is common in the state of Nayarit, Mexico, and has been taken at Mecca, in Riverside Co., Calif.

FAMILY HYDROPHILIDAE

Of recent years the composition of this family has been changed several times. D'Orchymont in 1919 removed a group of genera to form the family Hydraenidæ; he subdivided it into 3 subfamilies: Hydraeninae, Limnebiinae and Spercheinae; the latter does not occur in our fauna. Forbes studied the wings of a great many species of beetles, and with reference to the Hydrophilidae concluded (1926: 66) that "*Octhebius* [sic!] and *Hydraena* (doubtless all the genera with more than six abdominal segments) do not belong here, but with the aberrant Silphidae." By this latter he meant the Leiodidae (written Liodidae by him and by Böving) of the Staphyliniformia.

After studying the larvae, Böving (in Böving and Craighead, 1931) proposed the family Limnebiidae (pp. 25, 26), to include the genera *Limnebius, Ochthebius* and *Hydraena,* and placed this family in the leptinid association of the Staphylinoidea. The genus *Spercheus* constitutes the family Spercheidae of the Hydrophiloidea in Böving's system. The same author (p. 32) proposes two other families, Helophoridae based on the genus *Helophorus,* and Hydrochidae for the genus *Hydrochus.*

In the present paper the family Limnebiidae has been accepted but the genera *Helophorus* and *Hydrochus* are left in the Hydrophilidae. It is felt that finality in the composition of the Hydrophilidae has not yet been reached.

KEY TO THE SUBFAMILIES, TRIBES, AND GENERA OF HYDROPHILIDAE OF LOWER CALIFORNIA

1. Pronotum with five longitudinal sulci, or produced anteriorly at middle so as to hide much of the head 2
—Pronotum not with 5 longitudinal sulci, not produced anteriorly, so as to hide much of head 3
2. Pronotum with five longitudinal sulci. Antennae short, 9-segmented; club pubescent, 3-segmented, not compact. Eyes not divided by a canthus. Form more or less elongate, not very convex, elytra not projecting below abdomen. **(Helophorinae). Helophorus**
—Pronotum produced anteriorly at middle, covering much of head. Antennae 9-segmented; club pubescent, compact. Eyes divided horizontally, partially or completely, by a canthus. Form short and convex, elytra often tuberculate; elytra projecting much below abdomen. **(Epimetopinae).** (Fig. 10) ..... **Epimetopus**
3. Lateral contours of body uneven, pronotum conspicuously narrower than elytral bases. Scutellum very small. Eyes prominent. Maxillary palpi never very long. Last segment of metatarsus as long as the four preceding, first segment short. Pronotum with more or less conspicuous impressions; abdominal segments two to five with numerous impressions. **(Hydrochinae).** (Fig. 9) ..... **Hydrochus**
Lateral contours of body even, pronotum not narrower than the elytral bases (except in some **Berosini,** but there note elongate triangular scutellum). Eyes prominent or not. Last segment of metatarsi much shorter than the preceding segments together (except *Helobata,* but note elongate maxillary palpi) 4
4. Antennae usually longer than maxillary palpi which are never very long, last glabrous antennal segment obconic, fitted more or less tightly against first segment of the pubescent club, which may be loose or compact. First segment of meso- and metatarsi

usually longer than second. Labrum often concealed or retractile. Always five visible abdominal sternites. Species terrestrial, or in damp places. **(Sphaeridiinae).** (Fig. 8) 16

—Antennae shortened, about as long as or shorter than maxillary palpi, last glabrous segment asymmetrical, often cup-like, embracing first segment of the pubescent always tri-articulate club, which is compact. First segment of meso- and metatarsi shorter than second (except in *Helobata,* but note very long maxillary palpi), often difficult to see. Labrum often exposed. Abdomen with five visible sternites, or with a sixth more or less retractile under fifth. Species aquatic **(Hydrophilinae)** 5

5. Scutellum not or not much longer than its basal width. Antennae at most 9-segmented (6 + 3). Eyes not prominent, not particularly convex. Pronotum not narrowed posteriorly, not narrower than bases of elytra and not received into an emargination or furrow therein (if with ability to roll up somewhat, armadillo-like, then meso- and metatarsi have no fringe of long swimming hairs on the inner sides) 7

—Scutellum a long triangle. Antennae at most 8-segmented (5 + 3). Pronotum somewhat narrowed posteriorly, hind angles reduced, underside of basal margin fitted to a groove across bases of elytra. At rest the pronotum is nearly vertical, and the mouthparts applied to or near the mesosternum. No fringe of long golden hairs on anterior margin of first visible abdominal sternite. **(Berosini).** (Fig. 13) 6

6. Mesosternal protuberance broadened anteriorly from just in front of mesocoxae, then narrowed again to a blunt point, the broadened area deeply excavated. Aedeagus and parameres only partly enclosed at foot by a small basal piece. Anterior tarsi pentamerous in both sexes ..... **Hemiosus**

—Mesosternal protuberance narrow, blade-like, usually falcate anteriorly (hooded in *rugulosus*). Aedeagus and parameres in great part sheathed in a large trough-shaped basal piece. Anterior tarsi of male tetramerous, of female pentamerous... **Berosus**

7. Meso- and metasternal carinae closely united and forming a continuous median ridge on ventral surface. **(Hydrophilini)** 8

—Meso- and metasternal carinae, if present, not intimately united 10

8. Prosternum carinate, not sulcate. Mesosternal carina with a small notch on anterior part (profile). Posterior end of metasternal carina not or hardly reaching beyond base of metatrochanters, not elongate and spinose ..... **Hydrochara**

—Prosternum sulcate to receive anterior part of mesosternal protuberance. Metasternal carina elongated and spinose posteriorly 9

9. Last segment of maxillary palpi shorter than penultimate. Larger species, 35 to 40 mm. long ..... **Hydrophilus**

—Last segment of maxillary palpi equal to or longer than penultimate. Smaller species, 8 to 15 mm. long ..... **Tropisternus**

10. First two abdominal sternites with a common excavation, large and spectacle-shaped, containing a hyaline transversely bilobed mass supported by a fringe of long stiff golden hairs arising from anterior margin of first visible sternite. Antennae 9-segmented, small beetles (1 to 2.5 mm.) with ability to roll up partially. **(Chaetarthriini)** ..... **Chaetarthria**

—First two abdominal sternites not with a broad common excavation; first sternite without a fringe of long stiff hairs. Five or six visible sternites. Antennae variously segmented. Species without ability to roll up. **(Hydrobiini)** 11

11. Maxillary palpi robust and short, nearly as long as antennae or shorter; ultimate segment as long as or longer than penultimate. Elytra with sutural stria, or if not, antennae have less than nine segments. **(Hydrobiae)** 12

—Maxillary palpi more slender, longer than antennae, with ultimate segment shorter than penultimate. **(Helocharae)** 14

12. First segment of meso- and metatarsi very short, second much longer; metafemora densely finely pubescent, or not 13

—Second segment of meso- and metatarsi not particularly longer than first, sometimes even of same length. Posterior femora not densely pubescent. Elytra with sutural striae. Antennae 7- to 9-segmented.....**Paracymus**

13. Metatrochanters not enlarged. Only five abdominal sternites normally visible. Metafemora densely pubescent on undersides except apically, in most species. Small species, about 2 to 2.5 mm. long.....**Anacaena**

—Metatrochanters elongate at apex and there separated from femora. Antennae 8-segmented. Elytra without sutural striae. Meso- and metafemora without dense hydrofugal pubescence. Fifth abdominal sternite truncate on hind margin, sixth showing .....**Laccobius**

14. All tarsi 5-segmented, though basal segment may be very small and difficult to see....15

—Meso- and metatarsi 4-segmented. Mesosternal protuberance small, transverse **Cymbiodyta**

15. Pseudo-basal segment of maxillary palpi curved, with the convexity to the front. Mesosternum with a longitudinal lamina. Elytra confusedly punctate.....**Enochrus**

—Pseudo-basal segment of maxillary palpi curved, with the convexity posteriorly. Mesosternum at most feebly protuberant. Elytra striatopunctate **(Hydrobaticus)**, or with only the sutural striae.....**Helochares**

16. Head not narrowed just before the eyes, outer margin not forming a conspicuous angle with the latter. Antennae inserted under a laminated border which conceals their bases from above; antennae usually much longer than maxillary palpi. Metasternum usually prolonged between the mesocoxae, closely united with the mesosternal protuberance. **(Sphaeridiini)**.....19

—Head abruptly narrowed before the eyes, the outer margin forming a conspicuous angle with the latter. Antennae inserted freely, not under a laminated border, their bases quite visible from above. Metasternum not prolonged between the mesocoxae.....17

17. Mesosternal protuberance longer than wide, laminate or flat. Mesocoxae never widely separated. Prosternum merely carinate at middle; or occasionally elevated, flat or tectiform. **(Cercyonini)**.....18

—Mesosternal process flat, at least as wide as long, always widely in contact with the metasternum. Mesocoxae very widely separated. Prosternal process always elevated at middle to plane of mesosternal process as a flat plate, not carinate. **(Megasternini)** **Cryptopleurum**

18. Mesosternal elevation appearing as a prolongation of disc of metasternum, the two in broad contact.....**Pelosoma**

—Mesosternal elevation obviously not an extension of the metasternum, the two in contact at a single point, or separated by a hiatus.....**Cercyon**

19. Apex of abdomen not covered by the elytra. Scutellum an elongated triangle. Elytra with sutural striae. First abdominal sternite not carinate. Antennae 8-segmented. First segment of metatarsi longer than second.....**(Sphaeridium)**

—Elytra covering apex of abdomen. Scutellum short, triangular. Antennae 9-segmented..20

20. First abdominal sternite carinate at middle. Sutural striae distinct. Prosternum carinate between the coxae.....**Dactylosternum**

—First sternite not carinate. No sutural striae. Prosternum not carinate between coxae **Phaenonotum**

Genus **Helophorus** [Fabricius] emend. Illiger

Helophorus [Fabricius 1775, as Elophorus] ILLIGER, 1801, Mag. f. Insektenk. 1:138. (not *Helophorus* Gistl., 1848, Coleoptera).

Genotype: *Silpha aquatica* Linnaeus, 1758; designated by Latreille 1810. The same species has been cited by Curtis (1833: 466), Westwood (1838: 9), and Duponchel (1845 (5): 281); the last author referred to it as "*grandis*

Illig. *aquaticus* Fabr.; c'est le *Dermeste bronzé* de Degeer. . . ." Knisch (1924: 66) also cited aquaticus Linnaeus, yet failed to place it in the typical subgenus.

(56) **Helophorus lecontei** Knisch

Helophorus obscurus LECONTE, 1852, Lyceum Nat. Hist. N. Y., Ann. 5:210 (not *Helophorus obscurus* Mulsant 1844); LECONTE, 1855, Acad. Nat. Sci. Phila., Proc. 7:357.
Helophorus lecontei KNISCH, 1924, *in:* Coleopt. Cat., Pars 79:88; D'ORCHYMONT, 1934, Soc. Ent. Belgique, Bul. & Ann. 74:255.

There are no specimens from Lower California in the material before me, but Horn (1894: 315) recorded it, as *obscurus* LeConte, from San Pedro Martir.

H. lecontei was described from San Francisco. D'Orchymont suspects that the Colorado River specimens mentioned by LeConte in 1855 may be another species, since his description of them differs somewhat from the 1852 description.

Genus **Epimetopus** Lacordaire

Ceratoderus MULSANT, 1851, Acad. Sci. Lyon, Cl. Sci., Mém. (N.S.) 1:1. (not *Ceratoderus* Westwood, 1841; not *Ceratoderus* Gemminger & Harold, 1870).
Epimetopus LACORDAIRE, 1854, Hist. Nat. Ins. Genera Coléopt. 1:465, 467.
Sepidulum LECONTE, 1874, Am. Ent. Soc., Trans. 5:47.

Genotype: *Ceratoderus graniger* Mulsant, 1851.

The species of this genus are American and Asiatic. Schwarz and Barber (1918: 131) suggested that the Asiatic forms are not congeneric with ours, but more recently d'Orchymont (1933: 288) has described a tiny species from Brazil which unites the two groups.

(57) **Epimetopus thermarum** Schwarz and Barber

(Figure 10)

Epimetopus thermarum SCHWARZ and BARBER, 1918, Ent. Soc. Wash., Proc. 19:130, and figs. 1, 2; D'ORCHYMONT, 1933, Soc. Ent. Belgique, Bul. and Ann. 73:287.

Length 2 to 2.8 mm. Head and pronotum black; elytra black in nearly basal half, and in a narrow oblique band just behind middle, elsewhere rufescent; undersurface black; legs, fifth abdominal sternite, and sides of preceding sternites, rufescent.

Dorsal surface of *head* and *pronotum* tuberculate, except labrum which is shining; eyes divided by an almost median horizontal canthus; a deep broadly V-shaped suture across middle of head. Pronotum extended over median base of head in an arc-form; a concave spear-shaped area outlined on middle of pronotum by costae; whole discal area much raised above lateral margins, which are strongly angulate just before middle, thence arcuate (except for a small angulation just behind primary) to basal angles which are obtuse; margins serrate in posterior half. Alternate *elytral* intervals including sutural, costate, costae finely irregularly tuberculate, other intervals with a median row of widely spaced tubercles, coarser basally; serial punctures large, round

(those near suture less so), separated by nearly their own diameters; humerus and a lateral post-humeral area tumid, third costa interrupted by a depression in basal fifth. *Prosternum* not carinate; *mesosternum* slightly arcuately protuberant at middle just before mesocoxae, vertically in front of that; *metasternum* tuberculate; abdominal *sternites* polished, shining; *legs* subtuberculate, profemora smooth and with an oval patch of golden hairs, on basal half of anterior face, near lower margin.

Type locality: "In the algal accumulations at the margins of the warm stream (about 100°F.) flowing from the Castle Creek Hot Springs, Yavapai Co., Arizona."

Recorded distribution: Type locality. (Also San José del Cabo, Lower California, presuming the *E. costatus* (LeConte) of Horn's list to be this species.)

New records: Lower California: Five miles west of San Bartolo, July 13; Five miles south of Miraflores, July 10. Sixteen specimens taken at light by Michelbacher and Ross.

The occurrence of this species in the Cape region of Lower California is a surprise indeed. Through the kindness of Dr. L. L. Buchanan I have for comparison four paratypes (two pairs) of *thermarum*. The Lower California examples average a little darker than Arizona specimens, but agree in all characters, including the male genitalia. There can be little doubt that this is the *costatus* of Horn's list.

The female of *Epimetopus* has been recorded as carrying her egg sac on the ventral surface of her abdomen (Sharp, 1874, Ent. Monthly Mag. **11**: 248). Schwarz and Barber (1918: 131) found this to be so in the types of *thermarum*, and stated that the sac would be described by E. A. Richmond, but to the best of my knowledge he never published on it.

One female from Five miles west of San Bartolo had an egg sac, but unfortunately it was detached before its significance was realized. The sac was yellowish-white in color, silky in texture, of the same size and shape as the ventral surface of the abdomen and contained ten eggs.

Genus **Hydrochus** Leach

Hydrochus LEACH, 1817, Zool. Misc. 3:90. (not *Hydrochus* Fallén, 1823, Diptera).
Hydrocus PROVANCHER, 1877, Petite Faune Ent. Canada, Coleopt. 1:211.
Hydrochoüs BEDEL, 1881, Faune Coléopt. Bassin Seine, 1:316.
Hydrochous GANGLBAUER, 1904, Käf. Mitteleur. 4:176; RICHMOND, 1920, Am. Mus. Nat. Hist., Bul. 42:27, 28, 29.

Genotype: *Elophorus elongatus* Fabricius, 1792 (= *Silpha elongata* Schaller, 1783), designated by Curtis (1831: 359), Westwood (1838: 9), Hope (1839: 148), Thomson (1859: 16), Crotch (1870: 230), and Knisch (1924: 96). The last two cited the species as *elongatus* Schaller.

It is almost impossible to make satisfactory identifications in this genus at present. Except for a key to the species of the Great Lakes region by Blatchley (1910: 251–252), and some notes on those expected to occur in Florida by Leng and Mutchler (1918: 98–99), there has been no recent published work on

the Nearctic forms. Most of the species have been founded on the shape of the pronotum, and the sculpture and punctation of the pronotum and elytra; but these last characters are more variable than was recognized by LeConte.

