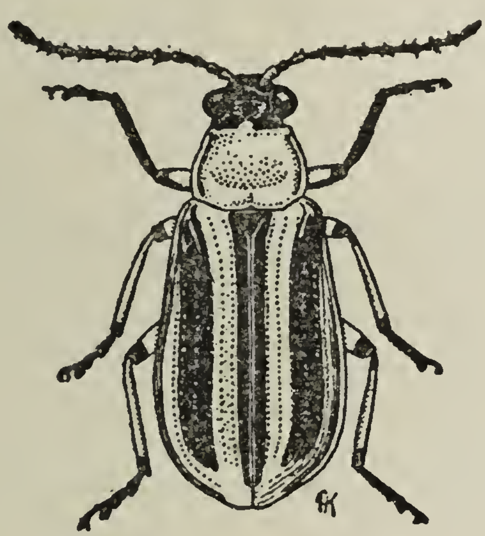
THE COLEOPTERISTS' BULLETIN

Volume V 1951



Published Bimonthly Beginning With February By:
The Coleopterists' Society

PUBLISHED FOR THE SOCIETY
BY SHERWOOD HOUSE

Contents and Index

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THE COLEOPTERISTS' SOCIETY

The Coleopterists' Society was founded on October 12, 1949, to increase interest in the insect order Coleoptera and to improve the study of it, by promoting research, providing for publication, and encouraging cooperation among students.

OFFICERS FOR 1951

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THE COLEOPTERISTS' BULLETIN

Published bimonthly beginning with February by The Coleopterists' Society at Washington, D. C. Terms of Subscription: $2.50 per annum, both domestic and foreign, payable in advance. Remittances should be made to The Coleopterists' Society. The Society does not exchange its publications for those of other societies.

The Coleopterists' Bulletin is conducted in the interest of coleopterists for the publication of short papers and other matter in the general field of coleopterology. Insofar as contributors supply suitable material, it is intended to include: (1) original papers on beetles, on methods and procedures, and on principles; (2) short notes about beetles, collecting, collectors, etc.; and (3) bibliographic aids to the student of taxonomic coleopterology.

Manuscripts should be prepared to conform to the style used in the Bulletin and to announcements of style therein. They should be typewritten, double-spaced. All manuscripts should be sent to the editor.

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Entered as second-class matter at the post office at Washington, D. C.

The Coleopterists' Bulletin

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NOTES ON CHRYSOBOTHRIS BACCHARI VAN DYKE
(Buprestidae)

By J. W. Tilden
San Jose State College, San Jose, California

As far as is known this species breeds only in *Baccharis pilularis* De Candolle, infesting both the prostrate coastal subspecies *typica* C. B. Wolf and the erect inland subspecies *consanguinea* De Candolle. According to Fisher[1] specimens from Arizona included in the original description of *bacchari* Van Dyke are *beyeri* Fisher, which has been reared from *Baccharis sergiloides* Gray. *Chrysobothris bacchari* is common in the larval stage and at times is destructive to the host plant.

Eggs were not found, but it appears that they are laid some distance above the ground, since young larvae are found frequently some distance above its surface. The larvae work first just beneath the bark, appearing to be phloem and cambium feeders. Later they work down into the crowns below the surface of the ground. When mature, the larvae turn and face upward, and construct a pupal cell that slants slightly outward toward the periphery of the stem, and then pupate head facing up.

Workings are not deep but consist of flat superficial tunnels in which the tender growing tissues are destroyed. Feeding larvae are found facing downward, indicating that during the

[1]Fisher, W. S., A revision of the north american species of buprestid beetles belonging to the tribe Chrysobothrini. U. S. Department of Agriculture, Misc. Publ. No. 470, pp. 61, 63. 1940.

feeding period the borings are directed toward the base of the plant. The distance traversed after turning up is small and most of the pupae are found at or close to ground level.

A number of larvae may be found in one stem. Whether this indicates that these are all the product of one female or of more than one is not known. Seven young larvae was the maximum number in any one stem. Feeding by the larvae girdles the stem, and, previous to the maturity of the larvae, the stem "fades" and eventually may die.

Infested branches are seldom large and are nearly always those of small plants or side shoots of larger plants. Shrubs of *Baccharis* that have been cut off at ground level and have crown-sprouted are much favored by *Chrysobothris bacchari*. The needs of the larvae seem to be for tender new tissues, and tough old limbs are not suitable. It is of special importance that the branch, to successfully support the larvae, must extend to the ground, apparently to fulfill the need for entry to the crown and the mode of pupation. Branches arising some distance above the ground do not seem to offer proper conditions for the development of this species.

Very small larvae are found in July. Larvae are mature or nearly so in February of the following year, indicating a one-year cycle. Maturity of the adult in the pupal cell does not coincide with its emergence. The adult matures long before it cuts its way free. Larvae pupating March 5 were fully formed as adults by April 11 to 14, but did not attempt to emerge. The first one to become active cut the usual oval hole to the exterior on April 23. The beetle could be seen through this hole, but it did not crawl out until May 2.

It is interesting to note that in one case, in which the side of the pupal cell had been cut away to facilitate observations, the adult did not use this obvious opening. It cut the oval opening with its mandibles and emerged through it in the normal manner, just as though the gaping hole on the side of the cell did not exist. This is a striking example of the compulsion of an insect to follow normal habit patterns even under changed conditions.

Field captures of adults were made from May 11 to June 19. Most of the reared adults emerged slightly earlier, perhaps because of higher average temperatures in the laboratory. Copulation was observed in the laboratory, but no oviposition took place, conditions evidently being unsuitable. A fungus disease killed a considerable percentage of the larvae, but no parasites were reared.

This species causes some injury to the plants, killing a rather extensive number of young shoots in some areas. Very old established stands offer less suitable growth. Cut-over areas with abundant new shoots are most heavily infested. Since a *Baccharis pilularis* stump sprouts readily, the entire plant may be pruned back to the crown without being killed by this beetle.

REPRINTS AND SEPARATES

Beginning with this issue it will not be possible for us to give an unlimited number of reprints free to authors. At least 50 separates (and usually up to 100) will be furnished free. Reprints can be supplied at cost if ordered in advance. Cost varies from about 1c to 2c per page per copy, with the smallest quantity (50) of the shorter papers being at the highest rate.

R. E. B., *Editor*

RESULTS OF THE ELECTION OF OFFICERS FOR 1951

The election of the following officers of the Coleopterists' Society for the year 1951 is announced.

President, E. C. Van Dyke, California Academy of Sciences

Manager, R. H. Arnett, Jr., U. S. National Museum

Secretary, H. Dietrich, Cornell University

Treasurer, W. H. Anderson, U. S. National Museum

Editor, R. E. Blackwelder, U. S. National Museum

R. H. A., *Manager*

OCCURRENCE AND RECORDS OF NITIDULIDAE

By George B. Vogt
College Park, Maryland

(*Concluded from Vol. 4, p. 91*)

3. NITIDULIDAE AT FERMENTING ORANGES IN FLORIDA

The writer was stationed at New Smyrna Beach, Florida from March 2 to 10, 1943 during which time he had opportunity to search for Nitidulidae in fallen fruit beneath orange trees. Although the list of findings given below has little significance by itself, it has some value for comparison with findings in South Texas.

Colopterus truncatus Randall. Several specimens.
Carpophilus (*Urophorus*) *humeralis* (F). Common.
Carpophilus dimidiatus (F). The most abundant species.
Carpophilus tempestivus. Four specimens.
Haptoncus luteolus (Er.) Common.
Stelidota strigosa (Gyll.) Several specimens.
Stelidota geminata (Say). Frequent.
Lobiopa insularis (Cast.) Common.

4. NITIDULIDAE COLLECTED IN SOUTH TEXAS

During almost two years of collecting in the Lower Rio Grande Valley from January 1, 1946, through October 6, 1947, the writer made some observations on occurrence of Nitidulidae. This family is not as well represented in this region as in Maryland, judging by the mere 15 species collected.

Sapflows were not found, the trees and their borers and the climate of the region seeming to be unsuited for their production. But there were other likely habitats for Nitidulidae. Rotting citrus fruit and packing house and cannery wastes were plentiful and provided one of the main sources of these beetles, though it was poor in species. In clearings, under bark of fire-scorched nopal (*Opuntia Lindheimeri* Engelm.) and *Yucca treculeana* Carr. proved to be excellent for collecting a few species of

Nitidulidae and a great variety of other Cucujoidea, Histeridae, etc. Under bark of rather freshly cut and fire-scorched trees in clearings also provided very fruitful collecting of micro-Coleoptera with several species of sap beetles being included. Hackberry (*Celtis laevigata* Wild.), cedar elm (*Ulmus crassifolia* Nutt.), and mesquite (*Prosopis juliflora* (Swartz) DeCandolle) are the trees from which collections were made. Flowers provided the only other general source of Nitidulidae.

Conotelus stenoides Murray. Common the year round; fermenting citrus fruit, rotten watermelons, tomato cannery wastes, and under bark of fermenting fire-scorched yucca and nopal and freshly cut and fire-scorched hackberry, cedar elm, and mesquite; Cameron and Hidalgo counties.

Conotelus mexicanus Murray. Two specimens on March 2 from flower of a dew berry (*Rubus* sp.); four specimens on March 16 from flowers of *Abutilon indicum* L.; jungle at Southmost.

Colopterus truncatus (Randall). Occurs abundantly in same situations as and often together with *Conotelus stenoides* Murray. Under bark of a fermenting fire-scorched cedar elm the writer found concentrations of thousands of individuals of this species to the exclusion of almost all other insects.

Carpophilus (*Urophorus*) *humeralis* (F.). Common at rotting citrus fruit the year round. Also under bark of fermenting fire-scorched yucca and nopal. Hidalgo and Cameron counties.

Carpophilus hemipterus (L.). Frequent at fermenting citrus and under bark of fermenting logs of hackberry and mesquite; year round; Hidalgo and Cameron counties.

Carpophilus pallipennis (Say). Abundant during late March, April, and early May in flowers of nopal. Larvae were frequently found in closed and unopened flowers. Cameron, Hidalgo and Starr counties. Six specimens on flowers of ebony (*Pithecolobium flexicaulis* (Benth.) Web.) on May 1, 1946 at s.e. Hidalgo county. One specimen was taken in flower of *Rubus* sp. at Southmost on March 2.

Carpophilus dimidiatus (F.). Occurs the year round in abundance with *Conotelus stenoides.* Also found in numbers on flowers of *Agave americana* L. in cultivation at Weslaco on June 8, and common at fallen fruit of yucca at Southmost during June and July.

Carpophilus nitens Fall. Numerous in tortilla factory waste at Pharr on March 19, 1946. A few *Carpophilus dimidiatus* occurred with it. Tortilla waste is dried corn that has been treated with lye and then ground.

Carpophilus sp. (near *brachypterus* Say). A single specimen found flying about ''Richardson's fly rearing medium'' inside insectary at Pharr, March 9.

Carpophilus sp. One specimen at light on August 27 at Pharr.

Haptoncus luteolus (Er.). Common under bark of fire-scorched yucca and at fermenting citrus fruit the year round. Cameron and Hidalgo counties. Also numerous at fallen fruit of yucca at Southmost during June and July.

Stelidota strigosa (Gyll.). At rotten citrus fruit and under bark of fire-scorched yucca; year round; Hidalgo and Cameron counties.

Stelidota geminata (Say). Common at rotten citrus fruit; year round; Hidalgo and Cameron counties.

Lobiopa insularis (Cast.). Common at fermenting citrus fruit; year round; Hidalgo and Cameron counties. Also in numbers at fallen fruit of Yucca at Southmost during June and July.

Camptodes texana Schffr. Common on various flowers; April 13 to November 30, possibly year round. In view of the tropical nature of this species and the interest in determining its life history, the writer cites his records in detail. Unusually abundant on flowers of nopal; April 13, 1947; West Cameron Co. Search for larvae in flowers without result. One in flower of *Solanum elaeagnifolium* Carr.; April 21, 1946; s. e. Hidalgo Co. Several from flowers of ebony (*Pithecolobium flexicaulis* (Benth.) Web.; May 1 to 2, 1946; s.e. Hidalgo Co. Two feeding in fruit of lote, *Condalia obtusifolia* (Hook.) Web.; May 11, 1946. Two on flowers of *Condalia obtusifolia* (Hook.) Web.; May 19, 1946; s.e. Hidalgo Co. Several on flower of *Croton punctatus* Jacq.; May 25, 1946; Southmost. Common on flower buds of sunflower, *Helianthus* sp.; May 31, 1946; s.e. Hidalgo Co. One in flower of *Croton* sp.; June 1, 1946; s.w. Hidalgo Co. One; June 8 to 15, 1947; western Cameron Co. Two on huisache, *Acacia farnesiana* Willd.; June 29, 1946; Southmost. Abundant; August 20, 1947; w. Cameron Co. One; September 28, 1946; e. Cameron Co. Several on flowers of coma, *Bumelia celastrina* H.B.K.; November 2, 1946; w. Cameron Co. Two at dung of raccoon or opossum composed almost entirely of berries of *Condalia obovata* Hook.; November 2, 1946; w. Cameron Co. Unusually abundant on flowers of yellow-top, *Verbesina encelioides* (Cav.) B.&H.; November 30, 1946; e. Willacy Co.

5. *LITERATURE ON THE OCCURRENCE AND BIOLOGY OF NITIDULIDAE*

Significant literature on the occurrence and biology of North American Nitidulidae is very limited, with only a few outstanding papers such as those of Murtfeldt (1903) and Forbes (1894) being known to the writer. A great number of European species have been the subject of close observation by many more authors. Here the writer wishes to list with brief commentary the outstanding papers known to him which deal with genera represented in the United States fauna. It is hoped these examples will stimulate coleopterists to make more observations and take more notes on the occurrence of their catches and to make more life history and ecological studies of our species.

Bagnall, Richard S. *Epuraea angustula* Er. and *Acrulia inflata* Gyll., coleopterous parasites on species of the Stephensian genus *Trypodendron*. Trans. Nat. Hist. Soc. Northumberland, Durham, and Newcastle-upon-Tyne, ser. 2, vol. 1, pp. 416-420. 1907.

This paper presents no concrete evidence of *Epuraea angustula* Er. being predatory or parasitic upon the scolytid *Trypodendron*. The nitidulid more likely feeds upon fungi and/or fermenting juices characteristic of the ambrosia beetle galleries it inhabits.

Blatchley, W. S. Coleoptera known to occur in Indiana. The Nature Publishing Co., Indianapolis. [Nitidulidae: pp. 628-652.] 1910.

This well known work is a good source of records on this family.

Forbes, S. A. The banded Ips. 18th Rep. State Ent. Nox. Benef. Insects, Illinois, pp. 23-28, 1894.

The larva of *Glischrochilus fasciatus* (Oliv.) is described as a pest of kernels of seed corn planted in turned-under turnip fields. This author mentions Walsh in 1867 reporting extensive injury to ears of corn by this species and Packard in 1883 describing its occurrence in roots of squash. Forbes further reports the species as frequently following the corn earworm and other burrowing larvae into corn and other vegetables. It is also stated to be a pest of the pantry, adults infesting bread and other cooked foods.

Heikertinger, F. Untersuchungen über die Standpflanzen der Blüten-käfergattungen *Meligethes, Brachypterus,* and *Brachypterolus.* Ent. Blätter, vol. 16, pp. 126-143. 1920.

Host records are given for *Brachypterus glaber, B. urticae, Brachypterolus pulicarius,* and 36 species of European *Meligethes.*

Hervey, G. E. R. A European nitidulid, *Brachypterolus pulicarius* L. Journ. Econ. Ent., vol. 20, pp 809-814. 1927.

An extensive account of the occurrence of this species in the northeastern United States, where it was reported for the first time in 1920. Adults occur on various flowers and are injurious to strawberry blossoms. However, larvae develop only in *Linaria* (toad-flax).

Hinton, H. E. Beetles associated with stored products, vol. 1, pp. 78-111. British Museum, London. 1945.

Contains a fine compilation of information on biology and occurrence of economically important species of Nitidulidae, including the following United States species: *Urophorus humeralis* (F.), *Carpophilus marginellus* Mots., *C. hemipterus* (L.), *C. dimidiatus* (F.), *C. pallipennis* (Say), *Haptoncus luteolus* (Er.), *Omosita colon* (L.), *Nitidula rufipes* (L.), *N.*

bipunctata (L.), *N. carnaria* (Schal.), *Glischrochilus fasciatus* (Oliv.).

Hubbard, H. G. The inhabitants of a fungus. Canadian Ent., vol. 24, pp. 250-256. 1892.

Adults and immature forms of *Epuraea monogama* Cr. are reported as having been found on June 7 living in the fruiting bodies of *Cryptoporus* (*Polyporus*) *volvatus* Peck. var. *obvolutus* Peck. on dead pines in the region of the North Bend in the Fraser River Canyon of British Columbia.

Kleine, R. Die europäischen Borkenkäfer und ihre Feinde aus den Ordnungen Coleoptera und Hymenoptera. Ent. Blätter, vol. 4, pp. 205-208, 225-227. 1908. Vol. 5, pp. 41-50, 77-79, 120-122, 140-141. 1909.

The following Nitidulidae are listed as enemies of bark-beetles: *Epuraea angustula* Er., *E. laeviuscula* Gyll., *E. rufomarginata* Steph., *E. oblonga* Herbst., *E. suturalis* Reitt., *Nitidula obscura* Er., *Glischrochilus quadriguttatus* (F.), *quadripustulatus* Herbst., and *Pityophagus ferrugineus L.*

The writer can find no evidence in this paper that any of these species is predatory or parasitic on the barkbeetles. Probably in all except the *Pityophagus, Epuraea angustula, E. laeviuscula,* and *E. refomarginata,* their occurrence in bark-beetle galleries is incidental, though, as Kleine points out, their mere presence in the galleries very probably interferes with the hosts. Thus Kleine's designation of all these nitidulids as enemies is questionable.

Knowlton, G. F. Nitidulidae in corn. Journ. Econ. Ent., vol. 35, p. 105. 1942.

Urophorus humeralis (F.), *Carpophilus lugubris* Murr., and *Glischrochilus quadrisignatus* (Say) are reported as extensively infesting corn ears in Utah.

Moennich, H. List of Coleop. found living in and on various fungi. Bull. Brooklyn Ent. Soc., vol. 34, pp. 155-157. 1939. Vol. 36, pp. 113-122. 1941.

Four species of Nitidulidae are reported identified fungi.

Murtfeldt, M. E. Another yucca-feeding insect. Ent. News, vol. 14, pp. 293-295. 1903.

Larvae of *Carpophilus melanopterus* Er. in the course of development extensively mine the segments of the perianth of *Yucca filamentosa* L. and enter the soil to pupate during June. Pupation takes place by the end of June, and adults develop within three weeks but do not emerge from soil until following spring. If beetles are removed from earthen pupal cells, they rebury themselves.

Ormerod, E. A. Life history of *Meligethes*. Ent. Mo. Mag., vol. 11, pp. 46-52. 1874.

Larvae of *Meligethes aeneus* develops in buds and particularly in partially opened flowers of turnip and rape, infested parts being distinguished by shriveled and stunted appearance. Pupation takes place in soil, and eggs are laid in flowers.

There are several other European papers devoted to the life history of this species which is a pest of crucifers in that part of the world.

Peyerimhof, P. de. Ethologie des *Brachyleptus* et notamment de *B. algericus* Grouv. Bull. Soc. Ent. France, 1921, pp. 281-285.

This genus does not occur in the United States, but the author in a footnote of this paper mentions the remarkable adaptations found in *Epuraea,* that is, in *E. angustula* Er., *E. laeviuscula* Gyll., and *E. rufomarginata* which live in galleries of Scolytids and there are nourished in company with the wood borers and their larvae on the fungal "ambrosia."

Scheerpeltz, O. and Höfler, K. Käfer und Pilze. 351 pp., 19 pl. 1947. Verlag für Jugend und Volk, Vienna.

This commendable little book includes detailed records of the occurrence of eight species of Nitidulidae fungi in the forests about Vienna, Austria.

Scott, Hugh. Notes on the biologies of some inquilines and parasites in a nest of *Bombus derhamellus* Kirby, with descriptions of larva and pupa of *Epuraea depressa* Ill. Trans. Ent. Soc. London, 1920, pp. 99-127.

E. depressa, which occurs in the United States and which occurs commonly on flowers in the spring in England, develops as larvae and lives much of its adult life in the nests of bumblebees. Examination of gut contents of the larvae revealed mineral particles, spores, and vegetable fragments considered to be hyphae of fungi, indicating that the insects are scavengers about the nest. Several other European papers report similar findings as well as records of nests of other species of *Bombus* being infested.

Smith, J. B. Annual Report of the N. J. State Museum, including a Rept. of the Insects of N. J. 1909.

This work includes an extensive set of records of occurrence of Nitidulidae. Those from pine sap and from under bark of pine stumps are amazing to the writer who hopes someone will find substantiative evidence of such occurrence.

Wasmann, E. Zur Biologie einiger Ameisengäste. Deutsche Ent. Zeitschr., vol. 36 pp. 347-351. 1892.

In this paper *Amphotis marginata* F. is considered a true guest Trophallaxis between *Lasius* (*Formica*) *fuliginosus* (L.) and this nitidulid and attempted protection of the beetle by the ants are described.

Weiss, H. B. and West, E. 1920-1922. Fungous insects and their hosts. Proc. Biol. Soc. Washington, vol. 33, pp. 1-20. 1920. Vol. 34, pp. 59-62, 85-88, 167-172. 1921. Canadian Ent., vol. 54, pp. 198-199. 1922.

This very desirable paper lists many species of Nitidulidae, mostly from New Jersey, from numerous identified fungi.

Wilson, G. F. Insect visitors to sap exudations of trees. Trans. Ent. Soc. London, vol. 74, pp. 243-253, 3 pls., 1 fig. 1926.

In his discusion of sap exudations or slime fluxes, this author gives a review of the literature on their nature and causes. A few nitidulid visitors are mentioned.

PLANS FOR THE SOCIETY

With the 1950 increase in the dues of the society, the Coleopterists' Bulletin is now able to meet its expenses, at the present level of printing costs. We are not yet able to meet the costs of a commercial printer, however. (Much of the work of producing the Bulletin, such as folding, assembling, stapling, and trimming, is done by the Washington members.) It is our hope that by next year we will be able to have the entire job done by a commercial printer. This will only be possible if we can increase the membership.

To do this we will need the help of every member. The first step is to invite all those who are interested in beetles to join the society. You can help in this by urging coleopterists to join or by sending to the Manager the names and addresses of prospective members. Additional library subscriptions would be equally helpful.

R. H. A., *Manager*

A NOTE ON "PASSALUS CORNUTUS FABRICIUS" (PASSALIDAE)

By W. D. Hincks
Manchester Museum, England

It is surprising to find that some modern American authors still use the name *Passalus cornutus* for the well-known horned passalid of the United States. It may be useful therefore to point out why its correct name is *Popilius disjunctus* (Illiger, 1800).

The genus *Popilius* Kaup, it should be realized, belongs to the subfamily Pseudacanthinae, which is very distinct from the Passalinae including the genus *Passalus*, so that the present use of the old name for the horned passalid is a misleading anachronism. The error dates back to Kaup who, in 1868, published a Prodromus to a monograph of the family wherein he first dismembered the old 'omnibus' genus *Passalus*. He included *cornutus* and other species in his restricted genus *Passalus*. Subsequently, in his Monograph of 1871 Kaup further restricted *Passalus* transferring some species to a new genus *Popilius* and several other genera, leaving *cornutus* and three further species in *Passalus*. Kuwert in his Monograph of 1897 also followed Kaup.

Both authors however had overlooked the fact that long before them the old writers on *Passalus* had clearly recognized the fact that its typical species was (*Lucanus*) *interruptus* Linnaeus, a widely distributed tropical American species. Thus the genus *Neleus*, established by Kaup and also used by Kuwert for *interruptus* and its immediate allies, became a synonym of

Passalus, together with a large number of weak groups which had been given generic names but which are now regarded as being without value. The invalid *Passalus* of Kaup, being congeneric with *Popilius* Kaup, must be known by the latter name.

The trivial name *cornutus* Fabricius, 1801, has been the one most generally adopted for the North American species; to a lesser extent *distinctus* Weber, 1801, has also been used. However as long ago as 1905 Richard Zang showed that an earlier trivial name, *disjunctus* Illiger, 1800, was valid and should be used. Thus, we have the transformation from *Passalus cornutus* to *Popilius disjunctus*. The latter name is the one adopted in the Passalidae part of the *Coleopterorum Catalogus* (Hincks & Dibb, pars. 142, 1935) where chapter and verse may be found.

EDITOR'S NOTE: We are glad to publish the background of this change of names, although we feel it is not quite correct to imply that "modern American authors still use the name *Passalus cornutus* . . ." The synonymic notes in 1905 by Zang were not followed by Leng, because Zang treated the species under the name *Odontotaenius disiunctus* Illiger and merely mentioned *cornutus* as a synonym in the text. Leng could hardly have been expected to catch such a reference. As soon as the Coleopterorum Catalogus part on Passalidae and the revision of the family by Hincks and Dibb appeared in 1935, this change was noted in the American checklist, appearing on page 56 of the Fourth Supplement to Leng in 1939. The only extensive American work on the family since that time was the Checklist of Coleoptera of Latin America (pt. 2, 1944), in which these names were again correctly cited.

It is impossible to prevent the copying of names from older works, especially by non-taxonomists who do not always check the latest sources. I doubt if any American coleopterist working in the Passalidae has made this error in the last fifteen years.

FORMATION OF THE ENTOMOLOGICAL SOCIETY OF CANADA

At the eighty-seventh annual meeting of the Entomological Society of Ontario, held at Guelph on November 1-3, 1950, it was decided to form a national society, to be called the Entomological Society of Canada. The new society will serve as a link between the various Canadian regional societies, namely, the Acadian Entomological Society, the Entomological Society of Ontario, the Entomological Society of Manitoba, the Entomological Society of British Columbia, the proposed entomological society of Quebec, and others that may be established. *The Canadian Entomologist* will be published jointly by the Ontario and the national societies, Dr. W. R. Thompson continuing as Editor, with Dr. G. C. Ullyett as Associate Editor.

W. A. Ross, Division of Entomology, Ottawa, was elected President and Professor A. W. Baker, Ontario Agricultural College, Guelph, Vice-President. R. H. Wigmore and A. B. Baird, Division of Entomology, Ottawa, have been named Secretary and Treasurer respectively. The Directors comprise the presidents of the regional societies, namely, D. D. Pond, Fredericton, N. B.; W. N. Keenan, Ottawa, Ont.; C. A. Smith, Winnipeg, Man.; and Prof. G. J. Spencer, Vancouver, B. C.; as well as Father O. Fournier, President, Montreal Branch of the Entomological Society of Ontario; Dr. C. W. Farstad, Dominion Entomological Laboratory, Lethbridge, Alta.; and Dr. A. S. West, Queen's University, Kingston, Ont.

The annual meeting of the national society will always be held jointly with the annual meeting of one of the regional societies. In 1951 the combined meetings will be held at Ottawa.

CANADA DEPT. OF AGRIC.

THE SIZE OF THE J. F. BRIMLEY COLLECTION

Mr. J. F. Brimley of Wellington, Ontario has kindly furnished the following information on the size of his beetle collection.

Space considerations prevent long series in the J. F. Brimley collection. There are 5,186 North American species represented in the 30,000 mounted specimens, with considerable amounts of material still undetermined. Species taken in Canada number 2,348, of which, by intensive collecting, 1,519 determined species have been taken in Prince Edward County, the smallest of the counties in Ontario. In addition to this, there are many thousands of specimens in papers available for exchange or study.

R. H. A.

Bibliographia

BOOK NOTICE

THE INSECTS OF PUERTO RICO, COLEOPTERA, by George N. Wolcott, Journal of Agriculture of the University of Puerto Rico, vol. 32, pp. 225-416, April 1948. (Actual date of publication November, 1950.)

This is further amplification of Dr. Wolcott's 1924 checklist, which was revised in 1936. It repeats much of the information in those works, but adds a great deal more. Unfortunately, there are a considerable number of misspelled names throughout the body of this work. There are seven new names: four are cited as new species, two others *are* new species although not intended as such by the author, and one is a nomen nudum. They are: *Zonitis guanicana,* p. 321; *Copidita* (*Asclera*) *desecheonis,* p. 323; *Hymenorus corchorophilus* [nomen nudum], p. 325; *Compsus luquillo,* p. 390; *Pseudomopsis cucubano,* p. 404; *Tyloderma danforthi,* p. 407; and *Geraeus montanus,* p. 409.

The paper is illustrated with the same cuts as used in the 1936 paper and a number of additional ones. Many of the drawings are good, a few rather crude.

All in all, there is a lot of information contained in this work. For the most part, the notes on the abundance, distribution, and habits of many of these beetles are most useful, though, I cannot believe that the larva of *Pyrophorus luminosus* (p. 273) kills ". . . for sport, as when it had eaten all that it could hold, it would continue to kill additional grubs merely for the joy of killing."

R. H. Arnett, Jr.

BOOK NOTICE

A BIBLIOGRAPHICAL SUPPLEMENT TO "COLEOPTERA OR BEETLES EAST OF THE GREAT PLAINS" APPLYING PARTICULARLY TO WESTERN UNITED STATES, by J. Gordon Edwards, pp. 183-212, 1950. (Published by the author, San Jose State College, California.)

The title of this work is self-explanatory. These many additional references broaden the scope and usefulness of Dr. Edwards original work. Some corrections to the first part are appended at the end of this supplement.

R. H. A.

CURRENT LITERATURE

Compiled by Ross H. Arnett, Jr.

This section is designed to contain all papers on the Coleoptera of North and South America which are not in the Leng (1920) catalogue or the supplements, or papers containing new species and records not included in Blackwelder's Neotropical checklist and which have not been previously listed in The Coleopterists' Bulletin.

Anthicidae

Beal, R. S., Jr. 1950. Systematic notes on the genus Formicilla in the United States and Mexico (Coleoptera: Anthicidae). Pan-Pacific Ent., vol. 26, pp. 122-130. [Key]

Coccinellidae

Wray, D. L. 1950. Hippodamia convergens Guer. Bull. Brooklyn Ent. Soc., vol. 45, p. 116.

Curculionidae

Tanner, Vasco M. 1950. Studies in the weevils of the western United States, no. VII: descriptions of a new genus. Great Basin Nat., vol. 10, pp. 71-73. [Illus.]

Elateridae

Glen, Robert 1950. Larvae of the elaterid beetles of the tribe Lepturoidini (Coleoptera: Elateridae). Smithsonian Misc. Coll., vol. 111, no. 11, 246 pp. [Illus., keys] **Stone, M. W.** 1950. An unusual record of longevity for an Elaterid larva. Journ. Kansas Ent. Soc., vol. 23, pp. 126-128. [Illus.]

Lampyridae

Green, J. W. 1948. Two new species of Lampyridae from Southern Florida with a generic revision of the Nearctic Fauna (Coleoptera). Trans. American Ent. Soc., vol. 75, pp. 61-73. [Keys, illus.]

Lycidae

Green, J. W. 1949. The Lycidae of the United States and Canada. I. The tribe Lycini (Coleoptera). Trans. American Ent. Soc., vol. 76, pp. 53-70. [Keys, illus.] 1950. Ibid., II. The tribe Lygistopterini (Coleoptera), loc. cit., vol. 76, pp. 13-25. [Keys, illus.]

Meloidae

Dillon, Lawrence S. 1950. A new species of Epicauta from Arizona (Col.: Meloidae). Ent. News., vol. 61, pp. 103-104.

Mylabridae

Downie, N. M. 1950. Notes on the distribution of Bruchus brachialis Fahraeus and Malachius aeneus (L.). Col. Bull., vol. 4, p. 20.

Oedemeridae

Arnett, R. H., Jr. 1950. Generic names of the beetle family Oedemeridae and their type species. Jour. Washington Acad. Sci., vol. 40, pp. 217-225.

NOTICES

Wants, exchanges, current research notices and similar material will be published under this heading and this service is available to all, providing it is confined to the fields covered by this bulletin.

CHANGE OF ADDRESS: Dr. J. Linsley Gressitt has left Canton, China. His new address is: 648 Hiratsuka-cho, 2-chome, Shinagawa-Ku, Tokyo, Japan.

INSECT LABELS—Printed in trimmed strips, one cut makes a label. Width of margins can be varied to suit the individual. Two and three line labels in either 3½ or 4 pt. type at $.50 per 500 of one exact label, $.75 per 1,000 and $.50 for each additional thousand of the same label. For four lines add $.05 per 500 (.55, .85, .55) and for five lines add $.10. Determination labels priced according to depth of label. No order for less than $.75. Type labels now 20 cents higher than the corresponding label on white paper. Samples on request. THE NATURE COMPANY, P. O. Box 403, Covington, La.