(58) **Hydrochus variolatus** LeConte

(Figure 9)

Hydrochus variolatus LECONTE, 1852, Lyceum Nat. Hist. N.Y., Ann. 5:211; LECONTE, 1855, Acad. Nat. Sci. Phila., Proc. 7:360; LENG and MUTCHLER, 1918, Am. Mus. Nat. Hist., Bul. 38:99.

Length 2.75 to 3.5 mm. *Pronotum* narrowed towards base, sides subsinuate, lateral margins crenate; a series of five large deep foveae, three across the pronotum at middle, median fovea largest, and two more elongate ones basad. *Elytra* coarsely punctate, interspaces narrower than or about as wide as striae; third and fourth interspaces usually somewhat raised at apical third. Ventral surface deeply sculptured, covered with very short velvety pubescence. *Legs* bicolored; femora piceous, tibiae yellowish-brown.

Many of the above characters vary, as follows: The punctation of the pronotum may be more extensive and include the foveae. The elytral punctation is coarser in some specimens than in others; the fourth, sixth and eighth interspaces may be noticeably elevated in the apical third, and differ on the two elytrons. The color may be opalescent, clay-like, or rarely almost black, with a varying number of small purplish spots.

Type locality: San Diego, California.

Recorded distribution: California; Texas. Wickham (1897: 114, and 1898: 39) recorded it as common in sloughs along the Rio Grande at Brownsville, his specimens being identified by G. H. Horn; but Brownsville examples before me are smaller, narrower, and apparently another species. Florida, recorded with doubt by Leng and Mutchler; almost certainly not the true *variolatus*.

New records: Lower California: Seventeen miles south of Ensenada, June 14; Hamilton Ranch, August 2. Thirty-four specimens collected by Michelbacher and Ross, probably at light. Also two examples labelled "Marine Bonndary [sic!], Lower California, (A. Forrer)," Leng-Leech Coll.; this is perhaps west of Tijuana?

Genus **Hemiosus** Sharp

Hemiosus SHARP 1882, Biol. Centr.-Amer., Coleopt. 1(2):84; D'ORCHYMONT, 1940, Soc. Ent. Belgique, Bul. & Ann. 80:171; D'ORCHYMONT, 1943 B, Musée roy. Hist. nat. Belgique, Bul. 19(42):1–2.

Genotype: *Hemiosus maculatus* Sharp, 1882; the only species listed by him.

(59) **Hemiosus maculatus** Sharp

Hemiosus maculatus SHARP, 1882, Biol. Centr.-Amer., Coleopt. 1(2):85, and pl. 3, fig. 2; SHARP, 1887, Biol. Centr.-Amer., Coleopt., (Suppl.) 1(2):767; D'ORCHYMONT, 1921, Soc. Ent. Belgique, Ann. 61(7):254; D'ORCHYMONT, 1940, Soc. Ent. Beligque, Bul. & Ann. 80:172, footnote 3.

Length 2.5 to 3 mm. Head and pronotum iridescent; elytra dull yellow with usually eight large black spots, those often obscured by a green or coppery colour which may cover the entire elytral surface; underparts piceous or rufo-piceous (or silvery because of a fine pubescence), mouthparts, antennae, tibiae, tarsi and apices of femora reddish-yellow.

Head and *pronotum* densely, coarsely punctate, with many fine punctures between large ones, pronotum with a small deep rounded impression near base at each side; *elytra* with striae impressed only in apical half, strial punctures large, round, and closely placed, much bigger laterally, interspaces very finely irregularly punctured. *Head* compresso-carinate beneath at middle; *prosternum* notched anteriorly at middle; *mesosternal process* narrowly almost rhomboidal, deeply excavated, dull and pubescent; median area of mesosternum raised as in *Berosus,* excavated at middle; abdominal *sternites* overlapping, not smoothly fitted, first apparent sternite with a broad median carina, fifth excavated apically, unidentate at middle as in many species of *Berosus;* metafemora pubescent nearly to apices. *Protarsi* of male 5-segmented, simple, not appreciably broader than those of female.

Type locality: Guatemala, Pantaleon, 1,700 ft. elev.

Recorded distribution: Guatemala; Panama; Mexico: La Noria, Sinaloa, Colima; Peru.

New records: Lower California: Twenty miles north of Comondu, July 23 (in a lagoon). Ten specimens collected by Michelbacher and Ross.

No authentic specimens of *maculatus* have been seen; the examples described above may possibly be a distinct species.

Genus **Berosus** Leach

Berosus LEACH, 1817, Zool. Misc. 3:92.

Genotype (*Berosus* s. str.): *Dytiscus luridus* Linnaeus, 1761, the only species cited by Leach, op. cit., p. 93.

One of the characters used in the key to species (the uni- or bidentation of the middle of the emargination in the apparent fifth abdominal sternite) requires a good light and a magnification of at least 25 ×, to be seen clearly.

Some of the species of *Berosus* stridulate loudly when captured.

KEY TO THE SPECIES OF BEROSUS OF LOWER CALIFORNIA

1. Elytra spinous or bispinous posteriorly, near or at suture; larger species, 6 to 8 mm. long. (Subgenus **Enoplurus** Hope) 2
—Elytra not spinous posteriorly, the apices acute at most; smaller species, 2.75 to 6 mm. (Subgenus **Berosus** s. str.) 3
2. Pronotum coarsely, deeply punctate, with a longitudinal carina at middle; each elytron with a tooth before the sutural angle, the angle itself acute and slightly produced (most males), or rectangular or obtuse (most females); elytral interspaces rough, with numerous punctures the margins of which are scabrous.... (60) **punctatissimus**
—Pronotum smooth, fairly coarsely but more sparsely punctate, median carina hardly differentiated; each elytron with a tooth before the sutural angle, the latter produced into a tooth; elytral interspaces smooth, shining (males) or finely alutaceous (females), the punctures separated by about twice their own diameters.. (61) **miles**

3. Head brown, pronotum yellowish-brown, translucid, not maculate; elytra yellowish-brown, often with a brown spot just behind middle near suture; usually only alternate intervals of elytra punctate; apical emargination of fifth abdominal sternite rounded at middle, not dentate; length 3 to 3.5 mm..... (62) **stramineus ?**

—Head metallic green or blackish, aenescent, not transparent; pronotum usually piceous or black discally, except for an elongate median pale area.....4

4. Apical emargination of fifth sternite arcuately rounded at middle, not dentate; pronotum immaculate; only alternate elytra intervals punctate, if at all.....(63) **metalliceps**

—Apical emargination of fifth sternite dentate at middle; all elytral interspaces clearly punctate 5

5. Apical emargination of fifth abdominal sternite unidentate at middle; elytral apices more acute in female than in male; abdominal sternites of male cristate medially (64) **dolerosus**

—Apical emargination of fifth sternite with two small teeth at middle.....6

6. Length 3 mm. Pronotum dark green or black, sides and anterior margin pale, the latter with a short extension into green area on each side of middle; punctures of elytral intervals coarse, as large as discal strial punctures, mostly uniseriate; first visible abdominal sternite with a carina from anterior to posterior margins at middle (65) **moerens**

—Length 4 to 6 mm. Pronotum pale except for a brown or metallic area at each side of middle on disk; elytral intervals mostly with two or more rows of punctures; first sternite with median carina in anterior half only.....7

7. Form elongate; pronotal punctures sparser, similar throughout; mesosternal process thin, blade-like, anterior tooth small; elytra shining in male, alutaceous in female (66) **infuscatus?**

—Form shorter, more convex; pronotum with fine punctures scattered between the coarser ones, which are larger and shallower towards sides; mesosternal process broader, anterior tooth almost hood-like; elytra shining in both sexes.....(67) **rugulosus**

(60) **Berosus (Enoplurus) punctatissimus** LeConte

Berosus punctatissimus LECONTE, 1852, Lyceum Nat. Hist. N. Y., Ann 5:211; LECONTE, 1855, Acad. Nat. Sci. Phila., Proc. 7:363; HORN, 1873, Am. Philos. Soc., Proc. 13:119; KNISCH, 1922, Archiv f. Naturg., 88:111.

Length 6 to 8 mm. Upper surface appearing dull but integument between the coarse punctures actually shining, except on pronotum and elytra of female which are alutaceous. *Head* except labrum green or bronzed, with median basal carina coarsely punctured, punctures at base and near eyes joined to form grooves. *Pronotum* with a low flat median longitudinal carina, largely impunctate; general punctation coarse, close, shallow, merging laterally into a series of rugosities; an elongate green or bronze marking on each side of median two-thirds of pale carina, and a duller less regular one halfway between the discal and the lateral margin, the two series at times coalesced. *Elytra* striate, more broadly toward sides and apex, strial punctures close to one another; punctures of interspaces coarse, their margins scabrous. *Undersurface* black, legs yellow, pubescent area on basal half of femora usually black. *Metasternum* triangularly elevated at middle, elevation concave medially, trifid posteriorly, the median projection narrow, blade-like, and in same plane as others. Apparent first abdominal *sternite* with median basal

carina which fits into apex of metasternal elevation. Middle of apical median emargination of fifth sternite bidentate: in male with a large narrow triangular elevation just anterior to teeth, a smaller process on fourth sternite, and usually an indication of one on the third.

Type locality: "San Diego, ad Missionem," California.

Recorded distribution: California; Arizona; Washington.

New records: Lower California: Seventeen miles south of Ensenada, June 14 (stream); Hamilton Ranch, August 2 (irrigation ditch); Nineteen miles east of Rosario, June 17 (in a spring); Twenty miles south of Santo Tomas, August 3 (in a brook). Twenty specimens collected by Michelbacher and Ross.

Knisch (1922) has placed *B. hoplites* Sharp and *salvini* Sharp as subspecies of *punctatissimus*. With adequate series of each before me, I find that they are readily separated on the external characters given by Sharp, and by the forms of the male genitalia; they appear to me to represent three valid species, as follows:

1. Metasternal elevation with an apical (posterior) carinate process which is in the same plane as the two lateral tooth-like projections, the whole having a trifid appearance; basal protarsal segment of male not as broad as apical width of tibia.....2
—Apical median process much more protuberant than rest of metasternal elevation, thin and blade-like; lateral teeth very small. Parameres of male genitalia suddenly constricted at about apical fifth, thence parallel-sided and spinous to apex. Basal segment of male protarsus as wide as tibial apex. Mexico; Texas.....**hoplites**

2. Apical median process of metasternum broad, triangular, tooth-like, obscurely carinate along middle. Form narrower (length 7 mm., width 3 mm.). Parameres of male genitalia less sharply constricted in apical fifth, more gradually narrowed to apices which though spinous are shorter. Mexico; Arizona.....**salvini**
—Apical process of metasternum narrower, with a sharp blade-like raised carina. Form broader (length 7 mm., width 3.75 to 4 mm.). Parameres gradually narrowed to apices, which are not spinous.....**punctatissimus**

(61) **Berosus (Enoplurus) miles** LeConte

Berosus miles LECONTE, 1855, Acad. Nat. Sci. Phila., Proc. 7:363; HORN, 1873, Am. Philos. Soc., Proc. 13:119.

Length 6 to 7 mm. Abdomen varying in color from bright rufous to piceous; legs testaceous; apical process of metasternum intermediate in form between those of *punctatissimus* and *hoplites* (vide ante); elytra with a marginal tooth before the sutural apices, which themselves are spinous, but shorter than the outer teeth. Readily separated from *punctatissimus* by the smooth, more finely punctate pronotum and elytral interspaces. Parameres of male genitalia shaped nearly as in *punctatissimus* in a dorsal view, but not similar in profile.

Type locality: "Ringgold Barracks, Texas."

Recorded distribution: Texas; Arizona; Lower California: Cabo San Lucas.

New records: Lower California: Triunfo, July 13 (pool in arroyo). Ten specimens collected by Michelbacher and Ross.

(62) **Berosus (Berosus) stramineus** Knisch ?

Berosus (*s. str.*) *stramineus* KNISCH, 1922, Arch. f. Naturg. 88(A.4):124.

It seems probable that the specimens mentioned below are *stramineus,* of which I have not seen authentic examples. The following description is based on the Lower California series.

Male. Length 3 to 3.5 mm. Form elongate-oval. Head brown, paler anteriorly pronotum transparent, each elytron with a small irregular brown spot near suture, just behind middle, and a trace of brown similarly before middle; suture and discal striae slightly darkened. Undersurface largely rufo-piceous; legs, mouthparts, and antennae except at tip, yellow.

Head rather coarsely closely punctate, more coarsely but less closely towards base; discal pronotal punctation like that of base of head, but coarser and closer laterally. *Elytra* striate, striae coarsely punctate, especially towards sides, not impressed on disk at base; alternate interspaces with a slightly irregular single row of punctures similar in size to those of pronotal disk, intervening intervals with a similar row of very fine punctures. *Mesosternal* elevation prominent, thin, falcate anteriorly. Median excavation of fifth apparent abdominal sternite rounded at middle, not tooth; first *sternite* with a median carina from anterior margin to middle. Basal segment of protarsi only slightly larger than of female.

Female. Similar to male; protarsi simple, pronotum microreticulate except at middle.

Type locality: "Mexico, Manzanilla." This is perhaps the same as Manzanillo in Colima State, Mexico.

New records (provisional identification): Lower California: 1, Coyote Cove, Concepcion Bay, July 24; 2, Twelve miles south of Santa Rosalia, June 27; 2, Twenty-five miles south of Santa Rosalia, July 25; 1, Five miles west of San Bartolo, July 13. All collected by Michelbacher and Ross.

This species is most closely allied to the much smaller *exiguus* Say of the middle and southeastern United States. *B. exiguus* has the head and pronotum more closely punctured, the elytral striae impressed to the base, and the median apical excavation of the fifth abdominal sternite unidentate at middle. Because of its pale color, sparsely punctate elytral interspaces, and nondentate fifth sternite, one might associate *stramineus* with *metalliceps* Sharp and *rubellus* Knisch, but both those species have the head metallic green or purplish.

(63) **Berosus (Berosus) metalliceps** Sharp

Berosus metalliceps SHARP, 1882, Biol. Centr.-Amer., Coleopt. 1(2):83; KNISCH, 1922, Arch. f. Naturg. 88(A.5):121.

Berosus (*s. str.*) *metalliceps,* D'ORCHYMONT, 1946, Musee. roy. Hist. nat. Belgique, Bul. 22(13):18, fig. 11.

Berosus salinus FALL, 1901, Calif. Acad. Sci., Occ. Papers 8:215.

Length 4.5 to 5 mm. Head dark metallic green or bronzed. Pronotum reddish-yellow, immaculate; elytra yellow, with the finely impressed striae piceous; undersurface largely piceous, legs yellow. Elytral interspaces impunctate, except three, five and seven which have each a short median series of single punctures.

Type locality: Tres Marias Islands.

Recorded distribution: Tres Marias Islands; Ventanas, Mexico.

There are no examples of this species in the material before me. Fall said that *salinus* would run to *styliferus* Horn in Horn's key of 1873; but Horn had already pointed out (1876: 251) that *styliferus* was originally described incorrectly.

(64) **Berosus (Berosus) dolerosus** Leech, new species

(Figure 13)

A rather small yellowish-brown species with non-metallic pronotum, abdominal sternites cristate in male. Allied to *B. peregrinus* (Herbst) and to *sharpi* Zaitzev.

Male. Length 3.8 mm., width 2 mm. Head metallic green, bronzed between eyes; pronotum yellowish-brown, with a somewhat V-shaped discal piceous area which has a paler extension toward each basal angle of pronotum; elytra darker yellowish-brown, each elytron with an indistinct piceous mark just before and behind middle near suture, one at humerus, and one post-median laterally. Undersurface black, legs yellow with basal pubescent area of femora piceous.

Head and *pronotum* closely moderately coarsely punctate, pronotum finely alutaceous. *Elytra* striate, strial punctures much coarser laterally; interspaces, especially lateral ones, a little more coarsely punctate than pronotum, roughened by invasion of strial punctures; elytral apices rounded. First visible abdominal *sternite* with a median carina across its width, second, third, and fourth each with a carinate median protuberance, fifth emarginate posteriorly with a single median tooth. Basal segments of protarsi slightly dilated.

Female. Elytra alutaceous, apices acute; protarsi simple; abdominal sternites not carinate medially.

Holotype, male (C.A.S. No. 5465), *allotype* female (No. 5466), and 15 *paratypes,* from Lower California: **Rosario,** June 17, 1938 (in pool), collected by Michelbacher and Ross. Also seventy-six specimens from San Fernando, August 1.

The paratypes show the following to be variable: shape and extent of piceous pronotal marking; presence of alutaceous sculpture on pronotum in male; size of carination on sternites two to four of male (usually simple on two and four, spinous on three); acuteness of elytral apices in female; coarseness of punctation of elytral intervals; body length 3.5 to 4 mm.

B. dolerosus must be close to *sharpi* Zaitzev (*dispar* Sharp, not Reiche and Saulcy) of Mexico, but the legs are said to be entirely yellow in that species, while they are piceous in the basal third to half in all the ninety-three *dolerosus*. *B. peregrinus* (Herbst) of the eastern United States is also allied to *dolerosus* but may be separated by its narrower front and protuberant eyes. If, as I suspect, the *"peregrinus"* in Arizona are in fact *sharpi*, then the latter is more closely allied to *peregrinus* than to *dolerosus*.

(65) **Berosus (Berosus) moerens** Sharp

Berosus moerens SHARP, 1882, Biol. Centr.-Amer., Coleopt., 1(2):84; LEECH, 1943, Pan-Pacific Ent. 19(2):62, (in part).

Berosus (*s. str.*) *moerens*, D'ORCHYMONT, 1946, Musee roy. Hist. nat. Belgique, Bul. 22 (13):19.

Berosus debilis SHARP, 1887, Biol. Centr.-Amer., Coleopt. (Suppl.) 1(2):767.

Length 3 to 3.5 mm. *Head* and *pronotum* coarsely closely punctate; *elytra* striate, striae and strial punctures coarser laterally, each interspace with an almost regular series of closely set coarse punctures. *Head* metallic, greenish or bronzed; *pronotum* largely metallic, side margins yellowish, as is front margin, which has a backward extension on each side of middle; elytra yellowish, two or three spots in a linear series near suture, a lateral and a postmedian spot, black. *Undersurface* black, legs except pubescent spot on femora, paler. First visible abdominal *siernite* with a median sharp carina across it; middle of apical emargination of fifth sternite with two very small teeth.

Type locality: Oaxaca, Mexico.

Recorded distribution: Mexico; Guatemala; Lower California: San José del Cabo; Texas; Arizona.

New records: Lower California: 2, Triunfo, July 13 (pool in arroyo); collected by Michelbacher and Ross; 5, Escondido Bay, June 14, 1921, J. C. Chamberlin collector (C.A.S.); 1, Concepcion Bay, Coyote Bay, June 18, 1921, E. P. Van Duzee collector (C.A.S.).

(66) **Berosus (Berosus) infuscatus** LeConte ?

Berosus infuscatus LECONTE, 1855, Acad. Nat. Sci. Phila., Proc. 7:365; HORN, 1873, Am. Philos. Soc., Proc. 13:121, 123; FALL, 1901, Calif. Acad. Sci., Occ. Papers 8:56.

Examination of a series of specimens from the southern United States (Kentucky, Georgia, Tennessee, Arkansas, Texas, California) all of which trace to *infuscatus* in Horn's key, shows that he had confused two and perhaps three distinct species. LeConte described *infuscatus* from the "Middle and Southern States, not rare; specimens from New Orleans were given me. . . ." If Georgia examples before me are typical, then the Lower California examples mentioned below are very similar.

Length 5.25 to 6 mm. Head metallic green; pronotum yellow, with a slightly arcuate longitudinal brown vitta on each side of middle; scutellum piceous; elytra yellowish-brown, punctures and striae piceous, as are a diagonal series of maculations on the interspaces from humerus to just before middle, from

middle at side to postmedian near suture and at apical three-quarters. Undersurface largely piceous, legs yellow to reddish-yellow.

Head closely, rather coarsely punctate, *pronotum* more sparsely, less coarsely so, finely microreticulate. *Elytral* striae punctate, more coarsely laterally, hardly impressed on disk at base, but deeply impressed at the declivity; interspaces rather finely irregularly punctate, intervals three, five and seven with some larger punctures.

Type locality and distribution: see preceding remarks.

New records (provisional identification): Lower California: 2, Twenty miles north of Comondu, July 23 (in tinaja); 1, Comondu, July 22. Collected by Michelbacher and Ross.

D'Orchymont (1946: 6–9) has discussed *infuscatus* LeConte, listing the following species as synonyms: *B. punctulatus,* 1852 (non Boheman, 1851); *flavicornis* Sharp; *bermudanus* Knisch.

(67) **Berosus (Berosus) rugulosus** Horn

Berosus rugulosus HORN, 1873, Am. Philos. Soc., Proc. 13:121, 124; FALL, 1901, Calif. Acad. Sci., Occ. Papers 8:56.

Length 4 to 5 mm. This species can be recognized by the distinctive shape of the *mesosternal protuberance,* the anterior part of which is broadened to form an elliptical hood. *Elytral* striae deeper and much more coarsely punctate laterally, interspaces with numerous punctures. *Pronotum* rather densely punctate, punctures as coarse as those on discal interspaces of elytra, and with very fine ones intermixed. Elytra varyingly maculate with piceous. Undersurface including legs, rufous to rufo-piceous.

Type locality: "Peninsula of Lower California, W. M. Gabb."

Recorded distribution: Southern California; Lower California: San José del Cabo.

New records: Lower California: 21, Triunfo, July 13, (pool in arroyo); 7, Twenty miles north of Comondu, July 23 (in tinaja). Collected by Michelbacher and Ross. Also 9, Espíritu Santo Isl., Gulf of California, June 9, 1921, collected by E. P. Van Duzee (C.A.S.); 19, San Felipe (A.M.N.H.).

In addition to the above, I have examples from Arizona: Bear Canyon, Sta. Catalina Mts., January 2, 1938 (E. C. Van Dyke Collector); Baboquivaria Mts., April (D. K. Duncan Collector). These latter have the head black, instead of the usual metallic green or bronze.

A series of typical specimens from Mexico: Oaxaca, Oax., elev. 5,000 ft., July 20, 1937 (M. E. Embury); and Apatzingan, Michoacan, elev. 1,200 ft., August 11, 1941 (H. Hoogstraal), are, quite certainly this species, and presumably the same as Sharp's Guatemalan types of *gracilipes.*

Genus **Hydrochara** Berthold

Hydrochara BERTHOLD, 1827, Latreille's Nat. Fam. Thierreichs, p. 355.

Hydrocharis HOPE, 1838, Coleopt. Man. 2:125.

Genotype: *Dytiscus caraboides* Linnaeus, 1758. Designated by Hope as the type of his emendation of *Hydrochara*. I have not seen Berthold's publication, and do not know whether or not his *Hydrochara* was monotypic. The same species has been designated by Westwood (1838:9). Duponchel (1845 (6): 763) and Thomson (1859:17) cited *caraboides* as the type of *Hydrous*, a generic name which has been attributed to Linnaeus, 1775 (see Strand 1935: 293), Thunberg, 1787, and Leach, 1815, the genus being monobasic for *Dytiscus piceus* Linnaeus, 1758. Curtis (1827:159), Hope (1839:125), and Knisch (1924:236), cited *caraboides* as the type of *Hydrophilus*, q.v.

(68) **Hydrochara lineata** (LeConte)

Hydrocharis lineatus LECONTE, 1855, Acad. Nat. Sci. Phila., Proc. 7:369. (The *H. substriatus* of LeConte, 1863, p. 18, is a lapsus memoriae according to Horn 1876:251. See also LeConte 1861:341).

Hydrocharis glaucus LECONTE, 1861, Acad. Nat. Sci. Phila., Proc. [13]:341; HORN, 1876, Am. Ent. Soc., Trans. 5:251; HORN, 1895, Calif. Acad. Sci., Proc. (2)5:233; FALL, 1901, Calif. Acad. Sci., Occ. Papers 8:56.

Hydrophilus lineatus, SHERMAN *in:* LENG, 1920, Cat. Coleopt. Amer. N. of Mex., p. 84.

Length 14 to 18 mm. Form broadly oval. Color varying from almost black to a beautiful blue-green dorsally; head, pronotum, elytra and legs often of the same blue-green color. These beetles prefer mineralized water, and occur also in hot springs.

Type locality: San Diego, California (*lineatus* LeConte); California (*glaucus* LeConte).

Recorded distribution: California; Utah; Arizona; Lower California.

New records: Lower California: Twenty miles south of Santo Tomas, August 3. A single male taken by Michelbacher and Ross.

Genus **Hydrophilus** Geoffroy

Hydrophilus GEOFFROY, 1762, Hist. Insect. Paris, 1:180. (If Geoffroy's publication is not acceptable, the name *Hydrophilus* can be credited to Muller, 1764: Faun. Insect. Friedrichs., p. XVI. See discussion of this under the genus *Gyrinus* Geoffroy.)

Genotype: *Hydrophilus piceus* Fabricius, 1775 (= *Dytiscus piceus* Linnaeus, 1758), designated by Latreille, 1810:428. This same species has been cited also by Westwood (1838:9), Duponchel (1845(6):754), Thomson (1859:17), and Crotch (1870:43). But Curtis (1827:159), Hope (1839: 125), and Knisch (1924:236) gave *caraboides* Linnaeus; see notes under *Hydrochara*, above.

There has been much difference of opinion on the use of the generic names *Hydrophilus, Hydröus,* and *Hydrochara.* Some authors have credited the first two genera to Leach 1815, refusing to accept Latreille's paper as establishing genotypes, despite "Opinion 11" of the International Commission on Zoological Nomenclature. The most recent summary is that of F. Balfour-Browne (1941:262–264). Other important and recent references are: Mutchler, 1931:1–3; Strand, 1935: 292, 293; Méquignon, 1937: 53–55; d'Orchymont,

1937 : 423–432 ; d'Orchymont, 1938 : 37–47 ; Hemming et al., 1939 : 13–20, and Hemming's editorial notes in the reprinted issue of "Opinion 11," 1945 : 184–189.

(69) **Hydrophilus insularis** Laporte

Hydrophilus insularis LAPORTE, 1840, Hist. Nat. 2:50, SHARP, 1882, Biol. Centr.-Amer., Coleopt. 1(2) :54, and pl. 2, fig. 1; HORN, 1885, Canad. Ent. 17(6) :138.

Stethoxus insularis, BEDEL, 1892, Rev. d'Ent. 10:313, 320; KUWERT, 1893, Deutsche Ent. Zeitschr. 1893, p. 88; RÉGIMBART, 1901, Soc. Ent. France, Ann. 70:216, and pl. 8, figs. 27, 27A.

Stethoxus behrensi KUWERT, 1893, Deutsche Ent. Zeitschr. 1893, p. 88.

A fine large canoe-shaped hydrophilid, 33 to 45 mm. long, shining, dark green to almost black. Much of the undersurface is clothed with short golden hairs, but abdominal sternites two to five are broadly glabrous, pubescent only narrowly along the sides ; the fifth sternite is distinctly longitudinally keeled medially, but not carinate. The apices of the elytra are minutely spinose apically at the suture. In the male the protarsal claws are unequal, the anterior ones thicker and almost twice as long as their fellows; the claw-bearing segment is broadly triangularly enlarged, and on the undersurface has a series of round suckers paralleling each margin, those near the larger claw being stalked, the rest sessile.

H. insularis is not likely to be confused with anything except the allied *triangularis* Say, which is common in central and southern California, but has not been recently identified from Lower California. *H. triangularis* averages a little smaller, the elytra are not spinose apically, the fifth segment of the male anterior tarsi is broadened, but not triangularly so, and the ventral suckers on it are not restricted to the margins and angles. Another species, *ater* Olivier, occurs in Mexico and the Antilles ; it is smaller (30 mm. or less), the second sternite has only a triangular median area glabrous, and the fifth protarsal segment of the male is only slightly broadened. A key to these species was prepared by Winters (see Secretary's report of the Proc. N. Y. Ent. Soc., meeting of March 19, 1912, *in* Jour. N. Y. Ent. Soc. **20**(3) : 217) but apparently was never published.

The male genitalia of a Jamaica specimen of *insularis* has been illustrated by F. Balfour-Browne, 1932. Bedel (1892 : 320, footnote 2) drew attention to the fact that Sharp's figure of *insularis* does not show the sutural spines of the elytra, and is therefore of *triangularis ;* but he failed to notice that Sharp's illustration clearly shows the triangularly enlarged fifth protarsal segment, typical of *insularis*. Régimbart (1901 : 216) states that *behrensi* Kuwert is a synonym.

Type locality of *insularis:* [original description not seen],
of *behrensi:* "Californien."

Recorded distribution : The Antilles ; Mexico ; Texas; Arizona; Lower California : Between San José del Cabo and Triunfo.

New records: Lower California: Triunfo, July 7 (a teneral male), and July 13 (2 males); collected by Michelbacher and Ross. San José del Cabo (Hopping Collection); "Lower California Betw. San José de Cabo and Triunfo, Albatross Exped., 1911" (A.M.N.H.)

A most excellent study of all stages of the allied *triangularis* has been given by Wilson (1923: 9–38).

Genus **Tropisternus** Solier

Tropisternus SOLIER, 1834, Soc. Ent. France, Ann. 3:308.

Genotype: *Hydrophilus collaris* Fabricius, 1775. In describing the genus, Solier (p. 310) stated: "J'ai formé ce genre très distinct des précédens, sur l'*Hydrophilus Lineatus* de M. le comte Dejean et j'y joins. . . . ," listing 4 other names. In Dejean's Catalogues of 1833 and 1837, amongst the names under *Hydrophilus,* there is the following entry: "{Lineatus. *Dej. Brasilia.* / *Collaris ? Fabr. Cuba.*"

Dejean's *lineatus* is a nomen nudum, but d'Orchymont (1919: 159) reported having found, in the old Germar collection, a *Tropisternus* identified by that entomologist as *lineatus* Dejean, which is in fact *collaris* Fabricius. Hope (1839: 125) designated *Hydrophilus lateralis* Fabricius, 1775, while Chevrolat (1848 (12): 705), d'Orchymont *loc. cit.* and according to him Chenu (1851–1861. Encycl. d'Hist. Nat., Coléopt. 1: 247), and Knisch (1924: 228), all cited *collaris.*

The genus is characteristic of the Americas and contains fifty or more species which are distributed from Canada to Uruguay and Argentina. Most of the species are about 10 mm. long, black and aenescent, or marked with yellow. In the males the inner claw of the meso- and metatarsi has a small median tooth on the lower edge (minute and sub-basal in *apicipalpis*); the anterior protarsal claw is more strongly curved basally than in the female, and straighter with a sinuate lower margin in the apical two-thirds.

All the species known from Lower California belong to the subgenus *Pristoternus* d'Orchymont 1936 (new name for *Cyphostethus* d'Orchymont, 1921, not *Cyphostethus* Fieber, 1860). It is possible that species belonging to *Tropisternus* s. str., will be found on the peninsula, as *T.* (*T.*) *niger* d'Orchymont, 1938, was described from examples taken in brackish water at Mazatlan, Sinaloa, Mexico. Accordingly both subgenera are included in the following key.