OFFERING FOR SALE.—South Indian insects of all orders, especially Coleoptera. All specimens with correct data. P. SUSAI NATHAN, Naturalist, Kurumbagaram P. O., via Karikal, Tanjore District, South India.

MALACHIIDAE, CANTHARIDAE, DASYTIDAE, DRILIDAE, PHENGODIDAE of the world, determined, exchanged, bought by WALTER WITTMER, Casilla de Correo, 1043, Buenos Aires, Argentina.

EXCHANGE AUSTRIAN high Alps beetles for American species. DR. H. WILCKE, Kössen/Tyrol, Austria.

INSECT PINS, noncorrosive, first class, in all sizes, 1,000 for $1.90, plus 30 cents postage. Will give as a free gift, series of Austrian beetles. Large orders, up to 10% discount given. DR. H. WILCKE, Kössen/Tyrol, Austria.

FOR SALE—4,000 unit trays, balsa pinning bottoms, white paper throughout, heavy caliber cardboard base. Sized to fit Cornell drawers except the 7″ long units. $1.00/dz. Free sample on request. Cornell and California Academy drawers available. Bio Metal Associates, P.O. Box 346, Beverly Hills, California.

WANTED TO BUY—ELMIDAE, DRYOPIDAE, LIMNICHIDAE, PSEPHENIDAE, EUBRIIDAE from exotic areas; will determine American species. Adults and larvae. HARRY G. NELSON, Dept. of Biology, Herzl Jr. College, Chicago 23, Ill.

PSAMMODIUS (SCARABAEIDAE: APHODIINAE) from North, Central, and South America wanted for revisional study. Will be glad to determine specimens for privilege of examination. O. L. CARTWRIGHT, Div. of Insects, U. S. National Museum, Washington 25, D. C.

HELODIDAE AND DASCILLIDAE of the world. Studying these families and would be glad to receive specimens in exchange for Australian material. J. W. ARMSTRONG, "Callubri," Nyngan, N.S.W., Australia.

WANTED—Bull. Buffalo Soc. Nat Sci., vols. 2-3; Proc. Ent. Soc. Philadelphia, vols. 1-6; Trans. American Ent. Soc., vols. 1-5; C. F. dos Passos, Mendham, N. J.

CERAMBYCIDAE, CHRYSOMELIDAE—of Pacific and Eastern Asia desired for study. At present work in progress on Cerambycidae, Hispinae, and Cassidinae from New Guinea, Philippines, China, etc. Will purchase material from some areas. Certain groups available for exchange. J. L. Gressitt, c/o E. S. Ross, California Academy of Sciences, San Francisco 18, Calif.

CURCULIONIDAE, CHRYSOMELIDAE, STAPHYLINIDAE, PHALACRIDAE—Identifications needed of Michigan examples in these and other families; also in the genera Cis, Canifa, Aphorista, Hallomenus, Scotochroa, Monachus, Lyctus. R. R. Dreisbach, 301 Helen Street, Midland, Mich.

DYTISCIDAE—Wanted to borrow or exchange specimens of *Hydrocanthus* (any species). Especially interested in seeing large series from single locality. Specimens returned promptly. F. N. Young, Zoology, Indiana Univ., Bloomington, Indiana.

CHRYSOMELIDAE—Revising the genus *Elytrosphaera*. I would be glad to receive specimens from Mexico and South America. Will purchase or exchange. P. Jolivet, 6 rue de Balzac, Franconville, S. et. O., France.

Oedemeridae—Desire Neotropical Oedemeridae for revisional studies. R. H. Arnett, Jr., U.S. National Museum, Washington 25, D. C.

SILPHIDAE—Would like to exchange French species of Silphidae (Silphini, Necrodini and chiefly Necrophorini) for American species of the same group (unmounted dry specimens). J. Theodorides, Laboratoire Arago, Banyuls s/mer Pyr. Or., France.

COCCINELLIDAE OF THE WORLD—Will purchase mounted or unmounted specimens, also literature on this family. Will determine species of any locality. Willard H. Nutting, 786 Santa Ray Ave., Oakland 10, California.

OFFERING, FOR CASH—Plusiotis woodi; Scaphinotus flammeus; Callichroma plicatum; Cicindela vulturina, and Canthon ebenus. L. H. Bridwell, Forestburg, Texas.

WANTED FOR IMMEDIATE STUDY—Clerid beetles belonging to the genus *Cymatodera* especially those from Central America. W. F. Barr, 112 Agricultural Hall, University of California, Berkeley 4, California.

JAPANESE BEETLES in exchange for Cerambycidae of America. I have at hand a good many specimens from the Japanese fauna. I desire to exchange our Coleoptera for American and other foreign Cerambycidae. Yoshiaki Nishio, Agriculture and Forestry Ministry, Sapporo, Japan.

PRINTED IN U S A
By The Sherwood Press

THE COLEOPTERISTS' BULLETIN

Volume V April, 1951 Number 2

CONTENTS

Published Bimonthly Beginning With February By:
The Coleopterists' Society

THE COLEOPTERISTS' SOCIETY

The Coleopterists' Society was founded on October 12, 1949, to increase interest in the insect order Coleoptera and to improve the study of it, by promoting research, providing for publication, and encouraging cooperation among students.

The annual dues are: $1.00. Members may receive The Coleopterists' Bulletin for $1.25 per volume; members who are students, $.50 per volume. Supporting members pay an additional $4.00 and receive The Coleopterists' Bulletin at no further cost.

THE COLEOPTERISTS' BULLETIN

Published bimonthly beginning with February by The Coleopterists' Society at Washington, D. C. Terms of Subscription: $2.50 per annum, both domestic and foreign, payable in advance. Remittances should be made to The Coleopterists' Society. The Society does not exchange its publications for those of other societies.

The Coleopterists' Bulletin is conducted in the interest of coleopterists for the publication of short papers and other matter in the general field of coleopterology. Insofar as contributors supply suitable material, it is intended to include: (1) original papers on beetles, on methods and procedures, and on principles; (2) short notes about beetles, collecting, collectors, etc.; and (3) bibliographic aids to the student of taxonomic coleopterology.

Manuscripts should be prepared to conform to the style used in the Bulletin and to announcements of style therein. They should be typewritten, double-spaced. All manuscripts should be sent to the editor.

Illustrations will be accepted if suitable and adequate. No charge will be made unless the cost is deemed excessive.

Proof will be submitted to authors in the form of galley proof if requested when submitting the manuscript. Authors alterations will be charged to the contributor if excessive.

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Subscriptions and back numbers: All orders should be directed to the manager. Institutions requiring the submission of vouchers and other such forms other than our invoices may be required to pay an additional fee to cover the cost of preparing such forms. Back numbers will be supplied when available at 35 cents each in volumes 1-3 and at 50 cents each in volume 4 and later volumes. Volumes 1 and 2 complete, each $1.50; volume 3 complete, $2.50; volume 1-3 together, $5.00. Later volumes $3.00 each.

Entered as second-class matter at the post office at Washington, D. C.

The Coleopterists' Bulletin

Volume V · April, 1951 Number 2

INSECTS FEEDING ON POISON OAK

(Rhus Toxicodendron L.)

By Henry F. Howden, Anne T. Howden, and Paul O. Ritcher

North Carolina State College, Raleigh, N. C.

On May 4, 1950, while collecting Scarabaeidae from host plants at night with the aid of flashlights, near Southern Pines, N. C., the authors accidentally found a *Phyllophaga* on the crown of a poison oak plant (*Rhus Toxicodendron* L.). On closer scrutiny evidence of feeding could be seen. This fact led to more intensive observation of these hitherto neglected plants.

The results of an hour's collecting produced the following species feeding on the poison oak:

Phyllophaga ulkei Smith (2 males, 3 females)
Serica vespertina Gyllenhal (8 males, 8 females)
Diplotaxis bidentata LeConte (1)

With the exception of the *Diplotaxis,* the specimens were as numerous on the poison oak as they were on several species of oak (*Quercus*) which grew in the same area. Both the *Phyllophaga ulkei* and *Serica vespertina* were observed feeding on the poison oak in almost all cases.

The collecting area was beside a golf driving range, on the right side of the road, approximately three miles from Southern Pines on the Pinehurst Road. Along the road was a sod border in which grew a number of long leaf pines (*Pinus australis* Michx.), turkey oaks (*Quercus laevis* Walt.) and persimmon saplings (*Diospyros virginiana* L.). The most striking part of the rather sparse xeric vegetation was the previously mentioned abundant poison oak plants (*Rhus Toxicodendron* L.).

In attempting to find references to other insects on poison oak, considerable difficulty was encountered due to the fact that until recently poison oak (*Rhus Toxicodendron* L.) and poison ivy (*Rhus radicans* L.) were considered a single species. Not a single reference was found that mentioned poison oak specifically, but a number of statements were found about insects found on poison ivy.

Folsom and Wardle in 1934 state that "poison ivy (*Rhus Toxicodendron*) is almost exempt from attack though even this plant is eaten by a leaf-mining caterpillar, two pyralid larvae and the larvae of a scolytid beetle." This statement is later repeated by S. W. Frost (1942). However as early as 1927 Criddle lists six lepidopterous larvae feeding on poison ivy. He also says 'the plant is distasteful to nearly all herbivorous animals, though its berries are eaten by a few rodents and birds." This, however, appears somewhat erroneous, as a rather long list can be compiled of insects feeding on the genus *Rhus* and a list of the forms on poison ivy (*Rhus radicans* L.) is included herein.

Coleoptera

Reported by Beal and Massey (1945)
- *Astylopsis macula* (Say) (Cerambycidae)
- *Leptostylus albescens* (Hald.) (Cerambycidae)
- *Cryptorhynchus fuscatus* Lec. (Curculionidae)
- *Pityophthorous rhois* Swaine (Scolytidae)
- *Xyleborus pecanis* Hopk. (Scolytidae)
- *Xyleborus affinis* Eichh. (Scolytidae)

Reported by Blatchley and Leng (1916)
- *Madarellus undulatus* (Say) (Curculionidae)
- *Hypothenemus toxicodendri* Hop. (Scolytidae)
- *Pityophthorus consimilis* Lec. (Scolytidae)

Lepidoptera

Reported by Criddle (1927)
- *Paectes oculatrix* Guer. (Noctuidae)
- *Epipaschia zelleri* Grt. (Epipaschiidae)
- *Episimus argutanus* Clem. (Oleothreutidae)
- *Cacoecia argyrospila* Walk. (Tortricidae)
- *Lithocolletis guttifinitella* Clem. (Gracilariidae)
- *Gracilaria rhoifoliella* Cham. (Gracilariidae)

Homoptera

Reported by Tissot (1928)

Carolinaia rhois Tissot (Aphididae)

Diptera

Reported by Felt (1928)

Dasyneura rhois Coq. (Cecidomyiidae)

The authors would like to express their appreciation to Dr. W. B. Fox, North Carolina State College, for determination of the *Rhus Toxicodendron* L., to Dr. R. W. Dawson, University of Minnesota, for the determination of the *Serica*, to Dr. M. A. Cazier, American Museum of Natural History, for the determination of the *Diplotaxis*, and to Dr. Milton W. Sanderson, Illinois Natural History Survey, for the verification of the *Phyllophaga*.

Literature Cited

Beal, J. A. & Massey, C. L. Bark beetles and ambrosia beetles (Coleoptera, Scolytoidea) with special reference to species occurring in North Carolina. Duke Univ. School of Forestry, Bull. 10. 1945.

Blatchley, W. S. and Leng, C. W. Rhynchophora or weevils of North Eastern America. Nature Pub. Co. 1916.

Criddle, N. Lepidoptera reared in Manitoba from poison ivy. Canadian Ent., vol. 59, pp. 99-101. 1927.

Felt, E. P. Observations and notes on injurious and other insects of New York State. New York State Mus. Bull. 274, p. 169. 1928.

Folsom, J. W. & Wardle, R. A. Entomology, with special reference to its ecological aspects. The Blakiston Co., 4th ed. 1934.

Frost, S. W. General entomology. McGraw-Hill. 1942.

Tissot, A. N. A new aphid from poison ivy (*Rhus radicans* L.). Florida Ent., vol. 12, pp. 1-2. 1928.

THE USECHINI OF OREGON (TENEBRIONIDAE)

By Kenneth M. Fender

McMinnville, Oregon

In searching the available literature, I was able to find only one record of a member of the Usechini for Oregon. Dr. F. E. Blaisdell, in his revision of the tribe, cites a single specimen of *Usechus nucleatus* Casey from Oregon with no specific locality given. This specimen, one of six before him at the time, was from the Linell collection of the U. S. National Museum. With this paucity of data on the tribe for Oregon, I feel that the following notes may be worth while.

Usechus nucleatus Casey

Oregon localities for this species are: Baker Creek, Yamhill County, July 10, 1937, July 13, 1939; Eola Hills, Yamhill County, June 16, 1939; Peavine Ridge, McMinnville, January 18, 1945, April 23, 1947, May 12, 1947; Camas Valley, June 15, 1936; Lake of the Woods-Ashland Road, June 11, 1945.

This species is usually found on mushrooms, where it occurs with various mycetophilous Staphylinidae, the erotylids *Triplax californica* LeConte and *Dacne californica* Horn, and the colydiid *Coxelus pacificus* Horn. Not overly common in the state, it is represented in our collection by 15 specimens. They all appear to be typical, except that they seem to average slightly larger than indicated by Blaisdell. His measurements are: Length 2.9 to 4.3 mm., width 1.18 to 1.6 mm. Our specimens vary from 4.1 to 5.0 mm. in length with an average of 4.8 mm. for the series. The width is similarly greater, 1.6 to 2.0 mm. with an average of 1.86 mm.

Usechimorpha barberi Blaisdell .

A single specimen from Boyer, Oregon, July 17, 1937, counting chamber #3, collected by James A. Macnab. It was collected from the soil in deep coniferous forest and a forest floor layer of Oregon Grape, *Clintonia*, moss and *Oxalis*.

This specimen is apparently a female as it lacks the spiculiferous puncture on the submentum that Dr. Blaisdell used as a male character. It is considerably larger than Dr. Blaisdell's lone male type which measured 3.2 mm. in length by 1.4 mm. in width. It is 4.7 mm. long by 2.2 mm. wide.

I have been unable to discover any recorded capture of this species other than that of the type, which was near Eureka, Humboldt County, California. Boyer is in the Coast Range of northwestern Oregon, thus the new record extends the known range of the species by nearly 300 miles.

REFERENCE

Blaisdell, Frank E., Sr. A revision of the beetles of the tenebrionid tribe Usechini, with descriptions of a new genus and new species. Proc. U. S. Nat. Mus., vol. 75, Art. 19, pp. 1-14, pl. 1. 1929.

A CABINET FOR SCHMIDT BOXES

By Henry Townes

North Carolina State College, Raleigh, N. C.

Storage of insect collections in tight cabinets is generally recognized as a superior method and has become standard for large collections. Deterioration due to pests, dusts, and mold is considerably reduced, and naphthalene fumigant lasts perhaps five times as long when insect boxes are stored in tight cabinets as when kept on open shelves. An advantage of tight cabinets not always realized is that they tend to compensate for poor boxes. In fact, it seems more practical and economical to emphasize tight cabinets rather than tight boxes or drawers. Good quality in both places is of course desirable, but in a tight fumigated cabinet any sort of box gives relatively safe storage. It is unfortunate that the commercially available cabinets for insect collections are so expensive, costing about $3.00 for storage of each Schmidt box and perhaps $7.50 for storage of each drawer. These prices are often out of reach for the private collector and are a real strain on museum budgets.

For about four years we have been using a home-made cabinet with a lift-off type of door designed for Schmidt boxes. It is as tight as any insect cabinet we have seen and has proven generally satisfactory in service. Superiority is not claimed over the steel covered insect cabinets or cases used at the Washington or the San Francisco museums nor over the masonite cabinet sold by Wards Natural Science Establishment; rather that our cabinet gives as good protection and is adapted to inexpensive and easy manufacture. We have made forty of them at a cost of about $13.00 in cash and five hours in labor for each. Drawings and directions are presented for the consideration of anyone who may wish to make this same type of cabinet. The dimensions given provide space for 30 Schmidt boxes stored on edge. They accommodate any box up to 10 inches high and 13¾ inches long. If other box sizes are used, appropriate changes can be made in dimensions, or if storage for drawers is wanted, in addition to dimension changes, the shelves will need to be omitted and wood or metal drawer runners installed. It would, however, not seem wise to make a cabinet requiring a door substantially larger than 3 feet by 2½ feet. A large door is awkward and is hard to fit tightly. Drawings are presented in figure 1 and a list of parts is given below.

Parts for one Cabinet

White pine, ¾-inch stock, clear.

- Piece A, ½″ x 1½″ x 26″. 1 piece for top door stop.
- Piece B, ¾″ x 1½″ x 26″. 1 piece for front support of bottom shelf.
- Piece C, ¾″ x ½″ x 26″. 1 piece for back support of bottom shelf.
- Piece D, ¾″ x 2½″ x 25″. 2 pieces for top and bottom of door. Groove and tenon as in drawing.
- Piece E, ¾″ x 2½″ x 34″. 2 pieces for sides of door. Groove and mortise as in drawing.

White or Ponderosa pine, ¾ inch stock, knotty.

- Piece F, ¾″ x 11½″ x 26½″. 2 pieces for middle and top shelf.

Douglas fir plywood, ¼ inch thick, good on one side.

- Piece G, ¼″ x 13¾″ x 26″. 1 piece for bottom shelf.
- Piece H, ¼″ x 27½″ x 34½″. 1 piece for back of cabinet.

Gum (*Nyssa*) plywood, ¼ inch thick, good on one side.

- Piece I, ¼″ x 22⅞″ x 28⅞″. 1 piece for door panel.

Douglas fir plywood, ¾ inch thick, good on one side.

- Piece J, ¾″ x 14⅝″ x 27″. 2 pieces for top and bottom of cabinet.
- Piece K, ¾″ x 14⅝″ x 34½″. 1 piece for left side of cabinet. Dado as in drawing.
- Piece L, ¾″ x 14⅝″ x 34½″. 1 piece for right side of cabinet. Dado to be a mirror image of piece K (make the ⅞″ wide dado on the edge opposite to that in piece K).

Hardware

- 2 crescent sash locks and screws for attaching.
- 2 steel mending plates 1/16″ x ⅝″ x 2″, drilled with 2 holes for screws.
- 2 steel angle plates ⅛″ x ⅝″, with each leg 2½″ long and drilled with two holes for screws in one or both legs.
- 8 flat-headed wood screws ⅝″ long, for attaching mending plates and angle irons.

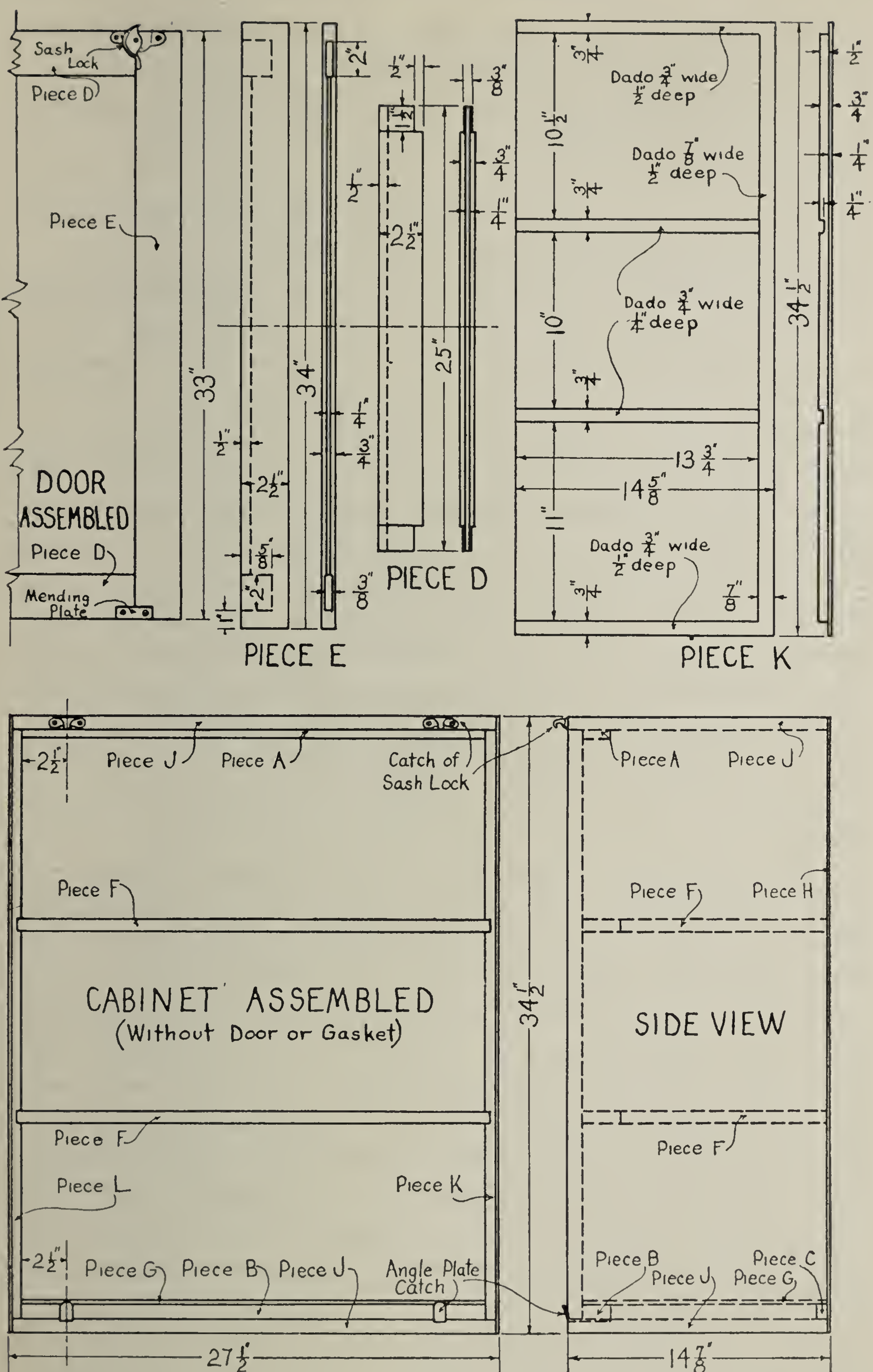

Figure 1. Details of a cabinet to house Schmidt boxes.

40 nails 1¼″ long for supports of bottom shelf and for back.

5 nails 1″ long for top door stop.

32 finishing nails 2½″ long, for sides, top, bottom, and top and middle shelves.

Miscellaneous.

10 feet of sponge rubber weather stripping ¼″ thick and ⅜″ wide, with adhesive back, for door gasket.

2 ounces of powdered plastic resin glue, for gluing all joints.

Plastic wood for filling nail holes and imperfections.

Spar varnish and turpentine for thinning, or penetrating floor sealer (tung oil base) for finishing cabinet.

All cuts must be made very accurately or wasted time and a poor job will result. If the stock lumber and plywood are not of the exact thicknesses specified, proper adjustments in other measurements will need to be made. All parts for our cabinets were cut in a local woodworking shop, at a cost of $2.00 for each cabinet, in lots of twenty cabinets at a time. The cutting could, however, be done in a home workshop equipped with a circular saw with a combination blade and dado head, a jointer, and a mortiser with ⅜″ bit. If a mortiser is not available, pieces "D" and "E" can be redesigned for a lap joint or some other type of joint. The cost of all materials at present prices is about $11.00.

The angled steel catches are a special problem. These are a pair of flat hooks in the bottom of the cabinet, behind which the lift-off door is set prior to clamping it shut with the pair of crescent sash locks at the top of the cabinet. They are each made from a steel piece ⅛″ thick and ⅝″ wide, originally about five inches long but bent at a right angle at the middle. Such pieces are commonly sold at hardware stores for reinforcing internal angles in woodwork and each leg of the angled piece has two countersunk holes for wood screws. Take one such angle and with a hack saw cut off one leg to a length of 13/16″, measured on the inside of the angle. Round off the cut edges and corners with a flat file and widen the 90° angle to make it about 100°. The catch is then ready for installation.

The tools needed for assembly after all parts are cut are a hammer, 2 wood clamps opening to at least 2½ feet, framing square, block plane, hand drill, nail set, ½″ chisel, screw driver, sandpaper (number 0), hand saw, and varnish brush. We find a machine sander a great time saver, but not essential. A vise, hack saw, and flat file are needed for making the angle plate catch. Assembly, fitting the door, applying the hardware and gasket, and finishing require about five hours per cabinet, or more with unfavorable conditions.

All joints are glued and except in the door are held also with nails. Mix the powdered glue with water as directed and apply it with a flat stick to both surfaces before they are nailed together.

In assembly, first attach the two pieces F between pieces K and L, making sure that the back edge of the pieces F are flush with the back edges of pieces K and L. Use four of the $2\frac{1}{2}''$ finishing nails at each joint and keep the assembly square by repeated checks with the framing square. The pieces F will probably fit snugly into their dadoed slots and will need to be hammered in tight. If they are somewhat warped, as is usually true, getting them into the dadoes will require a lot of pushing and hammering. Always protect the cabinet from hammer marks by shielding it from direct hammer blows with a piece of scrap wood. When these parts are assembled stand the frame on one end and put a piece J into place. Use two wood clamps to draw pieces K and L tight against J, check squareness with the framing square, and while clamped tight nail from above with four $2\frac{1}{2}''$ finishing nails on each end. To avoid marring the cabinet with the clamp jaws, insert pieces of wood between the clamp jaws and the cabinet. Now turn the frame so that the other end will be up and attach the other piece J likewise. Next, turn the frame on its face to put on the back (piece H). The back is glued on also, not so much for strength as to fill all cracks with glue and thus make an airtight joint. Check the squareness carefully with the framing square and then nail on the back with the $1\frac{1}{4}''$ nails spaced about 4 inches apart. Put three nails into each of the shelves (F) also, and the main part of the cabinet is assembled. Next comes the door. Smear the mortises and the tenons of the pieces D and E with glue, put them together with the panel (piece I) in place, clamp them up tight with the wood clamps, check the door for squareness with the framing square, and leave it in the clamps overnight for the glue to set. Do not glue in the panel. It must be free to expand and contract in its slots as the humidity changes.

The larger pieces are now assembled and the smaller more tedious work comes. Put one angle plate catch in its proper position, mark around it with a pencil, and chisel out the marked area just deep enough to set the plate in flush with the wood. Attach the plate with two screws and put in the second plate similarly. Next glue and nail pieces A, B, and C in place. With a block plane now round all outside edges slightly and smooth up the dado cut for the door (the 7/8" cut). Sink the nails in pieces K and L with a nail set and fill these holes and any others that will be conspicuous with plastic wood. With number 0 sandpaper smooth all outside corners, smooth up the dado cut for the door, and take off any dirt or other blemishes. Brush and wipe out all chips and sandpaper dust and apply the finish. For a finish we have used two coats of spar varnish (three might be better), the first coat thinned with turpentine for priming. The inside is given only the first coat and the shelves are left unvarnished to avoid the possibility of having the Schmidt boxes stick to the shelves. At this time give piece G a single coat. Sandpaper lightly between coats to get a smooth finish. The penetrating wood finishes with a tung-oil base are also good finishes and some may prefer them to varnish. Use at least two coats.

After the main part of the cabinet is varnished, attach the sponge rubber gasket. This type of material is sold for weather stripping, or in automobile supply stores for cushioning or weather stripping. It comes with a backing which is moistened with gasoline to make it sticky. Glue the gasket flat against the top and side door stops, but at the bottom of the door opening, glue it flat against the part of piece J where the door will rest. The door will thus rest on the bottom strip of gasket and shut against the side and top pieces. Fitting the door is next. The door has been made exactly the size of the door opening (without the bottom gasket) and will need to be trimmed for a loose fit that permits it to be taken in and out with no or very little scrape. Allow about 1/16 inch clearance at top and sides. After the door is fitted, round the corners slightly with a block plane and sandpaper smooth and clean with number zero sandpaper.

Next attach the two mending plates, one on each side, each flush with the bottom edge and centered over the joint between pieces D and E as shown in the drawing. Chisel out beds for the plates so that they lie flush with the wood surface and attach them with screws. These plates are in a position to prevent the angle plate catches from wearing into the door.

Finish the door with two or more coats of varnish or a penetrating finish as for the cabinet. Next put on the crescent sash locks and their catches, put in the bottom shelf piece G (nail it in or leave it loose), and the cabinet is finished. However, unless all measurements were perfect, the door is either too tight or too loose against its gasket in one or more places. Make adjustments to get an even pressure against the gasket by bending the angle plate catches with hammer taps and by putting washers under the sash locks or their catches as needed.

In use we stack these cabinets two high, with the bottom cabinet resting on a 1¾ inch wooden base (made from 1¾″ x 3¾″ stock) to raise it a little above the floor. Living in the humid southeast, we have several times encountered problems of moisture and the resulting mold, both before and after this type of cabinet was adopted. The cabinets give substantial protection against moisture if it is present in dangerous amounts for less than a few weeks at a time. When moisture problems were acute and prolonged we have used a small calcium chloride dryer in each cabinet. This consists of a hardware cloth container suspended in a jelly glass. The hardware cloth container is filled with calcium chloride which absorbs moisture from the air in the cabinet and gradually deliquesces and drips into the jelly glass. About every six weeks the jelly glasses need emptying and the hardware cloth containers a refill of calcium chloride. These dryers have given satisfactory service, but it seems that silica gel or a two watt electric light in each cabinet may be a better answer to the problem. The kind of building and the place in the building where the collection is stored are important factors in moisture control. It is well to avoid rooms that are cooler than the rest of the house in summer, or in winter unless the heat is by circulating hot air, and to avoid storage against outside walls during cold weather.

HABITAT OF PHELLOPSIS PORCATA LEC.

By Richard Guppy

Wellington, B. C.

During my first year or two as a beetle collector I considered *Phellopsis porcata* LeC. rather a prize, as I seldom came across it. Dr. Hugh B. Leech, in a letter, had informed me that I would find plenty under bracket fungi on coniferous trees, but much searching in such situations did not produce a single specimen. Occasionally I found one or two under bark or in the wood of rotten fir logs.

All this early collecting was done near sea level on the east coast of Vancouver Island. In this area the dominant tree is Douglas fir, *Pseudotsuga taxifolia,* with a considerable admixture of balsam, *Abies grandis.* On many Vancouver Island mountains there is a strip on which the western hemlock, *Tsuga heterophylla,* predominates, at about 2,000 to 3,000 ft., or just before the strictly alpine conifers take over. On my first attempt at collecting in this zone I found that I was able to take almost any number of *Phellopsis porcata* specimens, by looking under fungi on hemlock trees.

During the last two seasons my brother, Arthur Guppy, has sent me a number of beetles which he collected for me at Tofino on the west coast of Vancouver Island. In this area, *Tsuga* predominates right down to sea level. As might be expected, *P. porcata* has appeared frequently among the material from this locality. Data accompanying these specimens shows them to have been taken from dead hemlock trees, either in fungi or under bark. We have here rather strong evidence to show that *P. porcata* is specifically attracted to fungi growing on *Tsuga heterophylla.*

Possibly the most interesting fact brought to light by my collecting of *P. porcata* is its association with *Ostoma* spp. My experiences with *O. pippingskoeldi* Mannh. exactly parallel those with *P. porcata.* I found only stray specimens until I got into the hemlock zone, and then I collected numbers on the same fungi as harbored *P. porcata.* On the west coast apparently the same association exists, except that there, *O. pippingskoeldi* is completely replaced by *O. columbiana.*

NEW SYNONYMY IN THE APHODIINI OF THE UNITED STATES

By O. L. Cartwright

Recent examination of type specimens of *Aphodius* and *Ataenius* in the collections of the Academy of Natural Sciences of Philadelphia and the Museum of Comparative Zoology at Harvard revealed three unrecorded cases of synonymy in these genera. Since contemplated revisions may be delayed, the three cases are recorded below.

Aphodius laevigatus Haldeman

Aphodius laevigatus Haldeman, 1848, Journ. Acad. Nat. Sci. Philadelphia, Ser. 2, vol. 1, p. 103

Aphodius goffi Cartwright, 1939, Ann. Ent. Soc. America, vol. 32, p. 354. (New synonymy.)