KEY TO THE SPECIES OF TROPISTERNUS OF LOWER CALIFORNIA

1. Prosternal groove open anteriorly; metatibiae not fringed with hairs (subgenus **Tropisternus**)
—Prosternal groove closed anteriorly. (subgenus **Pristoternus**) 2
2. Metatibiae with a submarginal fringe of long, fine hairs along the inner side; fifth abdominal sternite with at most a small median apical spine; penultimate segment of maxillary palpi equal to or shorter than ultimate segment 4
—Metatibiae without a fringe of hairs along the side 3

3. A large black species, 12 to 15 mm. long; fifth sternite with a prominent median spine; penultimate segment of maxillary palpi longer than ultimate.....(70) **apicipalpis**
—A small black species, 7 to 10 mm. long; fifth sternite without a spine, though with a small tuft of golden hairs arising from a small subapical median tumidity; penultimate segment of maxillary palpi shorter than ultimate.....(71) **laevis mergus**
4. Head, pronotum and elytra margined with yellow.....(72) **lateralis** subspp.
—Black or aenescent dorsally, not margined with yellow.....5
5. Margin of epipleura, from apex almost or quite to base, with a series of setigerous punctures; epipleura behind metacoxae folded in, so that their lower (inner) margin runs along the inner face of the elytra.....6
—Margin of epipleura completely without setigerous punctures; epipleura behind metacoxae gradually narrowed, not turned under until just before the elytral apex (73) **obscurus**
6. Lateral median series of punctures of pronotum fine, four to twelve in number, forming an oblique line; body not strongly convex in profile.....7
—Lateral median series of punctures of pronotum coarser, 1 or 2, rarely 4, the anterior ones smaller; body equally obtuse anteriorly and posteriorly, strongly convex in profile (74) *ellipticus*
7. Pubescent area at base of metafemora small, not extending beyond apex of trochanters; metafemora with numerous coarse setigerous punctures, and black or piceous in at least the basal half; elytra much more coarsely punctate apically..(75) **californicus**
—Basal quarter of metafemora pubescent; metafemora with few or no setigerous punctures, the black color confined to the pubescent area; elytra not more coarsely punctate apically..... (76) **salsamentus**

(70) **Tropisternus (Pristoternus) apicipalpis** (Chevrolat)

Hydrophilus apicipalpis CHEVROLAT, 1834, Coléopt. Mexique, fasc. 3, sp. no. 54.
Tropisternus apicipalpis, SHARP, 1882, Biol. Centr.-Amer., Coleopt. 1(2):55, and pl. 2, fig. 2; SHARP, 1883, Ent. Soc. London, Trans. 1883 (2):104; HORN, 1885, Canad. Ent. 17(6):138; FAUVEL, 1889, Rev. d'Ent. 8:106; LEECH, 1943A, Soc. Mexicana Hist. Nat., Revista 4(1–2):18, 20, figs. 2, 4, 6.
Tropisternus (*Cyphostethus*) *apicipalpis*, D'ORCHYMONT, 1921, Soc. Ent. Belgique, Ann. 61:364.
Tropisternus agilis LAPORTE, 1840, Hist. Nat. Ins. 2:53; SHARP, 1883, Ent. Soc. London, Trans. 1883 (2):116.

Black, slightly aeneous or metallic; form narrowed behind, deltoid. Length 12 to 15 mm. A large backwardly-pointing spine arises from middle of fifth abdominal sternite; mesosternal process punctate in anterior three-quarters, more finely so in female; metasternal process more densely and finely punctate. Pubescent area of metafemora covering almost basal half, outer half with a mixture of small and moderately coarse punctures. Mentum more coarsely punctate in male than in female. Male tarsal claws distinctive, anterior protarsal claws with a small sharp basal tooth, usual tooth of the inner meso- and metatarsal claws nearly basal, and minute. Elytral punctation fine and even.

Type locality of *apicipalpis* (Chev.): Véra-Cruz, Mexico.
of *agilis* Lap.: St. Vincent Island.

Recorded distribution: Arizona; Mexico; Guatemala; Costa Rica; the Antilles; Colombia; Venezuela; Argentina; Lower California: Cabo San Lucas.

New records: Lower California: 1, Triunfo, July 13; 3, Twenty miles N. of Comondu, July 23; collected by Michelbacher and Ross. Also five from San Felipe (A.M.N.H., and Leng-Leech Coll.).

(71) **Tropisternus (Pristoternus) laevis mergus** (Say)

Hydrophilus mergus SAY, 1835, Boston Jour. Nat. Hist. 1(2):171; SAY, 1859, *in* LeConte ed. of his works, 2:646.

Tropisternus nitens LAPORTE, 1840, Hist. nat. anim. artic. 2:54; SHARP, 1882, Biol. Centr.-Amer., Coleopt. 1(2):56; SHARP, 1883, Ent. Soc. London, Trans. 1883 (2):105.

Tropisternus (*Cyphostethus*) *laevis mergus,* D'ORCHYMONT 1921, Soc. Ent. Belgique, Ann. 61:360.

Horn (1894: 316) recorded this species, as *nitens* Castelnau, from Lower California: San Pedro Martir. I have not seen any examples from the Peninsula, but would expect it to occur in the southern part, as this or a closely allied subspecies is common in the near-by state of Nayarit, Mexico. It resembles the other medium-sized black species, but the following characters will distinguish it: the metatibiae without a submarginal fringe of hairs; fifth abdominal sternite not armed with a spine; basal pubescent areas of metafemora large, extending beyond trochanters; lateral median series of punctures on pronotum usually in series, forming an oblique line.

Type locality of *mergus* (Say): Mexico.

of *nitens* Laporte: Véra Cruz.

Recorded distribution: Mexico; Lower California: San Pedro Martir; Guatemala; Costa Rica; Honduras; Guadeloupe; Trinidad; Grenada; Venezuela; Colombia.

The other subspecies, *T. laevis laevis* (Sturm), occurs in Venezuela, Guiana, Brazil, Paraguay and Argentina.

(72) **Tropisternus (Pristoternus) lateralis** (Fabricius) subspp.

Hydrophilus lateralis FABRICIUS, 1775, Systema Ent., p. 228; LECONTE, 1855, Acad. Nat. Sci. Phila., Proc. 7:367.

Tropisternus lateralis, HORN, 1876, Am. Ent. Soc., Trans. 5:251, 252; SHARP, 1882, Biol. Centr.-Amer., Coleopt. 1(2):60; HORN, 1883, Ent. Soc. London, Trans. 1883(2): 111; SHARP, 1887, Biol. Centr.-Amer., Coleopt. (Suppl.) 1(2):763; BLATCHLEY, 1910, Coleopt. Indiana, p. 256, fig. 127; LENG and MUTCHLER, 1918, Am. Mus. Nat. Hist., Bul. 38:102.

Tropisternus (*Cyphostethus*) *lateralis,* D'ORCHYMONT, 1922, Soc. Ent. Belgique, Ann. 62:32.

This variable species occurs from British Columbia and Quebec to Argentina. With such a range, it is not surprising that names have been applied to some of the color variants. Several well-characterized subspecies are involved, and in the Nearctic fauna at least the following names must be considered: *T. nimbatus* (Say), 1823; *dorsalis* (Brullé), 1838; *limbalis* (LeConte), 1855; *marginatus* and *humeralis* Motschulsky, 1859; *binotatus* (Walker), 1866.

In examining a series of more than 500 specimens from many parts of Canada, the United States, and Mexico, and in comparing them with a short series from Brazil, the following points have been noted.

(a) Examples from an area extending from Quebec and Ontario to Florida, and westward at least to Nebraska, Colorado (Loveland), New Mexico, and eastern Mexico, are narrower posteriorly, with the point of greatest width at the middle of the length. The lateral yellow margins tend to be very narrow, and regular. This form is well illustrated by Blatchley (1910), though many females are wider than his example.

(b) A similar form occurs in California, Nevada, Arizona, and thence into western Mexico, but these beetles are wider posteriorly, with the point of greatest width a little behind the middle. The yellow markings are broader, with the inner margins ragged; well-marked specimens occur in the mountains and at many places grade insensibly into

(c) A larger and more robust form with broad yellow margins which extend across the elytral base to the scutellum, and sometimes almost meet near the apices. Occurs from latitude 51° in British Columbia and Alberta, southward through Washington, Oregon, northeastern California, Idaho, Nevada, Utah, Colorado (North Park), and Arizona, thence (according to the literature) south through Mexico to Chile and Argentina. In at least southern Arizona this type merges into

(d) A shorter and broader form with the yellow margins of the elytra almost as broad as the dark green area, but not extending inward along the base, though meeting medially just anterior to the elytral apices. Occurs from San Diego Co., Calif., eastward to Texas.

(e) The examples found in Lower California are smaller than those of (b) above, have the legs largely black, the yellow margins narrow and much reduced on the elytra, and approach the eastern (a) rather than the western (b) in form.

Specimens from Organ Mt., Brazil, presumably *T. lateralis lateralis,* agree best with the Californian form described as (b) in shape, but with the eastern (a) in color. The eastern form is certainly *nimbatus* (Say). D'Orchymont (1922: 32) has suggested that Say's insect might really belong in the subgenus *Tropisternus,* since the description says in part *"pectus* with a bifid prominence." Only species of the typical subgenus have the prosternum bifid anteriorly, it is true; but all the species of the genus have it bifid posteriorly, and I believe that Say referred to this, for on p. 201 of the same paper he had described the prosternum (= pectus) of *Hydrophilus triangularis* Say as having "a bifid prominence for the reception of the anterior tip of the sternum."

The California (b) form has been described by Motschulsky (1859: 176) as his *humeralis* and *marginatus;* I have examples which fit his descriptions excellently.

The northwestern and mountain form (c) is a well-marked subspecies, and has long been referred to as *dorsalis* (Brullé). Sharp (1887: 112) gave the type locality for this as "Chili, Corrientes (*teste* Brullé)," but Brullé says "Cette espèce, qui n'est peut-être qu'une variété de la précédente, a été trouvée au même endroit," and the preceding, his *limbatus,* is given as "trouvée à

Corrientes (République Argentine)." There are no specimens before me which agree exactly with Brullé's figure of *dorsalis;* d'Orchymont compared examples from Texas and Argentina, and thought them to be the same. Unless a large series from South America proves to the contrary, I believe we should refer our material to *binotatus* (Walker), especially since Brullé's name *"Hydrophilus (Tropisternus) dorsalis"* is preoccupied by that of a European helophorid, described by Marsham in 1802 as *Hydrophilus dorsalis.*

The broader form (d) has been described as *limbalis* (LeConte). Sharp (1887 : 763) placed it as a synonym of *dorsalis,* but I suspect that the true *dorsalis* does not occur here, and as *limbalis* differs in form and distribution from *binotatus,* it may warrant subspecific standing.

Since the Lower California population of *lateralis* is obviously distinct from the subspecies mentioned above, it probably should be given a subspecific name. I hesitate to do this without adequate material from western Mexico, and Central and South America.

Recorded distribution in Lower California : San José del Cabo.

New records : Lower California : 71, Triunfo, July 13 (pool in arroyo) ; 17, Twenty miles N. of Comondu, July 23; 3, Fourteen miles S.E. of Santonio, June 7 ; all collected by Michelbacher and Ross. Also 1 from Santa Inez near Catavina, July 16, 1941, collected by C. F. Harbison (S.D.N.H.M.) ; 1 from Mulege, May 14, 1921, collected by E. P. Van Duzee (C.A.S.) ; 1 male, Cape San Lucas (Leng-Leech Colln.). Five examples from San Marcus Island in the Gulf of California, June 19, 1921, collected by E. P. Van Duzee (C.A.S.), differ in having the yellow margins broader.

There is also (Figure 4) a single (callow) typical specimen of *T. lateralis limbalis* (LeConte) from the Colorado River at El Mayor, Lower California, April 5, 1939 ; collected by Michelbacher and Ross. Horn (1894 : 315) records *limbalis* from Cabo San Lucas, but the example before me is not that form ; see above.

Todd (1942) has named a new genus and species (*Zonothrix tropisterna* Todd) of parasitic nematode from adults of *"Tropisternus nimbatus* Say" in Nebraska. Wilson (1923) has described and illustrated the immature stages, and given notes on the habits of larvae and adults of *lateralis* at Fairport, Iowa.

(73) **Tropisternus (Pristoternus) obscurus** Sharp

Tropisternus obscurus SHARP, 1882, Biol. Centr.-Amer., Coleopt. 1(2):60, and plate 2, fig. 7.
Pleurhomus obscurus SHARP, 1883, Ent. Soc. London, Trans. 1883 (2)115; SHARP, 1887, Biol. Centr.-Amer., Coleopt. (Suppl.), 1(2) :763.
Tropisternus (Cyphostethus) obscurus, D'ORCHYMONT, 1921, Soc. Ent. Belgique, Ann. 61:350–352; D'ORCHYMONT, 1922, Soc. Ent. Belgique, Ann. 62:18, 31.

This shiny black species resembles *ellipticus* at first glance, but the elytra are more pointed apically, and the epipleura are diagnostic by their form (see key) and lack of marginal setigerous punctures. In 1883 Sharp placed *obscurus* as the second species in his new genus *Pleurhomus.* In 1921 d'Orchy-

mont discussed the matter exhaustively, put *Pleurhomus* as a subgenus of *Tropisternus* and included only *sahlbergi* Sharp.

The elytra of *obscurus* are finely punctate, a little more coarsely at the apices; mesosternal process with a few punctures on anterior part (I have seen only females); metafemora with a few coarse punctures, the basal pubescent area smaller than in *ellipticus*. Fifth apparent abdominal sternite with an apical median raised area from which a tuft of golden hairs protrude, but without a definite spine.

Type locality: Duenas, Guatemala.

Recorded distribution: Guatemala; Mexico and "California."

New records: Mexico: El Banito, Valles, San Luis Potosi, June 29, 1940, collected by H. Hoogstraal (Leech Colln.). Lower California: 1, Twenty miles north of Comondu, July 23, collected by Michelbacher and Ross.

The Lower California example agrees well with Sharp's figure, but the female from Valles is broader. It is possible that the single specimen d'Orchymont saw labelled California, was from Baja California.

(74) **Tropisternus (Pristoternus) ellipticus** (LeConte)

Hydrophilus ellipticus LECONTE, 1855, Acad. Nat. Sci. Phila., Proc. 7:368.

Tropisternus ellipticus, HORN, 1876, Am. Ent. Soc., Trans. 5:252; SHARP, 1883, Ent. Soc. London, Trans. 1883(2):107.

Tropisternus (*Cyphostethus*) *ellipticus*, D'ORCHYMONT, 1922, Soc. Ent. Belgique, Ann. 62:18, 31.

Tropisternus concolor SHARP, 1882, Biol. Centr.-Amer., Coleopt. 1(2)57; SHARP, 1883, Ent. Soc. London, Trans. 1883 (2):107.

Tropisternus affinis MOTSCHULSKY, 1859, Soc. Imp. Nat. Moscou, Bul. 32(3):175.

This common shiny black species is equally obtuse anteriorly and posteriorly, and strongly convex in profile. Lateral median series of pronotal punctures usually grouped closely together, appearing as one or two punctures, but if more numerous anterior one or two are much smaller than rest; elytra very finely punctate; mentum punctate in male, smooth in female; legs entirely black, or with femora paler apically; metafemora coarsely punctate in outer half, basal pubescent area extending to apex of trochanters; mesosternal process sparsely punctured anteriorly.

Type locality: "New Mexico and California."

Recorded distribution: From Washington, south to Lower California (San José del Cabo) and southeast to Texas, Mexico, Guatemala, and Costa Rica. Through the kindness of my friend Dr. Mont Cazier, I have before me the series listed by Grossbeck (1912: 324) as *"Hydrophilus californicus,"* including one so labelled, determined by G. Beyer; these specimens from "Betw. San José del Cabo and Triunfo, Albatross Exped. 1911," are all *T. ellipticus*.

New records: Lower California: 5, Rosario, June 17 (in pool); 4, Seventeen miles south of Ensenada, June 14 (in stream); 1, Catavina, June 19; 2, Triunfo, July 13 (pool in arroyo); 1, Twenty miles north of Comondu, July 23; 1, Twenty miles south of Santo Tomas, August 3; all collected by Michelbacher

and Ross. Also 1 from San Ignacio, July 20, 1941, collected by C. F. Harbison, and 14 from Ensenada, June 27, 1925 (S.D.N.H.M.); 1, Escondido Bay, June 14, 1921, collected by J. C. Chamberlin (C.A.S.). Gulf of California: 3, San Marcos Island, June 19, 1921, collected by E. P. Van Duzee (C.A.S.).

(75) **Tropisternus (Pristoternus) californicus** (LeConte)

Hydrophilus californicus LECONTE, 1855, Acad. Nat. Sci. Phila., Proc. 7:367.

Tropisternus californicus, HORN, 1876, Am. Ent. Soc., Trans. 5:252 (in part); SHARP, 1883, Ent. Soc. London, Trans. 1883 (2):109 (in part); FALL, 1901, Calif. Acad. Sci., Occ. Papers 8:214; ESSIG, 1926, Ins. West. N. Am., p. 379.