In checking the LeConte series of *A. concavus* Say in the MCZ collection, the #5 specimen was found to bear the type label of Haldeman's *laevigatus* and to be quite different from other specimens in the *concavus* series. Further examination and comparison of *laevigatus* with a paratype of *goffi* Cartw. showed these two were identical. *Aphodius laevigatus* Haldeman should be restored to good standing and *goffi* Cartw. placed in synonymy.

Ataenius puncticollis (LeConte)

Euparia puncticollis LeConte, 1858, Proc. Acad. Nat. Sci. Philadelphia, vol. 10, p. 66.

Ataenius inops Horn, 1887, Trans. American Ent. Soc., vol. 14, p. 73. (New synonymy.)

After examination of the LeConte type of *Ataenius puncticollis,* I believe it to be only a much worn dirty broken specimen of the species we have accepted as *Ataenius inops* Horn. Since LeConte's description of *puncticollis* was published first, the name *inops* should be placed in synonymy.

Ataenius lobatus Horn

Ataenius lobatus Horn, 1871, Trans. American Ent. Soc., vol. 3, p. 287.

Ataenius laeviventris Horn, 1887, Trans. American Ent. Soc., vol. 14, p. 74. (New synonymy.)

The noticeably lobed pronotum of Horn's *lobatus* serves as an excellent character in recognizing the species. The same lobed pronotum in *laeviventris* led to a direct comparison of the series of each in the Horn collection at the Philadelphia Academy, and they were found to be the same. The only essential difference given by Horn seems to be the dentate or angulate clypeus. The specimens bearing the type labels were compared and found identical in punctuation, shape of pronotum, humerus, abdominal segments, posterior femoral line, tarsi and spurs. Only the angulate clypeus of *laeviventris* seemed to differ and here the clypeal edge was thickened but not dentate. This condition of the clypeal edge was probably due to wear since the teeth of the fore tibiae also showed evidence of having been worn away. Angulate and dentate specimens were found in both series from Arizona and California. I believe the holotype of *Ataenius laeviventris* is only a worn specimen of *lobatus* and that the name should be relegated to synonymy.

REPORT OF THE TREASURER FOR 1950

RECEIPTS

Balance brought forward	$0.00
Memberships and subscriptions	723.75
Supporting memberships	218.38
From Smithsonian Institution for illustrations	47.17
Sale of back numbers	96.95
Sale of reprints	5.75
Total receipts	$1092.00

EXPENDITURES

Printing Volume IV	$505.95
Miscellaneous printing and mimeographing	68.99
Purchase of back volumes	89.80
Account books	14.23
Second class mailing permit	25.00
Postage	35.82
Bank Charges	13.55
Advertising (Naturalists' Directory)	6.00
Illustrations in volume IV	60.86
Miscellaneous	2.00
Total expenditures	$822.20
Balance in bank, December 31, 1950	$88.35
Cash on hand	181.45
Balance carried forward	$269.80

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Compiled by Ross H. Arnett, Jr.

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NOTICES

Wants, exchanges, current research notices and similar material will be published under this heading and this service is available to all, providing it is confined to the fields covered by this bulletin.

FOR SALE—Biologia Centrali-Americana Coleoptera by J. S. Baly, H. W. Bates, G. C. Champion, H. S. Gorham, M. Jacoby, D. Sharp, and others. 18 volumes, 9,099 pp., 350 plates (297 colored). Beautifully bound in blue cloth with gilt lettering, as new, 4to, 1880-1910. **John J. Kellner, 41-03 171st Str., Flushing, N. Y.**

COLEOPTERA OF THE ARID SOUTHWEST. Will be collecting in southern New Mexico and southwestern Texas during June, July and August. Careful attention to lists of desiderata. **L. H. Bridwell, Box 44, Forestburg, Texas.**

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CHANGE OF ADDRESS: Dr. J. Linsley Gressitt has left Canton, China. His new address is: 648 Hiratsuka-cho, 2-chome, Shinagawa-Ku, Tokyo, Japan.

OFFERING FOR SALE.—South Indian insects of all orders, especially Coleoptera. All specimens with correct data. P. SUSAI NATHAN, Naturalist, Kurumbagaram P. O., via Karikal, Tanjore District, South India.

MALACHIIDAE, CANTHARIDAE, DASYTIDAE, DRILIDAE, PHENGODIDAE of the world, determined, exchanged, bought by WALTER WITTMER, Casilla de Correo, 1043, Buenos Aires, Argentina.

EXCHANGE AUSTRIAN high Alps beetles for American species. DR. H. WILCKE, Kössen/Tyrol, Austria.

INSECT PINS, noncorrosive, first class, in all sizes, 1,000 for $1.90, plus 30 cents postage. Will give as a free gift, series of Austrian beetles. Large orders, up to 10% discount given. DR. H. WILCKE, Kössen/Tyrol, Austria.

FOR SALE—4,000 unit trays, balsa pinning bottoms, white paper throughout, heavy caliber cardboard base. Sized to fit Cornell drawers except the 7″ long units. $1.00/dz. Free sample on request. Cornell and California Academy drawers available. Bio Metal Associates, P.O. Box 346, Beverly Hills, California.

WANTED TO BUY—ELMIDAE, DRYOPIDAE, LIMNICHIDAE, PSEPHENIDAE, EUBRIIDAE from exotic areas; will determine American species. Adults and larvae. HARRY G. NELSON, Dept. of Biology, Herzl Jr. College, Chicago 23, Ill.

PSAMMODIUS (SCARABAEIDAE: APHODIINAE) from North, Central, and South America wanted for revisional study. Will be glad to determine specimens for privilege of examination. O. L. CARTWRIGHT, Div. of Insects, U. S. National Museum, Washington 25, D. C.

HELODIDAE AND DASCILLIDAE of the world. Studying these families and would be glad to receive specimens in exchange for Australian material. J. W. ARMSTRONG, "Callubri," Nyngan, N.S.W., Australia.

WANTED—Bull. Buffalo Soc. Nat Sci., vols. 2-3; Proc. Ent. Soc. Philadelphia, vols. 1-6; Trans. American Ent. Soc., vols. 1-5; C. F. dos Passos, Mendham, N. J.

CERAMBYCIDAE, CHRYSOMELIDAE—of Pacific and Eastern Asia desired for study. At present work in progress on Cerambycidae, Hispinae, and Cassidinae from New Guinea, Philippines, China, etc. Will purchase material from some areas. Certain groups available for exchange. J. L. Gressitt, c/o E. S. Ross, California Academy of Sciences, San Francisco 18, Calif.

CURCULIONIDAE, CHRYSOMELIDAE, STAPHYLINIDAE, PHALACRIDAE—Identifications needed of Michigan examples in these and other families; also in the genera Cis, Canifa, Aphorista, Hallomenus, Scotochroa, Monachus, Lyctus. R. R. Dreisbach, 301 Helen Street, Midland, Mich.

DYTISCIDAE—Wanted to borrow or exchange specimens of *Hydrocanthus* (any species). Especially interested in seeing large series from single locality. Specimens returned promptly. F. N. Young, Zoology, Indiana Univ., Bloomington, Indiana.

CHRYSOMELIDAE—Revising the genus *Elytrosphaera*. I would be glad to receive specimens from Mexico and South America. Will purchase or exchange. P. JOLIVET, 6 rue de Balzac, Franconville, S. et. O., France.

OEDEMERIDAE—Desire Neotropical Oedemeridae for revisional studies. R. H. Arnett, Jr., U.S. National Museum, Washington 25, D. C.

SILPHIDAE—Would like to exchange French species of Silphidae (Silphini, Necrodini and chiefly Necrophorini) for American species of the same group (unmounted dry specimens). J. THEODORIDES, Laboratoire Arago, Banyuls s/mer Pyr. Or., France.

COCCINELLIDAE OF THE WORLD—Will purchase mounted or unmounted specimens, also literature on this family. Will determine species of any locality. WILLARD H. NUTTING, 786 Santa Ray Ave., Oakland 10, California.

WANTED FOR IMMEDIATE STUDY—Clerid beetles belonging to the genus *Cymatodera* especially those from Central America. W. F. BARR, 112 Agricultural Hall, University of California, Berkeley 4, California.

JAPANESE BEETLES in exchange for Cerambycidae of America. I have at hand a good many specimens from the Japanese fauna. I desire to exchange our Coleoptera for American and other foreign Cerambycidae. YOSHIAKI NISHIO, Agriculture and Forestry Ministry, Sapporo, Japan.

PRINTED IN U.S.A.
BY THE SHERWOOD PRESS

THE COLEOPTERISTS' BULLETIN

Volume V June, 1951 Number 3

CONTENTS

Published Bimonthly Beginning With February By:
The Coleopterists' Society

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The Coleopterists' Society was founded on October 12, 1949, to increase interest in the insect order Coleoptera and to improve the study of it, by promoting research, providing for publication, and encouraging cooperation among students.

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The annual dues are: $1.00. Members may receive The Coleopterists' Bulletin for $1.25 per volume; members who are students, $.50 per volume. Supporting members pay an additional $4.00 and receive The Coleopterists' Bulletin at no further cost.

THE COLEOPTERISTS' BULLETIN

Published bimonthly beginning with February by The Coleopterists' Society at Washington, D. C. Terms of Subscription: $2.50 per annum, both domestic and foreign, payable in advance. Remittances should be made to The Coleopterists' Society. The Society does not exchange its publications for those of other societies.

The Coleopterists' Bulletin is conducted in the interest of coleopterists for the publication of short papers and other matter in the general field of coleopterology. Insofar as contributors supply suitable material, it is intended to include: (1) original papers on beetles, on methods and procedures, and on principles; (2) short notes about beetles, collecting, collectors, etc.; and (3) bibliographic aids to the student of taxonomic coleopterology.

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Entered as second-class matter at the post office at Washington, D. C.

The Coleopterists' Bulletin

Volume V | June, 1951 | Number 3

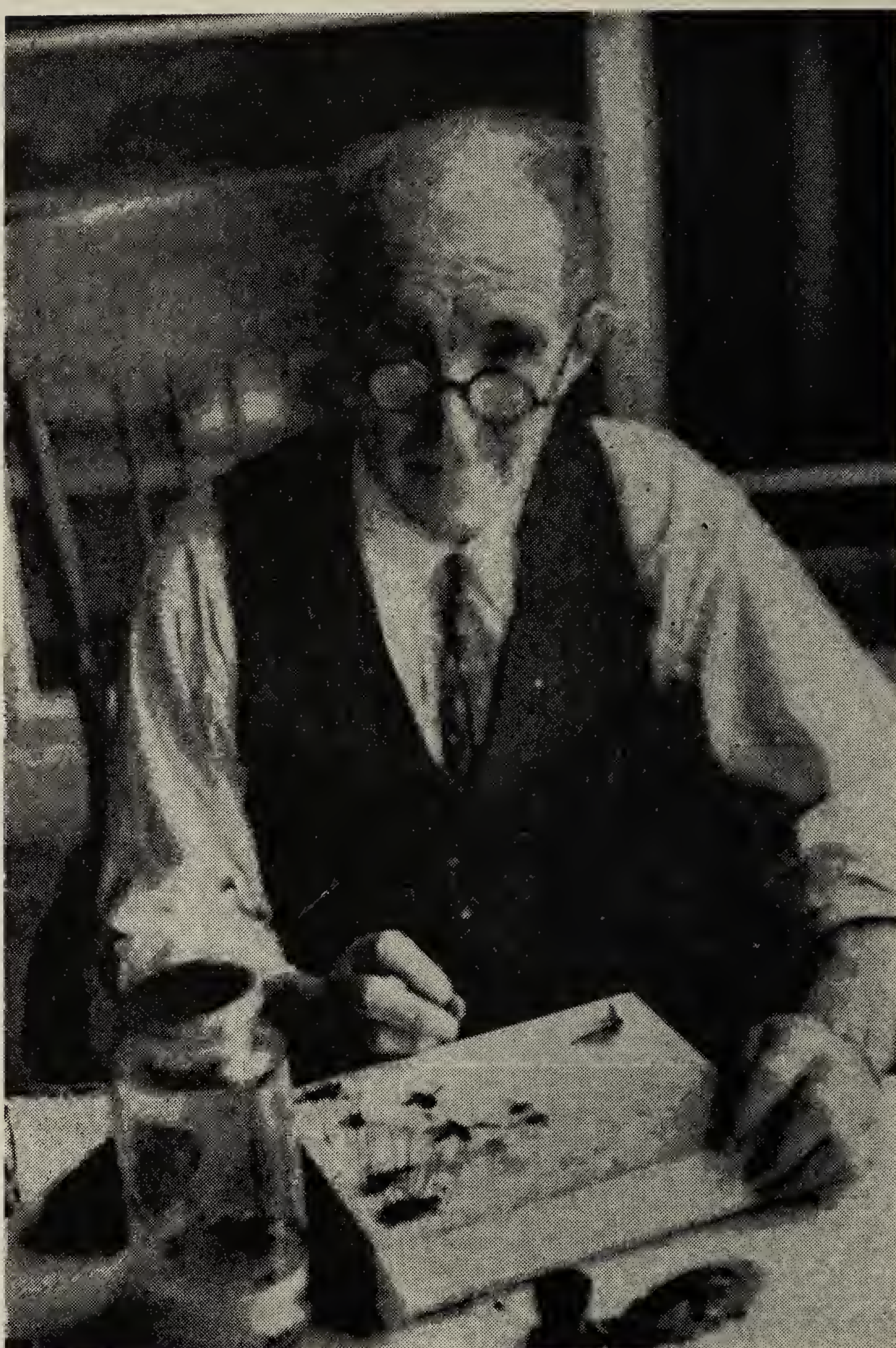
ALBERT BURKE WOLCOTT
1869-1950

The death of Albert Burke Wolcott, on December 8, 1950, at the age of nearly 82 years, marks the passing of one of the few remaining members of the generation of prominent coleopterists that followed LeConte and Horn.

Mr. Wolcott was born in Bloomington, Illinois, on January 9, 1869. His father, a cabinet maker, was a descendant of an old New England family. His mother traced her ancestry to a French soldier in the American Revolution.

As a boy, Mr. Wolcott preferred the fields and the forests to the schoolroom. He spent many days and weeks tramping in the forest a few miles south of his home, often in the company of a Kickapoo Indian boy. Later, he keenly felt the lack of even a primary school education and, after an apprenticeship as a decorator and painter, enrolled in a preparatory school operated in connection with Illinois Wesleyan University.

It was there that he met the biologist Charles C. Adams, later Director of the New York State Museum at Albany, New York. This meeting clearly had a deciding influence on young Wolcott. He had previously made a small collection of varnished insects mounted on shawl pins from which the heads had been removed. Charles C. Adams showed him drawer after drawer of properly mounted insects and shelves of entomological publications, among which was LeBaron's Outlines of Entomology published by the State of Illinois in 1874. This latter work, more than any other, aroused in him the desire to study the Coleoptera. Several published lists of the Coleoptera of Central Illinois resulted from his active interest in collecting and studying beetles during this period. During this period also (in 1895), he collected a specimen of the brilliant red clerid beetle, *Zenodosus sanguineus*. In



ALBERT BURKE WOLCOTT
At about the age of 65

later years, Wolcott often pointed to this specimen in his collection and remarked that its capture was the stimulus that ultimately led him to a study of the family Cleridae.

On April 30, 1896, before he had completed two years of his course at the preparatory school, Mr. Wolcott married Bertha Mary Friedrichs, the daughter of a local farmer; shortly after he left Bloomington to establish a photography shop at Heyworth, Illinois. After vainly waiting through two harvests for the patronage of the local farmers, he closed his photographic business and enlisted in a company that was in training for the Spanish-American war. The company was never called to active service, and, after various trial ventures, Mr. Wolcott moved to Chicago and established a sign-painting shop on North Clark Street.

While in Chicago, he continued collecting beetles on the beach of nearby Lake Michigan and farther afield. In 1902, on a collecting trip to the south of Chicago, he met Mr. William J. Gerhard, the then newly appointed Assistant Curator of the Division of Insects of Field Columbian Museum (now Chicago Natural History Museum). This chance meeting in the field was followed by the close association and friendship, which lasted until Mr. Wolcott's death and which was to have an important effect on his entomological career.

During the following years, Wolcott collected actively and generally in the Coleoptera. His interest in the family Cleridae grew and in 1908 his first papers on the family appeared. From that time until his death, his interest in the Cleridae never ceased. In 1908, also, he was appointed as a field collector for Blatchley who was then preparing his manual on the Coleoptera of Indiana. In July of that year, he joined the staff of the Division of Insects of Field Museum.

In 1914, Wolcott was transferred to the newly formed N. W. Harris Public School Extension of the Museum and there worked (except for a three year interval from 1918 to 1921) on the preparation of educational exhibits for the public schools of Chicago until his retirement in 1942. His wife died in 1907, leaving no surviving children. In 1909, Mr. Wolcott married Antilla Virginia Drapier, the daughter of a French sailing master, who together with a son, John Homer, survives him.

Mr. Wolcott collected extensively in the Chicago region. He made few field trips out of this area, except for one trip to Brownsville, Texas, and another to the Ozarks of southern Missouri. His general collection of Coleoptera, apart from the Cleridae, was acquired by Chicago Museum in 1943 through the Psota collection of Coleoptera. It is particularly important because of the representation of beetles from localities later engulfed by the growth of the metropolitan area of Chicago.

Mr. Wolcott's contribution to the knowledge of the Cleridae is a positive one and is represented both by his published papers and by his important collection and library. During most of his life, Mr. Wolcott did not have sufficient funds to enlarge his collection by purchase. The small size of the collection, moreover, partly stemmed from his willingness to exchange liberally from his series in order to add unrepresented species. The size of the collection does not measure its notable representative character. Thus the approximately 5000 specimens of clerids in the collection represent about a thousand species, or nearly a third of the world fauna. The entire collection and library of the Cleridae were deposited in Chicago Museum in 1946.

Most of Mr. Wolcott's descriptive work was done with the aid of a hand lens, and only occasionally was this supplemented by examination with a binocular microscope. Many of his papers were illustrated with his own well-executed habitus drawings. His knowledge of the world literature was exceptionally thorough and his interest in the family was world-wide. His relations with other entomologists were always cooperative, and his association and correspondence with other workers on the Cleridae, such as Dr. E. A. Chapin of Washington, D. C. and Dr. J. B. Corporaal of Holland, gave deep satisfaction to him.

In person, Mr. Wolcott was friendly and unassuming and always ready to exchange views and stories. The twinkle in his eye which preceded a humorous observation, often at his own expense, was a characteristic part of his personality. Throughout the nine years following the stroke that caused his retirement—during which he was virtually confined to a wheel-chair and was able to read only with painful difficulty—the ability and readiness to enjoy the lighter aspects of life never deserted him.

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HENRY S. DYBAS

Chicago, Illinois
Feb. 22, 1951

HUNTING FOR FABRICIAN TYPES

By Doris H. Blake
Arlington, Va.

During the summer of 1950 while my husband was in Europe to attend the International Botanical Congress held in Stockholm, I had a chance to visit some of the European museums for a short time. My main interest was in looking up old Fabrician types. When I had been in Paris in 1925, M. Pierre Lesne had shown me some Fabrician cotypes, as he called them, from the Bosc collection. But when I asked for them last summer, no one at the Paris museum knew anything about such a collection. For one thing, there is no one there working on Chrysomelidae, of which the Bosc collection chiefly consisted. Prof. Jeannel, spending his mornings at the administration building, did not come to the entomological museum until after lunch, and then he was busy with other groups. Neither M. Descarpentries nor M. Colas was concerned with the Chrysomelidae, but M. Descarpentries obligingly took me up to the attic to hunt for this collection. The attic is a long open one, running the length of the building and with frequent window alcoves with a table before the window on each side. Down the length of this long dim room range two rows of double cases, filled with paper insect boxes. There are others along the walls. This collection is arranged first according to families and then according to individual collectors. There are collections of individuals such as Sedillot, Sicard, Abeille de Perrin, Demaison, Fairmaire, Rothschild, Bedel and many others. Cases 5, 6, 7, 8, 9, and 34 are of Chrysomelidae. M. Descarpentries hunted for some time but was unable to locate the Bosc collection and left me to continue the search. M. Colas later told my daughter who understood French conversation much better than I, that her mother was possessed of the "sacré feu." Howbeit, they most kindly left me undisturbed and in full possession of the attic for the two weeks that I stayed there. I spent the rest of that first day going through insect boxes and noting the great amount of mostly undetermined, well mounted and labelled specimens. Down near the bottom of case 9, which contained many miscellaneous boxes such as the Biologia cotypes and Lefèvre's Eumolpids, I found two old red paper boxes labelled Bosc Collection.

Bosc, a French naturalist living from 1759 to 1828, was a close friend of Fabricius, with whom he shared his collection. He spent two years in America, living near Charleston, S. C., at the garden where Michaux had established a nursery for plants to ship back to France. When Bosc returned to Paris he distributed his specimens among the naturalists of that day and both Fabricius and Olivier described beetles from Bosc's collections. I found there the cotypes of approximately 30 species of American Chrysomelidae, and made full notes on them which I hope will appear shortly in a report on that collection.

From Paris I travelled to Stockholm and worked at the Riksmuseum on the outskirts of that city, a beautiful large light museum surrounded by gardens of flowers. Dr. René Malaise made me welcome and used to dispense tea and cheese at lunch time with much entomological gossip interspersed with theories on the distribution of animals. There were no Fabrician types but what formed the nucleus of the museum, the Linnaean collection of insects. It is a good-sized, well-preserved collection, sacredly kept. I was most interested in Boheman's and Weise's types of Chrysomelidae from South America on which I spent several days taking notes.

The largest collection of Fabrician types that I saw was at Copenhagen. Mrs. Zimsen is working there on that collection with a view to publishing on the authentic Fabrician types there and in other collections. She expected to have Fabricius' own collection from Kiel shipped to her for study last fall, and I have since heard that this has happened. She most generously gave up her desk to me as space was limited in the museum. I noted her fine new Leitz microscope and she told me that it was a German war reparation. Dr. S. Tuxen, also, was most cordial to me, and Dr. Elizabeth Deichmann of the Museum of Comparative Zoology who was home for the summer working there, took pains to show me the country about, especially the King's Deer Park, with its huge old beech forest.

In Amsterdam I hunted for an entomological collection at the Natural History Museum near the Zoological Park, but was told it had been moved out to a building beyond the Indian Museum.

I walked along a canal a long way and finally found the place and was admitted to a great building with huge, high rooms, each heated by a tiny iron stove. There was not a large collection there, although a great many Indonesian beetles.

The remainder of the summer was spent at the British Museum in South Kensington. I arrived early in August on a bank holiday but was admitted to the entomological quarters by R. B. Benson, who was on duty that holiday. He let me into the Coleoptera room and left me quite alone with the collection in that great room at a visitor's desk. I had not been working there long before a gray-haired man appeared, looked at me questioningly, and introduced himself as Sir Guy Marshall. Although retired he works there every day as does G. E. Bryant. It was a great pleasure to be only a few desks away from these vigorous old-timers, and to have daily chats with them. Sir Guy Marshall, although 80 years old, was going for a 3-months collecting trip to South Africa a few weeks later. I had been looking forward to meeting Mr. Maulik, but was told that he died rather suddenly a fortnight before. The collection of Chrysomelidae at the British Museum contains type after type. Mr. Bryant has arranged it in the beautiful mahogany drawers with ample spacing. The Banks collection of Fabrician species, kept separately, is a sizable one containing many types. There are about 30 species of American Chrysomelidae in it. I was most reluctant to leave the British Museum in September when I was booked to sail home.

IXth INTERNATIONAL CONGRESS OF ENTOMOLOGY

Amsterdam, August 17-24, 1951

A second circular on the Ninth International Congress of Entomolgy has been issued. It contains complete information regarding the program, trips, ladies' program, accommodations, fees, etc. Anyone interested in this information should contact Prof. J. Chester Bradley, Department of Entomology, Cornell University, Ithaca, N. Y.

R.H.A.

CUPESID BEETLES ATTRACTED TO SOAP IN MONTANA

By J. Gordon Edwards
San Jose State College, California

Last summer, while in Glacier National Park, Montana, the writer's wife discovered hordes of large gray-and-black beetles flying feebly about in the vicinity of her laundry tubs and clustering upon clothing drying on the clothesline. This was on the morning of July 1st, while the author was fulfilling his duties as Ranger-Naturalist elsewhere in the park. She didn't bother to collect many of the insects, believing them to be some extremely common species. However, when the writer returned home that evening he was shocked to find that the collecting jar contained eleven specimens of *Priacma serrata* (LeC.). These weird Cupesidae are always considered a good find, so much so that a single specimen in flight near the summer cabin just three days earlier had caused great exultation; hence the catch resulted in much pleasure and amazement. On the following day (July 2, 1950), a neighbor began doing her wash in the woods behind the cabins (along the shore of Lake McDonald about 300 yards south of the Lake McDonald Hotel). Shortly after the soapy water had been fluffed up and the scrubbing of clothes begun, the cupesids made a mass invasion, fluttering about the washtub in large numbers. After the clothes were hung on the line, the beetles continued to flutter about and alight upon the damp clothing. A large percentage of them were noted to be pairing off and assuming mating positions. This continued until the clothes dried, after which the beetles disappeared. Without any effort to collect large numbers of specimens twenty-three Cupesids were picked up on this second washday. During the next few days energetic collecting was carried on in the woods of the area but no trace of *Priacma* was found. Yet on the 6th of July when another small wash was done the beetles again put in an appearance, although in no such large numbers. Only half a dozen of the most persistent and bothersome individuals were picked up that day, and during the rest of the summer not one was seen, even on washdays. This is the first record known to the author of the occurrence of *Priacma* in Montana, although its occurrence there is not surprising since it seems fairly abundant in British Columbia under similar ecological conditions. The soap which proved such a lure for these beetles was Super Suds, and though it is not known whether other strong soaps would exercise the same attraction, it is presumed that they would.

At the close of the season, when a binocular microscope became available, all of these Cupesidae were examined more carefully and the male genital appendages were removed and studied. At this time the rather startling discovery was made that all forty of the beetles were males. It would therefore seem evident that the Super Suds served as a strong sexual attractant for the male cupesids, so potent in fact that many of them attempted to mate with other males while under the influence of the soapy odor.

The forests surrounding the cabins for a considerable distance are predominantly Western Larch (*Larix occidentalis* Nutt.) with a good representation also of Giant Western Redcedar (*Thuja plicata* Donn.), but no *Priacma* specimens were ever found except those in flight near the soap, hence their host plant remains unknown. Dr. E. C. Van Dyke relates (verbally) the finding of *Priacma* in the California Sierra Nevada upon fir trees, collected by beating the branches. The only firs present along Lake McDonald are an occasional (very rare) Grand Fir (*Abies grandis* Dougl.) and a few Douglas Firs (*Pseudotsuga taxifolia* Poir.). It is possible that the beetles discussed above migrated from some of these ''fir'' trees, but it remains for another summer's observations to verify that fact and to collect female specimens on the host plant.

Incidentally, the genitalic study has revealed the fact that, while the Montana, Washington and British Columbia specimens are *Priacma serrata* (LeC.) the *Priacma* species of California is evidently as yet undescribed. In another paper this description is soon to be published, with additional observations and drawings of the amazing and extremely complex male terminalia.

ANOTHER NAME FOR THE FURNITURE CARPET BEETLE

By H. S. Barber*

Changes in names of insects are unpleasant and often regrettable, but when misuse of a name is due to error of published analysis or record, technical honesty requires correction. Economic ecologists and teachers agree with hobbyists in resenting such correction when the mistake involves some name which they think they have learned. Although most of these objectors will be unable to see why changes are necessary, a few may be able to understand that Linnaeus' devotion to his objective of cataloging the divinely created kinds by their names has been continued with very imperfect results by his followers for two centuries Linnaeus himself and many of his disciples, as a result of their divergent personal theories, have misapplied his names in their continued attempts to classify and record zoological kinds. If, during his life work, Linnaeus named a tenth of a percent of the kinds we now believe exist and if, after two centuries of continued effort, only 5 percent or even 10 percent of the species of animals have been definitely named, it should be plain that our duty to our successors who will distinguish and name the remaining 90 percent or 95 percent which are still without names, is to correct errors as they are found. The yet unaccomplished part is still so great that corrections in our working records seem far preferable to the perpetuation of errors by nomina conservanda. Yet some idealistic organizers who revolutionize the procedures by which students in different countries have sought to coordinate their records seem to believe continued misuse of names is better than correction of errors.

Anthrenus fasciatus Herbst, 1797, was recorded as a pest in Georgia by Lutz in 1911 (Journ. New York Ent. Soc., vol. 19, p. 200), the specimens upon which the record was based having been identified by Walther Horn. This name was used until the late Mr. G. J. Arrow at the British Museum concurred in my opinion (in litt., 1926) that the original description and figures

*Among the numerous notes and manuscripts left by Mr. Barber was this one upon a subject in which he was interested shortly before his death. It is printed as it was in his hand-written copy, with only minor changes.

of *Anthrenus fasciatus* Herbst (Natursystem . . . Insekten, vol. 7, p. 337, pl. 115, figs. 11, L) could not be applied to our pest, which, he informed me, was the species named *Anthrenus vorax* by Waterhouse, 1883 (Ann. Mag. Nat. Hist., Ser. 5, Vol. 11, p. 61). This latter name was thereafter used for the "furniture carpet beetle" and adopted by Mutchler and Weiss in 1927 (New Jersey Dept. Agric. Bur. Stat. Insp., Cir. 108, pp. 15, 24).

During 35 years experience with this household pest and its two color forms, subspecies, or close relatives, doubt as to its correct name frequently disturbed me. Especially interesting was the uncertain identity of *Anthrenus flavipes* LeConte, 1854 (Proc. Acad. Nat. Sci. Philadelphia, vol. 7, p. 112) described from one specimen found in New York (City?) which had been misassigned as a variety of *scrophulariae* (L.) by Jayne (Proc. American Philos. Soc., 1882, vol 20, p. 370) and apparently never re-examined. The same suspicion came independently to Dr. E. G. Linsley but neither of us wished to advocate adoption of the name *flavipes* without personal study of the type. Opportunity for such study came to me recently (April 1950). I found the well preserved type specimen of *Anthrenus flavipes* LeC. agreed with the form recorded in our economic literature as *fasciatus* Herbst and *vorax* Waterhouse. Of these latter names the former seems to have been a misidentification long used in Europe and the latter had been wrongly suppressed as its synonym. The homonym *Anthrenus vorax* Casey, 1900 (not Waterhouse, 1883), the type of which seems to be a well nourished individual of *Anthrenus verbasci* (L.), has been confusing to those relying on the Catalogue by Leng, 1920 (and its supplements) in which *vorax* Waterhouse is not found.

The correct name for our common furniture carpet beetle, therefore, should be *Anthrenus flavipes* LeC., and *A. vorax* Waterhouse, 1883 (not Casey, 1900) should stand as its synonym.

NEWS

Mr. O. L. Cartwright, U. S. National Museum, is spending two months in Costa Rica collecting beetles. He is currently working on the Aphodiini of Central and South America. While in Costa Rica Mr. Cartwright will visit the Inter-American Institute of Agricultural Science.

Change of addresses: Mr. Joseph B. Hayes, 7522 Forest Preserve Drive, Chicago 34, Ill. Mr. Paul F. Robinson, Ring Factory Rd., R. D. 2, Bel Air, Md. Mr. Raymond Q. Bliss, Central YMCA, 1421 Arch St., Philadelphia, Pa. Dr. R. L. Araujo, Caixa Postal 7.119, Sao Paulo, Brasil.

New members: Dr. Carl H. Lindroth, Professor Zoological Institute, Lund, Sweden. W. Wayne Boyle, Department of Entomology, Cornell University, Ithaca, N. Y. Sr. Francisco Silverio Pereira, Rua da Bahia, 1596, Belo Horizonte, M.G., Brasil. Prof. Calvert E. Norland, San Diego State College, San Diego 5, Calif. Herr Paul Albrecht, Berlin-Rummelsburg, Wilhelmstr. 116, Germany. Prof. Roy D. Shenefelt, Department of Entomology, University of Wisconsin, Madison 6, Wis. Dr. H. Wilcke, Kossen, Tyrol, Austria. Mr. George W. Thomas, Department of Entomology, University of Missouri, Columbia, Missouri. Mr. David Kissinger, Washington Missionary College, Washington 12, D. C. Mr. Edward E. Gilbert, Department of Entomology, University of Kansas, Lawrence, Kansas. Mr. Herbert L. Dozier, Jr., 6513 46th Place, Riverdale, Md. Mr. Cyrus W. Hoy, 337 Edwards St., Fort Collins, Colo. Mr. Gordan A. Marsh, 2401 Durant Ave., Berkeley 4, Calif. Mr. James H. Eads, Jr., 30C Riverside Apts., Box 2661, University, Ala. Mr. Paul J. Spangler, Ohio Univ. Trailer Site A-9, Athens, Ohio.

Members resigned: Miss Ruth Beresford; Mr. Albert W. Shertz; Mr. Leon Siroto; Mr. S. R. Piazza.

Necrology: Dr. William Procter; Mr. A. B. Wolcott.

Mr. George B. Vogt, U. S. National Museum, has entered the U. S. Public Health Service and will be in Burma for two years. His correspondence address for the present is 2120 Frederick Rd., Catonsville 28, Md.

MEMBERSHIP DRIVE

The Society has circularized all of the college and university libraries in this country to get new subscribers for the Coleopterists' Bulletin. This has resulted in a few new subscribers, and perhaps, as the wheels of red tape move on, more orders will be received. Our present membership and subscription list carries a few over 250, (counting about 50 who have still not paid their dues!). Each year shows an increase in subscribers and members. We have had certain expenses, however, which still leave us without sufficient funds to pay all the costs of commercial printing. Beginning with the first issue this year, our printing costs were increased $27.00 per issue. The treasurer's report does not clearly show our present financial status, because it neglects to indicate the bills outstanding at the end of last year. Unless we are to increase the subscription rate we must increase the membership. About 75 new members and/or subscribers would easily solve our problem.

The last notice regarding membership brought in a few new members. A survey of the latest issue of the Naturalists' Directory, and other membership lists, indicates about 100 persons interested in beetles in this country alone who are not members. It should be possible for members in universities and museums to add substantially to that list by sending us names of interested students and museum visitors, or by inviting them to join directly. Our requirements for membership are only an interest in beetles. To aid you in supplying us with these names, we shall shortly send you another list of the members and subscribers and also two application blanks which explain the aims of the Society and the fees involved. We hope that the past service of the Society has been worthwhile to you and that, therefore, you will feel enough esprit de corps to help the Society through a major crisis.

R. H. Arnett, Jr., Manager

LIST OF DETERMINERS

Since the publication of the last list of determiners and revisers, (Col. Bull., vol. 2, pp. 94-106, 1948) I have had many requests, particularly from non-members of the Coleopterists'

Society for another more complete list. They have claimed benefit from this list in that much of their undetermined material has been gone over and they are able to incorporate it in their collections. Moreover, many revisers have been able to see a lot of good (and no doubt some bad) material as a result of this list. Therefore, I propose to circulate to the members of the Society, both here and abroad, a form in order to gather information for a similar list to be published late this year. I hope you will comment freely and that the response is representative of the available determiners in this country and so far as practicable throughout the world.

My experience with the last list indicates a certain reluctance, which is understandable, on the part of many workers to indicate the groups that they are actively revising, or even to indicate the groups they are willing to determine, probably mainly because they do not wish to be swamped with material from the less careful collectors. This of course is purely a private matter. However, I not infrequently get requests from students and sometimes faculty members for advice on groups of beetles suitable for study for graduate work, etc. It is usually desired to pick some group on which there is no person at the moment working. It is very disappointing for a student to select a group, do all of his preliminary work and be ready to investigate the collections of various museum and private collectors, only to find that John Doe has either borrowed all of the material, or that he now has a paper in press on the group. So it would be highly desirable to have in the files of the Coleopterists' Society at least, if not published, all possible information on current research projects. Therefore, provision will be made on the forms which will be circulated for indicating the information you are willing to have published, and the information you would rather have merely placed on file but available for use of the Society in correspondence at the discretion of the officers of the Society.

Your cooperation and your suggestions on this list will be most welcome. Project lists as a rule are of questionable value. Apparently our lists in the past have been of some value, and I believe that with your cooperation, and particularly your frank suggestions, the proposed list can serve a real need in our work.

R. H. Arnett, Jr.

NOTICES

Wants, exchanges, current research notices and similar material will be published under this heading and this service is available to all, providing it is confined to the fields covered by this bulletin.

FOR SALE—Biologia Centrali-Americana Coleoptera by J. S. Baly, H. W. Bates, G. C. Champion, H. S. Gorham, M. Jacoby, D. Sharp, and others. 18 volumes, 9,099 pp., 350 plates (297 colored). Beautifully bound in blue cloth with gilt lettering, as new, 4to, 1880-1910. **John J. Kellner, 41-03 171st Str., Flushing, N. Y.**

COLEOPTERA OF THE ARID SOUTHWEST. Will be collecting in southern New Mexico and southwestern Texas during June, July and August. Careful attention to lists of desiderata. **L. H. Bridwell, Box 44, Forestburg, Texas.**

INSECT LABELS—Printed in trimmed strips, one cut makes a label. Width of margins can be varied to suit the individual. Two and three line labels in either 3½ or 4 pt. type at $.50 per 500 of one exact label, $.75 per 1,000 and $.50 for each additional thousand of the same label. For four lines add $.05 per 500 (.55, .85, .55) and for five lines add $.10. Determination labels priced according to depth of label. No order for less than $.75. Type labels now 20 cents higher than the corresponding label on white paper. Samples on request. **THE NATURE COMPANY, P. O. Box 566, Lawrence, Ks**

CHANGE OF ADDRESS: Dr. J. Linsley Gressitt has left Canton, China. His new address is: 648 Hiratsuka-cho, 2-chome, Shinagawa-Ku, Tokyo, Japan.

OFFERING FOR SALE.—South Indian insects of all orders, especially Coleoptera. All specimens with correct data. P. SUSAI NATHAN, Naturalist, Kurumbagaram P. O., via Karikal, Tanjore District, South India.

MALACHIIDAE, CANTHARIDAE, DASYTIDAE, DRILIDAE, PHENGODIDAE of the world, determined, exchanged, bought by WALTER WITTMER, Casilla de Correo, 1043, Buenos Aires, Argentina.

EXCHANGE AUSTRIAN high Alps beetles for American species. DR. H. WILCKE, Kössen/Tyrol, Austria.

INSECT PINS, noncorrosive, first class, in all sizes, 1,000 for $1.90, plus 30 cents postage. Will give as a free gift, series of Austrian beetles. Large orders, up to 10% discount given. DR. H. WILCKE, Kössen/Tyrol, Austria.

FOR SALE—4,000 unit trays, balsa pinning bottoms, white paper throughout, heavy caliber cardboard base. Sized to fit Cornell drawers except the 7" long units. $1.00/dz. Free sample on request. Cornell and California Academy drawers available. Bio Metal Associates, P.O. Box 346, Beverly Hills, California.

WANTED TO BUY—ELMIDAE, DRYOPIDAE, LIMNICHIDAE, PSEPHENIDAE, EUBRIIDAE from exotic areas; will determine American species. Adults and larvae. HARRY G. NELSON, Dept. of Biology, Herzl Jr. College, Chicago 23, Ill.

PSAMMODIUS (SCARABAEIDAE: APHODIINAE) from North, Central, and South America wanted for revisional study. Will be glad to determine specimens for privilege of examination. O. L. CARTWRIGHT, Div. of Insects, U. S. National Museum, Washington 25, D. C.

HELODIDAE AND DASCILLIDAE of the world. Studying these families and would be glad to receive specimens in exchange for Australian material. J. W. ARMSTRONG, "Callubri," Nyngan, N.S.W., Australia.

WANTED—Bull. Buffalo Soc. Nat Sci., vols. 2-3; Proc. Ent. Soc. Philadelphia, vols. 1-6; Trans. American Ent. Soc., vols. 1-5; C. F. dos Passos, Mendham, N. J.

CERAMBYCIDAE, CHRYSOMELIDAE—of Pacific and Eastern Asia desired for study. At present work in progress on Cerambycidae, Hispinae, and Cassidinae from New Guinea, Philippines, China, etc. Will purchase material from some areas. Certain groups available for exchange. J. L. Gressitt, c/o E. S. Ross, California Academy of Sciences, San Francisco 18, Calif.

CURCULIONIDAE, CHRYSOMELIDAE, STAPHYLINIDAE, PHALACRIDAE—Identifications needed of Michigan examples in these and other families; also in the genera Cis, Canifa, Aphorista, Hallomenus, Scotochroa, Monachus, Lyctus. R. R. Dreisbach, 301 Helen Street, Midland, Mich.

DYTISCIDAE—Wanted to borrow or exchange specimens of *Hydrocanthus* (any species). Especially interested in seeing large series from single locality. Specimens returned promptly. F. N. Young, Zoology, Indiana Univ., Bloomington, Indiana.

CHRYSOMELIDAE—Revising the genus *Elytrosphaera*. I would be glad to receive specimens from Mexico and South America. Will purchase or exchange. P. JOLIVET, 6 rue de Balzac, Franconville, S. et. O., France.

OEDEMERIDAE—Desire Neotropical Oedemeridae for revisional studies. R. H. Arnett, Jr., U.S. National Museum, Washington 25, D. C.

SILPHIDAE—Would like to exchange French species of Silphidae (Silphini, Necrodini and chiefly Necrophorini) for American species of the same group (unmounted dry specimens). J. THEODORIDES, Laboratoire Arago, Banyuls s/mer Pyr. Or., France.

COCCINELLIDAE OF THE WORLD—Will purchase mounted or unmounted specimens, also literature on this family. Will determine species of any locality. WILLARD H. NUTTING, 786 Santa Ray Ave., Oakland 10, California.

WANTED FOR IMMEDIATE STUDY—Clerid beetles belonging to the genus *Cymatodera* especially those from Central America. W. F. BARR, 112 Agricultural Hall, University of California, Berkeley 4, California.

JAPANESE BEETLES in exchange for Cerambycidae of America. I have at hand a good many specimens from the Japanese fauna. I desire to exchange our Coleoptera for American and other foreign Cerambycidae. YOSHIAKI NISHIO, Agriculture and Forestry Ministry, Sapporo, Japan.

PRINTED IN U.S.A
BY THE SHERWOOD PRESS

THE COLEOPTERISTS' BULLETIN

Volume V | August, 1951 | Number 4

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Published Bimonthly Beginning With February By:
The Coleopterists' Society

THE COLEOPTERISTS' SOCIETY

The Coleopterists' Society was founded on October 12, 1949, to increase interest in the insect order Coleoptera and to improve the study of it, by promoting research, providing for publication, and encouraging cooperation among students.

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The annual dues are: $1.00. Members may receive The Coleopterists' Bulletin for $1.25 per volume; members who are students, $.50 per volume. Supporting members pay an additional $4.00 and receive The Coleopterists' Bulletin at no further cost.

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Published bimonthly beginning with February by The Coleopterists' Society at Washington, D. C. Terms of Subscription: $2.50 per annum, both domestic and foreign, payable in advance. Remittances should be made to The Coleopterists' Society. The Society does not exchange its publications for those of other societies.

The Coleopterists' Bulletin is conducted in the interest of coleopterists for the publication of short papers and other matter in the general field of coleopterology. Insofar as contributors supply suitable material, it is intended to include: (1) original papers on beetles, on methods and procedures, and on principles; (2) short notes about beetles, collecting, collectors, etc.; and (3) bibliographic aids to the student of taxonomic coleopterology.

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Entered as second-class matter at the post office at Washington, D. C.

The Coleopterists' Bulletin

Volume V | August, 1951 | Number 4

TWO OLD COLEOPTERISTS

By Doris H. Blake

This is an account of two entomologists, Dr. F. H. Chittenden and Dr. E. A. Schwarz, with whom I worked in the Bureau of Entomology at Washington, D. C. during the last ten years of their lives.

The true naturalist is born so. From earliest years he is interested in natural phenomena. I began catching grasshoppers and storing them in my pinafore pockets as soon as I could toddle. Later it was frogs. When I reached adolescence I used to betake myself regularly with the grievances of sensitive youth to the New England woods and old pastures. There I would promptly forget the woes of being misunderstood in tracking down a rare fern, hunting a chewink's nest, or merely standing in pantheistic ecstasy among the great beeches near Float Meadow. About this time I found a copy of Walden in the school library and it became a Bible to me. So, later I was to feel a deep underlying kinship with these two old naturalists with whom I came to be associated and who were my teachers, two men utterly different from each other but permeated with the same devotion to entomology, and in particular to beetles. One man left his people and country, never to see either again, that he might continue his studies. The other, with equal consecration, spent most of his life observing and writing of the habits of insects. Neither ever married.

On Armistice Day, 1918, I was working at the headquarters of the National Red Cross at Washington, D. C. When war was declared, I had been finishing college, and shortly after came to Washington to marry a young scientist there; in the belief that he was soon to enter the army. The armistice intervened just as he had received his orders to leave for camp, and after that we stayed on in Washington where he continued his work as botanist in the Department of Agriculture. In those war days the terrific pressure and monotonous high speed work behind the lines had not lasted long enough to wear people's nerves to the state of rebellion that is so evident after this last war. But for me, I had had sufficient war work pounding out letters in a long roomful of hammering typewriters to be desperate for another sort of job. After tramping through a great many corridors of Washington bureaus I found a place in the corner of an old entomologist's office where I was to carry on insect breeding experiments, catalogue scientific articles, mount entomological specimens, and help in a multitude of ways. The novelty and diversity of this work was to prove most agreeable after the hours of typing at the Red Cross.

It was my good fortune to find myself associated with the group of naturalists who had originally built up the Bureau of Entomology. The majority were now past their prime but wise in long years of pioneer work. They were altogether a remarkable set of men. Under the wisely tempered leadership of Dr. L. O. Howard each one had been allowed to develop his special field of entomology in his own brilliant way, and together they had built the permanent framework of the Bureau. From many years of close association these men had grown to know each other and get along with each other like the inhabitants of a little village, each tolerant, although perpetually critical, of the others. Within a short decade this group was to vanish and the old red brick building which housed them was to be demolished and the Bureau as a small well-knit unit was to be swallowed up in the great new South Building. The end of an era had come. All the older men and many of the younger ones of whom I write are now dead and gone.

To begin with I had written to Dr. Howard asking him for a place in the Bureau, and in his short, courteous reply he had referred me to his colleague Dr. Frank H. Chittenden, who needed an office assistant. Very well do I recall entering his lofty old office, one side of which was a wide ivy-hung window facing the north. The room was divided into two parts by a row of high cases and a series of desks below the cases. On the wall sides of the room stood glass-doored cases full of books and Schmitt boxes. On every desk, table, and even chair were piled high in the greatest confusion heaps of books, boxes, and papers, and everywhere too were glass jars covered by cotton cloth in which were live insects. At the desk next to the window sat a huge man. He arose to greet me, over six feet in height, erect, deep-chested, small-hipped. He had a rosy-cheeked florid complexion, curly gray hair, and dark hazel, almost brown eyes. He wore a shiny dark navy suit and an old-fashioned wing collar with a made-up tie. It was characteristic of him that he never had learned to tie a four-in-hand or even a bow knot for his shoe lacings. He smiled widely showing magnificent strong teeth and greeted me in a big hearty voice. But when he shook hands, his grip was curiously shy. His hands were small and the fingers delicate and fine for so large a man. That day he put me through a short examination to gauge my intelligence. My college training had been strong in Greek, Latin, modern languages, and the classics, but with a minimum of science. When he asked me the date of the Linnaean binomial system I was completely ignorant. But because I wanted that job so much, I drew a great breath and brought out the date 1758. He looked as amazed as I did and asked, "You didn't know that before, did you?" "No," I confessed honestly. Indeed, it must have been mind reading on my part. I remember he asked me the scientific name of the white pine too. I felt better prepared for that and said, "*Pinus albus*" to his amusement. The fact that I came from New England and had a degree from Harvard weighed more in my favor than my scientific knowledge. He had a certain reverence for New Englanders and Harvard, though characteristically he poked fun at both.

Though he himself had been born in Cleveland, Ohio and had grown up in a small Ohio town (Elyria), his father had come from near Lenox, Massachusetts. Later I learned that his father had died when he was very small, and his mother had supported her two children, the elder a girl, by teaching school. She had sent him to Cornell University. After leaving Cornell he had worked for a little while in an editorial job at the Brooklyn Museum and in 1891 had come to the Department of Agriculture where his fellow student at Cornell, Dr. Howard, was already located. He had brought his mother to live with him and later his widowed sister. His mother had lived to be 90 years old. All this came out later, of course.

That day he vigorously pressed a button on his desk—I noted that he had a row of buttons there—and in came a messenger boy with dragging feet. "Lift up your feet, boy," he called, "and go and find Pops and tell him that I want him." In due course another huge but much younger man swung lightly into the room, humming under his breath. "What do you want, Doctor?" "This is my assistant, Mr. Charles Popenoe," he announced to me, "and here is a young lady who is looking for a job. You know that I was thinking that you needed an assistant." Pops' mild blue eyes surveyed me for an instant, and then with a friendly grin he handed me a big dasheen. "Open it," he commanded, indicating where it had been neatly cut across. I lifted off the top, disclosing an ugly cutworm curled in the centre. Again I arose to the occasion and took up the loathsome worm by one end, saying, "Isn't he a beauty!" The two men looked at each other and nodded. "She'll do," breathed Pops. Thus I came into the Division of Truck Crops Insects of the old Bureau of Entomology.

It happened that at this time, Mr. Popenoe, affectionately known all over the Bureau as "Pops," was sent on an annual inspection trip among the field stations. So, for the present, I was installed in a corner of the "Doctor's" office. Everywhere the Chief of this Division was known as the "Doctor," although he had never received even his bachelor's degree from Cornell. He was sensitive on that point. He had spent full time there as a student but for some reason rather vaguely explained by him, was not given his degree, but merely a licentiate. Later, W. J. Holland, sensing his worth as an entomologist, had brought it about that an honorary Doctor of Science degree was conferred on him from the University of Pittsburgh. It had been a very satisfactory performance for Doctor Chittenden who loved to relate it to me, even to the wearing of the borrowed black-tasselled "louse cage," as Professor Holland had called the academic cap that he had lent Chittenden for the ceremony. In spite of his rancour against Cornell for not giving him a degree, I think that the time he had spent there was the happiest of his life. He often dwelt on the teachings of an old professor there, Burt Wilder, a Harvard man for whom he had a boy's reverence. Later a teacher by the name of Barnard had come who was antagonistic to him. Dr. Howard has suggested that Chittenden probably knew more than Barnard about entomology. It was his nature even then not to be submissive under such circumstances. He probably took just what studies he wanted to and did as he pleased at Cornell. He often told me of his long summers there. The usual program of the day was to work in the laboratory all the forenoon, go swimming after lunch, collect insects on the way home, and mount them all the evening. Many of his specimens pinned at that time are still in existence. They are beautifully labelled in his fine handwriting. He met Comstock at Cornell at about this time and didn't like him either. Comstock had offended him by requesting that he cease whistling while he worked in the laboratory. To the end of his life Chittenden sang or whistled as he worked, and it was a very musical singing or whistling, too. When I heard "Oh Promise me" rolling out, I always knew that all was well with the world for the nonce. Mrs. Comstock had soothed him and won his regard because after the edict against whistling she had come to him privately and said, "I like your whistling, Frank, and I hope you won't stop."

Dr. Chittenden gave me a desk on the other side of the cases to clear off for my own. He said, "Everyone ought to have a room by himself, but this is the best I can do. You will sit over on the other side of the cases and we can communicate by this little basket under my desk." That little basket attached by a string at either end was to prove some days the most maddening piece of office furniture that I ever had kicked at me. On his more irascible days in especial, he would load it up with papers and boxes at a rate to keep a dozen assistants busy and kick it through for me. But on the whole he was considerate.

The real naturalist is born with an abnormally large collecting and hoarding proclivity. Added to it, there is usually a total indifference to appearances. Shortly there results a disorder not equalled anywhere except in a junk shop. I know this from long experience of years of struggling to keep order in my own house with another such naturalist. Dr. Chittenden's office was a typical example. But for me it was from the start the most fascinating place I ever hope to be let loose in. He would rather irritably say, "Your whole scientific interest amounts to putting this office in order." The innumerable drawers of the desks and cabinets were crammed with all the paraphernalia of an entomologist,—vials of all sizes, strips of cork, pins, mounting boards, chemical reagents, forceps, scalpels, brushes, dissecting scissors, lenses. There was the hoarding of 40 years in that room. It took me nearly a week to clean off my desk, and as for the rest of the room I was months getting that in shape. I had to use all my diplomacy to do this as Dr. Chittenden had never allowed anyone to meddle very much with his belongings. His desk was absolutely sacred ground. Exactly a year after I came I tackled the desk. This is the way it came about. He had lost the galley proof of an article that he was publishing, and called me over to help him find it. I began by softly searching about while he left the room. He was gone for some time. His desk was piled a foot high with the usual papers, boxes, books, vials, with a bag or two of halfeaten peanuts scattered among the papers. He was very fond of peanuts. Down in the litter I even found the beginnings of a mouse nest. When the Doctor returned I called out, ''There is a mouse nest right here on your desk.'' ''That so?'' He hated mice and I knew it. He retreated behind the cases on my side of the room, and I worked fast. Every little while when he poked his head out to see how things were progressing, I talked about mice vigorously. Once he asked, ''You will put everything back where you found it?'' ''Oh yes'' and I went on clearing away the stuff as fast as I could. At last when I had it half way presentable, he came back and sat down solidly in his chair and said, ''It is a relief to have all this congestion away,''—the greatest admission for him.

(To be continued.)

PLATYPSYLLUS CASTORIS Ritsema

The other day W. J. Hamilton, Jr., the mammalogist, brought me a vial with a nice series of the beaver parasite, *Platypsyllus castoris* Ritsema, collected from a beaver found in the Six Mile Creek gorge near Ithaca, N. Y. With the beaver coming back, evidently its interesting beetle parasite is also coming back. Leng records it only from Texas, California, Dakota, Alaska and Europe. It is not listed in the Insects of New York.

Henry Dietrich

DR. FRANZ SPAETH AND THE CASSIDINAE

By W. D. Hincks

Manchester Museum, England

The tortoise beetles known for some time after Linnaeus completed his work were all included in the Linnaean genus *Cassida*. The first generic dismemberment was undertaken by Chevrolat in Dejean's Catalogue (1837) and many of these catalogue names were characterized subsequently by Chevrolat and Duponchel (in D'Orbigny 1843) (see Barber & Bridwell, 1940, and Hincks 1950). After the publication of the Dejean Catalogue, in 1840, the Rev. F. W. Hope made a valuable contribution to the study of the group but it is to Boheman (1850-62) that we owe a fine four-volume monograph which remained the standard work for many years.

In 1898 Dr. Franz Spaeth published the first of his many papers dealing with cassidine taxonomy. By 1943, the date of his last publication, one hundred and twenty papers, several of them large and consisting of from two to five parts, had appeared. Spaeth rapidly became the leading specialist and eventually practically all the available material passed through his hands. Although he did not publish on cassids until 1898 it is interesting to note that according to a bill enclosed in the first volume of his copy of Boheman's monograph Spaeth bought that work from a Paris bookseller in 1888, evidently being interested in the group for ten years before he first published on it.

Franz Spaeth was born in Vienna on October 4th, 1863 and died there in 1946 at the age of 82. For nearly half a century he specialized almost exclusively on the cassids and in the course of this long period he was continually engaged in building up his fine collection which contains the types of the majority of the species and lower categories which he described. In 1918 he acquired most of the types of Wagener who published on the subfamily in 1877 and 1881. In addition he was able to add some type material described by Fairmaire, Baly, Pic, Champion, Weise and others. The large Donckier de Donceel and Van der Poll collections which he purchased were also important accessions to Spaeth's collection, but some of the richest additions were those received through museums, institutions, and the firm of Staudinger, in exchange for his services in the identification of specimens.

During the war the collection was concentrated from 80 into 40 large cabinet drawers and stored in the Naturhistorisches Museum, Vienna. Afterwards it returned to the Spaeth flat in Vienna where I first saw it in February 1950. Through the munificence of the well-known British coleopterist Mr. R. W. Lloyd, and the cordial cooperation of the University of Manchester and the Manchester Museum, I was able to visit Vienna in February last year in order to endeavour to secure this superb collection. It would be unnecessary to refer to the many difficulties which had to be overcome, and it will suffice to say that arrangements were concluded for the collection to come to the Manchester Museum. After special packing the whole collection was transported by air and reached the museum in March without the slightest damage.

The collection contains over 20,000 specimens of which more than 3,000 are types. Still in its overcrowded wartime condensed condition the collection is now undergoing rearrangement and expansion in order to make it available for study and reference. In addition to the collection it was possible to secure all of Spaeth's cassid literature, card-index, and notes, and Herr Franz Spaeth, the eldest son of Dr. Spaeth, was good enough to entrust to my care a very extensive manuscript revision of the cassids of the world on which Dr. Spaeth had worked during his last years. I understand that this manuscript, which is in a very confused condition and has some extensive lacunae, is only the second copy of the work, the original unfortunately being destroyed during the bombing of Vienna together with the proofs of the first part which had already been set up in print. It is hoped that it may be possible to publish part, at least, of this important work. Unfortunately the problems of editing it, together with the present publishing difficulties, are conspiring to delay its appearance.

It will be a matter for satisfaction amongst coleopterists that this beautiful and extremely important collection is now housed in a museum where it will be carefully conserved and where it is available to students of the Cassidinae.

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A PRELIMINARY KEY TO THE NEOTROPICAL GENERA OF OEDEMERIDAE

By Ross H. Arnett, Jr.

A preliminary key to the genera of the family Oedemeridae of the world, excepting the subfamily Oedemerinae, was presented in this journal several years ago (1948, vol. 2, pp. 12-14). It was largely a compiled key. Since that time the genera of neotropical Oedemerinae have been similarly worked out and are presented here as a supplementary key which includes all the neotropical genera of Oedemeridae.

Recent studies on genotypes (1950, Journ. Washington Acad. Sci., vol. 40, pp. 217-225) and synonymy (unpublished) have revealed several necessary changes of names. Since these have not been fully worked out and the nomenclature correlated with the systematics, the older names are used here. In the meantime, it is hoped that this key will be useful to the reader in assigning his undetermined material and will stimulate interest in the group.

As I stated in the introduction to the previous key, I hope this key will be tested and that any corrections necessary will be brought to my attention either directly or in published notes. Also, I would be very glad to receive material in any of these groups for study purposes.

The generic names preceded by an (*) have been checked with specimens.

Key to neotropical genera of Oedemeridae

[Note: The genus *Rhopalobrachium* is removed from this family and placed in the family Lagriidae, subfamily Trachelosteninae.]

1. Pronotum with denticulate lateral margins (probably not an Oedemerid). **Cycloderus** Sol. 1851
   Pronotum without denticulate lateral margins .... (2)
2. Antennae situated in deep emarginations of the eyes; male with a central basal apodeme on the eighth abdominal sternite (Calopodinae) ***Sparedrus** Latr. 1829
   Antennae situated in front of the eyes, which may be emarginate or not; male lacking a basal apodeme on the eighth abdominal sternite........ (3)
3. Front tibia with a single apical spur; eighth abdominal sternite of male with apical lobes scoop-shaped, large and prominent (Nacerdinae)........ (4)
   Front tibia with two apical spurs; eighth abdominal sternite of male never with large and prominent scoop-shaped lobes (Oedemerinae)........ (8)
4. Eyes large; front between the eyes narrower than the eyes; eyes moderately deeply emarginate .... (5)
   Eyes small, front between eyes broader than the eyes; eyes not or scarcely emarginate .... (6)
5. Head produced in front........ **Sisenopiras** Pic 1923
   Head normal, not elongate........ ***Xanthochroa** Schm. 1846
6. Eyes emarginate........ (7)
   Eyes without an emargination........ ***Dityloidea** F. & G. 1863
7. Apical spine on fore tibia very weak........ **Micronacerdes** Pic 1923
   Apical spine on fore tibia normally stout........ ***Nacerdes** Dej. 1834
8. Last segment of the maxillary palpus more or less widened, cultriform, sub-cultriform, or subtriangular (Asclerini) .... (9)
   Last segment of the maxillary palpus narrowly ovate, with the apex obliquely rounded or truncate; claws simple or toothed; mandibles bifid (Oedemerini) ....(20)
9. Body more or less stout; mandibles bifid; antennae inserted at some distance before the eyes; eyes small, finely granulated, and usually rather prominent; tibial spurs long; claws simple; body carabidiform........ ***Ditylonia** Seidl. 1899
   Body slender and more parallel........(10)
10. Mandibles bifid at apex........(11)
    Mandibles pointed or entire at apex........(16)
    Right mandible only with a short tooth on the inner upper side........(19)
11. Claws toothed........ ***Asclera** Steph. 1839
    Claws simple........(12)
12. Thorax cordate or quadrate, with more or less prominent hind angles; fifth ventral segment emarginate in the middle in the male........(13)
    Thorax oblong-cordate, narrowed from the middle to the base, and with less prominent hind angles; eyes not prominent, oblique, coarsely granulated (Except in C. dugesi); fifth ventral segment not emarginate in the middle in the male........ ***Copidita** sensu auct.

13. Eyes transverse, prominent; thorax strongly constricted behind and with prominent hind angles: elytra with rows of double lines or vague costae; antennae and legs stout or moderately stout; form rather convex, moderately broad .... (14)
Eyes more oblique, less prominent; thorax more quadrate and with less prominent angles; elytra with sharply raised lines; antennae and legs slender; form narrowly elongate and more depressed .... *Vasaces Champ. 1889
14. Apical segment of maxillary palpus elongate, subcylindrical; thorax very short, constricted near the base .... (15)
Apical segment of maxillary palpus cultriform; thorax longer than wide, moderately constricted behind the middle, with the posterior margin moderately elevated .... ***Diplectrus** Kirsch 1866
15. Thorax strongly elevated behind .... **Mimodiplectrus** Pic 1923
Thorax scarcely elevated behind .... **Matusinhosa** Pic 1923
16. Elytra shorter than the abdomen, not meeting at the suture; wings absent. **Meloeditylus** Pic 1926
Elytra covering the abdomen, meeting at the suture; wings present .... (17)
17. All segments of the hind tarsus tomentose beneath .... **Diplectroides** Champ. 1889
At most only two segments of the hind tarsus tomentose beneath .... (18)
18. Head inserted into the thorax to the eyes; tarsi very broad .... ***Sessinia** Pasc. 1863
Head with visible area behind the eyes, tarsi normal .... ***Oxacis** LeC. 1866
19. Head not or only a little prolonged in front .... ***Alloxacis** Horn 1896
Head prolonged in front into a beak; eyes oblong, depressed, and finely granulated. .... **Piras** Champ. 1889
20. Penultimate tarsal segment with a pronounced, membranous, flap-like appendage (probably not an Oedemerid) .... **Loboglossa** Sol. 1851
Penultimate tarsal segment of the normal broadened, cordate shape .... (21)
21. Body lampyroidiform; elytra never narrowed behind .... (22)
Body not lampyroidiform; pronotum small, usually somewhat broader than long; antennae simple .... (25)
22. Pronotum transverse; antennal segments 3 to 5 longer and broader than the preceding and the following; habitus like a Lampyris .... (24)
Pronotum as long as broad, small; habitus of a Lycus; elytra somewhat broadened behind; two segments of the hind tarsus tomentose beneath (23)
23. Antennal segments 3 and following very broad; elytra strongly distinctly costate .... **Uroplatosisenes** Pic 1934
Antennal segments rarely somewhat broadened; elytra with fine costae or double costae .... ***Sisenes** Champ. 1889
24. Pronotum broadest in the middle; epipleurae distinct anteriorly .... **Mecopselaphus** Sol. 1849
Pronotum distinctly cordate; epipleurae lacking .... ***Platylytra** F. & G. 1863
25. Claws toothed; eye not emarginate; elytra without raised costae .... **Vodomarus** Champ. 1889
Claws simple; elytra with distinct costae .... **Oedemera** Oliv. 1789

MUSEUM G. FREY

Herr Georg Frey, a member of the Coleopterists' Society, has recently issued a new journal called ENTOMOLOGISCHE ARBEITEN AUS DEM MUSEUM G. FREY, MÜNCHEN. In this first volume of a series to be published twice a year, Herr Frey gives an account of his museum, its staff, and some of his personal history. There is in the front of the publication a halftone illustration of the museum building and an inside view of the museum. The staff members of the museum and Herr Frey are also in the picture.

The Frey collection is probably one of the largest private collections of beetles in existence today. Frey began as a collector of local insects, and as his interest grew, so did his scope. He began to trade and purchase, took longer collecting trips throughout Europe, and finally his interest turned to exotic species. He has made trips to Africa, South America, and the United States to add more material to his collection. This has resulted in amassing a large collection, particularly representing such families as Scarabaeidae, Tenebrionidae, and Chrysomelidae.