Tropisternus (*Cyphostethus*) *californicus*, D'ORCHYMONT, 1922, Soc. Ent. Belgique Ann. 62:17, 29 (in part).

Tropisternus (*Pristoternus*) *californicus*, LEECH, 1946, Canad. Ent. 77(10):179, 180, 182, fig. 2.

Tropisternus (*Pristoternus*) *caligans* D'ORCHYMONT, 1941; Musée roy. Hist. Nat. Belgique, Bul. 17(41):3.

Length 9 to 10 mm. Black, sometimes distinctly aenescent. *Elytral* punctation much coarser apically and on sides posteriorly, than on disk, coarser punctures of irregular sizes and shapes; mesosternal process flat and sparsely coarsely punctate in male, narrower with more rounded sides and fine punctation in female; mentum with coarser and more numerous punctures in the male. *Metafemora* piceous in basal half or more, remainder yellowish-brown; coarsely punctate in outer two-thirds or more; basal pubescent area small, not extending beyond trochanters. Fifth abdominal sternite with a median posterior raised area from which a group of golden hairs arises, but without a definite projecting spine. Tooth of inner meso- and metatarsal claws (male) variable in shape, not useful to distinguish *californicus* from *salsamentus*.

Type locality: "San Francisco and San Diego," California.

Recorded distribution: Washington to Mexico. Lower California: Cabo San Lucas, according to Horn (1894: 316), but the record needs confirmation. I have not seen any specimens from Mexico proper. For the "*Hydrophilus californicus* Lec." of Grossbeck's list, see *T. ellipticus*.

New records: Lower California: 3, Seventeen miles south of Ensenada, June 14 (in stream). Collected by Michelbacher and Ross.

(76) **Tropisternus (Pristoternus) salsamentus** Fall

Tropisternus salsamentus FALL, 1901, Calif. Acad. Sci., Occ. Papers 8:214; BLAISDELL, 1925, Pan-Pacif. Ent. 1(4):169.

Tropisternus (*Cyphostethus*) *salsamentus*, D'ORCHYMONT, 1922, Soc. Ent. Belgique, Ann. 62:15, 26.

Tropisternus (*Pristoternus*) *salsamentus*, LEECH, 1946, Canad. Ent. 77(10):182, fig. 5.

A brackish-water species, elongate and narrow, resembling the east-coast salt-marsh *quadristriatus* (Horn). Length 9.5 to 10.5 mm. *Elytral* punctation fine, sparser than that of pronotum, especially near apices. *Legs* brownish-yellow, except femora basally and meso- and metatarsi which are piceous; pubescent area of metafemora occupying almost the basal third, outer two-

thirds of femur with a few moderately coarse punctures. Mesosternal process wider, flatter and more coarsely punctate in the male; mentum the same in both sexes. Fifth apparent abdominal *sternite* with a median carina which may project posteriorly as a short spine.

Type locality: "a small salt lake just back of the ocean beach at Redondo [Calif.]. This lake is much saltier than the ocean itself."

Recorded distribution: Southern California and "Basse Californie" (d'Orchymont, 1922); Lower California: Ensenada.

New records: California: Santa Cruz, July 31, 1901, det. H. C. Fall (Leng-Leech Colln.).

D'Orchymont (1941: 1–2) says that *T. californicus* Motschulsky, 1859 (not LeConte, 1855) is *salsamentus,* but I am unable to agree.

Genus **Chaetarthria** Stephens

Chaetarthria (Waterhouse MS) STEPHENS, 1833, Nomencl. British Ins., ed. 2, p. 22.
Cyllidium ERICHSON, 1837, Käfer der Mark Brandenb. 1(1):211.

Genotype: of *Chaetarthria* Stephens, *Hydrophilus seminulum* Paykull, 1798 (=*H. seminulum* Herbst, 1797); of *Cyllidium* Erichson, *Hydrophilus seminulum* Paykull, 1798, the only species cited by Erichson.

Tiny yellow or piceous beetles, 1.25 to 2.5 mm. long, resembling the silphid *Agathidium* in form. Readily known by the fringe of long golden hairs arising from the anterior margin of the apparent first abdominal sternite, and covering it and the following segment; beneath the hairs the segments are excavated and filled with a hyaline gelatin-like substance.

These beetles live in the sand at the margins of streams and rivers, whence they can be taken by flooding. They are nocturnal, and if one visits their haunts at night, with a bright light, they will be found in hundreds, several species often crawling over the sand together.

Except in color most of the Nearctic species are very much alike. Fall (1901: 216) pointed out that the shape of the protibiae of the males is diagnostic, while d'Orchymont (1939: 1–7) has shown that the male genitalia offer excellent characters.

(77) **Chaetarthria** sp. near **bicolor** Sharp

There is a single male, in poor condition, from five miles south of Miraflores, July 10, 1938, collected by Michelbacher and Ross. The protibiae are sinuate along the inner margin as in *bicolor,* not angulate as in *pallida* LeConte and its allies. Length 1.5 mm., head black, pronotum brown shading to yellow on the sides, elytra yellowish-brown. Closely allied to *bicolor;* d'Orchymont reported *bicolor* from Mazatlan, Sinaloa, Sierra de Durango, and Vera Cruz, Mexico (1939: 4–5) but Balfour-Browne (1939: 299–300) figured the aedeagus of Sharp's Guatemalan type, and distinguished the Mexican examples as subspecies *mexicana.* The Miraflores male appears to me to differ from either of the above subspecies.

Genus **Paracymus** Thomson

Paracymus THOMSON, 1867. Skandin. Coleopt. 9:120.

Genotype: *Hydrophilus aeneus* Germar; monobasic.

Small beetles, usually aeneous dorsally, and strongly convex. They are found in shallow water, often at the edges of lakes, ponds and slow streams. Some kinds occur only in brackish water. The species are separated in part upon the number of antennal segments; the median segments are tiny, and difficult to count accurately.

(78) **Paracymus elegans** (Fall)

Creniphilus elegans FALL, 1901, Calif. Acad. Sci., Occ. Papers 8:218; FALL, 1910, American Ent. Soc., Trans. 36(2):100.
Paracymus elegans, WINTERS, 1926, Pan-Pacific Ent. 3(2):56–57.

Length 2.5 to 3 mm. Oblong-oval moderately convex. *Head* black, pronotum and elytra piceous, pronotum pale laterally, elytra more broadly so, especially apically, and distinctly aeneous at sides. *Antennae* 7-segmented. *Prosternum* carinate; mesosternal protuberance large, broadly triangular and medially carinate from a posterior view. *Metafemora* shining, slightly hairy at base. Elytral punctation fine, that of pronotum sparser.

The above description is drawn from a topotypical pair collected and identified by the late H. C. Fall.

Type locality: Salt lake at Redondo, Calif.

Recorded distribution: Redondo, Calif.; salt springs at Salton, Colorado Desert, Calif.

New records: Gulf of California: 3, San José Island, June 10, 1921, collected by E. P. Van Duzee (C.A.S.). These specimens agree excellently with the topotypes except that they are more finely punctate.

Genus **Anacaena** Thomson

Anacaena THOMSON, 1859, Skandin. Coleopt. 1:18.

Genotype: *Hydrophilus globulus* Paykull, 1798; designated by Thomson, *loc. cit.*

Anacaena is usually distinguished from *Paracymus* by the pubescent metafemora, and from *Crenitis* by the non-protuberant eyes. However, d'Orchymont (1933: 302–304) says that on the basis of the world fauna, there are certain species which make it almost impossible to separate *Anacaena* and *Paracymus;* he places the genus *Crenitulus* Winters 1926 (type, *Limnebius suturalis* LeConte) as a synonym of *Anacaena,* s. lat. More recently (1942A: 34–38) he has given a key to the known species.

Horn (1894: 317) recorded two species of *Anacaena* from Lower California, both under the generic name *Creniphilus: infuscatus* (Motschulsky) from San Pedro Martir, and *suturalis* (LeConte) from San José del Cabo, San Esteban, and Comondu. The former does not occur much south of San Fran-

cisco, and specimens from the Peninsula prove to be *A. signaticollis* Fall; the *suturalis* of Horn (not LeConte) is here described as a new species.

KEY TO THE SPECIES OF ANACAENA OF LOWER CALIFORNIA

1. Length 2.5 to 3mm.; form broadly oval. Pronotum yellowish-brown except for a darker M-shaped mark on disk. Metafemora except at apex densely pubescent; metatarsal segments together shorter than metatibia.....(79) **signaticollis**
Length 1.6 mm.; form elongate-oval, narrowing posteriorly from near bases of elytra. Pronotum piceous, sharply narrowly pale laterally. Metafemora sparsely pubescent along anterior margin; metatarsal segments together as long as metatibia
(80) **sternalis**

(79) **Anacaena signaticollis** Fall

Anacaena signaticollis FALL, 1924, New York Ent. Soc., Jour. 32:87; D'ORCHYMONT, 1942A, Musée roy. Hist. nat. Belgique, Mem. Ser. 2, Fasc. 24:37, 50.

Length 2.5 to 3 mm., form oval, strongly convex. Head black, usually pale just before the eyes; pronotum yellowish-brown, except for a large somewhat M-shaped brown or piceous mark on the disk; elytra yellowish-brown; coarseness of elytra punctation variable.

Type locality: Pomona, Calif.

Recorded distribution: Southern California; New Mexico; Lower California: San Pedro Martir (as *infuscatus*); "Basse-Californie."

New records: Lower California: 1, Nineteen miles east of Rosario, June 17 (in a spring); 6, Twenty miles south of Santo Tomas, August 3 (in a small stream); collected by Michelbacher and Ross.

Winters (1926:55) placed *signaticollis* as a synonym of the European *A. bipustulatus* (Marsham), but Fall denied this—see Leng and Mutchler 1933: 16, and d'Orchymont 1942A.

(80) **Anacaena sternalis** Leech, new species

A tiny elongate blackish species; lateral margins of pronotum yellowish, elytra narrowly rufous laterally in apical two-thirds. This is the *Creniphilus suturalis* Lec. of Horn 1894: 317.

Male: Length 1.65 mm.; width 0.91 mm. Form elongate-oval, elytra narrowing posteriorly almost from the humeri. Head black; pronotum piceous, lateral margins yellowish-white in anterior two-thirds, transparent in posterior third and part way along base. Elytra rufo-piceous, palest apically; lateral margins yellowish-brown from just before middle to apex, broader posteriorly. Undersurface rufo-piceous; antennae and palpi yellowish brown, apical segment of palpi darker; legs rufous, femora infuscate.

Head finely punctate, size and distribution of punctures irregular. *Pronotum* finely sparsely irregularly punctured, punctures averaging smaller than those of head; corners broadly rounded. *Elytra* with sutural striae in apical half; punctation finer than that of pronotum, distinctly serial basally, but coarser and irregular in apical half; each puncture gives rise to a fine

recumbent hair. *Antennae* 9-segmented. Maxillary *palpi* short and stout, about as long as the almost cylindrical ultimate, penultimate two-thirds as long as ultimate. *Prosternum* not carinate. Mesosternum with a transverse median protuberance which, viewed from posteriorly, is broadly conical and much like that of *infuscata* or *signaticollis* but blunter. Metafemora sparsely pubescent with elongate hairs along anterior edge.

Holotype, the male described above (at present retained in my collection) from San José del Cabo. The left antenna is broken, the tarsi from the right proleg and the tarsi and tibia of the left mesoleg, are missing. This specimen was amongst the palpicornes bought from the late Charles W. Leng.

A. sternalis is closely allied to *suturalis* and the two may at once be separated from all our small hydrophilids by their shape, color, and fine punctation. Horn (1890:272) said of *suturalis* "The prosternum and mesosternum are simple, without trace of carina," but this is not true; in some specimens the transverse mesosternal protuberance is small, but it is always present and usually visible even at a magnification of only 20×. In *sternalis* the protuberance is twice as high, but there does not seem to be any other character to distinguish the species. *A. suturalis* has been recorded from the Great Lakes region to Florida; the only western extension seems to be Horn's listing of "Texas." I have before me thirteen examples from various localities in Georgia, and a pair from Lucedale, Miss.; LeConte's type series of five specimens contained examples from "Pennsylvania, New York and Lake Superior."

Genus **Laccobius** Erichson

Laccobius ERICHSON, 1837, Käfer der Mark Brandenb. 1:202.

Genotype of *Laccobius* s. str.: *Chrysomela minuta* Linnaeus 1758, the only species cited by Erichson (though at least one of the names he placed in the synonymy thereunder, represents a valid species). Thomson (1859:18) designated *minutus,* but Westwood (1838:10) cited *Hydrophilus bipunctatus* Fabricius, 1775.

The species of *Laccobius* live in shallow water at the margins of streams, springs, and swampy places. Some kinds like muddy shores, others prefer coarse sand or gravel. The beetles are from 2.5 to 3.5 mm. long, rather broadly oval; the head and pronotum are often largely a beautiful green or coppery red, maculate with black, the elytra usually yellowish, marked with black, green, or reddish. The legs are long and slender. The elytral punctation may be confused, or in longitudinal series.

At present only eight species are recognized from North America north of Mexico, but study of eight hundred specimens in my collection shows that others await description. Specific identifications must be based on males, which are easily recognized by the enlarged second and third protarsal segments. See d'Orchymont 1942:1–18.

(81) **Laccobius** sp.

Horn (1873: 125) recorded the California *ellipticus* LeConte from Lower California, and in 1894 specified San Pedro Martir and Cabo San Lucas. Because the material under that name in collections is composite, I accept the identification only provisionally. This applies also to Winters' (1926: 50) record of "Lower California" for *ellipticus*.

New records (*Laccobius* sp.): Lower California: 1 female. Nineteen miles east of Rosario, June 17 (in a spring); 1 female, Hamilton Ranch, August 2; both collected by Michelbacher and Ross. Gulf of California: 1 female, San Marcos Isl., June 19, 1921, collected by E. P. Van Duzee (C.A.S.).

Genus **Cymbiodyta** Bedel

Cymbiodyta BEDEL, 1881, Faune Coleopt. Bassin du Seine 1:307.

Genotype: *Hydrophilus marginellus* Fabricius, 1792; designated by Bedel, 1881: xxiii.

Distinguished from *Helochares* and *Enochrus,* which the species of *Cymbiodyta* resemble, by the 4-segmented meso- and metatarsi.

There are no examples of *Cymbiodyta* in the Lower California material before me, but Horn has recorded *dorsalis* (Motschulsky) from the peninsula (1890: 256; 1894: 316). The following description is drawn from California specimens.

(82) **Cymbiodyta dorsalis** (Motschulsky)

Hydrobius dorsalis MOTSCHULSKY, 1859, Soc. Imp. Nat. Moscou, Bul. 32: (2): 177.
Philhydrus dorsalis, HORN 1873, Am. Philos. Soc., Proc. 13: 131.
Cymbiodyta dorsalis, HORN 1890, Am. Ent. Soc., Trans. 17: 254, 255; FALL, 1901, Calif. Acad. Sci., Occ. Papers, 8: 57; WINTERS, 1927, Pan-Pacific Ent. 4(1): 26, 27.

Length 4.5 to 5.25 mm. Head black, pronotum and elytra black, reddish-yellow laterally, pronotum more broadly so; undersurface black, mouthparts, trochanters, femora apically, tibiae and tarsi, usually rufous.

Head, pronotum and elytra densely rather finely punctate, head and pronotum with a few coarser punctures laterally; *elytra* with sutural striae in apical two-thirds, and laterally five or six longitudinal series of punctures, outer series coarser and longer, though apically a full complement of ten (including sutural) may show. *Prosternum* not carinate medially; mesosternal protuberance small, arcuate, transverse; apparent fifth abdominal *sternite* with a small shallow emargination at apex, emargination fringed with stiff hairs.

Type locality: San Francisco, Calif.

Recorded distribution: Washington; California; Santa Cruz Island; Lower California: San Pedro Martir.

Genus **Enochrus** Thomson

Philydrus SOLIER, 1834, Soc. Ent. France, Ann. 3: 315 (not *Philydrus* Duftschmidt, 1805, Dryopidae).

Philhydrus BRULLÉ 1835, *in:* AUDOUIN and BRULLÉ, Hist. Nat. Insect. 5:276 (not *Philhydrus* Brookes, 1828, Reptilia).
Enochrus THOMSON 1859, Skandin. Coleopt. 1:18.