Several other workers have been attracted by the Frey collection. At the present time Herr Frey has working at the museum, and in his employ, Herr Fr. Stöcklein, Herr H. Kulzer, Frl. R. Roi, Frl. B. Bechyne, and Herr Dr. J. Bechyne.

Such a collection and group of workers would naturally result in some outlet for the results of the research carried on. Thus, Herr Frey has started the ENTOMOLOGISCHE ARBEITEN AUS DEM MUSEUM G. FREY. This first issue contains sixteen titles in 284 pages, illustrated by 4 halftone plates in addition to the frontispiece. These consist of very fine drawings and photographs of the beetles discussed in the text. The journal is edited by Herr Hans Kulzer. There is no subscription price given, but copies are offered for exchange.

R. H. A.

NOTES ON THE DISTRIBUTION OF *APION GODMANI* WAGNER (CURCULIONIDAE)

By Arthur C. Smith

Cornell University, Ithaca, New York

Apion godmani was originally described in 1912 by Hans Wagner from specimens collected at various localities in Guatemala by Godman and Salvin (1). Blackwelder, in his checklist of the beetles of Latin America (2), lists this species as occurring only in Guatemala. However, its occurrence in Mexico has been reported by A. Dampf and others in various publications of the Mexican Department of Agriculture. In Principales plagas y enfermedades de los cultivos de la Republica Mexicana *Apion godmani* is listed as "una de las plagas mas importantes del frijol en México" (3).

Inasmuch as this species has been confused in the literature in the past with *A. griseum* Smith, its most closely related Nearctic species, it seems worthwhile to report that *A. godmani* is the common species of this genus found on cultivated beans (*Phaseolis vulgaris* L.) in Mexico and Guatemala.

In a survey of bean insects[1] conducted by the author for the Mexican Agricultural Program of the Rockefeller Foundation in the summer and fall of 1948 and again in 1949, *A. godmani*[2] was collected in many localities throughout much of Mexico, as shown in fig. 1. A similar but less extensive survey was made in 1947 by Dr. J. J. McKelvey, Jr., of the Rockefeller Foundation staff. Each dot on the map represents a collection or series of collections of adult beetles made at a specific geographic locality in Mexico. Additional specimens were collected by J. J. McKelvey

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[1]I wish to express my gratitude to Ingeniero Marcos Ramirez Genel and Ingeniero Francisco J. Osorio A., of the Oficina de Estudios Especiales, Dirección de Agricultura, Estados Unidos de México, without whose constant assistance in the field my survey trips would have been impossible.

[2]I am indebted to Mr. J. Balfour-Browne, Senior Scientific Officer, Department of Entomology, British Museum (Natural History) for the verification of the determination of this species and for supplying me with a table of anatomical characters for its identification.

in Guatemala. All specimens are at present in the collection of the writer. A complete listing of the geographic localities represented on this map may be found in the writer's thesis THE ECOLOGY AND CONTROL OF THE APION POD WEEVIL IN MEXICO in the library at Cornell University.

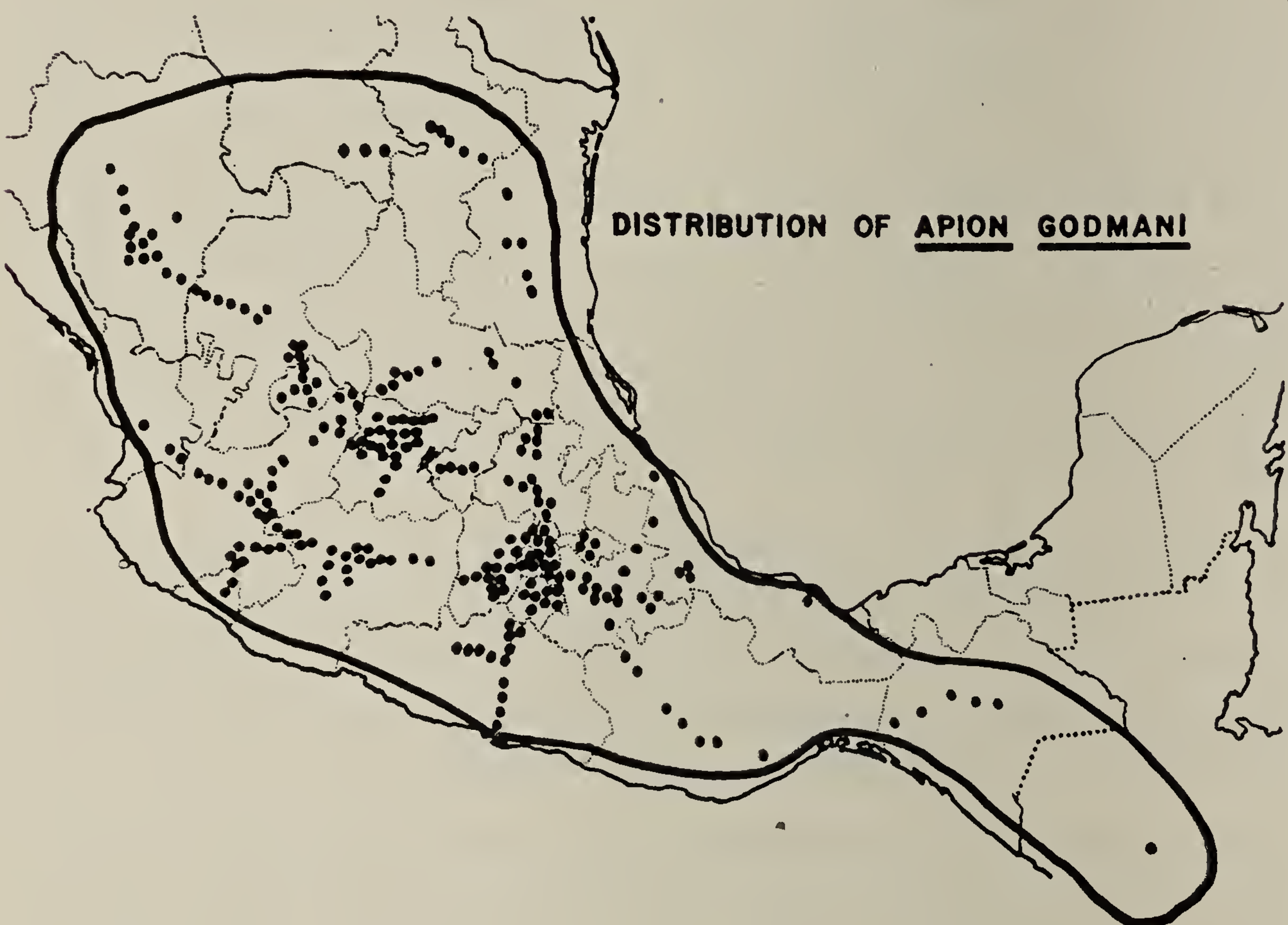

Fig. 1.—Collections of *Apion godmani* made in Mexico; representing its known distribution.

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CURRENT LITERATURE

Compiled by Ross H. Arnett, Jr.

This section is designed to contain all papers on the Coleoptera of North and South America which are not in the **Catalogue of the Coleoptera of America, North of Mexico** and its supplements, or in the **Checklist of the Coleopterous Insects of Mexico, Central America, the West Indies, and South America** and which have not been previously listed in The Coleopterists' Bulletin.

Note: Some time ago we published a request for each author to send us a list of his papers which have not been cited in this section. The response to this request was very good and resulted in a much more complete literature section. I would again ask all authors reading this section to send me the titles, or papers which have not been previously listed in this section and also call to my attention omissions which should be listed. The system of listing papers by families has proven to be very useful to the specialist and I would like to have it as complete as possible and as current as possible.

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NOTICES

Wants, exchanges, current research notices and similar material will be published under this heading and this service is available to all, providing it is confined to the fields covered by this bulletin.

THE COLEOPTERISTS' SOCIETY needs copies of Volumne III, no. I of The Coleopterists' Bulletin. We are down to a few sets of volume three and need this number to complete additional sets. If there are any copies available, from members who do not wish to keep complete sets, please send them to us immediately. We will pay 50 cents each for them or give you credit.

CHRYSOMELIDAE—Studying the American Clytrinae and would be glad to receive specimens for privilege of examination. I can exchange and determine material from the group. **F. Monros, Fundacion Miguel Lillo, Miguel Lillo 205, Tucuman, Rep. Argentina.**

CORNELL UNIT PINNING TRAYS—For sale. Only 900 left, size 1-3/16 x 1-5/8 x 4-3/8 inches. Heavy caliper cardboard throughout. Slightly defective balsa pinning bottoms. $1.00/doz. CORNELL DRAWERS and cabinets $6.75 each. **Bio Metal Associates, P. O. Box 346, Beverly Hills, Calif.**

FOR SALE—Biologia Centrali-Americana Coleoptera by J. S. Baly, H. W. Bates, G. C. Champion, H. S. Gorham, M. Jacoby, D. Sharp, and others. 18 volumes, 9,099 pp., 350 plates (297 colored). Beautifully bound in blue cloth with gilt lettering, as new, 4to, 1880-1910. **John J. Kellner, 41-03 171st Str., Flushing, N. Y.**

COLEOPTERA OF THE ARID SOUTHWEST. Will be collecting in southern New Mexico and southwestern Texas during June, July and August. Careful attention to lists of desiderata. **L. H. Bridwell, Box 44, Forestburg, Texas.**

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CHANGE OF ADDRESS: Dr. J. Linsley Gressitt has left Canton, China. His new address is: 648 Hiratsuka-cho, 2-chome, Shinagawa-Ku, Tokyo, Japan.

OFFERING FOR SALE.—South Indian insects of all orders, especially Coleoptera. All specimens with correct data. P. SUSAI NATHAN, Naturalist, Kurumbagaram P. O., via Karikal, Tanjore District, South India.

MALACHIIDAE, CANTHARIDAE, DASYTIDAE, DRILIDAE, PHENGODIDAE of the world, determined, exchanged, bought by WALTER WITTMER, Casilla de Correo, 1043, Buenos Aires, Argentina.

EXCHANGE AUSTRIAN high Alps beetles for American species. DR. H. WILCKE, Kössen/Tyrol, Austria.

INSECT PINS, noncorrosive, first class, in all sizes, 1,000 for $1.90, plus 30 cents postage. Will give as a free gift, series of Austrian beetles. Large orders, up to 10% discount given. DR. H. WILCKE, Kössen/Tyrol, Austria.

WANTED TO BUY—ELMIDAE, DRYOPIDAE, LIMNICHIDAE, PSEPHENIDAE, EUBRIIDAE from exotic areas; will determine American species. Adults and larvae. HARRY G. NELSON, Dept. of Biology, Herzl Jr. College, Chicago 23, Ill.

PSAMMODIUS (SCARABAEIDAE: APHODIINAE) from North, Central, and South America wanted for revisional study. Will be glad to determine specimens for privilege of examination. O. L. CARTWRIGHT, Div. of Insects, U. S. National Museum, Washington 25, D. C.

HELODIDAE AND DASCILLIDAE of the world. Studying these families and would be glad to receive specimens in exchange for Australian material. J. W. ARMSTRONG, "Callubri," Nyngan, N.S.W., Australia.

CERAMBYCIDAE, CHRYSOMELIDAE—of Pacific and Eastern Asia desired for study. At present work in progress on Cerambycidae, Hispinae, and Cassidinae from New Guinea, Philippines, China, etc. Will purchase material from some areas. Certain groups available for exchange. J. L. Gressitt, c/o E. S. Ross, California Academy of Sciences, San Francisco 18, Calif.

CURCULIONIDAE, CHRYSOMELIDAE, STAPHYLINIDAE, PHALACRIDAE—Identifications needed of Michigan examples in these and other families; also in the genera Cis, Canifa, Aphorista, Hallomenus, Scotochroa, Monachus, Lyctus. R. R. Dreisbach, 301 Helen Street, Midland, Mich.

DYTISCIDAE—Wanted to borrow or exchange specimens of *Hydrocanthus* (any species). Especially interested in seeing large series from single locality. Specimens returned promptly. F. N. Young, Zoology, Indiana Univ., Bloomington, Indiana.

CHRYSOMELIDAE—Revising the genus *Elytrosphaera*. I would be glad to receive specimens from Mexico and South America. Will purchase or exchange. P. JOLIVET, 6 rue de Balzac, Franconville, S. et. O., France.

OEDEMERIDAE—Desire Neotropical Oedemeridae for revisional studies. R. H. Arnett, Jr., U.S. National Museum, Washington 25, D. C.

SILPHIDAE—Would like to exchange French species of Silphidae (Silphini, Necrodini and chiefly Necrophorini) for American species of the same group (unmounted dry specimens). J. THEODORIDES, Laboratoire Arago, Banyuls s/mer Pyr. Or., France.

COCCINELLIDAE OF THE WORLD—Will purchase mounted or unmounted specimens, also literature on this family. Will determine species of any locality. WILLARD H. NUTTING, 786 Santa Ray Ave., Oakland 10, California.

JAPANESE BEETLES in exchange for Cerambycidae of America. I have at hand a good many specimens from the Japanese fauna. I desire to exchange our Coleoptera for American and other foreign Cerambycidae. YOSHIAKI NISHIO, Agriculture and Forestry Ministry, Sapporo, Japan.

PUBLISHED FOR THE SOCIETY
BY THE SHERWOOD PRESS

Nat. Hist.

THE COLEOPTERISTS' BULLETIN

Volume V | October/December, 1951 | Number 5/6

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Published Bimonthly Beginning With February By:
The Coleopterists' Society

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The Coleopterists' Bulletin is conducted in the interest of coleopterists for the publication of short papers and other matter in the general field of coleopterology. Insofar as contributors supply suitable material, it is intended to include: (1) original papers on beetles, on methods and procedures, and on principles; (2) short notes about beetles, collecting, collectors, etc.; and (3) bibliographic aids to the student of taxonomic coleopterology.

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Entered as second-class matter at the post office at Washington, D. C.

The Coleopterists' Bulletin

Volume V October/December, 1951 Number 5/6

TWO OLD COLEOPTERISTS (Continued)

By Doris H. Blake

[*This is the second installment of Mrs. Blake's account of the two old entomologists, Dr. F. H. Chittenden and Dr. E. A. Schwarz, with whom she worked when she first went to the Bureau of Entomology. In the previous installment she had just related how she had finally contrived to clean up the mountainous accumulation on the desk of the Doctor* (*Dr. Chittenden*).]

Long before this happened I was taken on permanently as the Doctor's own assistant, and under his tutelage I had passed two Civil Service examinations. At the time I came, he had a young woman working for him as laboratory assistant, Miss Van Horn, shortened by him to "Miss Van." He had a nickname for everyone. She was a little, stooped, browned, country woman with a habit of coming late or not at all. I think that she had the care of an invalid mother. At any rate she was most ingenious in her excuses for being away and almost oriental in her way of bowing before the storm of his rages and escaping somehow. Indeed her feelings were greatly hurt when he transferred her to another office, although she was far more gently treated there. Afterwards he said, "Well, that's over. I've met a good many of these Virginia women and they all have that same low monotonous gabbing tone of voice. It drives me crazy."

As for Pops, he remained permanently without an assistant. He had his quarters in the little round brick building behind the old Bureau of Entomology, and his desk, which one reached eventually by going through a maze of concealing furniture, was as littered as the Doctor's, only with quite different things—books on a wide range of scientific subjects, especially chemistry, piles of pictures and photographic supplies, gadgets and mechanical parts. Unlike Dr. Chittenden who could at once see anyone who put his nose inside his door, Pops' chair was as concealed from the public as a spider in her hideout. This was undoubtedly arranged on purpose so that if the Doctor or any other unexpected visitor arrived, Pops might have time to conceal his occupation. Of all the men there, he had by far the most extensive knowledge. He was musical and could outdo the Chief by not only whistling but at the same time keeping up a bass accompaniment in his throat and carrying an alto in his nose—a trick that he was called upon to exhibit for the Doctor on many an occasion. He was very gifted with the paint brush too. I remember that Dr. Chittenden going over one morning on his tour of inspection found Pops at work with an easel before him making an oil painting from a photograph of his deceased father for his mother's birthday. "It must be finished today, Doctor, in order to be there in time," he explained with determination. Pops' father was the well-known E. A. Popenoe, a pioneer in Kansas entomology and long-time professor at Manhattan. Beside his innate artistic abilities, Pops was a genius in a mechanical way. He could successfully tinker with anything from his car to my binocular. He was always in demand. His great capable fingers could make any contraption go. Dr. Chittenden was forever ranting against Pops' multitudinous interests. One morning he went over to find him with three parrots. Another time Pops brought a huge rabbit down to the office, another time it was an alligator, and when that was gotten rid of, aquaria with tropical fish appeared. Once, Dr. Chittenden related, he came in leading a raccoon on a chain. "And that's not all," roared the Doctor, "He has brought his saxophone down here twice and squawked away on it at lunch hour." Pops was the gentlest of men, loyal and lovable, and he enjoyed life to the utmost. I can see him now looking out of his office window into the insectary garden where the plum trees were blooming and saying, "It is like being in Japan to look out of this window." Everyone knew that he was dilatory in his routine work. Life was far too interesting for him to devote all his time to petty red tape. He would have been a wonderful teacher. In fact he did teach in his spare time at George Washington University during his last years. He was well liked by his students and after his mother died and he had safely launched his youngest brother into the working world, he married one of his pupils. On the days when Dr. Chittenden was his most irritable, Pops bore the brunt of his fault finding. He would be summoned over to his Chief's office a dozen times during the afternoon. One morning he ventured to remonstrate. "Don't try to talk me down," thundered Dr. Chittenden. "As if I could," retorted the maddened Pops, "I'm simply stating the facts, I can't do it all." Dr. Chittenden leaned more than he suspected upon Popenoe. One day he would call him "an impossible necessity," on more polite occasions, "my consultant." Indeed Pops was a consultant for the entire Bureau. I think that the real reason at the bottom of Dr. Chittenden's perpetual rage at him was because he could enjoy life so thoroughly. He was a perfect example of the rosy-gilled borrower of Charles Lamb's essay, always outwardly serene and happy even in his much harassed life as the "Doctor's consultant." He remained in the Bureau, to which he had come as a fresh-faced boy just out of college, for nearly 30 years, when he was fired. When he was confronted with the loss of his job and the necessity of supporting a wife and two babies, his heart simply stopped beating. It was a pity that he could not have had the benefit of an income that had been offered him by a commercial firm for a spraying formula that he had worked out some years previously. Because he was a civil servant he had been obliged to decline a yearly income that was nearly as much as his salary. I have heard the rumor that he committed suicide, but this is not true. Only six months before his death in one of our more serious talks, Pops told me that never in his life had he had any wish for its end. We did not appreciate him at that time. His big clumsy body, his inability to save a cent, his pure happiness in spite of being unable to fit himself into the pettiness of a government clerk's job, made him something of a joke to us all. Since his death he has grown in stature. Only the other day one of his colleagues said, "He was one of the great men of the Bureau."

Much more adaptable to a government clerk's position was a third member of the scientific staff of the Division, a still younger man who had recently been discharged from the army. He was of shorter stature but of similar rotundity of build that was to grow in the way of his elders as time went on. The Doctor called him "Whitey." Pops addressed him as "Bill White." He had charge of the greenhouses and had his office in a small cottage in the insectary garden, in the rear of which was located the Doctor's insectary. As I was given charge of rearing of the insects there, I had to pass through White's office, and my trampings to and fro soon became an irritation to him. "You interrupt his cogitations," let us say," explained the Doctor, adding, "It might be his slumbers," when White applied for an addition to his building that he might be less interrupted. Nothing fascinated Pops more than a construction of this sort. He wanted to be present at every nail that was hammered into the little house. Consequently whenever the Doctor tried to telephone him, Pops was not in. One morning the Chief had the telephone ringing and the messenger boy racing the whole forenoon. And between rings he would come around my corner swearing roundly about Pops. After lunch his soul, vexed from smouldering all the forenoon, began to blaze. He rang steadily for a while, then strode down to the insectary and then and there before White, little Tiddletywinks, the artist, the new stenographer, carpenter, architect, gardener, and everyone else within earshot, delivered himself of his opinion of Pops. He came back to me a bit appalled by what he had said and asked, "Do you suppose it penetrated?" I made light of it and advised him to go home early and forget it, so shortly he left.

Then Fergus, the messenger boy, timidly peeped in, "Has he gone?" with a great sigh of relief. Then White, "Has he gone? The Lord be praised. I never put in a worse day." He hadn't more than closed the door before Pops burst in, "He's gone! The Doctor must have been feeling rotten bad the way he treated me. I've had pretty good practice keeping my temper today," and he related it and then went off to watch the building to his heart's content and to smoke innumerable cigarettes.

Fergus, the messenger boy, probably felt the bad days nearly as keenly as Pops. He was my chief aide and shadow, and in turn I helped him with his Caesar and scolded him when he played hookey. "That young whelp," Dr. Chittenden would explode, when he found him hanging about my desk. Eventually, when appropriations ran low, Fergus was discharged. He came in to me with the tears running down his cheeks to bid me goodbye and to sob, "I'm going to Cornell and be a real entomologist some day."

Another member of the office who came shortly after I did was one whom the Doctor soon dubbed "the big Hun." He was fair, blue-eyed, and bull-necked and with a slightly hooked nose. He would sit at Dr. Chittenden's knee taking dictation as amenably as a little child and as full of questions. He was an expert stenographer and typist and knew it, and from the day he arrived began asking for more money and threatening to leave if he didn't get it. Dr. Chittenden took a great fancy to him. The fellow, after receiving two raises in pay in rapid succession, decided he might stay and took up the best quarters by the window in the clerks' room. He spent much time out in the insectary garden and was not reprimanded for it the way the others would have been. He was constantly bringing in green worms to the Doctor who overwhelmed him with praises. Later his entomological researches centered on collecting "Gold bugs," the golden tortoise beetles that occur on sweet potato vines. He was all over the garden on his hands and knees collecting them. He even appropriated poor Fergus' sole jar, which was full of butterfly chrysalids, to keep them in. Then he made another entomological discovery and came wailing in to us like a defrauded child. "They don't stay golden." After that he had no more use for "gold bugs," but spent his spare moments wood carving. Pops said that he had a bedstead down at the office that he was working on at one time. The entire Bureau roared when after one of his trips to New York he came back with his face "lifted." For a time his nose was quite straight, but after a little it regained its customary hook. Of all of us he was the most gently treated by the Chief who prized his superb stenographic and typing ability.

Out in back of the Bureau beside Pops' little building and the insectary was a small plot of ground given up to the garden and greenhouses—a pleasant little rendezvous for the Doctor where at odd moments he might observe the potato beetles on the row of potato plants or collect parasites on the bean worms, or even observe the robin's new nest up in the plum tree. He had an old Scotch gardener, too, whose tongue as well as whose troubles were unceasing. Dr. Chittenden called him "the old man," a poor skeleton of a man with hollow sunken eyes and a maniacal grin. He had recently had all his teeth out at once and kept mumbling, "Didn't take nuttin' either." His wide grin was ghastly. Every morning he used to appear at the office to report on the garden. One morning he came shuffling in to say, "I lost my money, Doctor; was goin' to git the upper set, can't git 'em now." There was a strong note of appeal in his voice, but he dared not ask for a loan and the Doctor didn't suggest it, far from it. The old man continued. "I've got an income tax to pay too, Doctor." The Chief sat as tight as an oyster. The old man repeated, "Yip, got to pay $8." As soon as he could, Dr. Chittenden got him onto how the tomato plants were growing. But the old gardener went out chuckling in his horrible way, "I've got an income tax to pay." "Humph," ejaculated the Doctor as soon as the door swung to, "I'm not going to lend him any money, nor anyone else either." A little later White coming in, said "I never saw anyone as happy as the old man is over that income tax. He thinks it is a great honor."

The Doctor lived in a 14-room brick house at 1323 Vermont Avenue, really the combination of two houses, which he had bought soon after coming to the city. During the crowded war years he had had the upper rooms converted into apartments. The lower floor and basement were reserved for him and his sister. She had an apartment on the right and he one of the left of the front hallway. In the basement was a dining room and behind that a dark kitchen, and on the other side, a room later transformed into a small office. These rooms in front had windows a little below the level of the street but were fairly cozy and light. I became well acquainted with the house in a period when the Doctor was laid up with a broken bone in his ankle. Looking back on the incident now, I realize that this might well mark the beginning of his many and increasing disabilities. Later he broke first one and then the other wrist. He had several bad falls. In short he was fast becoming an old man, even in his sixties.

White, the first to report on this first accident, came in one morning to say, "The Doctor has a pretty big ankle. He's keen on knowing everything that is happening down at the office, wants to know if Pops is sitting in his chair and not to let him. He and his sister appear to be getting on pretty well. She's all right," said White boyishly, "just as kind-hearted as can be and waiting on him by the inches. The only thing is she has a worse tongue than he has.'' A few days later White reported, ''He's in fighting humor now. His sister is 'the most irritating woman God ever made.' I don't see anything wrong with her. Everytime he raps on the floor with his crutches, she comes flying upstairs to wait on him. Even that irritates him because she can walk and he can't.''

Soon after that I called at the house with some boxes of beetles that he had been wanting. It was early spring and feeling the joy of it I had come out in my new spring suit. I had completely forgotten that Pops once told me, ''If a young girl comes to want to rent an apartment, Mrs. Jones, the Doctor's sister, always says they are all taken.'' So when Mrs. Jones met me at the door, a tall stoutish, pale-faced and red-headed woman, she looked at me with suspicion. I asked if Dr. Chittenden was in, and she said grimly, ''The Doctor is in bed.'' She stood eyeing me very hostilely until I smiled and said that I was Mrs. Blake. At that her whole face changed. ''Come right in,'' she flung the door open wide, ''he's only lying *on* the bed, he can get up,'' and chattering away she led me into the front room, apologizing as she went. ''We are all up in arms, not housekeeping, only existing,'' she flung up the shades, separated the chairs and designated one for me. ''This one is too low for him, that one is broken or rather I am fearful it will break if Mr. Popenoe sits in it,'' and she bustled about talking all the time and absorbing the details of of my appearance. And then, when the Doctor pushed open the door, she disappeared. From then on I spent many mornings there transferring his own personal collection into Schmitt boxes to take back to the Bureau. His sister produced for my especial use a beautiful little table inlaid with mother-of-pearl, and on orders from him to ''hang around'' would appear at intervals with a tray of cookies or glasses of fruit juice. From his big easy chair he directed the household affairs. The darkey servant girl was to bring in the clothes from the line, his sister wouldn't have time to go to the market before lunch, but she might afterwards. Once, turning to me, he exclaimed in a burst of pride, ''This house is a regular bandbox, we have everything.'' Indeed it looked as if he had tried to fill it as full as his office. That small front living room contained a piano, couch, three tables, five chairs, a bookcase, small secretary and a revolving what-not, not to speak of the mantelpiece covered with knickknacks and the big old-fashioned pictures on the wall. With the Doctor in his chair in the midst, one could scarcely turn around. In the days to follow, he recounted to me the history of most of his furnishings and then of his tenants and finally even his neighbors. Apparently in the red brick houses along Vermont Avenue in those days there lived a succession of old ladies and old gentlemen, genteel and stingy, and well versed in each other's affairs. Of his sister he would say, "If she would only eat less she would look better." The poor lady was not much overstout. She always dressed soberly in black. In her way she was as all-wise into the nature of her tenants as a French concierge. Dr. Chittenden had respect for her sharpness in this regard. He said rather shyly one day, "My sister asked me this morning if my best girl was coming today," and then he exclaimed, "How much better it is for a man and a woman to be working together, there is a flow of sympathy between them. Now that big Hun is an excellent stenographer, but I'd as soon have a post sitting there." When I would return from a forenoon's work with him, I would have multitudinous memoranda, such as orders for "Whitey to come early in the afternoon," or for Pops to "give that big Hun Hell," and various other commands that were received with amusement by his Staff.

(To be continued.)

AN UNUSUAL TIGER BEETLE

By P. W. Fattig

Emery University, Georgia

On June 14, 1951, while collecting at about 4,000 feet elevation along a side trail from the Appalachian Trail through Indian Grave Gap on Rocky Mountain in north Georgia, I saw an unusual tiger beetle whose coloration was like none I had ever seen before. Its color was a combination of that of two very different common local species, the bright green head and thorax of *Cicindela sexguttata* and the dull brown elytra of *C. unipunctata.* I first noticed the specimen resting on the ground and approached cautiously. Moving my net slowly above the beetle and dropping it suddenly over the specimen, I expected it to run into the net as numerous *sexguttata* had done, but it did not move. Then, raising the net upward carefully, I attempted to pick the beetle up by hand, but it flew up into the net. In taking *sexguttata* I usually reach down into the net and catch the specimen running around in the net. This method resulted disastrously with the prize specimen, however, for as I reached into the net it flew straight upward about eight feet and then off up the mountainside. I walked up and down the road several times hoping it would fly back into the road, but I did not see it again. A week later five hours' collecting in the same spot failed to turn up other unusual specimens.

From its appearance this unusual tiger beetle must have been a rare hybrid, for no known Georgia species combines the bright green head and thorax of *sexguttata* with the brown elytra of *unipunctata.* I had opportunity for close observation of the specimen and am positive I could not have been mistaken in the coloration recorded here.

In answer to a letter to the U. S. National Museum regarding the identification of this specimen, O. L. Cartwright, Associate Curator of the Division of Insects, replied that he believes it might have been a hybrid specimen resulting from the mating of *C. sexguttata* and *C. unipunctata.* As a further bit of evidence supporting this possibility he stated that together with Prof. Franklin Sherman he once observed and captured a male of *C. sexguttata* in copulo with a female of *C. unipunctata.* He and Prof. Sherman both observed the two before taking them. The specimens, mounted on the same pin and now in the U. S. National Museum collection, were collected at CCC Camp F2, Oconee County, South Carolina, 12-VII-1936. This mountain locality is only a mile or two across the Chatooga River opposite Clayton, Georgia.

A COLONIAL COCOON IN THE GENUS *APION* (CURCULIONIDAE)

By ARTHUR C. SMITH
Cornell University, Ithaca, N. Y.

While engaged in research on the ecology and control of the Apion Pod Weevil for the Mexican Agricultural Program of the Rockefeller Foundation, a unique case of colonial cocoon-making was discovered. It appears to be the first such case reported in the genus *Apion*.

In Mexico there are two common species of curculionids in this genus which occurs as pests on the cultivated bean *Phaseolis vulgaris* L. The adult beetles are quite similar in appearance, and anatomical details must be checked carefully with a hand lens or microscope in order to distinguish the two species. Biologically, however, the two species are quite distinct. In both, the eggs are deposited in the side-wall tissues of the bean pod when it is quite small. In the case of *Apion godmani* Wagner*, the eggs are placed at random one at a time up and down the bean pod. From one to twenty eggs may be deposited in a pod. In *Apion aurichalceum* Wagner*, 30 to 130 eggs may be deposited in the pod, frequently with a preference being shown for the tip of the pod.

The growth of the larva from the first to last instar is quite similar in the two species as far as is known. However, the larvae of *A. aurichalceum* are found all crowded together in one place in the pod, whereas the larvae of *A. godmani* are distributed evenly throughout the pod.