Genotype: F. Balfour-Browne (1941: 264–265) has discussed the genotype of *Philydrus,* accepting the designation of *Hydrophilus melanocephalus* Fabricius, 1801 (= *H. quadripunctatus* Herbst, 1797) by Thomson, 1859: 18. However, he has overlooked the earlier designation by Hope (1839: 125) of *Hydrophilus bicolor* Fabricius, 1792. Thomson, loc. cit., in creating *Enochrus,* cited as type *Hydrophilus bicolor* Paykull (= *Hydrophilus melanocephalus* Olivier, 1792), and Knisch (1924: 200) gave *melanocephalus* Olivier.

Our species of *Enochrus* have been divided amongst three subgenera, i.e., *Enochrus* s. str., *Methydrus* Rey, and *Lumetus* Zaitzev. D'Orchymont's key to these subgenera (1919: 155) has been rearranged and given by Winters (1927: 19) as follows:

"Last 2 joints of maxillary palpi nearly equal in length.....Subgen. **Enochrus** st. str.
Last joint of maxillary palpi always shorter than the preceding.....2
2. Series of coarser punctures on head and thorax indistinct or very much reduced
Subgen. **Methydrus** Rey.
Series of coarser punctures distinct.....Subgen. **Lumetus** Zaitz."

This last character, the series of coarser punctures of the head and pronotum, is very difficult or impossible to use. In 1939 J. Balfour-Browne, discussing *E. esuriens* (Walker), decided that the differences in punctation did not justify two subgenera, but unfortunately he made the older *Methydrus* Rey a synonym of *Lumetus* Zait. D'Orchymont (1939) reviewed the matter and agreed that a separation on punctation was unsatisfactory. He proposed to retain both subgenera, distinguishing them on the form of the apex of the fifth abdominal sternite, as follows (translated):

"1. Fifth ventral segment without a cilate notch, the posterior margin entire, without a fringe of stiff hairs at the middle. Subgenotype: *Hydrophilus bicolor* F., 1792
Lumetus
1'. This segment with a semi-circular notch fringed with stiff russet or golden hairs. Sometimes the notch is shallow and poorly indicated, but in that case, the fringe of hairs, distinct from the surrounding pubescence, is present. Subgenotype: *Hydrophilus affinis* Thunberg, 1794.....**Methydrus**"

By this arrangement, only the following of the Nearctic *Enochrus* will run to the subg. *Lumetus: conjunctus* (Fall), *reflexipennis* (Zimmermann), *hamiltoni* (Horn), the *diffusus* (LeConte) complex, and *collinus* Brown.

The four species at hand from Lower California all trace to the subgenus *Methydrus* in the 1939 key. They may be separated as follows:

KEY TO THE SPECIES OF ENOCHRUS OF LOWER CALIFORNIA

1. Prosternum carinate at middle.....2
—Prosternum not carinate. Head black except above base of each mandible; pronotum and elytra rufo-testaceous or tinged with piceous; basal marginal line of pronotum distinct; protarsal claws of male not toothed, though with a basal angulation
(83) **californicus**

2. Length 4 mm. or over; form elongate-oval, pronotum unicolorous.....(84) **rossi**
—Length 2.25 to 3.5 mm.; form more broadly oval; pronotum unicolorous or maculate...3
3. Length 2.75 to 3.5 mm. Pronotum black or piceous at middle; head black except for a pale area just in front of eyes; elytral punctation usually as apparent as that of pronotum; form narrower.....(85) species near **cristatus**
—Length 2.25 to 3.25 mm. Pronotum uniformly testaceous, except for darkenings formed by internal muscle attachments; head broadly testaceous in front of eyes; elytra usually impunctate (as seen at 20×) except for a few longitudinal series; form broader .....(86) species near **pectoralis**

(83) **Enochrus (Methydrus) californicus** (Horn)

Philhydrus latiusculus HORN, 1873, Am. Philos. Soc., Proc. 13:128, 130 (not *Philhydrus latiusculus* Motschulsky, 1859:179).
Philydrus californicus HORN, 1890, Am. Ent. Soc., Trans. 17:243, 248.
Enochrus (Lumetus) californicus, WINTERS 1927, Pan-Pacific Ent. 4(1):20, 22.

Length 4 to 5 mm., form broadly oval. Punctures of *head,* pronotum and elytra similar, densest on head, sparest on elytra. *Elytra* not striate, except for a sutural stria in posterior half. Basal marginal line of pronotum fine but distinct. *Prosternum* slightly inflated at middle, not carinate; mesosternal protuberance lineal, not sharp, with an indication of a tooth at apex.

Type locality: "California (probably northern)."

Recorded distribution: California; Washington.

New records: Lower California: 1, Rosario, June 17 (in pool); collected by Michelbacher and Ross.

(84) **Enochrus (Methydrus) rossi** Leech, new species

A yellowish-brown species with carinate prosternum, belonging to the *pygmaeus* group.

Length 4.1 mm., width 2 mm. Form elongate-oval, nearly parallel-sided. Head black except for a large pale area in front of each eye. Pronotum and elytra yellowish-brown, transparent; undersurface black or piceous, except mouthparts, anterior coxae, all trochanters, tibiae and tarsi, which are yellowish-brown.

Head, pronotum and elytra finely punctate, those of *elytra* a little coarser, separated by more than their own widths; coarser series of punctures on *pronotum* present, but not greatly differentiated. *Prosternum* carinate at middle, carina somewhat produced anteriorly, moderately sharp and narrow medially and posteriorly. *Mesosternal* protuberance large, narrow, slightly mucronate anteriorly. *Palpi* rather short, ultimate segment two-thirds length of penultimate.

Holotype, female, **Coyote Cove, Concepcion Bay,** Lower California, July 24, 1938; collected by Michelbacher and Ross (C.A.S. No. 5467).

Paratype, female, same data. Differs from the type in having the head pale across the front.

This species is not strongly differentiated. Its prosternal carina is most like that of *pygmaeus* (Fabricius), but the body form is even more elongate and

parallel-sided than that of *cristatus* (LeConte), from which the immaculate pronotum immediately separates it. Its size alone will separate it from the other two species of the *pygmaeus* complex known from Lower California. I have not been able to recognize it in any of Sharp's descriptions of Mexican species.

Enochrus pygmaeus complex

In regard to the *Enochrus pygmaeus* complex, following Winters (1927: 20, 21), the two small species from Lower California would be identified as *nigellus* (Sharp) [not *nigrellus,* as written by Winters] and *nebulosus* var. *pectoralis* (LeConte). A careful study of material in this group from many places across the United States suggests that the matter is not so simple. There do not seem to be any constant differences in the shapes of the mesosternal carina, which is large, thin, and of greatest depth anteriorly, where it may be mucronate. But the form of the prosternal carina, the elytral punctation, the body shape and color, are characters correlated with distribution, and enable us to group the material as follows:

(1) Average length 3.5 mm. Prosternal carina low, broad, not much more protuberant anteriorly. Punctation of head usually more distinct than that of pronotum; elytral punctation sparse, the punctures separated by two or more times their own width, and not deeply impressed; pronotum yellowish, not with a median black area. Ontario and Quebec to Florida, Missouri and eastern Texas.

This is the *nebulosus* (Say) of LeConte and later authors, and presumably of Say, though he does not describe the ventral carinae. Say mentions a specimen from Lake of the Woods, and judging from Barber's map of the former's travels (1928: 16) the type locality could be in either Ontario or Minnesota. Motschulsky's *maculifrons* has been placed as a synonym, though the short description does not agree as to color, but his *latiusculus* and *obtusiusculus,* also so placed, appear to me to differ; see notes under No. 3. D'Orchymont (1933: 307) says that *nebulosus* (Say), 1824, is a synonym of the Antillean *pygmaeus* (Fabricius) 1792, of which latter he has seen the type.

(2) Very similar to *pygmaeus* dorsally, but the average length is 3.25 mm., the prosternal carina is higher and much sharper, the head is finely if at all punctate, and the elytra are finely to almost impunctate. In most Texas and Arizona examples the elytra appear to be impunctate under a magnification of 40×, and the usual median blackish mark on the clypeus is reduced or absent.

This may be *pectoralis* (LeConte), described from the Colorado River, California. A few specimens from Arizona, and one from New Mexico, and all those from California (Riverside to Fresno) are distinctly punctate, and the clypeus is piceous medially. Motschulsky's *Philhydrus maculifrons* (1859: 179) was placed as a synonym of *pectoralis* LeConte, but the description does not tally. I have seen this labelled *nigellus* Sharp, by Winters; he seems to have used *nigellus* on specimen labels, though it is given as "*nigrellus*" in his paper.

(3) Average length 3.5 mm. Prosternal carina lower and broader, as in *pygmaeus,* but mucronate anteriorly; pronotal and elytral punctation coarser than in *pygmaeus.* Pronotum piceous medially. California, from Los Angeles north at least to Mendocino Co.; Arizona; New Mexico; Utah. Examples from the last three states are usually a little more finely punctate, and may differ.

This is quite certainly *obtusiusculus* (Motschulsky) 1859, described from San Francisco, which locality was used by him in a broad sense. It is also one of the three forms which I have seen labelled *nigellus* by Winters. If it is the true *nigellus,* described from Guanajuato and Oaxaca, Mexico, then Sharp's name will be a synonym.

It should be noted that *latiusculus* (Motschulsky) was described as more coarsely punctate than *obtusiusculus;* this would not apply to No. 2 above, and so it is possible that *latiusculus* may prove to be a small form of the *diffusus* (LeConte) complex.

(4) Average length 3.25 mm. Head piceous except just before the eyes; pronotum broadly piceous, elytra tinged with piceous; elytral punctation about as in *pygmaeus;* prosternal carina as in No. 2; form narrower. San Diego, Calif.

This is *cristatus* (LeConte); it appears to be a distinct species of restricted distribution. I have seen topotypical specimens. It is also the *nigellus* Sharp of Winters, in part.

(5) Average length 3.3 mm. Form more convex than in *pygmaeus,* prosternum less strongly carinate, elytral punctation much coarser; maxillary palpi shorter, the apical segment more nearly equal the penultimate in length. Capron, Florida.

The Lower California specimens differ appreciably from any of the above and without a revisional study it seems best not to propose new names for them.

(85) **Enochrus (Methydrus)** sp., near **cristatus** (LeConte)

Length 2.75 to 3.5 mm. Differs from typical *cristatus* in that the elytra are paler, and the pronotum is black only on the disk. *E. obtusiusculus* (as defined above) has the pronotum similarly marked, but it is a broader and more coarsely punctate species, with the prosternum not nearly so sharply carinate.

Records: Lower California: 19, Hamilton Ranch, August 2 (irrigation ditch); 7, Twenty miles north of Comondu, July 23; 1, San Miguel, July 3; all collected by Michelbacher and Ross. These are presumably the same species as the "*Philhydrus nebulosus* Say, var. *cristatus* Lec.," of Horn's list, and recorded by him from La Joya and San Ignacio.

(86) **Enochrus (Methydrus)** sp., near **pectoralis** (LeConte)

Length 2.5 to 3.25 mm. Differs from what I take to be typical *pectoralis* in that the head is more distinctly punctate, and the front of the head darker at middle. The mesosternal protuberance is variable in form, and a few specimens have been seen in which it is small; such examples simulate *ochraceus* (Mel-

sheimer), an eastern species recorded from Riverside, Calif., by Winters. The non-carinate prosternum will at once distinguish *ochraceus,* which I have not seen from further southwest than Dallas, Tex.

Records: Lower California: 11, Triunfo, July 7; 172, Triunfo, July 13 (at light); 2, Twenty miles north of Comondu, July 23; 4, Five miles west of San Bartolo, July 13; 1, Five miles south of Miraflores, July 10; all collected by Michelbacher and Ross. Also 1, Angeles Bay, June 26, 1921; and 3, San Marcos Island, June 19, 1921; collected by E. P. Van Duzee (C.A.S.).

Genus **Helochares** Mulsant

Helophilus MULSANT, 1844, Hist. Nat. Coléopt. France, Palpic., 3:132 (not *Helophilus* Leach 1817, Diptera).

Helochares MULSANT, 1844, Hist. Nat. Coléopt. France, Palpic., 3:197; MULSANT, 1844, Sci. Soc. Agric. Lyon, Ann. 7:379.

Helocharis THOMSON, 1859, Skand. Coleopt. 1:18.

Genotype: of *Helochares* s. str. *Dytiscus lividus* Forster, designated by Thomson (1859:18), whose misspelling of the generic name is not listed in Neave's Nomenclator. Knisch (1924:192) also cited *lividus.*

A key to the subgenera (world fauna) has been given by d'Orchymont (1919:149). Winters (1927:24) has given one for the North American fauna.

Horn (1873:126; 1890:252; 1894:316) recorded *H. normatus* (LeConte), and later (1896:368) *maculicollis* Mulsant, from Lower California. Both species belong to the subgenus *Hydrobaticus* MacLeay, characterized by the ten lines of coarse elytral punctures, which may be impressed as striae. There are no examples of *maculicollis* in the Lower Californian material at hand, and I am inclined to doubt the record.

Winters (1927:23) says that *Helochares* is the only hydrophilid genus in which the female beetle carries her egg-case against her abdomen. But the same habit has been recorded for *Epimetopus* (q.v.) and *Spercheus.* Blatchley (1917:139) mentioned the egg-case of *H. maculicollis,* while Richmond (1920: 62, 63, and pl. 13, fig. 9) has described and illustrated it. A figure of a case *in situ* has been given by Böving (Böving and Henriksen, 1938, item P. of fig. 1) and by Balduf (1935). For a full review of the method of spinning, egg-laying, and the placing or carrying of the egg-cases by different genera of hydrophilid beetles, see Laabs, 1939.

(87) **Helochares (Hydrobaticus) normatus** (LeConte)

Philhydrus normatus LECONTE 1861, Acad. Nat. Sci. Phila., Proc. 1861, p. 341; HORN, 1873, Am. Philos. Soc., Proc. 13:126.

Helochares normatus, HORN 1890, Am. Ent. Soc., Trans. 17:252; FALL, 1901, Calif. Acad. Sci., Occ. Papers 8:57; WINTERS, 1927, Pan-Pacific Ent. 4(1):24; D'ORCHYMONT, 1929, Soc. Ent. Belgique, Ann. and Bul. 69:94.

Length 4 to 6 mm. Form rather egg-shaped, broadest just behind the middle. Color luteous to rufo-piceous, head basally and pronotum discally black; elytra often with an oblong transparent area beneath each serial puncture;

undersurface black, palpi, antennae, tibiae, and tarsi rufous. *Head* and pronotum finely sparsely punctate; elytra with a short scutellar and ten long series of coarse punctures which do not reach the elytral apices, but may be slightly impressed to form faint striae; interspaces very finely punctate. *Prosternum* feebly carinate at middle; mesosternum inflated and faintly carinate in front of the coxae; fifth abdominal sternite with a small ciliate emargination at middle of hind margin.

Type locality: Bodega, Calif. This is in Sonoma Co., just north of Dillon Beach, and about 50 miles north of San Francisco.

Recorded distribution: California; Arizona; Mexico; Lower California: Baja Purisima and Cabo San Lucas.

New records: Texas (Leng-Leech colln.); Lower California; 1, Twenty miles south of Santo Tomas, August 3 (small stream); collected by Michelbacher and Ross. Also 1, Mulege, May 14, 1921, collected by E. P. Van Duzee (C.A.S.); 10, San Marcos Isl., June 19, 1921; 2, Espíritu Santo Isl., June 9, 1921, collected by E. P. Van Duzee (C.A.S.).

D'Orchymont (1929:95) suspected that *seriatus* Sharp, of Guatemala and Mexico, is a synonym of *normatus*, and later (1943A: 4) made the synonymy definite, suggesting *regularis* Sharp as another synonym.