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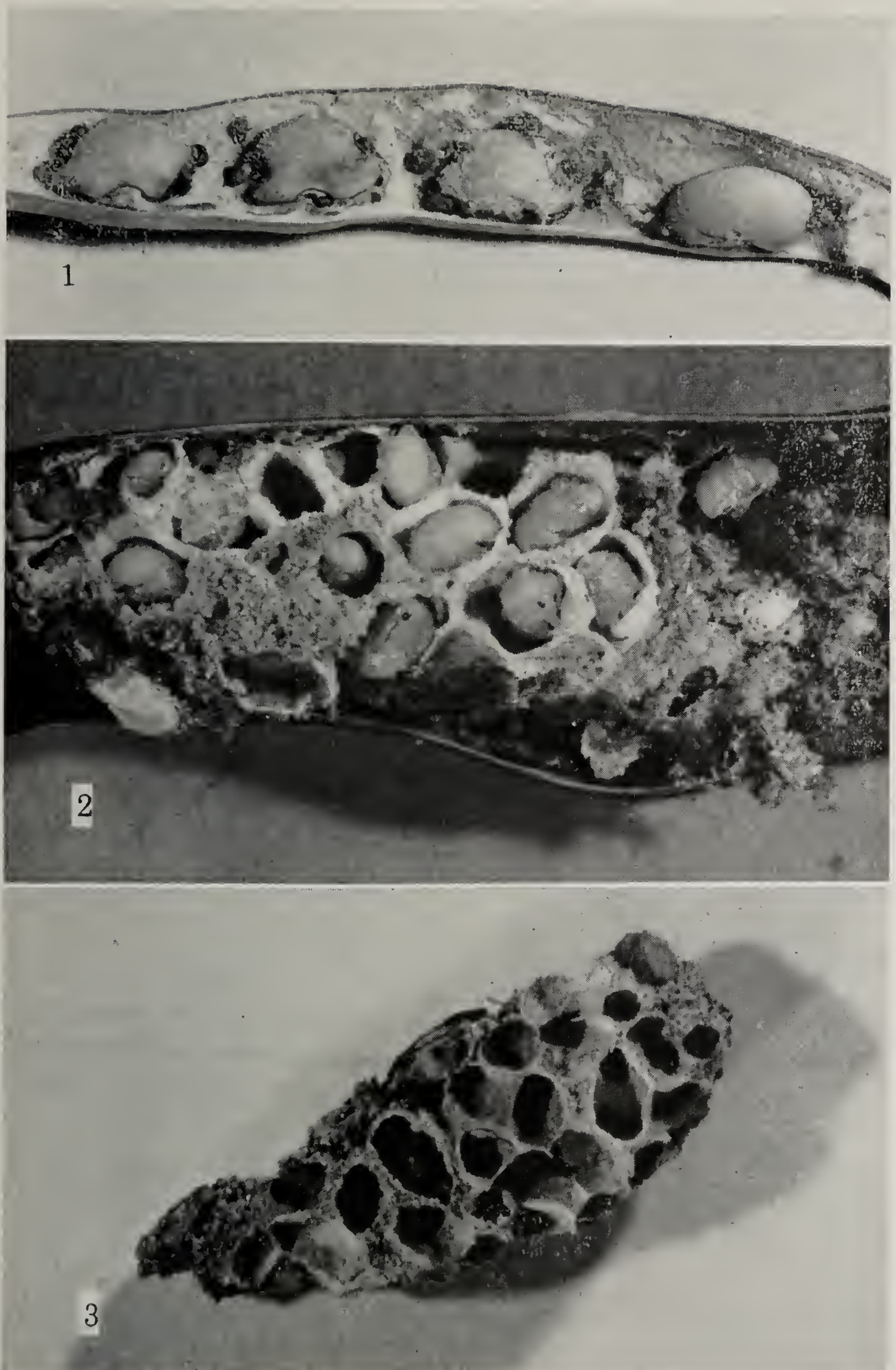
*I am indebted to Mr. J. Balfour-Browne, Senior Scientific Officer, Department of Entomology, British Museum (Natural History) for the identification of these two species, and for calling my attention to the rarity of this phenomenom.

Plate I, figures 1-3, Cocoons and Pupae of Apion.

Fig. 1.—Bean pod showing cocoons of *Apion godmani.* Fig. 2.—Bean pod showing colonial cocoon and pupae of *Apion aurichalceum.* Fig. 3.—Colonial cocoon of *Apion aurichalceum* removed from pod.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When ready to pupate, the larva of *A. godmani* settles down in a cavity that has been eaten in the bean and surrounds itself completely with a cocoon made of partially chewed and regurgitated bean pulp. The pupa is then formed within this protective covering. Cocoons of *A. godmani* are shown in figure 1.

The larvae of *A. aurichalceum* consume practically all of the bean in that part of the pod and then construct a colonial cocoon made up of as many as 100 or more individual cells united together. This cocoon fills the pod completely from side to side and may extend from ¼ to as much as the full length of the pod. The cocoon is made of regurgitated, partially digested bean pulp and frass. When the cocoon is first formed, it is very light in color but within a few days it turns a dark brown. In figure 2 the colonial cocoon may be seen with one wall of the bean pod removed so that the naked pupae are exposed. In figure 3 the colonial cocoon may be seen removed from the pod after the adult beetles have emerged.

INSECTS FEEDING ON PLANTS OF THE *TOXICODENDRON*-SECTION OF THE GENUS *RHUS* (POISON OAK, IVY, OR SUMAC)

By George Steyskal

Grosse Ile, Michigan

The interesting account of insects feeding on poison oak, contributed by Howden, Howden, and Richter in this Bulletin (volume V, number 2, 1951), prompts me to present my own observations and records pertaining to the same subject. Although the plants are not exactly favored as food by insects, they are, nevertheless, the favorite food of a few forms, and the total list of species which do, on occasion at least, feed upon these plants which are so poisonous to humans will eventually be considerable. The Howdens and Richter record twenty species; I here add seventeen.

In the recent eighth edition of Gray's Manual of Botany (Fernald, 1950), the poisonous species of *Rhus* in the eastern United States are grouped in the section *Toxicodendron* and include *Rhus Vernix* (poison sumac), *Rhus radicans* (poison ivy), and *Rhus Toxicodendron* (poison oak), the latter two of which are very similar. Along the Pacific Coast the Western poison oak (*Rhus diversiloba*) also occurs. It seems desirable for such studies as the present one to consider the botanical group as a unit. A Farmers' Bulletin (Crooks and Kephart, 1945) gives a good popular account of the plants and those seeking more technical botanical information may be referred to the monograph by Barkley (1937).

The following species of insects and mites have come to my notice in addition to those mentioned by Howden, Howden, and Richter.

Acarina, Eriophyidae

Eriophyes rhois Stebbins (Felt 1940: 279).
Phyllocoptes toxicophagus Ewing (Felt 1940: 279).

Coleoptera

Eusphyrus walshi LeConte (Anthribidae; Knull 1930; 102, from dead gall).
Astylidius parvus LeConte (Cerambycidae; Knull 1946: 247).
Eupogonius vestitus Say (Cerambycidae; Knull 1946: 264).
Leiopus variegatus Hald. (Cerambycidae; Knull 1930: 102; Knull 1946: 248).
Lepturges querci Fitch (Cerambycidae; Knull 1946: 253).
Lepturges signatus LeConte (Cerambycidae; Knull 1946:253).
Saperda lateralis Fabr. (Cerambycidae; Knull 1946: 272).
Saperda puncticollis Say (Cerambycidae; Leng and Hamilton 1896: 151).
Orthaltica copalina Fabr. (Chrysomelidae; observed feeding on *Rhus radicans* in the Great Smoky Mountains National Park, Tennessee, on June 10 and 11, 1946).
Pachybrachys tridens Melsh. (Fall 1915: 479, 481; the present writer has also observed this species feeding on *Rhus radicans* in Detroit, Michigan. Fall states that this is the only eastern species of *Pachybrachys* which seems to have a definite food plant).
Ctenicera hamata Say (Elateridae; Lugger 1884: 203, bred from wood of "Rhus toxicodendron").
Synchroa punctata Newm. (Melandryidae; Knull 1930: 84, from dead stems of poison ivy).

Homoptera, Aphididae

Rhopalosiphum rhois Monell (Swain 1919: on *Rhus diversiloba* at Berkeley, California).

Hymenoptera, Tenthredinidae

Hylotoma humeralis Beauvois (MacGillivray 1916: 163).

Lepidoptera, Nepticulidae

Nepticula rhoifoliella Braun (Needham et al .1928: 318; Forbes 1923: 87).

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BLISTERING CAUSED BY OEDEMERID BEETLES

By Patricia Vaurie

American Museum of Natural History

This report on experiences with the blisters caused by Oedemerid beetles was suggested by Dr. Ross H. Arnett, Jr., whose revision of the Nearctic Oedemeridae has recently been published (1951, Amer. Midl. Nat., vol. 45, pp. 257-391). He said that blistering had been attributed to the Oedemeridae but that more records of it were needed as well as of other biological data.

From June 8 to August 23, 1951, my husband and I collected insects on the Bimini Islands, Bahamas, where we were the guests of the Lerner Marine Laboratory of the American Museum of Natural History. The laboratory and residence are on North Bimini, but nearly all our collecting was done on South Bimini. Oedemerids of the genera *Oxacis* and *Alloxacis* were common on both islands, being especially abundant during the first part of the summer. In June around the laboratory lights at night and on a large coconut palm trunk near a light, they were clustered so thickly as to hide the surface beneath them. On South Bimini they were found in the daytime on black mangrove blossoms and at night came in great numbers to the collecting sheets. They also swarmed at night over blossoming flowers of the Sabal Palmetto. Being so numerous on the sheets they would inevitably at times get crushed under our hands as we reached for other insects and they also flew into our faces as we knelt over the sheets with our lighted head lamps.

The day after a good collecting night we might have from one to six or seven or more blisters or even no blisters at all. They might appear at breakfast time or later on in the day. They were always a surprise as there was no itching or pain of any kind, merely a round or elongate or irregularly shaped blister, either somewhat flat or much raised, appearing on our faces, necks, forearms, back of the hand, between the fingers, or on the knuckles, sometimes on the upper part of the body. If not broken they remained for four or five days and new skin formed beneath them. Usually, however, they broke in the course of further collecting, leaving the skin exposed and raw, and they might take weeks to heal completely if on a spot subject to rubbing, salt water, insect repellent, et cetera.

Two other collectors who had preceded us had the same experiences although we were not all affected to the same degree. My husband who apparently was most susceptible, remarked often, after he had inadvertently crushed on Oedemerid, that he would probably get a blister in that place and this, unfortunately for him, almost always turned out to be true. On the other hand I believe that I did not get more than a dozen blisters all summer. In August we both got much fewer blisters, but I do not know whether this was owing to any sort of building up of immunity or to the fact that at that time the Oedemerids grew less numerous.

BOOK NOTICE

LARVAE OF INSECTS, PART II, (COLEOPTERA, DIPTERA, NEUROPTERA, SIPHONAPTERA, MECOPTERA, TRICHOPTERA), by Alvah Peterson, 1951, 416 pages, fully illustrated. [Published by the author, Ohio State University, Columbus, Ohio.]

The following quotations from the introduction and preface indicate the scope of this very useful work by Prof. Peterson. The beetle section is on pages 2-218 and includes keys, illustrations and descriptions as well as a bibliography, a glossary, and a list of family names of Coleoptera. Introduction: "This volume is a continuation of Part I and concludes the first edition of Larvae of Insects. It presents larvae of Coleoptera, [etc.]. The Coleoptera and Diptera are treated in a manner similar to the portions of Part I which consider the more common, important and unusual species of Lepidoptera and plant infesting Hymenoptera. . ." Preface to part II: "Part I made its appearance in December 1948. At that time it was stated that Part II would not be ready for publication for several years. To date the author has figured and described most representatives of practically all families of all the orders which he has been able to obtain. Eventually after more extensive collections of larvae have been assembled, especially many species of economic importance, the author hopes to add these and others in future revisions or supplements."

R.H.A.

BOOK REVIEW

COLEOPTERORUM CATALOGUS, pars 23 (editio secundo), CLERIDAE, by J. B. Corporaal. 373 pp., W. Junk, The Hague, Netherlands. December 1950.

This recent issue of the Coleopterorum Catalogus constitutes a valuable addition to the series. It not only will have considerable utilitarian value for present day curators and taxonomists of Coleoptera, but should also provide a stimulus for much-needed taxonomic work in the Cleridae. It certainly is a splendid reflection of Dr. Corporaal's vast knowledge of the family, and also of his ability to gather together and organize the many, scattered, and frequently obscure references and citations into a neat, orderly, and workable taxonomic tool.

This catalog does not differ too greatly in presentation and form from the Schenkling catalog of 1910. The genera are treated in a phylogenetic manner and the 3,366 species are listed alphabetically along with their approximate distribution. Species belonging to some of the larger genera are frequently arranged under faunal regions.

The species' synonymical bibliographies, in the reviewers opinion, are of a high caliber and appear as one of the more valuable features of the catalog. Several infraspecific categories are recognized and defined. No taxonomic (except for subgenera) or nomenclatural changes have been effected. Such changes having already been made in a series of articles by Dr. Corporaal which appeared in Entomologische Berichten (1947-1950).

An interesting departure in the catalogue is the absence of our recognized subgenera as such. Dr. Corporaal has given them the same status as genera, not for taxonomic reasons, but for the sake of convenience. With our knowledge of the Cleridae so incomplete this procedure appears to have considerable merit. However, an indication of previous subgeneric status in the synonymical bibliographies of these now elevated subgenera, would appear to be in order.

Errors are at an absolute minimum and no omissions have been noted, thanks to Dr. Corporaal's careful and thorough preparation.

W. F. Barr
University of Idaho

NOTICES

Wants, exchanges, current research notices and similar material will be published under this heading and this service is available to all, providing it is confined to the fields covered by this bulletin.

Erotylidae—Revising nearctic species and wish to obtain on loan or otherwise all possible material. Am also interested in buyng or trading exotic Erotylidae and determining N.A. specimens. W. Wayne Boyle, Dept. of Entomology, Cornell Univ., Ithaca, N. Y.

Hypocephalus armatus—Can dispose of a few perfect male specimens of this beetle. R. J. Araujo, Caixa Postal 7.119, Sao Paulo, Brazil.

Desire to exchange specimens of Carabidae, Curculionidae, and Cerambycidae from N. Eastern America for specimens of these families from other regions of North America. David Kissinger, Washington Missionary College, Washington 12, D. C.

Chrysomelidae—Studying the American Clytrinae and would be glad to receive specimens for privilege of examination. I can exchange and determine material from the group. F. Monros, Fundacion Miguel Lillo, Miguel Lillo 205, Tucuman, Argentina.

European Coleoptera—I can offer European Cicindelidae, Carabidae, Cerambycidae, Scarabaeidae, etc. in exchange for American Cychrus, Carabus, Calosoma, and Cicindela. Armin Korell, Kassel-Nordshausen, Buehlchenweg 3, Hessen, American Zone, Germany.

THE COLEOPTERISTS' SOCIETY needs copies of Volumne III, no. I of The Coleopterists' Bulletin. We are down to a few sets of volume three and need this number to complete additional sets. If there are any copies available, from members who do not wish to keep complete sets, please send them to us immediately. We will pay 50 cents each for them or give you credit.

CHRYSOMELIDAE—Studying the American Clytrinae and would be glad to receive specimens for privilege of examination. I can exchange and determine material from the group. **F. Monros, Fundacion Miguel Lillo, Miguel Lillo 205, Tucuman, Rep. Argentina.**

CORNELL UNIT PINNING TRAYS—For sale. Only 900 left, size 1-3/16 x 1-5/8 x 4-3/8 inches. Heavy caliper cardboard throughout. Slightly defective balsa pinning bottoms. $1.00/doz. CORNELL DRAWERS and cabinets $6.75 each. **Bio Metal Associates, P. O. Box 346, Beverly Hills, Calif.**

FOR SALE—Biologia Centrali-Americana Coleoptera by J. S. Baly, H. W. Bates, G. C. Champion, H. S. Gorham, M. Jacoby, D. Sharp, and others. 18 volumes, 9,099 pp., 350 plates (297 colored). Beautifully bound in blue cloth with gilt lettering, as new, 4to, 1880-1910. **John J. Kellner, 41-03 171st Str., Flushing, N. Y.**

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CHANGE OF ADDRESS: Dr. J. Linsley Gressitt has left Canton, China. His new address is: 648 Hiratsuka-cho, 2-chome, Shinagawa-Ku, Tokyo, Japan.

OFFERING FOR SALE.—South Indian insects of all orders, especially Coleoptera. All specimens with correct data. P. SUSAI NATHAN, Naturalist, Kurumbagaram P. O., via Karikal, Tanjore District, South India.

MALACHIIDAE, CANTHARIDAE, DASYTIDAE, DRILIDAE, PHENGODIDAE of the world, determined, exchanged, bought by WALTER WITTMER, Casilla de Correo, 1043, Buenos Aires, Argentina.

EXCHANGE AUSTRIAN high Alps beetles for American species. DR. H. WILCKE, Kössen/Tyrol, Austria.

INSECT PINS, noncorrosive, first class, in all sizes, 1,000 for $1.90, plus 30 cents postage. Will give as a free gift, series of Austrian beetles. Large orders, up to 10% discount given. DR. H. WILCKE, Kössen/Tyrol, Austria.

WANTED TO BUY—ELMIDAE, DRYOPIDAE, LIMNICHIDAE, PSEPHENIDAE, EUBRIIDAE from exotic areas; will determine American species. Adults and larvae. HARRY G. NELSON, Dept. of Biology, Herzl Jr. College, Chicago 23, Ill.

PSAMMODIUS (SCARABAEIDAE: APHODIINAE) from North, Central, and South America wanted for revisional study. Will be glad to determine specimens for privilege of examination. O. L. CARTWRIGHT, Div. of Insects, U. S. National Museum, Washington 25, D. C.

HELODIDAE AND DASCILLIDAE of the world. Studying these families and would be glad to receive specimens in exchange for Australian material. J. W. ARMSTRONG, "Callubri," Nyngan, N.S.W., Australia.

CERAMBYCIDAE, CHRYSOMELIDAE—of Pacific and Eastern Asia desired for study. At present work in progress on Cerambycidae, Hispinae, and Cassidinae from New Guinea, Philippines, China, etc. Will purchase material from some areas. Certain groups available for exchange. J. L. Gressitt, c/o E. S. Ross, California Academy of Sciences, San Francisco 18, Calif.

CURCULIONIDAE, CHRYSOMELIDAE, STAPHYLINIDAE, PHALACRIDAE—Identifications needed of Michigan examples in these and other families; also in the genera Cis, Canifa, Aphorista, Hallomenus, Scotochroa, Monachus, Lyctus. R. R. Dreisbach, 301 Helen Street, Midland, Mich.

DYTISCIDAE—Wanted to borrow or exchange specimens of *Hydrocanthus* (any species). Especially interested in seeing large series from single locality. Specimens returned promptly. F. N. Young, Zoology, Indiana Univ., Bloomington, Indiana.

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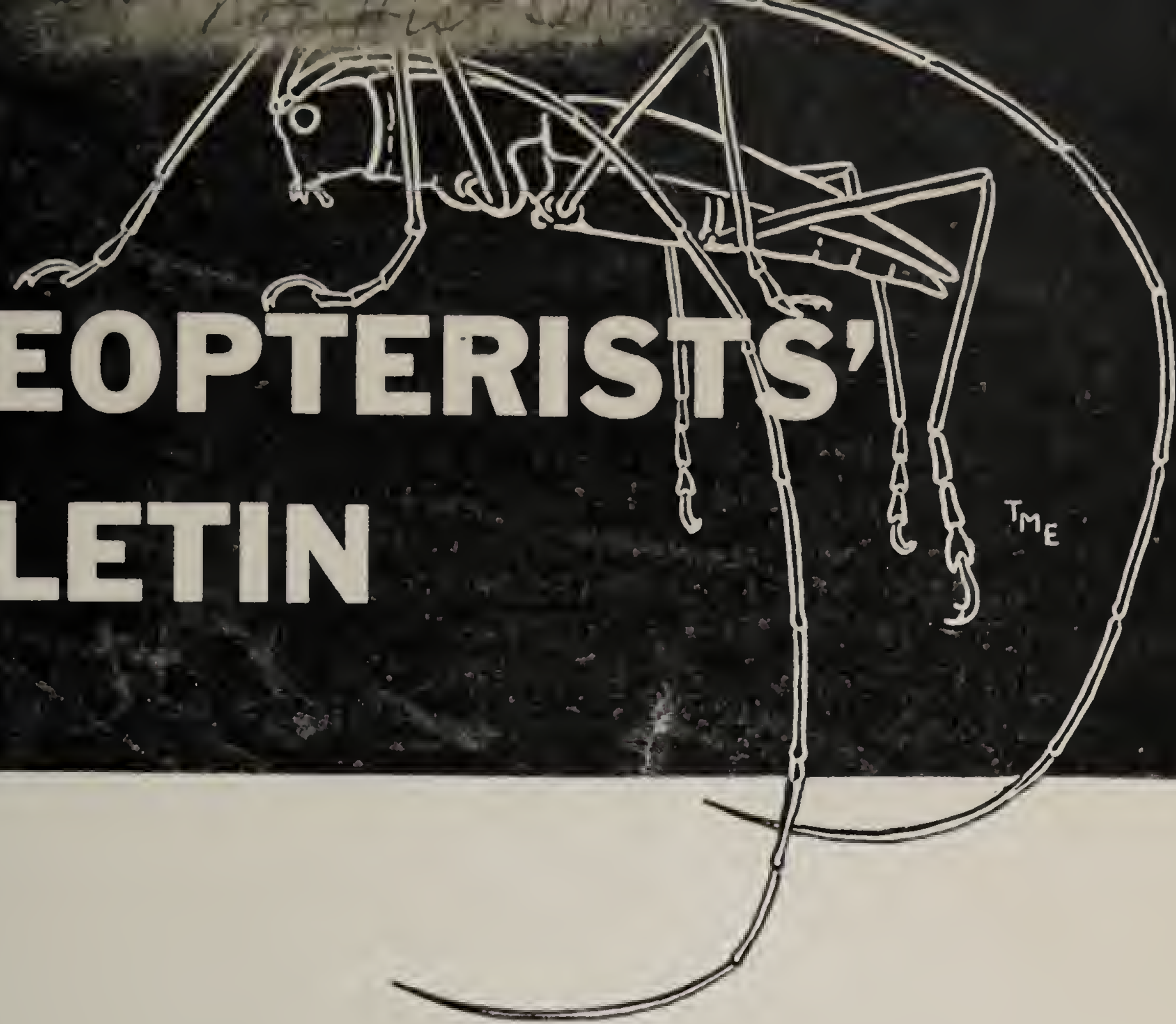
THE COLEOPTERISTS' BULLETIN



VOLUME 6, 1952

No 5 & 6 [illegible]

Published Bimonthly Beginning With February
at Washington, D. C.

THE COLEOPTERISTS' BULLETIN

The Coleopterists' Bulletin is published and edited by Dr. Ross H. Arnett, Jr., c/o Division of Insects, U. S. National Museum, Washington 25, D. C. It is issued six times a year beginning with February.

Subscriptions: The subscription price for each annual volume of six numbers is $4.00 payable in advance. All subscriptions begin with the first issue of the year and those subscribing later in the year will receive the back issues of that volume.

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NEW NAME IN THIS VOLUME

Geotrupes (*Peltotrupes*) *profundus*, Howden
(Scarabaeidae), p. 41

DATES OF PUBLICATION

No. 1 (pp. 1-16), March 26, 1952
No. 2 (pp. 17-32), May 3, 1952
No. 3 (pp. 33-48), June 20, 1952
No. 4 (pp. 49-64), September 15, 1952
Nos. 5 and 6 were not published, and will not be published.

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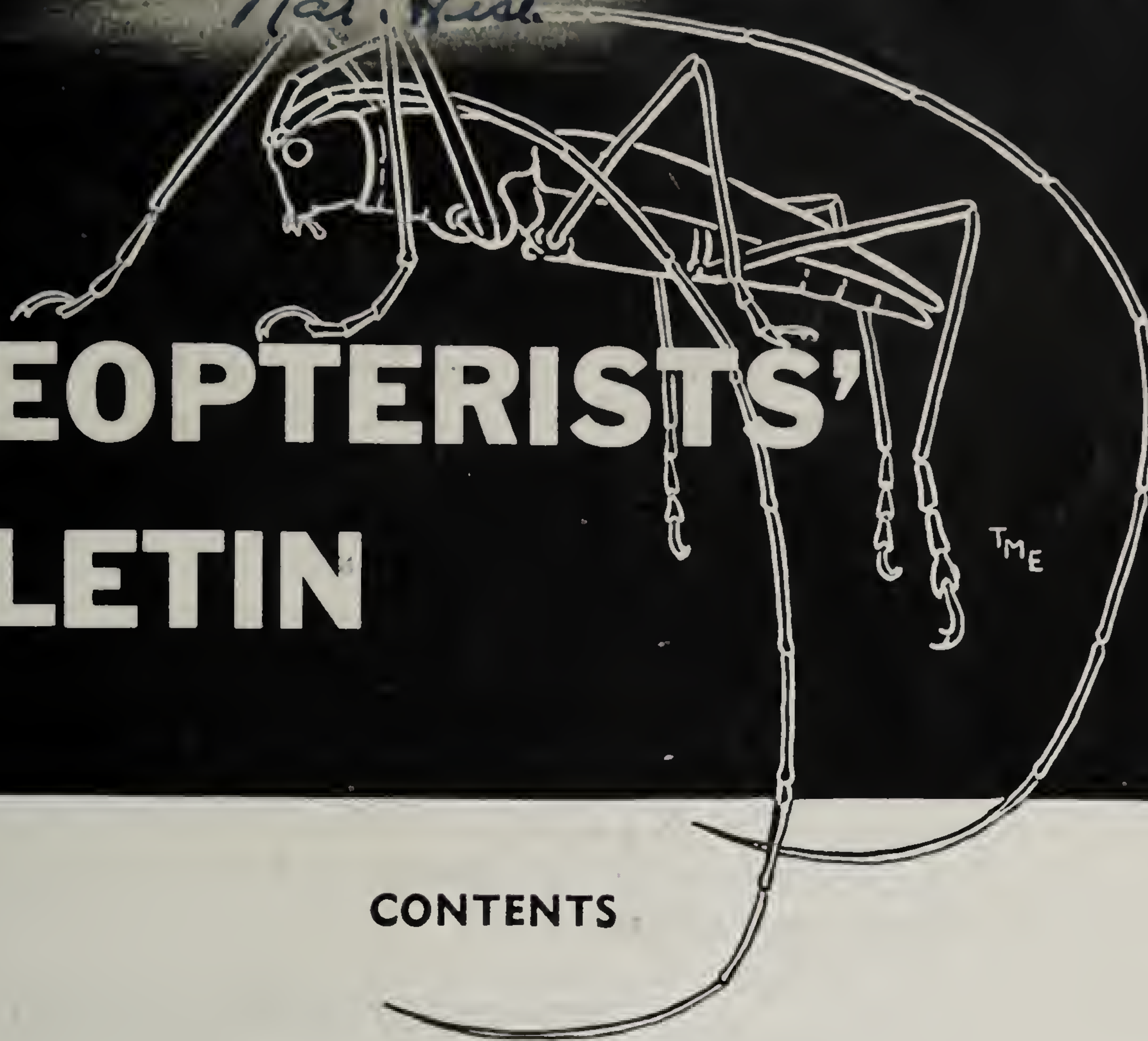

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VOLUME 6 FEBRUARY 1952 NUMBER 1

Published Bimonthly Beginning With February By:

THE COLEOPTERISTS' SOCIETY

THE COLEOPTERISTS' SOCIETY

The Coleopterists' Society was founded on October 12, 1949, to increase interest in the insect order Coleoptera and to improve the study of it, by promoting research, providing for publication, and encouraging cooperation among students.

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Published bimonthly beginning with February by The Coleopterists' Society at Washington, D. C. Terms of Subscription: $2.50 per annum, both domestic and foreign, payable in advance. Remittances should be made to The Coleopterists' Society. The Society does not exchange its publications for those of other societies.

The Coleopterists' Bulletin is conducted in the interest of coleopterists for the publication of short papers and other matter in the general field of coleopterology. Insofar as contributors supply suitable material, it is intended to include: (1) original papers on beetles, on methods and procedures, and on principles; (2) short notes about beetles, collecting, collectors, etc.; and (3) bibliographic aids to the student of taxonomic coleopterology.

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The Coleopterists' Bulletin

Volume VI February, 1952 No. 1

TWO OLD COLEOPTERISTS

By Doris H. Blake

[*This is the third installment of Mrs. Blake's account of the two old coleopterists, Dr. F. H. Chittenden and Dr. E. A. Schwarz, at the Bureau of Entomology.*]

Throughout the Bureau, the Doctor had the reputation for being "close." To me, brought up in New England, he appeared like a typical old New Englander in his habits of thrift. He never denied himself good food or clothing. He subscribed to the usual number of scientific journals and belonged to various entomological societies, although he would never attend their meetings. Not a smoker himself, he could not endure the heavy tobacco smoke of such gatherings. Indeed the Entomological Society of Washington in those days had a reputation for knocking out even the smokers themselves sometimes. Like most naturalists he was of simple tastes and lived quietly. Money had little value to him beyond his immediate needs. After his death a packet of government salary checks totalling nearly $5000 was found tucked away in his desk. He took delight in getting me raises in salary, finally pushing it up to within a couple of hundred dollars of my husband's. Then pitying my husband, he had a talk with Dr. Howard, who in turn conferred with Dr. Coville, my husband's superior, with the result that my husband too had an increase soon. He said on that occasion, "Your husband has the misfortune to work under a stingy old cuss; now I am a liberal man." Looking back to him now, after later contacts with other government heads, I realize that he was exceedingly liberal to me. He never opposed my many short collecting trips with my husband or my long summers either in New England or abroad. He was satisfied that I was studying and collecting and kept in constant communication with me. His letters were full of notes on breeding of insects and advice on what I was to observe. I soon learned that behind his superficial roughness and caustic tongue, there was real kindness. Maddening as his irritability was, I knew that it was only skin deep. After a trying morning he would come around to my desk with an apple or bag of peanuts, and, in this unspoken apology, I would sense his contrition. I remember how irritated he once became with a middle-aged clerk in the editorial office and how he flared out at her, "You are a homely old maid even if you are married,—all right, I apologize."

After two months at home with his ankle, he said to me innocently, "Everyone tells me how careful I must be with that foot, everyone but the doctor, and not to come back too soon. But I'm coming down to the office now." And he did. One of the results of his long absence from the office was to strengthen his determination to complete certain taxonomic studies in groups of beetles in which he had long been interested. Ever since I had been there, he had been receiving quantities of acorns from many species of oaks collected by the field men who were located in different parts of the country, and I had been breeding from these acorns many specimens of the slender-snouted *Curculio*.

During his years of work in the Bureau, Dr. Chittenden had envied the Museum specialists their freedom from the everyday chores of office work. In those days the man in charge of the Division had to be able to identify the economic insects that were sent in from all parts of the country as injuring the crops to which each office was assigned. Chittenden, as head of Truck Crops division (until shortly before my arrival it had included also Stored Products), had to be able to recognize the work of the insect as well as the insect itself and recommend remedies for its extermination. As one of the handful of government entomologists that had been in the Bureau almost since its beginning, his knowledge not only of the injurious insects of his particular field but of all economic species was prodigious. He had written innumerable Farmers' Bulletins and longer treatises on life histories of economic pests. His studies have been the basis of much later work. Even the beautiful illustrations made under his direction are still being reproduced in various bulletins and textbooks. His little green bound book on "Insects Injurious to Vegetables" was one of the first of its kind in this country.

Aside from his entomological writing, he had been steadily adding to his collection begun in college years, until now it was easily the largest in the Bureau. In fact, collections of that sort had for some time been frowned upon. But to part Chittenden and his collection was unthinkable. Once he had been at the point of knocking Dr. Marlatt down with his bare fists when that one had argued that the Chittenden collection should be sent to the National Museum. Never after that did he trust Dr. Marlatt. There was a threatening rumble in his throat whenever he spoke of him. He used to tell me how he remembered when Marlatt first came to the Bureau as a farmer boy from Kansas in blue jeans. "Now look at him," he would say, "He has married two wealthy women in succession and lives up on 16th Street. He isn't interested in insects; never was."

Dr. Chittenden with his great collection to work on now sought to cap his life's work by writing taxonomic revisions of groups with which he had done considerable biological work, such as *Curculio*. There was one great obstacle. But with my help he hoped he would get around this,—it was, in short, to be able to work on the material in the National Museum collection. As a first step towards this, he had an interview with Dr. Howard. Mr. Banks always said, "If Chittenden wanted anything he would go to Howard, and he would get it too." Dr. Howard with his deep understanding of his old friend was always kind to him, although he kept him in bounds as no one else could,—that was Dr. Howard's genius. He had a way of curbing him by a mere flick of his silken though potentially cutting tongue.

One day Dr. Chittenden came to me glowing, "Dr. Howard wants to see you. He said that you might go over to the Museum and get some specimens for me if you would come to see him first. I'd advise you to dress up a bit, put on your new hat." So, after a preliminary going over, I timidly entered Dr. Howard's front office. He welcomed me with his usual fine courtesy and said, "Chittenden wants some specimens and I authorize you to go over to the Museum and get them. You can tell Dr. Schwarz that I told you to get them." "I don't think there will be any trouble" I began, "Dr. Schwarz likes me." "I know he does, but he doesn't like Chittenden, see. So use your diplomacy." When I returned to the office, Dr. Chittenden met me, "Tell me exactly what he said," he demanded. "Just what you told me, only to use my diplomacy." "Oh," beamed Dr. Chittenden. "You can get the beetles in your name and be responsible for them yourself; keep them on your side and all, if you will only get them.''

I had my own way of going about this, however. White had told me much earlier that Dr. Schwarz, dean of Washington entomologists, would have nothing to do with the Doctor, and would not even name a beetle for him. And Dr. Chittenden himself had told me sadly, ''He got his back up over something. When two people fall out I think it is because they like each other but see the other's faults.'' He plainly regretted the loss of Dr. Schwarz' friendship. When I had been in the Bureau only a few months, I had brought in some firefly larvae and Dr. Chittenden had advised me to take them over to Mr. H. S. Barber at the Museum as he was working on fireflies and knew all about them. Mr. Barber had been Schwarz' assistant since he was a boy in his teens, or for about twenty years. He was then a thin, dark-haired, intense man with a big nose and fine, nervous hands that could dissect the tiniest beetles and prepare the most beautiful specimens. He was always flaming with enthusiasm over some biological discovery. His desk, like Dr. Chittenden's, was piled up in a mountain of stuff. There had been an instant flash of understanding and liking between us, and I had been taking specimens over for him to compare with the Museum collection for months.

In those early trips to the Museum I used to see Dr. E. A. Schwarz, the well known specialist in Coleoptera, poring over his boxes of beetles at the other end of the room. He was then nearly 80. As he sat bent over his desk he reminded me of a very shaggy little skye terrier with his long hair, his bushy eyebrows, and drooping moustache. One day it slowly dawned upon me that he was actually peering over his glasses and nodding to me. Mr. Barber then informed him that I was about to go on a trip up to Cambridge to the Museum there, and Schwarz smiled all over his face till his hairy eyebrows fairly met his cheeks and nodded till the little tuft of hair on his forehead waved, and said, ''Remember me to Mr. Banks and Mr. Henshaw and also to Mr. Fall, who spends one day a week there.'' When I related this to Dr. Chittenden, he said, ''Schwarz thinks a great deal of Cambridge. That is where he came when he first arrived in this country, and there he met Hubbard. Hubbard was a rich

Harvard man whom Schwarz tutored. Then the two became great friends and were constantly together till Hubbard died." The next time I went over to the Museum, Mr. Barber was away and Dr. Schwarz beaming upon me invited me to sit down beside him and he would identify my specimens. He said, "Interest in these beetles is good; I like to see young folks have it. I will show you some insects that you can collect. Come this way." He produced a drawer of beautiful silver and green scarabs and other striking beetles. "I call this the 'Oh my' drawer," he said chuckling. I asked him if I might come again. "Any time," and I left him standing there peering after me, a little bent-over figure with one suspender slipping down over his old shoulder. When I returned to Dr. Chittenden, I told him all about the interview and how I had even taken some of his specimens that he wanted most of all named and had presented one of the rare ones to Dr. Schwarz. "I am glad you did," said Dr. Chittenden solemnly in a husky voice. "Do you know how he regards you? He thinks of you as just a little girl. You give him pleasure." Then he said, "You have done something that couldn't have happened otherwise, you have connected up this office and Schwarz. I couldn't do it, no one else could, but you have." From that day on, Schwarz identified the beetles that I brought over to the best of his ability. He said one day in speaking of Dr. Chittenden, "He is sick now, he is failing, and he is not an old man either." Schwarz grasped that fact long before the rest of us did. The two did not meet although Dr. Chittenden was eager to hear every detail of my interviews with Schwarz and would sit rapt as I related what had been said. Once I recall how Schwarz brought out his rare old books to show me, all his treasures. There was so much that was dear and tender about him, and over all there played his droll little humor.

There is a picture of the entomological staff taken on the 9th of November 1922 out on the terrace in front of the old red Agriculture building that was torn down not long afterwards. We all stand with our backs to the formal garden shaded by the yellowing ginkgo trees with the Washington monument rising in the background. The picture is the last one taken of the Bureau of Entomology as a whole. All the messenger boys, clerks, librarians, laboratory assistants, and the entomologists themselves are grouped there. Dr. Howard stands in the midst and old Schwarz near him and kneeling below them both is Dr. Chittenden. He was enraged afterwards when he saw himself in that posture, but it is symbolic. When we were all huddled together, the camera man shouted, ''All hats off'', and off they went, all but Dr. Howard's. He wasn't going to show his bald pate. White told me afterwards, ''Do you know what the Doctor did out there when they were taking the picture? He must be crazy. He moved up to old Schwarz—you know Schwarz won't speak to him—and put his hand on his shoulder and shoved him right up to Dr. Howard saying, ''There's where you belong, Dr. Schwarz.''

One of our field men who made periodic visits to Washington to report was John E. Graf, called by everyone Johnny. He was immensely popular all over the Bureau. Dr. Chittenden frequently threatened to put him in Pops' position and was only deterred by the fact that he believed Pops off on a field job would never do a stroke of work without him to whip him into activity. When Johnny came, it was impossible to separate the young people of the office. As is the way of youth, they clung together like burs, and I too would escape to them as often as I dared. On one such occasion when we were all gathered in White's office—I with the excuse of tending to my insectary jars—the Doctor arrived too. Pops immediately left. I began sorting larvae. The Doctor looked around glowering. ''You are all down here like sheep; you can't exist alone''. He was struggling to keep in. For the life of me, I couldn't help grinning and that didn't please him. After a few more sarcastic remarks he slammed out. Tiddletywinks, his name for the little artist, giggled hysterically, and White said, ''Lord, how he must hate us''. Then one of the clerks arrived and related how the Doctor had entered their room in a towering rage. He had stamped and bawled at them till one could hear him all over the place. Pops came on the clerk's heels to tell me that the Doctor was cussing me out too. As I had just finished a rehearsal to the others of what he had said of Pops, Johnny suggested, ''Tell Pops what he said about him.'' And the old Scotch gardener, who was helping me with my jars of sand, grumbled in his mumbling toothless way. ''Naow that man is crazy, crazy, he'll have a lot to answer for when he dies.'' But the truth of it was that Dr. Chittenden was jealous. He wanted that likeable, cheerful, young chap, Johnny, all to himself. He was planning how he was to place him in Pops' room and banish Pops for good and all. He did not realize that in the struggle to overthrow Popenoe, he himself would fall over the precipice.

(*To be continued.*)

THE MALE GENITALIA OF THE NEARCTIC SALPINGIDAE

By T. J. Spilman[1]
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Upon beginning a study of the Nearctic genera of the family Salpingidae Leach, 1815 (*olim* Pythidae Thomson, 1859), a search through the literature was made for published descriptions or illustrations of the external male genitalia. Only two figures were found: Sharp and Muir (1912), p. 553, fig. 178, of *Pytho depressus* L., and Jeannel and Paulian (1944), fig. 40, of *Mycterus* sp. Thus, the apparent need for an introduction to the genitalic types in the salpingids was the impetus behind this article.

The external male genitalia of the Salpingidae are similar in many ways to those of the family Oedemeridae described by Arnett (1951). As in his revision, the term genitalia as used here includes segments eight and nine because of their modification and probable role in copulation. Much of the list of definitions in the oedemerid revision can be used for the genitalia of the salpingids. However, the following additions must be made:

> Parameral struts—Apodemes extending proximad from the lateral basal angles of the paramere for attachment to the base of the median lobe. A single paramere possesses two struts; double parameres have but one strut each.

Figures of portions of salpingid genitalia are appended to illustrate basic or aberrant types. Figure 1, of *Boros* (*Lecontia*) *discicollis* (LeConte), 1850, exhibits many salpingine features, whereas figure 4, of *Cononotus sericans* LeConte, 1851, accomplishes the same for the Mycterinae. Figure 2, of *Trimitomerus*

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[1]This research was conducted under the supervision of Dr. V. S. L. Pate at Cornell University, and to him I am especially indebted for many suggestions and enthusiastic help.

riversii Horn, 1888, and figure 3, of *Vincenzellus elongatus* (Mannerheim), 1852, help to explain aberrant types.

Segment eight and nine are, for the most part, hidden within the abdomen when the genitalia are at rest. Tergite eight and sternite eight are not greatly modified, and are usually semicircular or rectangular in shape having a spiracle in the lateral membrane. The sclerites of segment eight seldom exhibit worthwhile taxonomic characters.

Sternite nine is typically made up of two lateral sclerites, well separated, each with an apodeme converging proximally, and the confluence of these apodemes causes the complete sternite to appear V-shaped. This is the *spiculum* of Sharp and Muir and the *spiculum gastrale* of Jeannel and Paulian. Pu (1938) has shown in other Coleoptera that muscles responsible for the protraction and retraction of the aedeagus are attached to sternite nine. Tergite nine is a small sclerite connecting the two apical lateral sclerites of sternite nine dorsally, and its sclerotized portion is usually U-shaped with the open end proximal. In *Lacconotus,* sternite nine appears U-shaped rather than V-shaped, and the lateral sclerites are greatly reduced; tergite nine is nonsclerotized and membranous. In *Mycterus,* the eighth and ninth segments are largely fused and complex; they will be discussed in a future paper. The form of segment nine can often be used as a generic character in salpingids, but specific characters are more frequent in the tergite.

The anus is situated between tergite nine and the aedeagus. Sternite ten is either absent or so membranous as to be obscure. The aedeagus as understood here then comprises all structures on a membranous tube, the second connecting membrane of Sharp and Muir, which extends apically from the anus and sternite nine. The parts of the aedeagus are: tegmenite, basal piece, paramere(s), and median lobe.[2] The tegmenite, which is present in most genera, assumes either of two forms: a simple sclerite, or a sclerite plus a membranous evagination. In *Pytho* the apex of the membrane connecting the apodemes of sternite nine contains two very small evaginations, which may indicate the possibility that the tegmenite is derived from sternite nine. It should be noted, however, that in *Pytho* the most obvious part of the tegmenite, a simple sclerite, is located midway between sternite

[2]The tegmenite, basal piece, and paramere(s) together constitute the tegmen.

nine and the basal piece. The form of the tegmenite is often a very reliable generic character.

Distad of the tegmenite are the other two parts of the tegmen: the basal piece and the paramere(s). Together these two parts constitute the tegmen of Sharp and Muir and of Jeannel and Paulian. The basal piece is usually longer than wide and is curved to form a partial sheath for the base of the median lobe. Attached to the apex of the basal piece is a single or double paramere. The single paramere is characteristic of the subfamily Salpinginae, whereas the double paramere is typical of the Mycterinae.

The salpingine paramere is an elongate sclerite, tapered to an acute apex, and curved for the reception of the median lobe. Two lateral lobes attached to, and articulated with, the base of the paramere, are present in all genera except *Trimitomerus* and *Vincenzellus*. In the former the lateral lobes are fused with the paramere for most of their length and are not articulated; in the latter genus the lateral lobes are completely lost. In all genera of the subfamily except *Sphaeriestes* and *Rhinosimus* parameral struts are present. The median lobe varies from curved to straight, and from well sclerotized to predominantly membranous. An eversible internal sac is not evident. The orientation of the tegmen is variable: either dorsal or ventral, depending on the genus.

On the other hand, the mycterine parameres are two in number, and are attached to, and articulated with, the apex of the basal piece. The parameres are either acute and prolonged, or blunt, curved, and abbreviated, and their various forms can often be used as generic or specific characteristics. Lateral lobes are absent. In *Cononotus* a parameral strut is present on each paramere. The median lobe is either long and slender (*Mycterus*), short and slender (*Cononotus*), or short and expanded proximally (*Lacconotus*); an eversible internal sac is not present. In the Mycterinae the tegmen is always ventral.

Jeannel and Paulian state that the aedeagi of both the Salpinginae and the Mycterinae are the "sheath type" (*type vagine*). However, the mycterine aedeagus appears very close to the *trilobe* type except for the somewhat sheath-like appearance of the basal piece and parameres; the correct designation is doubtful. On the basis of the form of the aedeagus each of the two subfamilies might eventually have to be raised to the rank of family. Investigation of the exotic members of the family will undoubtedly throw more light on the question.

As Sharp and Muir[3] suggested, the family Eurystethidae, sometimes incorrectly termed the Aegialitidae, must be relegated to a subfamily position in the Salpingidae because of the typical salpingine genitalia with simple tegmenite. However, in addition, the median lobe of *Eurystethus* possesses an eversible internal sac.

Several early authors noted the resemblance of *Boros unicolor* Say, 1827, to the salpingids. Its genitalia were found to be similar to those of *Lecontia discicollis* (LeConte), 1850; the only obvious difference is the shape of tergite nine. Various external characters parallel this internal similarity. As a result, the genus *Lecontia* Champion, 1889, will have to fall as a junior synonym of *Boros* Herbst, 1797.

The genus *Polypria*, heretofore placed in the subfamilies Lacconotinae or Mycterinae, must be removed from the Salpingidae on the basis of the genitalia. The genus is temporarily placed in the Melandryidae until further investigation. A short description and figure of the genitalia is planned for the near future.

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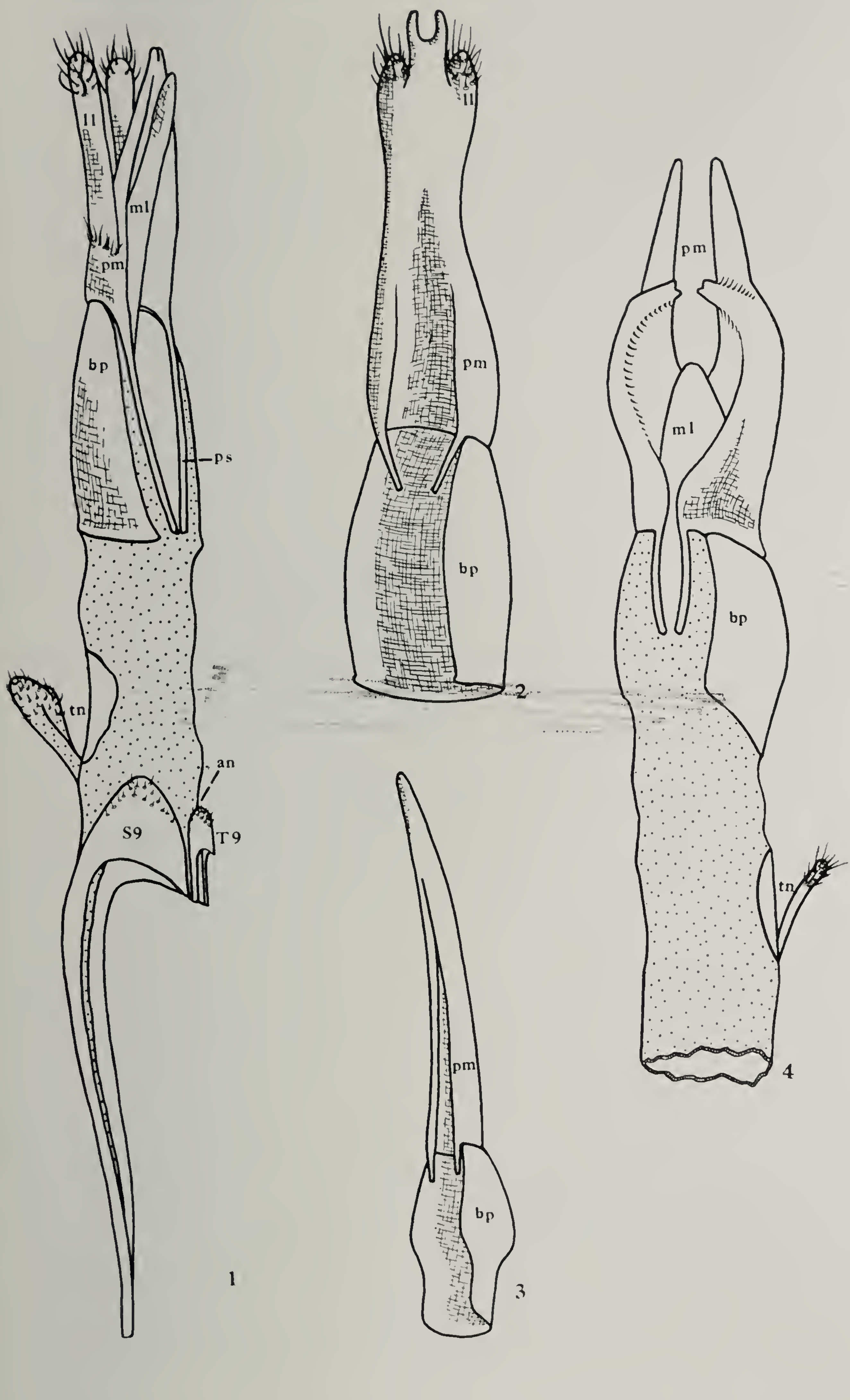
Male Genitalia of Salpingidae

1. *Boros* (*Lecontia*) *discicollis* (LeConte), 1850, dorso-lateral view. 2. *Trimitomerus riversii* Horn, 1888, dorso-lateral view. 3. *Vincenzellus elongatus* (Mannerheim), 1852, ventral-lateral view. 4. *Cononotus sericans* LeConte, 1851, dorso-lateral view. Legend, an–anus, bp–basal piece, ll–lateral lobes, ml–median lobe, pm–paramere(s), ps–parameral strut, S9–sternite nine, tn–tegmenite, T9--tergite nine.

[3]1912, p. 617, fig. 173.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OLIGOMERUS PTILINOIDES IN CALIFORNIA (Anobiidae)

By HUGH B. LEECH

California Academy of Sciences, San Francisco

In July, 1951, Mr. R. L. Regal of San Francisco brought in some Anobiidae which he said were emerging from antique furniture of Italian origin. Since they differed from any American species in the Academy collection, immediate fumigation of the furniture was recommended.

A pair of the beetles was sent to Mr. J. Balfour-Browne at the British Museum. He identified them as *Oligomerus ptilinoides* (Wollaston), after comparison with the type, and wrote "This species has the elytral punctate series finer and rather more regularly unserial than does *brunneus* (Oliv.) in which the series are irregularly biserial."

O. reyi Brisout, a synonym of *ptilinoides*, is the type of the subgenus *Oligomerinus* Portevin. *O. ptilinoides* is listed as from southern Europe, Russia, Syria, North Africa, the islands of Madeira (type), etc., but to the best of my knowledge has not previously been recorded from the New World. In Fall's key to the North American species[1] it runs to the second part of couplet 1, because of the contiguous front coxae, but does not fit any of the choices thereunder. It differs from our species in its parallel-sided elytra with very fine strial punctures; the pronotum is notably broad anteriorly, hardly at all gibbous discally, and its pubescence seems to vary from sub-erect to recumbent; length 4 to 6 mm., antennae 11-segmented.

It may be noted that the references "62-228" after *O. obtusus* LeC. and *alterans* LeC. in Leng's Catalogue, 1920, p. 242, should be to LeConte's paper of 1865, p. 228. The *O. thoracicus* LeC. of this latter page, of Fall's revision, p. 288, of Pic in Coleopterorum Catalogue, Pars 48 : 27, and of Leng's Catalogue, appears to me to be a nomen nudum. In his paper of 1862, p. 205, LeConte merely wrote "To Oligomerus belong *A. thoracicus* Melsh." The description which followed is for *Petalium bistriatum* (Say), not *thoracicum,* and I have not found the latter in earlier catalogues.

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[1]Fall, H. C. 1905. Revision of the Ptinidae of boreal America. Trans. American Ent. Soc. vol. 31, pp. 97-296, pl. 7. [*Oligomerus,* pp. 162-167.]

THE VESICATING PROPERTIES OF A STAPHYLINID, PAEDERUS NR. INTERMEDIUS BOH., IN THE PHILIPPINES

By Donald De Leon[1]

One evening in November, the writer, who was then working at the Abaca Experiment Station in Guinobatan, Albay, in the Philippines, was reading by the light of a Primus lantern. There had been a rainy spell, and insects were unusually numerous about the light. As he read, he brushed them off his arms and face.

Two mornings later his upper eyelids were irritated, red, and slightly swollen. They continued to swell until both eyes were all but closed. Many small blisters formed on the left eyelid. These blisters seemed not the usual blisters, filled with clear liquid, but looked as if they had become infected. The eyes were bathed with boric acid solution, but the treatment had no apparent effect. In a few days the swelling receded and the blisters dried, leaving a hard scab. Eight days after the irritation was first noticed, the eyes were practically back to normal.

At the time, the author suspected that the irritation was caused by an insect. After reading a paper by Theodorides[2] concerning the vesicating properties of the genus *Paederus*, he considered it likely that a staphylinid might have been the cause.

It was not until after the December typhoon that there was again such a flight of insects. Among them were two species of *Paederus*. One of each was caught, and each was rubbed lightly, not crushed, on a different area on the inside of the forearm.

Two mornings later the area on which *P.* nr. *intermedius* had been rubbed became red. The morning after the reddening had been observed, blisters were present on the arm. By the fifth day after exposure, a blister about ½ inch by 1 inch had developed. The skin around the blister was itchy. The blister dried up quickly, and by the eighth day a loose scab had developed and the spot gave no further trouble. *P. sondaicus*, the other species tested, gave no reaction.

Four more *P.* nr. *intermedius* were similarly tested at later dates. All four caused blisters. A third species, *P. fuscipes* Curt., tested in the same way, gave no reaction.

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[1]Entomologist, Office of Foreign Agricultural Relations, U. S. Department of Agriculture, now working under the Point IV program in the Philippines.

[2]Theodorides, J. Experiments on the vesicating properties of species of *Paederus* (Staphylinidae) in France. Col. Bull., vol. 4, pp. 21-22. 1950.

Later there was such a large flight of *P.* nr. *intermedius* that about 60 were caught. Half of them were placed in a milliliter of about 90% ethyl alcohol; the other half, in the same amount of linseed oil. Two days afterward a drop of liquid from each vial was placed on the forearm. The alcohol caused no blister; the linseed oil caused a large blister.

All three species of *Paederus* have been mounted, in the same manner, and kept in the same box. The two species that did not cause blisters have molded heavily; the other species shows no trace of mold.

Acknowledgments are made to R. E. Blackwelder of the U. S. National Museum, who kindly made the identifications.

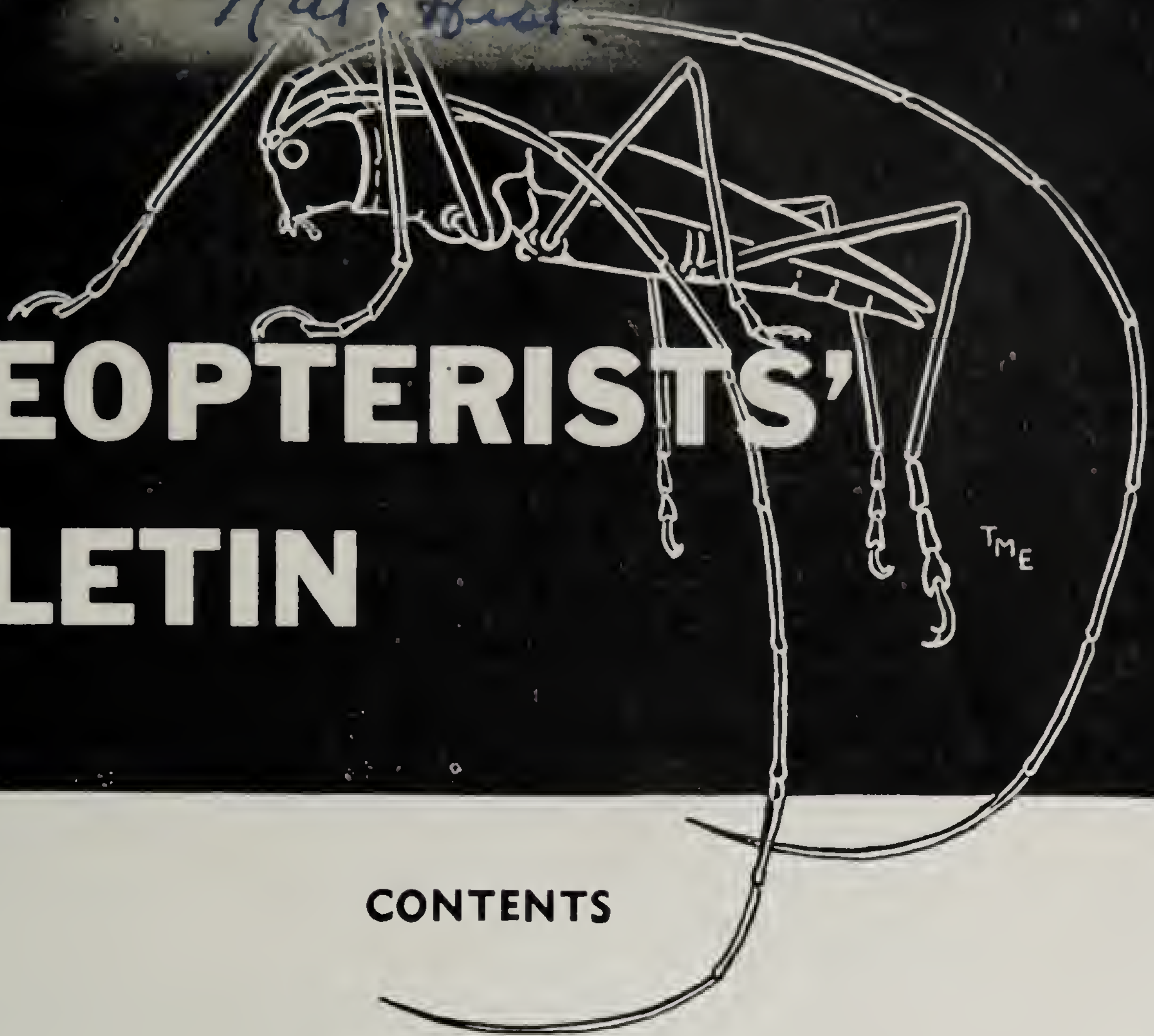
AN ABNORMAL MATING RESPONSE AMONG LAMPYRIDS

By Frank A. McDermott
Wilmington, Del.

Ordinarily the quite specific flash-and-response mating signal system of the Lampyridae would seem to prevent any extensive cross-breeding. However, they occasionally make mistakes. One of the most peculiar of these was observed near Newark, Del., on June 8, 1951. What was at first assumed to be a female of *Photuris hebes* responding to the flashes of two males of that species, abundant in the adjoining field, in foot-high grass along the roadside, proved to be a very gravid female of *Photinus scintillans*. No males of *scintillans* were seen at the time, which was well in advance of the usual prevalence of this species, but both sexes were abundant in the same locality a month later. It is peculiar that the males of *hebes,* which give a rather greenish flash, should be attracted by the distinctly orange-colored flash of *scintillans.*

A single large male of *P. scintillans* was collected in early May in Wilmington some years ago, and identified by H. S. Barber.

THE COLEOPTERISTS' BULLETIN



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Published Bimonthly Beginning With February By:

THE COLEOPTERISTS' SOCIETY

THE COLEOPTERISTS' SOCIETY

The Coleopterists' Society was founded on October 12, 1949, to increase interest in the insect order Coleoptera and to improve the study of it, by promoting research, providing for publication, and encouraging cooperation among students.

The annual dues are: $1.00. Members may receive The Coleopterists' Bulletin for $1.25 per volume; members who are students, $.50 per volume. Supporting members pay an additional $4.00 and receive The Coleopterists' Bulletin at no further cost.

THE COLEOPTERISTS' BULLETIN

Published bimonthly beginning with February by The Coleopterists' Society at Washington, D. C. Terms of Subscription: $2.50 per annum, both domestic and foreign, payable in advance. Remittances should be made to The Coleopterists' Society. The Society does not exchange its publications for those of other societies.

The Coleopterists' Bulletin is conducted in the interest of coleopterists for the publication of short papers and other matter in the general field of coleopterology. Insofar as contributors supply suitable material, it is intended to include: (1) original papers on beetles, on methods and procedures, and on principles; (2) short notes about beetles, collecting, collectors, etc.; and (3) bibliographic aids to the student of taxonomic coleopterology.

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Entered as second-class matter at the post office at Washington, D. C.

The Coleopterists' Bulletin

Volume VI | April, 1952 | No. 2

TWO OLD COLEOPTERISTS

By Doris H. Blake

[*This is the fourth installment of Mrs. Blake's account of the two old coleopterists, Dr. F. H. Chittenden and Dr. E. A. Schwarz, at the Bureau of Entomology.*]

At about this time there came to the Department a director of scientific research in the form of an over-energetic man, E. D. Ball. He also was an entomologist, and, possibly because of this, his interest in bringing the Bureau of Entomology up to his concept of full efficiency soon brought about many changes. It was the beginning of the end of the age of the individual and the real naturalist in the Bureau. Under Dr. Howard there had grown up and come to full maturity a group of scientists not to be seen there since. He had brought them together as a body of trained and enthusiastic men and then left them alone to work on their own projects in their own way. The result was outstanding fullness of production of high worth. What Ball and his successors did not realize is that you cannot inspire either an artist or a scientist by holding up before him schedules of efficiency. Real genius does not flourish under such conditions. Regimentation of any sort is a barren soil in which only red tape and officiousness grow.

Dr. Chittenden was one of the first to be deposed. He came in and told me, "Johnny has been put in as acting chief of this Division." I suspect that in the past Johnny [Graf] had steadily refused to act as the Doctor's subordinate in the position that Pops held. Now he had been put in charge. Four days later the Doctor was out on the back steps of the Bureau watching a great truck backed up to the steps of Pops' building loading on all Pops' belongings to be transferred to Sligo. He pointed to them with his cane and grinned at me silently. He believed that with Graf and Dr. Howard in charge his ways of life would not be greatly changed. Yet he was humiliated. He raged about "that scoundrel of a Ball. I would like to strangle him.'' And ''I know I'm an old 'has been' but there are no new entomologists to take the place of the old ones.'' That was true enough.

His sister had evidently pricked his pride too. He came around to relate to me, ''She said that I was an old, worn-out, broken-down man,—huh.'' He stood staring out of the window at Theodor Holm, the old Danish botanist, who happened to be passing. ''His nose grows redder and bigger every time I see him, but he can get over the ground better than I can.'' Holm seeing himself so scrutinized came into the office to greet his old acquaintance. He had an insect that he had collected on one of his plants. Dr. Chittenden looked at it and said, ''No, I can't name that thing.'' And Holm squeaked nastily, ''Didn't think you could.'' For once Dr. Chittenden was humbly speechless.

Dr. Schwarz' 79th birthday had taken place in April, a month previous to Dr. Chittenden's deposition. I had slipped up to his office very early that morning with a bunch of wild phlox and golden ragwort that I had gathered from the river woods near Plummers Island, his beloved haunt of younger years. Dr. Schwarz was always at his desk long before the rest arrived. In fact he came to the Museum before the main elevator was running and used to ride up on the slow freight elevator. I found him humped over a box of insects as usual. He arose, as always, beaming and bowing and saying, ''Good morning, good morning.'' ''Dr. Schwarz,'' I asked, ''do you ever have birthdays?'' His old head drooped, ''No, no more, no more.'' ''Well, I have brought you a bouquet of flowers.'' He took them in his trembling old hands, ''But how did you know it was my birthday? Where did you find it?'' I smiled and hoped that he would have many happy returns. ''No, I can't have. When one is 80, one can't have. It is not good to be old. One is no good. One must go, give up to the rising generation.'' I left him shaking his head and murmuring, ''Thank you, thank you.''

A few days later Mr. Barber and Mr. Fisher took him on a spring collecting trip to Cape Henry. Mr. Barber had found an interesting beetle down on the sand dunes, and he related how excited Schwarz had become. He had wanted to go down and collect some. In spite of their protestations he slid right down the bank saying, ''I'll get back.'' But when the excitement was over, he couldn't. Barber had to push him from behind, and Fisher had to pull him from above, till finally they hoisted him back again.

About this time the Bureau was humming with rumors of what would happen to Dr. Chittenden since Graf had taken his place. One was that he was to be sent over to the Museum. On one of my trips there I plunged directly into asking them if they had heard anything of our office affairs. Attention was at once brought to tenseness. Mr. Barber spoke, "Rumors have been so bad that I have not said anything to you for fear of saying too much." "What?" "That your Dr. Chittenden was to be sent over to us." "What do you think about it, Dr. Schwarz?" "I shan't be here, I shan't be here," groaned old Schwarz. As I left, Barber followed me out saying that there was talk too of Schwarz's retirement. Schwarz had divulged none of his plans for the future but once had said that he would like to spend the rest of his life in Mexico. Barber said, "If he goes to Mexico, Schwarz will quickly drink himself to death. And if Dr. Chittenden is sent over here it will be the last straw for Schwarz; he will go." "I will see Johnny Graf." "I will go to Rohwer," promised Barber. So Dr. Chittenden was not sent to the Museum. He didn't want to go anyhow. "They keep the place too damned hot," he said.