H. normatus may be separated from *maculicollis* and a species I identify as *bipunctatus* Sharp, as follows (however, d'Orchymont (1943A: 4) suggests that *bipunctatus* is a synonym of *maculicollis*):

1. Front margin of mentum nearly straight; mesosternum tumid at middle before coxae, but not carinate; abdominal sternites flatter, close fitting; series of coarse punctures on elytra usually in distinct striae.....2
—Front margins of mentum strongly arcuate inward; mesosternal protuberance distinctly carinate; abdominal sternites not flat, the sutures deep, sternites not fitting closely one to another; series of coarse punctures on elytra not or only very slightly impressed as striae.....normatus
2. Form broader behind, more convex; elytral striae less deeply impressed. Eastern and southeastern United States.....maculicollis
—Form narrower, more parallel-sided, flatter; elytral striae deeply impressed. Mexico bipunctatus

D'Orchymont (1943: 2) has given a somewhat different key for the first two species.

Genus **Cryptopleurum** Mulsant

Cryptopleurum MULSANT, 1844, Hist. Nat. Coléopt. France, Palpic., 3:188.

Genotype: *Sphaeridium atomarium* Fabricius, the only species listed by Mulsant. The *S. atomarium* Fab. of Mulsant is presumably, in part at least, the true *S. atomarium* Olivier, 1790 (= *S. minutum* Fabricius, 1775), though Knisch listed *atomarium* Mulsant (ex. p.), as a synonym of *crenatum* Panzer, 1794. Thomson (1859: 19) cited as type *atomarium* Fabricius, while Knisch (1924: 159) gave *minutum* Fabricius.

These are small terrestrial hydrophilids, found in rotting vegetable matter and in animal faeces.

(88) **Cryptopleurum impressum** Sharp

(Figure 8)

Cryptopleurum impressum SHARP, 1882, Biol. Centr.-Amer., Coleopt. 1(2):115.

Length 1.7 to 2 mm. Black to brown, shining. Elytral striae punctate, not impressed except apically; interspaces with small sparse punctures, from each of which a fine golden hair arises. Metasternum distinctly inflated medially, its punctures similar to those of the elytral striae.

Type locality: Cordova, Mexico.

Recorded distribution: Mexico.

New records: Lower California: 4, Seventeen miles south of Ensenada, June 14; 1, El Arco Mines, June 23 (in rotting *Pachycereus*); collected by Michelbacher and Ross.

A specimen was identified for me by Mr. J. Balfour-Browne, who compared it with Sharp's type in the British Museum.

Genus **Pelosoma** Mulsant

Pelosoma MULSANT, 1844, Hist. Nat. Coléopt. France, Palpic., 3:184, and fig. 18.

Genotype: *Pelosoma laferti* Mulsant, 1844; by single reference.

(89) **Pelosoma** sp. near **capillatum** (LeConte)

A series of 54 specimens represent a species closely allied to *capillatum* (LeConte), but distinct and probably undescribed. However, as I have not seen any of the Mexican species described by Sharp in the "Biologia," and since Mr. J. Balfour-Browne is making a revisional study of the *Cercyonini*, it seems best not to name this species.

Length from 1.75 to 2.15 mm. Shining, black, the front of the head and the elytra apically rufous; ventral surface black, the mouthparts, antennae, legs, and last abdominal sternite rufous.

Elytra with fine decumbent golden hairs, except on disk; striae not impressed except laterally at middle, punctures larger at middle of elytra, fine near base and apex, where they are hardly distinguishable from those of intervals. *Prosternum* carinate; mesosternum raised, flat, pentagonal, densely punctate. *Metasternum* inflated (females), or with an ovate depression (males), and punctate.

P. capillatum differs by its more coarsely punctate elytra, and the broader and longer depression in the male metasternum. LeConte (1855: 374) described his species from San Diego and the valley of the Gila, in putrid cacti. Horn (1890: 307) cited only Arizona and Texas. Moore (1937: 21) recorded it from San Diego, Calif., but Blackwelder omitted it entirely from his paper on the Sphaeridiinae of the Pacific Coast.

Records (*Pelosoma* sp.): Lower California: 39, Santonio, June 7 (rotting cordon); 14, Fifteen miles north of San Ignacio, June 24 (rotting cactus); 1, El Arco Mine, June 23 (rotting *Pachycereus*). All collected by Michelbacher and Ross.

Genus **Cercyon** Leach

Cercyon LEACH, 1817, Zool. Miscellany 3:95.

Genotype: Leach listed two species: "1. *unipunctatum,* 2. *melanocephalum* &c." Thus the designations of *Hydrophilus quisquilius* Linnaeus, 1761, by Westwood (1838:10), and Hope (1839:154), can not stand. Thomson (1859: 19) cited *melanocephalum* Linnaeus, 1758, which is a valid designation. Knisch (1924:127) gave *unipuctatum* Linnaeus, 1758.

The species of this genus are to be looked for under carrion, faeces, rotting fruits and vegetables, and seaweed; some occur in the damp soil near water. The beetles are all small, and are poorly known; Mr. J. Balfour-Browne of the British Museum has undertaken a revisional study of the North American species. The three species here recorded belong to the typical subgenus.

KEY TO THE SPECIES OF CERCYON OF LOWER CALIFORNIA

1. Elytra with impressed striae. Form broad, rather flat; head held obliquely. Raised area of metasternum limited to middle of metasternum, not extended by an oblique line toward outer anterior angle. Head and pronotum closely, rather coarsely punctate. Length 2.5 to 3.5 mm.....2
—Elytra with rows of punctures which are not impressed as striae. Form oval, convex; head held vertically. Raised area of metasternum limited to middle of metasternum. Head and pronotum sparsely finely punctate. Length 2 mm.....(90) **rufescens**
2. Elytral striae deeply impressed from base to apex, intervals distinctly convex. Median mesosternal elevation narrowly fusiform, punctate, acute anteriorly, rounded posteriorly, sides nearly vertical to mesosternum proper.....(91) **fimbriatum**
—Elytral striae shallow, intervals flat. Mesosternal elevation a narrow shining carina, the sides sloping gradually to mesosternum proper.....(92) **lunigerum**

(90) **Cercyon rufescens** Horn*

Cercyon rufescens HORN, 1895, Calif. Acad. Sci., Proc. (2)5:233.

This species is probably known only by the type, now in the California Academy of Sciences (Ent.), at San Francisco.

Horn's original description is quoted: "Oval, convex, form of *tristis,* rufescent moderately shining. Head and thorax sparsely finely punctate. Thorax without basal marginal line. Elytra without impressed striae but with rows of moderate punctures not closely placed, the eighth, ninth and tenth rows with the punctures deeper and closer for part of their length; intervals flat, equal in width, irregularly biseriately punctate. Body beneath colored as above. Metasternal area not well defined, moderately coarsely punctate. Mesosternum oval, acute in front, coarsely punctured. Prosternum strongly carinate. Length, .08 inch; 2 mm.

From its form and the fact that the head is vertical the species seems best placed near *tristis* and *floridanus,* but it differs from all of that series by its

* After first proof of this paper had been received, I had an opportunity to examine the type of *Cercyon rufescens* Horn, and was astounded to find that it is a species of *Pelosoma!* Indeed it traces directly to *Pelosoma* in Horn's own revision of the tribe (1890A:287) and the mesosternal elevation is even broader, shorter, and more abruptly pointed than in his illustration for *P. capillatum,* pl. 9, fig. 8. *Pelosoma rufescens* (Horn) is perfectly distinct from the species near *capillatum,* No. 89 above.

pale color, which is not due to immaturity. At first glance it would be taken for an *Olibrus*.

One specimen. Sierra San Lazaro."

(91) **Cercyon fimbriatum** Mannerheim

Cercyon fimbriatum MANNERHEIM, 1852, Soc. Imp. Nat. Moscou, Bul. 25(2):344; LECONTE, 1855, Acad. Nat. Sci. Phila., Proc. 7:374.

Cercyon fimbriatus, HORN, 1890A, Am. Ent. Soc., Trans. 17:290, 292; FALL, 1901, Calif. Acad. Sci., Occ. Papers 8:58; BLACKWELDER, 1931, Pan-Pacific Ent. 8(1):22, 24.

Length 2.5 to 3.5 mm. Known at once by its deeply striate elytra, with convex intervals. Color variable: head black; pronotum and elytra yellow to almost entirely black; undersurface yellowish-brown to piceous, legs, mesosternal protuberance and raised median area of metasternum shining, punctate, rest opaque because of a fine close vestiture. Punctures of discal elytral interspaces about same size as those of head and pronotum. Mannerheim mentioned four color variants in his discussion of the species.

Type locality: "Sub fucis e mare rejectis in insula Edgecombe [Alaska] a D. Frankenhaeuser copiose lectum."

Recorded distribution: Along the Pacific Coast of the United States and Canada, from Alaska to San Diego, Calif.

New records: Lower California: 49, Fifteen miles north of Rosario, August 1 (beach, under seaweed); collected by Michelbacher and Ross. Also twelve examples from Rosarito Beach, collected by Ian Moore (Leech Colln.). These latter specimens were identified as *C. fimbriatum* by Mr. J. Balfour-Browne.

(92) **Cercyon lunigerum** Mannerheim

Cercyon lunigerum MANNERHEIM, 1853, Soc. Imp. Nat. Moscou, Bul. 26(3):168 (not *C. lunigerum* Motschulsky, 1863 = *lunulatus* Gemminger and Harold, 1868); BLACKWELDER, 1931, Pan-Pacif. Ent. 8(1):23, 24.

Cercyon luniger HORN, 1890A, Am. Ent. Soc., Trans. 17:290, 293, and pl. 9, fig. 22 (not *C. luniger* Régimbart, 1902 = *lunulatus* G. & H., 1868); FALL, 1901, Calif. Acad. Sci., Occ. Papers 8:58.

Heteryon luniger, WINTERS, 1944, Brooklyn Ent. Soc., Bul. 39(3):94.

Length 2.5 to 4 mm. Readily separated from *fimbriatum* by the characters given in the key. Occurs with that species under decomposing seaweed. The elytral surface is finely granulate and opaque laterally and in the apical quarter.

Type locality: "in insulae Kadjak stercoratis," Alaska.

Recorded distribution: Along the Pacific Coast of Canada and the United States, from Alaska to Catalina Island.

New records: Lower California: 2, Fifteen miles north of Rosario, August 1 (beach, under seaweed); collected by Michelbacher and Ross. Also 1, Rosarito Beach, collected by Ian Moore (Leech Colln.).

These specimens differ slightly from two from the Queen Charlotte Islands of British Columbia, in the form of the mesosternal protuberance and the

width of the pronotal marginal bead. There are not enough specimens at hand from intermediate localities to allow me to evaluate these differences. Mr. Balfour-Browne agrees with my identification.

Winters (1944) has placed *lunigerum* in Sharp's genus *Heteryon,* but this diagnosis cannot be upheld. *Heteryon* has been adequately redescribed by d'Orchymont 1937 : 1–5.

Genus **Dactylosternum** Wollaston

Dactylosternum WOLLASTON, 1854, Ins. Maderensia, p. 99.
Trichopoda BRULLÉ, 1835, Hist. Nat. Ins. 5(2) :289, 294.
Coelostoma (ex. p.) LAPORTE, 1840, Hist. Nat. Anim., Art. 2, p. 58.
Cyclonotum (ex. p.) MULSANT, 1844, Sci. Soc. Agric. Lyon, Ann. 7:167, 169.
Macrocercyon ALLUAUD, 1899, Soc. Ent. France, Bul. 1889, p. 379.

Genotype: *Dactylosternum roussetii* Wollaston, 1854, p. 100, pl. 3, fig. 1, = *D. insulare* (Laporte) 1840 : 59.

(93) **Dactylosternum cacti** (LeConte)

Cyclonotum cacti LECONTE 1855, Acad. Nat. Sci. Phila., Proc. 7:373; SCHWARZ, 1878, Am. Philos. Soc., Proc. 17:355.
Dactylosternum cacti, HORN, 1890A, Am. Ent. Soc., Trans. 17:283, 284; FALL, 1901, Calif. Acad. Sci., Occ. Papers 8:58; BLACKWELDER, 1931, Pan-Pacific Ent. 8(1) :21.

Length 4.5 to 6 mm. Form broadly oval, sides subparallel. Black above and below, except for the mouthparts, antennae and legs, which are tinged with rufous. *Head,* pronotum and elytra finely densely punctate, punctures separated by a little more than their own width; *elytra* with longitudinal series of coarser punctures, lateral ones coarser, not striate except for a lightly impressed sutural one in apical third. *Prosternum* carinate medially, carina protuberant anteriorly; mesosternal protuberance broadly sagittate; middle of metasternum inflated, shining, finely punctate. First abdominal *sternite* distinctly carinate at middle.

Type locality: "San Diego, California, in putrid opuntia."

Recorded distribution: Southern California; Arizona.

New records: Lower California: 3, El Arco Mines, June 23 (rotting *Pachycereus*); 4, Fifteen miles north of San Ignacio, June 24 (rotting cactus); 3, Venancio, July 17; 6, Santonio, July 7 (rotting cordon). All collected by Michelbacher and Ross.

Genus **Phaenonotum** Sharp

Phaenonotum SHARP, 1882, Biol. Centr.-Amer., Coleopt. 1(2) :97.

Genotype: *Phaenonotum tarsale* Sharp 1882, p. 98, pl. 3, fig. 8 (according to Knisch 1924 : 114).

This genus has not been recorded from Lower California before.

(94) **Phaenonotum** sp., near **exstriatum** (Say)

Length 3 mm. Form rather broadly oval, strongly convex, shining. Black, sides of pronotum diffusedly paler; undersurface piceous to rufo-piceous.

Head finely punctured, pronotum hardly more coarsely so; *elytra* much more coarsely punctate than head or pronotum, punctures separated by more than their own width, confused, without trace of striae or coarser series of punctures. *Prosternum* short, not carinate medially; mesosternum with a narrow linear median elevation which joins the similar but broadening metasternal elevation.

This species is closely allied to *P. exstriatum* (Say), but is smaller, narrower, and darker ventrally. This is probably one of the species described from Mexico by Sharp, but I have not been able to recognize it with certainty from his descriptions.

Records (*Phaenonotum* sp.): Lower California: 2, Twenty miles north of Comondu, July 23; 1, San Miguel, July 3; 3, Five miles south of Miraflores, July 10; collected by Michelbacher and Ross. Also 1 labelled San José del Caba [sic!], November 15, 1934 (S.D.N.H.M.).

FAMILY LIMNEBIIDAE

As mentioned in the discussion under the family Hydrophilidae, Böving (1931) proposed the family *Limnebiidae* for the genera *Limnebius, Ochthebius* and *Hydraena,* which he moved from the Hydrophiloidea to the Staphylinoidea.

Judging from the recent work of students of other orders of insects, and their interpretation of the International Rules and of Opinion 133, the name Limnebiidae should be credited not to Böving but to Mulsant who proposed it as "Limnebiaires" (1844: 88). On the other hand, the name *Hydraenidae* has been in use for many years by d'Orchymont, and perhaps should take precedence. It too may be credited to Mulsant (1844: 27), based on his "Hydraenaires."

Only one genus of this family has yet been reported from Lower California, but I am certain that the other two occur in the northern part of the peninsula, and give a key for separating the three.

1. Second segment of metatarsi elongate, longer than third; pronotum behind as broad as base of elytra, smooth, not coarsely punctate or sculptured, sides evenly arcuate; tiny black or rufescent beetles about 1 mm. long ..... **Limnebius**
—Second segment of metatarsi short, about as long as third; pronotum slightly or decidedly narrower than base of elytra, surface uneven, coarsely punctate or with a transparent margin, sides sinuate or irregular; small black or reddish beetles, 1 to 2 mm. long..2
2. Maxillary palpi very long, much longer than antennae; pronotum coarsely, closely punctate, sides without a transparent border ..... **Hydraena**
—Maxillary palpi shorter than antennae; pronotum variously sculptured, often with deep fossae and grooves, always with a transparent border in at least basal half (fig. 14) ..... **Ochthebius**

Genus **Ochthebius** Leach

Ochthebius LEACH, 1815, Ent., *in* Brewster's Edinb. Encyclop. 9:95.

Genotype: apparently *Hydraena riparia* Illiger, 1798 (= *Hydrophilus impressus* Marsham, 1802), not *Hydraena riparia* (Kugelann). Knisch (1924) does not use the typical subgenus to include *impressus.*

Tiny beetles, 1.3 to 2 mm. long; found in ponds and streams. Only one species has been reported from Lower California, but I have no doubt that careful collecting would disclose many others. They occur on the undersides of stones and wood, debris, etc., in running water, and can often be taken in quantity by stirring up the muddy edges of ponds or backwaters, as well as by splashing water onto the sandy edges of streams and rivers.

(95) **Ochthebius** (s. str.) **interruptus** LeConte

(Figure 14)

Ochthebius interruptus LECONTE, 1852, Lyceum Nat. Hist. N.Y., Ann. 5:210; LECONTE, 1855, Acad. Nat. Sci. Phila., Proc. 7:361; LECONTE, 1878, Am. Philos. Soc., Proc. 17:379; HORN, 1890B, Am. Ent. Soc., Trans. 17(1):23, and pl. 2, fig. 9; D'ORCHYMONT, 1943, Musée roy. Hist. nat. Belgique, Bul. 19(10):3, 7, and fig. 1A.

Length 1.60 to 1.75 mm.; piceous, aenescent, or cupreous. *Pronotum* broader than long (5.3 : 3.95), widest anteriorly, thence gradually narrowed to base, with a thin transparent broader from base to anterior quarter. Median groove two-thirds length of pronotum, sometimes interrupted, a discal forea at each side of it anteriorly, and another pair on each side at basal end, foveae moderately deep but their margins indistinct; an elongate anterior fovea on each side of pronotum, about on a line with eyes. Surface of *pronotum* sparsely finely punctate, the higher parts of the disk shining, remainder alutaceous. *Elytra* striate, punctures somewhat indistinct because of fine transverse wrinkles on interspaces, which are wider than striae.

Type locality: San Diego, Calif.

Recorded distribution: Lower California (Comondu) to British Columbia, Wyoming, Colorado, and Arizona.

New records: Lower California: Twenty miles north of Comondu, July 23; a single male collected by Michelbacher and Ross.

Typical specimens from southern California differ from this example in that the elytral punctures are coarser and not made indistinct by transverse ridges; there is also a small difference in the width of the aedeagus.

I am sure that the distribution as given by Horn (see above) covers two or more undescribed species, and suspect that one of them was used to provide his illustration of *interruptus*.

There are three specimens of *O. sculptus* LeConte in my collection (ex. C. W. Leng Collection) labelled simply "B.C." As British Columbia is far out of the range of this species, the specimens may be mislabelled, or the letters may be an abbreviation of Baja California.

O. sculptus is the same size as *interruptus*, but black, hardly aeneous. The pronotum is shaped as in *interruptus* but has a small "tooth" on each side, behind the middle, and a narrower transparent border. The median groove of the pronotum is hardly visible, each anterior discal forea tending to join the posterior one behind it, to form a continuous sulcus. The elytral striae hardly impressed, the punctures much smaller toward apex. Occurs in southern California and in Arizona.

APPENDIX A

Water Beetles of the Revillagigedo Islands

To the best of my knowledge, no species have previously been recorded from this group of islands.

(1) **Eretes sticticus** (Linnaeus)

For a description of this dytiscid, see species No. 45, ante.

APPENDIX B

Water Beetles of the Tres Marias Islands

(1) **Eretes sticticus** (Linnaeus)

For a description of this dytiscid, see species No. 45, ante.

(2) **Berosus metalliceps** Sharp

This hydrophilid was originally described from the Tres Marias Islands. See No. 63, ante.

CHECK-LIST OF THE HYDRADEPHAGA AND PALPICORNIA KNOWN TO OCCUR IN LOWER CALIFORNIA, THE REVILLAGIGEDO ISLANDS, AND THE TRES MARIAS ISLANDS

Species numbered as in the text

HALIPLIDAE

1. Peltodytes Régimbart
    1. callosus (LeConte)
    2. simplex (LeConte)
2. Haliplus Latreille
    3. concolor LeConte
    4. rugosus Roberts
    5. species

DYTISCIDAE

3. Macrovatellus Sharp
    6. mexicanus Sharp
4. Hydrovatus Motschulsky
    7. species
5. Desmopachria Babington
    8. species
    9. dispersa (Crotch)
    10. latissima (LeConte)
6. Bidessus Sharp
    11. quadripustulatus Fall
    12. cinctellus (LeConte)
    13. species near decoratus Fall
    14. subtilis (LeConte)
    15. amandus (LeConte)
    16. youngi Leech, new species
    17. affinis (Say) complex
7. Celina Aubé
    18. angustata Aubé?
8. Hygrotus Stephens
   Coelambus Thomson (subgenus)
    19. medialis (LeConte)
    20. fraternus (LeConte)
9. Hydroporus Schellenberg
    21. vilis LeConte
10. Deronectes Sharp
    22. addendus (Crotch)
    23. funereus (Crotch)
    24. striatellus (LeConte)
11. Laccophilus Leach
    25. pictus Laporte
    26. atristernalis Crotch
    27. decipiens LeConte
    28. terminalis Sharp
12. Suphisellus Crotch
    29. lineatus (Horn)
    30. levis (Fall)
13. Hydrocanthus Say
    31. species
14. Copelatus Erichson
    32. fragilis Sharp
    33. chevrolati Aubé
15. Agabus Leach
    34. regularis (LeConte)
16. Rantus Dejean
    35. atricolor (Aubé)
    36. gutticollis (Say) ?
    37. anisonychus (Crotch)
    38. mexicanus (Laporte)
    39. flavogriseus (Crotch)
17. Megadytes Sharp
    40. species near fraternus Sharp
    41. species near flohri Sharp
18. Cybister Curtis
    42. ellipticus LeConte
    43. explanatus LeConte
19. Dytiscus Linnaeus
   Dytiscus *s. str.* (subgenus)
    44. marginicollis LeConte
20. Eretes Laporte
    45. stricticus (Linnaeus)
21. Thermonectus Dejean
    46. peninsularis (Horn)
    47. nigrofasciatus (Aubé)
    48. basillaris (Harris)
    49. marmoratus (Hope)
    50. margineguttatus (Aubé)
22. Hydaticus Leach
    51. species
    52. species

GYRINIDAE

23. Gyrinus Geoffroy
    53. plicifer LeConte
    54. parcus Say?
24. Dineutus MacLeay
    55. sublineatus (Chevrolat)

HYDROPHILIDAE

25. Helophorus Fabricius
    56. lecontei Knisch
26. Epimetopus Lacordaire
    57. thermarum Schwarz and Barber
27. Hydrochus Leach
    58. variolatus LeConte
28. Hemiosus Sharp
    59. maculatus Sharp
29. Berosus Leach
    Enoplurus Hope (subgenus)
    60. punctatissimus LeConte
    61. miles LeConte
    Berosus *s. str.* (subgenus)
    62. stramineus Knisch?
    63. metalliceps Sharp
    64. dolerosus Leech, new species
    65. moerens Sharp
    66. infuscatus LeConte?
    67. rugulosus Horn
30. Hydrochara Berthold
    68. lineata (LeConte)
31. Hydrophilus Geoffroy
    69. insularis Laporte
32. Tropisternus Solier
    Pristoternus d'Orchymont (subgenus)
    70. apicipalpis (Chevrolat)
    71. laevis mergus (Say)
    72. lateralis (Fabricius) subspp.
    73. obscurus Sharp
    74. ellipticus (LeConte)
    75. californicus (LeConte)
    76. salsamentus Fall
33. Chaetarthria Stephens
    77. species near bicolor Sharp
34. Paracymus Thomson
    78. elegans (Fall)
35. Anacaena Thomson
    79. signaticollis Fall
    80. sternalis Leech, new species
36. Laccobius Erichson
    81. species
37. Cymbiodyta Bedel
    82. dorsalis (Motschulsky)
38. Enochrus Thomson
    Methydrus Rey (subgenus)
    83. californicus (Horn)
    84. rossi Leech, new species
    85. species near cristatus (LeConte)
    86. species near pectoralis (LeConte)
39. Helochares Mulsant
    Hydrobaticus MacLeay (subgenus)
    87. normatus (LeConte)
40. Cryptopleurum Mulsant
    88. impressum Sharp
41. Pelosoma Mulsant
    89. species near capillatum (LeConte)
42. Cercyon Leach
    90. rufescens Horn
    91. fimbriatum Mannerheim
    92. lunigerum Mannerheim
43. Dactylosternum Wollaston
    93. cacti (LeConte)
44. Phaenotum Sharp
    94. species near exstriatum (Say)

LIMNEBIIDAE

45. Ochthebius Leach
    95. interruptus LeConte

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PLATES

PLATE 20

Fig. 1. *Laccophilus terminalis* Sharp. To show certain structural characters used in the identification keys.

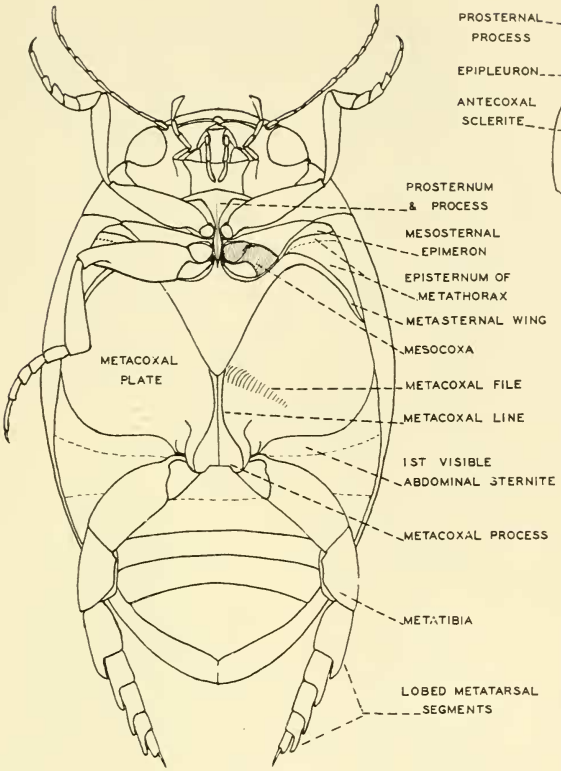
Fig. 2. *Peltodytes callosus* (LeConte). Same.
Figs. 1 and 2 are drawn to the same scale: 17 times natural size. Spines and setae have been omitted.

Fig. 3. *Thermonectus nigrofasciatus* (Aubé).

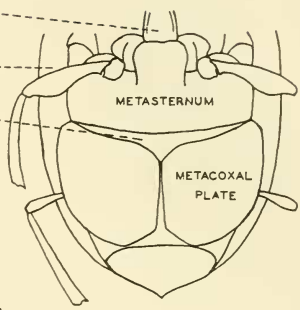
Fig. 4. *Tropisternus lateralis limbalis* (LeConte)

Fig. 5. *Dineutus sublineatus* (Chevrolat).

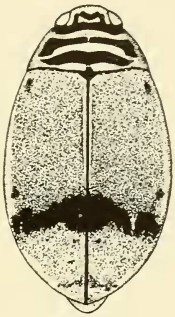
Fig. 6. *Cybister explanatus* LeConte.
Figs. 3 to 6, drawn by George R. Hopping, are 3 times natural size, and all to the same scale.



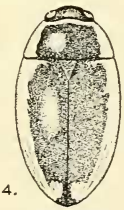
1. LACCOPHILUS TERMINALIS



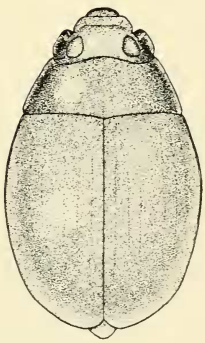
2. PELTODYTES CALLOSUS



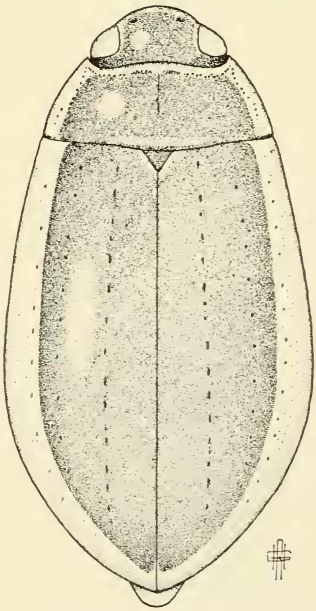
3. THERMONECTUS NIGROFASCIATUS



4. TROPISTERNUS LATERALIS LIMBALIS



5. DINEUTUS SUBLINEATUS



6. CYBISTER EXPLANATUS

PLATE 21

Fig. 7. *Desmopachria dispersa* (Crotch).

Fig. 8. *Cryptopleurum impressum* Sharp.

Fig. 9. *Hydrochus variolatus* LeConte.

Fig. 10. *Epimetopus thermarum* Schwarz & Barber.

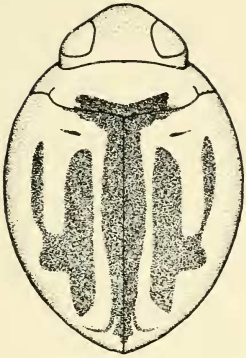
Fig. 11. *Peltodytes simplex* (LeConte).

Fig. 12. *Bidessus youngi* new species.

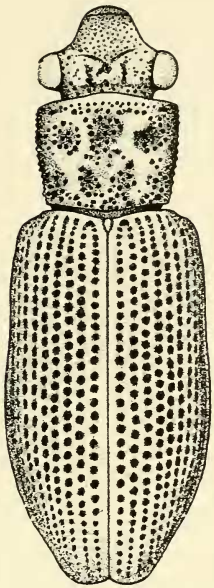
Fig. 13. *Berosus dolerosus* new species.

Fig. 14. *Ochthebius interruptus* LeConte.

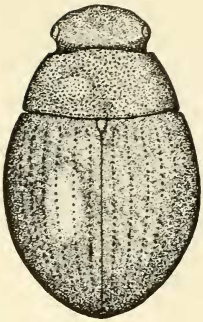
Figs. 7 to 14, drawn by George R. Hopping, are 20 times natural size, and all drawn to the same scale.



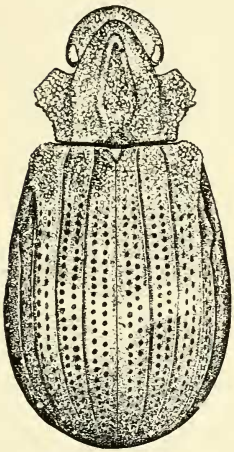
7. DESMOPACHRIA DISPERSA



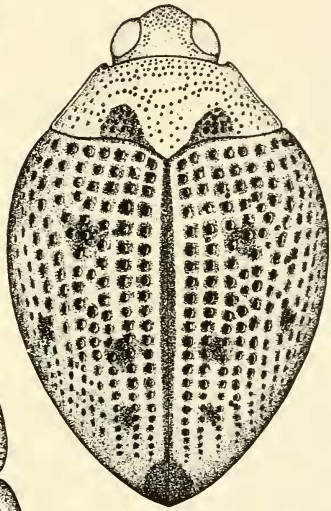
9. HYDROCHUS VARIOLATUS



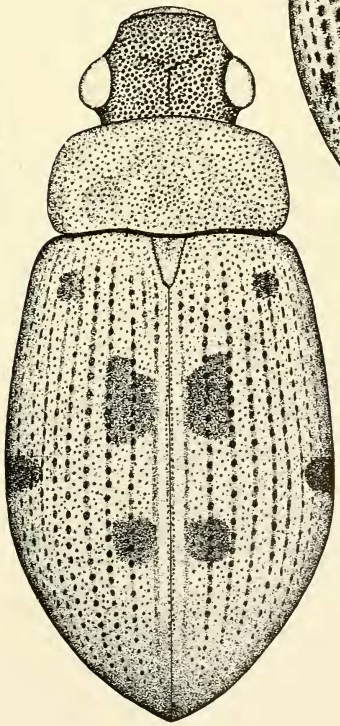
8. CRYPTOPLEURUM IMPRESSUM



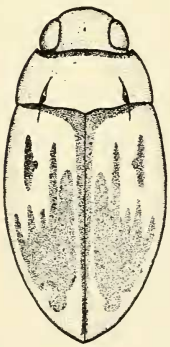
10. EPIMETOPUS THERMARUM



11. PELTODYTES SIMPLEX



13. BEROSUS DOLEROSUS



12. BIDESSUS YOUNGI

14. OCHTHEBIUS INTERRUPTUS