At last it was decided to move him temporarily into a little brick building out in front of the Bureau. His one stipulation was that I was to go too, and Dr. Howard has assented to that. I had never seen him so gloomy as at the thought of moving. Indeed it proved to be a fearful task to transport all his books and boxes of delicate insects as well as the heavy old desks and cases with all their contents. After we were at last settled, Dr. Howard came over to see us and remarked, "I wonder where they will put me when they want to get rid of me." "You can come right here with me," returned Dr. Chittenden. Dr. Schwarz was very curious about it too. "It is terrible, terrible to move," he said. His understanding and even sympathy were deeper than the others'. He was worried too over the collection, fearful lest it not be housed in a fireproof building.

For a while it seemed to me that instead of Dr. Schwarz drinking himself to death in Mexico, Dr. Chittenden would do so right there in the Bureau. Never before had I seen him tipsy, but all that winter he kept coming in with a flushed face and was often stupid half the day. Some days he didn't come at all. Pops dropping in from Sligo one afternoon said, "If he continues to dabble in liquor he will sooner or later get hold of some moonshine that will do for him." Those were prohibition days. One day after he had been absent from the office for some time, I went out to hunt him up and stood ringing his doorbell repeatedly before anyone answered. Then the basement door opened and his gruff voice demanded, "What is wanted?" I descended to find him standing there with his face all plastered up, a great bump on his forehead, the bridge of his nose scabbed, and eyes that still had a blackish tinge. "Had a tumble?" "Yes," he answered sheepishly. "Shall I tell them you had a fall?" "No, just say a little accident," he begged. Another day we called at his house with our new little Ford car to bring him down. He had difficulty that morning fastening on one of his spats, so he tossed it back to his sister who was standing in the doorway. She immediately threw it back at him and they kept throwing the spat between them for some time till at length he wearily put it in his pocket and limped out to our car. We began to take him for short drives and little collecting trips which he thoroughly enjoyed. He would say, "There isn't another city in the whole United States as beautiful as Washington."

Gradually he began to pull himself together again and to study his beetles and become enthusiastic over writing a revision of *Curculio*. He came around to my desk to say, "My name will live for hundreds of years but that thing (pointing to Ball's office) will be forgotten in fifty years."

The only bright spot that winter was the celebration of Schwarz' 80th birthday in April. A month earlier I said to Dr. Chittenden, "We ought to do something for Dr. Schwarz on his birthday next month." He sat down heavily on the stepladder which I had been using and looked over his glasses faraway. At length he said, "I know what he would like and I believe I could get it for him,—a case of lager beer. I'm going over and talk to Dr. Howard about it." A few minutes later when I looked across the lawn to Dr. Howard's office, I saw his bald head gravely wagging in discourse with the Doctor. Dr. Howard wisely suggested that it might "hurt" Schwarz.

The Doctor's next move was to write a paper in which he described a new species of *Sphenophorus* that he named *Sphenophorus schwarzi,* and, on Schwarz' birthday, he sent me over to the Museum with the type specimen as well as the manuscript and a beautiful ink drawing of the beetle. I found Dr. Schwarz sitting happily at his desk behind a huge bouquet of red roses with my modest little tumbler of wild flowers placed beside it. His hair had been carefully trimmed and he was in his best black suit with a white shirt. He looked ten years younger than usual. I handed him the box with the *Sphenophorus schwarzi* and he opened it eagerly. "Oh I remember that thing, I remember it. I am glad to see it again, I am that." He related how he himself had collected it at Ft. Monroe, Virginia, at the flood of spring migrations, when things were washed up. He wondered if it was not a tropical insect. He pored over the beetle, the manuscript, and the illustration and said, "That is a fine paper, a very fine paper." If Dr. Chittenden had been there I think Schwarz would have shaken hands. The Doctor was quite sober that day and as eager to hear of Schwarz as ever. After I had told him all about it, he had to go over to Johnny's office to talk it over, and when he left that evening, he said, "I think between you and me we have given Schwarz a pretty fine day."

But others had also contributed to make it a festive birthday. Johnny told me that all the girls in the entomology section had filed into Schwarz' room and each had presented him with a kiss, a great embarrassment as well as pleasure, no doubt, to the shy old bachelor. In the evening the entomologists had a banquet for him at the Cosmos Club. Schwarz had made a little speech in which he told of his early life in Germany, of coming to America, and of Hubbard. When he spoke of Hubbard he had broken down and wept. Dr. Howard had made a speech too and even Dr. Ball, and Dr. Ball had said that as long as Schwarz came to his office he would not be retired, that his desk would always be there.

That spring I spent a week at the Museum of Comparative Zoology in Cambridge. On a previous trip, Mr. Banks, the curator of insects then, had not received me because I had come from Dr. Chittenden's office. Old Mr. Henshaw had most politely met me and opened the collection for me. He had told me, wrinkling up his nose, "Banks doesn't like Chittenden." This time Mr. Banks had welcomed me and after he had ushered me into the long museum room that is always so quiet and deserted, he brought out the LeConte boxes that I wished to examine and gave me paper to make notes on. He was a mite strained though. I endeavoured to overcome this by chatting about the men in Washington, especially Schwarz. After a little he warmed up and talked. The talk lasted nearly two hours and afterwards I wrote down as much as I could remember. He told me that he had been trying to get Schwarz up to pay a visit to Cambridge in order to tell him about a lot of old labels and insects. He spoke of Schwarz' early life in Cambridge. There was some mystery about his leaving Germany. He had not finished his course at Breslau. Later it developed that Schwarz' people had not intended him to be a naturalist but rather a professor of philology. Schwarz could not continue in that, and quietly he had slipped away never to return to Germany. He had come to Hagen in Cambridge. Then he had gone to Washington, but when he had understood that he would have to give up his collection of beetles he was about to resign. Hubbard had persuaded him to stay and eventually he was allowed to keep his beetles. Mr. Banks then spoke of Chittenden with considerable warmth. He said that Chittenden used to "steal specimens right and left," and no one would show him a collection because he took so much. He wanted all the specimens, and if he couldn't get them he would go to Dr. Howard. Schwarz didn't like him. Chittenden used to get books from the library there and then vow that he didn't have them. Schwarz used to go about his room collecting the books when he had gone home, and the next day Chittenden would rage. Mr. Banks told how Chittenden had once thrown a paperweight at Tommy Kelliher, the messenger boy, and hit him in the leg, laming him. Tommy had threatened to go to the Secretary.

Later I asked Tommy Kelliher about this incident. Tommy had grown old in the Bureau and was now in charge of the silkworm culture. That afternoon he was down in the insectary garden gathering mulberry leaves to feed his worms. He remembered the paperweight and "a lot of other things that the Doctor had fired at him." He said, "Mr. Banks used to be an easy going, bashful sort, but a real entomologist, just the same. He knew everything. He wasn't treated right here. One thing about the Doctor, though he is irritable, and a crank, and upset about little things, still he is always working on his beetles. He doesn't put on the lugs the way Marlatt does. Schwarz, now, is a real man. He always gives everyone the benefit of the doubt. He is always educating young fellows. There was Barber and Shannon and another lad who died of tuberculosis. Schwarz even sent him out to California and paid all his expenses. Anyone can go to Schwarz, and he will put his hand in his pocket to help him out. He is a grand old man," wound up Tommy.

When I returned to Washington I told Dr. Schwarz how much Mr. Banks wanted him to visit them, and how they had planned all the details of his stay here. Schwarz said, "Oh you terrify me, you frighten me. I have great trouble with my legs, I am literally on my last legs," and with a whimsical smile, "but I am afraid that I shall go." A few days later Dr. Chittenden called my attention to Schwarz shuffling along in his slow fearful fashion into the Bureau, and in a moment we saw Dr. Howard, Dr. Marlatt, and others gather about him to shake hands at this unusual visit. Dr. Chittenden stood staring across from his window. He said to me, "He has come over to see about his trip to Cambridge. He couldn't transact such important business without consulting Dr. Howard." I met the old man about ten days later on his return. He extended his warm hand to me, and at my inquiry, "Did you have a good time?" he said, "Oh my, yes, they entertained me all the time. They gave me a lunch at the Bussey and one afternoon I went to Melrose Highlands. I didn't recognize Harvard or Cambridge or even Boston." While he was speaking someone who had been standing in the dark hallway behind me stepped forward and extended his hand. It was Dr. Chittenden and Schwarz shook hands with him and returned the greeting,—the first time in years. But he turned again to me although the Doctor stood by listening, and addressed all his eager talk to me. Most of all he bubbled about the collection there, how large and crowded and unarranged, with no one to work on it. He had seen Wheeler many times, but "not once any of Wheeler's ants." He couldn't recognize at all where he had worked so long ago. It had been in Agassiz's first museum, a little shanty with the collection upstairs and he and Hubbard had lived downstairs. It stood on the street where the first horsecar had run. But he had found there in the big new Museum the same chair in which he had sat, and the chair that Hubbard had used. In the old days they had spoken only French there. When at last his talk was concluded he said in a burst of friendliness, "Goodbye, goodbye, God bless you," and he shuffled off without once glancing in the Doctor's direction.

Dr. William Procter Dies

Dr. William Procter, 78, scientis and a director of Procter and Gamble Co., soap manufacturers, died on April 19, 1951. Born in Cincinnati, he spent much of his early life in western Connecticu, and retired from active business in 1920. The following year he established a laboratory on Mount Desert Island in Maine and was the author of sereval publications on marine ando insect life of the Mount Desert region. He was a trustee of the American Museum of Natural History, on the Board of Managers of the Wistar Institute of Anatomy and Biology in Philadelphia, and member of several scientific societies, including The Coleopterists' Society. Dr. Procter had a summer home at Bar Harbor, Maine, and is survived by a brother, Rodney. His Wife died several years ago.

R.H.A.

BOOK NOTICE

KÄFERKU&DEFÜR NATURFREUNDE, by Adolf Horion, 1949, 292 pp., 21 pl., 169 figs. Vitorio Klostermann, Frankfurt am Main, Germany.

This is a beginners' book on the biology of beetles, covering all of the large families and discussing the common European species. It is well illustraed for the most part. Few of the illustrations are original, however, having been adopted from many European books and papers. It should prove to be a very useful book for the person beginning field work, even to sudents in this country who read German. Although the species discussed are not Norh American, the habits and habitats are roughly similar.

R. H. Arnett, Jr.

PLATYSMA MELANARIUM (ILL., 1798) IN NEW YORK STATE (CARABIDAE: PTEROSTICHINI)

By George E. Ball
Cornell University, Ithaca, N. Y.

The common European carabid *Platysma* (*Omaseidius*) *melanarium* (Ill., 1798)[1] [= *vulgare* Schaum, 1847 (nec Linn., 1758)], which has previously been recorded from Oregon and Washington (Hatch, 1933), southwestern British Columbia (Hatch, 1933, and Leech, 1935), and Nova Scotia and southwestern Ontario (Brown, 1950), has recently been collected in northwestern New York. Ten specimens, 5 males and 5 females, were taken 0.8 miles west of Mertensia in Ontario County on June 21, 1951, by Robert M. Roecker, Vernon L. King, and George E. Ball. They were found under logs and stones on moist sandy-clay soil about twenty feet from Fish Creek, a small tributary of Ganargua Creek, which drains into Lake Ontario. A single male was collected by the writer in downtown Rochester, at dusk on June 27, 1951, and an additional series of thirteen specimens, 9 males and 4 females, was collected during the summer of 1947 on the Fred Cornwell farm, near Paltneyville in Wayne County. They were found under rocks on the shore of Lake Ontario. These localities are within thirty miles of one another. The Mertensia locality is about twenty miles south of Lake Ontario.

The best single character for separating *melanarium* (Ill.) from the other North American species of *Platysma* (subgenera *Melanius* and *Metamelanius*) is the presence of setae on the ventro-lateral margins of tarsal segment 5. This is also one of the diagnostic features of the subgenus *Omascidius* Jeannel, 1944. The number of setae per ventro-lateral margin is 3, but occasionally a segment is found with only 2 or as many as 4 setae per margin. Hatch (1933) gives 1 or 2 as the number of setae on either margin of the ventral surface of the last tarsal segment. This is not the case in the specimens which I have examined.

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[1]Brown (1950), following Andrewes (1939), places *melanarium* (Ill.) in the genus *Feronia* Latr., 1817. This is correct if the super specific name *Platysma*, which includes *melanarium*, is considered as representing a group of species which is accorded subgeneric rank in the genus *Feronia*. However, it is my opinion that *Platysma* Samouelle, 1819, represents a distinct genus, and therefore I use it as the generic name for *melanarium*.

TABLE I

Variation in total size and development of hind wings in 24 specimens of *Platysma melanarium* (Ill.) from northwestern N. Y.

	Size in mm.		Hind wings	
	length	width	fully devel.	partially devel.
♂♂	17.0-19.0 (18.0)	5.5-6.5 (5.8)	12	3
♀♀	17.0-20.0 (18.4)	5.5-7.0 (6.1)	5	4

TABLE II

Variation in elytral punctation of 10 specimens of *Platysma malanarium* (Ill.) from northwestern N. Y.

	Number of punctures	
No. and sex	Left elytron	Right elytron
9♂♂ 6♀♀	2	2
1♂	2	3
1♂	2	4
5♂♂	3	2
1♂	3	3
1♂	4	3

Data on variation in total size and development of the hind wings for these specimens are presented in Table I, and data on variation in elytral punctation are presented in Table II. Elytral punctures are on interval 3, close to stria 2. This information is presented for the benefit of future workers who may study the introduced population of this species, and who may want some idea of intra-specific variability at the time this population was first recorded.

Further studies should be made to determine the geographical limits of distribution of this species within the state, its morphological variability, and its mode of introduction. In connection with the latter, Dr. Henry Dietrich has suggested that because there are a large number of greenhouses and plant nurseries in the general area in which *melanarium* was taken, the species may have been introduced in earth attached to roots of imported plants. It will be interesting to find out if the population of *P. melanarium,* which is apparently established in northwestern New York State at least, will be able to compete successfully with the native fauna, extend its range, and eventually become widespread, as, for example, *Carabus nemoralis,* another introduced species, has succeeded in doing.

The specimens mentioned in this paper will be distributed as follows: 3 males, 2 females, Museum of Comparative Zoology; 3 males, 2 females, United States National Museum; 3 males, 2 females, Cornell University; 6 males, 3 females, the writer's collection.

In conclusion, I wish to thank Dr. Henry Dietrich, Curator of Entomology, Cornell University, for help in determining this series of specimens.

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ANOTHER INSECT FEEDING ON Rhus OF THE Toxicodendron-SECTION

Epipaschia superatalis Clem., a pyralid, is an addition to the lists in this Bulletin by Howden, Howden, and Ritcher (volume 5, number 2, 1951) and Steyskal (volume 5, number 5/6, 1952) in this Bulletin. It was reported by Dyar (1904, Journ. New York Ent. Soc., vol. 12, p. 249). A good account of this species and of *Epipaschia zelleri* Grote (listed by the above authors) is given by Dyar, who observed them on poison ivy at Weekapaug, Rhode Island.

S. D. Hicks,
Division of Entomology,
Ottawa, Canada.

NECROLOGY

We learn with regret of the death at Austin, Texas, on October 15, 1951, of J. O. Martin, who was for many years at the California Academy of Sciences. His publications started about 1919 and dealt with many groups of beetles. R.E.B.

BOOK REVIEWS

HORNED BEETLES by Gilbert J. Arrow; edited by W. D. Hincks, Dr. W. Junk, Publishers, The Hague, 1951, 154 pp., 15 plates.

This book by the late Gilbert Arrow (1873-1948) of the British Museum (Natural History) is a general account of the occurrence and structure of horns in beetles and the biology of the species that possess them. Fifteen halftone plates illustrate 78 species, all but a dozen of which belong to the Scarabaeidae and Lucanidae. Most of the fantastic structures which Mr. Arrow studies he finds to be of no adaptive significance. They appear to reach their highest expression in species in which the males have no other function than to seek out and copulate with the females. Certain portions of their bodies, accordingly, especially the dorsal surfaces of the head and prothorax in the scarabs and the mandibles in the lucanids, are free to evolve fantastic growths. Mr. Arrow certainly leaves a lot still to be explained, but he does call attention to the fact that such horns do not develop in the female sex or on parts of the body in the male sex where they would interfere with the performance of essential functions of the species. For example, only where the mandibles are of on great use to the beetle, as in the male lucanids, do they become enlarged.

Two or three small categories of "horns" Mr. Arrow finds of adaptive significance. The excavated posterior end of certain Scolytidae and Platypodidae and the correspondingly excavated anterior ends of *Sinodendron* (Lucanidae) and a few genera of Scarabaeidae are used by the insects in pushing frass or freshly excavated debris out of their borrows. Usually only the body of the male is thus modified, in which cases there is apparently a division of labor between the sexes, the female doing the work of excavation, the male shoving out the debris as it accumulates. The males in some species of the scarabs that make ground burrows (*Bolboceras, Athyreus*) have horns that may assist them in climbing their burrows with a load of dirt on their heads! In the males of certain species in other genera (*Onthophagus, Pinotus, Catharsius, Phalops, Synapsis*) there is a short head horn for forming a flat surface by the combination of head and thorax, likewise for removing debris from the burrows.

In *Lethrus apterus* (Geotrupinae) the male has processes on the lower surfaces of the mandibles which may aid him in climbing plants for the tender shoots which he bites off and stores for the forthcoming brood in a burrow in the ground. Both sexes cooperate in making the borrow, but only the male climbs around the shoots!

Incidentally, Mr. Arrow has cited enough interesting information on the habits of dung beetles, including the Batesian mimicry in Africa of three species of *Gymnopleurus* by three species of *Onthophagus,* to suggest that an absorbing book could be made of a systematic survey of the varying habits of this group of beetles.

MELVILLE H. HATCH

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Compiled by ROSS H. ARNETT, JR.

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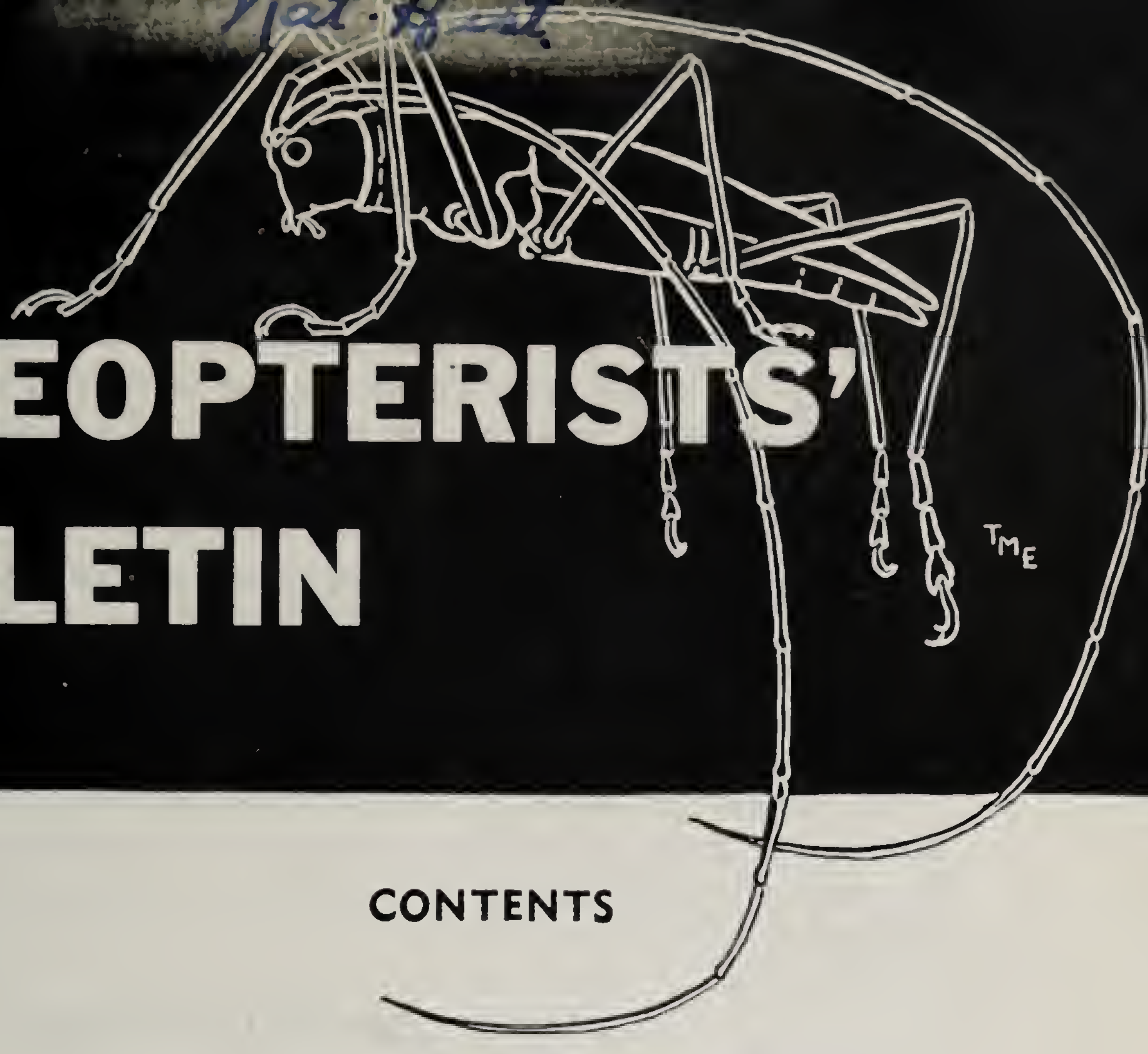

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VOLUME 6 JUNE 1952 NUMBER 3

Published Bimonthly Beginning With February By:

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THE COLEOPTERISTS' BULLETIN

Published bimonthly beginning with February by The Coleopterists' Society at Washington, D. C. Terms of Subscription: $2.50 per annum, both domestic and foreign, payable in advance. Remittances should be made to The Coleopterists' Society. The Society does not exchange its publications for those of other societies.

The Coleopterists' Bulletin is conducted in the interest of coleopterists for the publication of short papers and other matter in the general field of coleopterology. Insofar as contributors supply suitable material, it is intended to include: (1) original papers on beetles, on methods and procedures, and on principles; (2) short notes about beetles, collecting, collectors, etc.; and (3) bibliographic aids to the student of taxonomic coleopterology.

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Entered as second-class matter at the post office at Washington, D. C.

The Coleopterists' Bulletin

Volume VI | JUNE, 1952 | No. 3

TWO OLD COLEOPTERISTS

By Doris H. Blake

[*This is the fifth and last installment of Mrs. Blake's account of the two old coleopterists, Dr. F. H. Chittenden and Dr. E. A. Schwarz, at the Bureau of Entomology.*]

That year both Barber and Shannon acquired cars and daily they took Schwarz out into the country and in particular to Plummers Island. Plummers Island is a small, high, rocky island ten miles above Washington that nearly fifty years ago was purchased by a group of naturalists. They had built a little cabin on the top of the island. There it stands, hidden in the trees, brown and homey, with its wide piazza in front overlooking the Potomac, and in back a long outdoor table around which the club members all gather for a spring shadbake and a November oyster roast. The place with fifty acres of adjoining mainland has been kept as untouched by civilization as its members could leave it,—only a narrow pathway through the woods to the river and a raft across the narrow inlet between the island and the mainland. In the spring the woods are bright with lavender phlox and other wild flowers that except for this protected place have all but disappeared in the neighborhood. Dr. Chittenden was not a member of this club and never on the island, although he would have given a great deal to go there earlier. Now he was unable to make the rather difficult trip. It involved crossing the canal at one of the locks over a narrow plank. Chittenden was dizzy at the thought of it. How Schwarz ever shuffled over is a mystery to me. Once I asked him about it, "Oh, it is terrible, terrible," he admitted, but his determination to get to Plummers Island was equal to it. He spent a week there in the fine hot July weather that he loved, with Barber joining him after work every evening. One day after work we took a picnic lunch up there and came upon him sitting out at the long table with the late afternoon sun flickering down through the leaves on his bare head and little old body. Over opposite him sat young Buchanan. He had brought Schwarz a couple of cigars and now the old man was smoking one. As soon as he caught sight of me he arose and grasped my hand saying, "I am glad that I have caught you on one of your trips." While we were preparing supper, he came hobbling out of the kitchen with cups, knives, and forks and even wanted to make coffee for us. But we couldn't persuade him to join us in eating. He was waiting for Barber. Soon we heard the creaking of the raft pulleys, and Barber appeared with a piece of steak and some ice cream for their meal. Afterwards we sat about chatting, and Schwarz lighted the second cigar. "Do you smoke?" he asked me. "Not yet, not yet," he chuckled. Barber and Buchanan brought out the glowing trap lights as the light faded and we sat about the table catching insects until it was time for us to go home and leave them. A golden moon was rising above the trees and the whip-poor-wills and big barred owl were sounding as we crossed the river. No wonder Schwarz loved the Island. It was his wish and it was faithfully carried out by Barber after his death that his ashes be strewn there. A big boulder near the top of the Island bears a bronze tablet with his name on it.

My first short entomological paper was written that summer. Dr. Chittenden was as anxious as I to have it perfect, and even prouder of it. He showed it to Dr. Howard one day when we were in the library. Dr. Howard, I remember, dropped one of the sheets. He apologized, "Beg pardon; no, that isn't correct to say nowadays," he said, "you should say 'Sorry' and if you step on their toes very hard, 'very sorry.' I did once to a man and turned to him with a 'very sorry' and his face was all screwed up and he said, 'Damn it all, go to hell, *shut up.*' "

When I was telling Dr. Schwarz about my small entomological discovery he became enthusiastic, "You must *pooblish,* nothing is known about those things." It was soon after this that he picked out a genus of beetles for me to work on. After that, my nearly daily visits to the Museum spurred Dr. Chittenden on to wishing to go too. He wanted to be driven over one afternoon. Startled, I telephoned to Mr. Barber to prepare them. Then Dr. Chittenden backed out at the last moment and I went alone. Barber's face when I appeared without him was comical, Schwarz' unreadable. I thought perhaps that he knew nothing about it and I said nothing. He received me more cordially than ever and named up my insects, and then when I was gathering up my boxes to leave, said to me, "You can tell Dr. Chittenden that whenever he comes over, he will be made welcome. It is time to let old days drop." I was amazed and stammered, "All right, he has been scared to come."

When I was back in the Doctor's room and repeated this to him, he tried to cover his emotion by passing quickly out of the room. He came back in a little while and said gruffly, "That isn't the reason I've stayed away, it is because there isn't any room for me over there. It probably pleased Schwarz when I named that *Sphenophorus* after him and gave him back the specimen which he thought he would never see again."

I contrived to let Dr. Howard know of this, too. He beamed, "Now that is the advantage of growing old—one gets so much sweeter. It was nice of him to say that, and I hope the two won't have another falling out." He told the Doctor, "I hear you and Schwarz metaphorically have fallen on each others' necks and are good friends," and Dr. Chittenden said, "I told him that as far as I was concerned we had been for the last three years, and that the only reason I had not been over there was because I couldn't get about." Dr. Howard remarked that he seemed to be walking all right now and even added, "I myself am walking better." Dr. Chittenden commented on that to me, quite truthfully, "He isn't, he just thinks he is. What a shame! Think of all those buzzards here waiting for him to die!" and then with a burst of indignation, "Not one of them a gentleman or even educated, all buzzards."

Dr. Howard once confided to me, "I don't care how efficient folks are; they don't have to be efficient at all, if they can only get along and not quarrel. You know, Mrs. Blake, my whole job consists of settling disputes and quarrels."

One morning in February 1925 after Dr. Chittenden and Dr. Schwarz were reconciled and after Dr. Chittenden's first visit to the Museum, which, according to Mr. Barber, passed off pleasantly enough, the report came to us that Thomas L. Casey, the great coleopterist, was dead. Dr. Chittenden was much moved and kept talking of it all the morning and especially of Casey's collection of beetles. Very few of the entomologists had ever had a peep at it, although Casey had lived and worked in Washington up to his death. The collection was willed to the National Museum. There was an important meeting at the Museum of the entomologists most interested in this famous collection. Charles Schaeffer came down from the Brooklyn Museum. Even Dr. Chittenden went over from the Bureau. The next morning as soon as I entered the office he made me sit down by his desk and told me all about it. He dwelt particularly on his relations with Schwarz, how friendly they had been that afternoon. Schwarz on his part had to discuss the Casey collection when I was over that noonday, over his after-dinner cups of coffee, and asked me how Dr. Chittenden felt. "He is arranging his newly acquired Bischoff collection so that he will be in practise to handle Casey's," I told him.

Another event that was of interest to Dr. Chittenden took place that same week. The little building into which we had been moved also housed the Department of Agriculture press service. As the partitions were thin, much that was said in the next room was quite audible to me, and when I heard Dr. Ball's name mentioned, I called Dr. Chittenden from his room. He was at once on the alert and stood up in the corner against the wall listening with all his old ears as he heard of Ball's coming resignation, and then he did a great joyful jig about my office till I was afraid he would hurt his lame leg.

That spring we were again moved with all the collection, this time over to the old National Museum. Dr. Chittenden wandered about in despair all through the moving, and after we were finally housed in a dreary old corner room that seemed to be located right over the furnace, he got pretty tipsy. I remember how, to escape the heat of the room, he staggered out on the Mall and ended by slumping down under a tree for the rest of the afternoon.

A few days later when I went over to present Dr. Schwarz with his annual birthday bouquet, I met Shannon, with whom Schwarz was now living, who told me that Schwarz had had a slight stroke. When he came down to breakfast they noticed that he couldn't speak very well. He kept repeating, "Zwei und zwanzig." Even as I talked Schwarz hobbled up and tried to say something to me. Dr. Chittenden had sent him a rare old entomological book. Schwarz, embarrassed and sad, sat down behind his desk, which was covered with flowers, and turned the pages of the book. It seemed as if it were his funeral rather than his birthday. But he continued to come to the Museum as usual and even attended the next entomological meeting. He enjoyed those meetings and always took a great part in them. At this one he arose to speak as usual and then sank in his chair and covered his face.

That year I was gone for nearly six months. When I returned, Dr. Chittenden had once more been moved, this time to a small temporary building near the Bureau. Schwarz too was more cheerful and talked better. He greeted me with a happy chuckle and made me sit down beside him. "I am all right but this," pointing to his throat. He never did get so that he could talk very much and gradually grew more feeble, but Shannon brought him down to the Museum every day. After he gave up working on his beetles he would sit at his desk reading. In the later days the book would sometimes be upside down and Schwarz would be asleep in his chair. He was never any trouble and never would be helped. When Shannon's work took him to South America, Schwarz was all broken up and wept. Then Barber took him to live with him and was very tender with him. But in spite of all his care the thing that Schwarz had feared for years happened. One October evening while Barber was preparing supper, the old man fell. Barber picked him up and put him in a chair and Schwarz waved for him to continue in his preparations. When he called Schwarz to supper, he found that he had broken his leg. It was like Schwarz not to want to cause any disturbance, although he must have been suffering badly. Only once did he break down, and that was when they were putting him in the ambulance to take him to the hospital. He had always regarded hospitals as the last rites. He lived only a week.

Meanwhile affairs in the Bureau were moving fast, the old order was changing and young men taking the reins. When Dr. Chittenden was informed that he must be moved a fourth time in three years, with all his cases of books and cases of Schmitt boxes, he came to me saying, "I have foreseen this, and when they told me, I said, 'There will be no more moving for me after this, for you are going to move me right up to Vermont Avenue. And you can't rush me either. I can't and I shan't move until I have everything all ready up there. That's that.' " Then he strolled off to discuss the weather and the arrival of the first grackles with the old gardener. He and Dr. Howard had a good talk which he repeated in part to me. They had been speaking of all the changes. Dr. Howard said, "After all, it has gotten to the place where I don't care a damn." Dr. Chittenden said, "I don't either." When moving day eventually came, Dr. Chittenden amused everyone by limping about with two little suitcases full of his precious manuscript. He left me to oversee the rest of the moving. His old desk and books were installed in the small front room of his basement and the boxes of insects on which he was working were also taken there. I was sent over to the Museum with the rest of the collection and found haven in a little corner next to Dr. Schwarz where I stayed until his death.

We used to go up to see Dr. Chittenden frequently, sometimes to take him and his sister to ride. He would see to it that his sister was in the back seat with me while he crowded his huge form into the front seat. And she as eager as a child, although trying hard to restrain herself, would chatter away to me, often confiding a great deal about him not wholly flattering. It was funny to hear him admonish her, "Now, Ella, look and don't talk." "I'm seeing with my eyes and talking with my tongue," she would retort.

One day about six months after he had taken up his office in his own house, I had a telephone call from him. He said that his sister had had an accident and was in the hospital and he wanted me to come up. When I arrived he was working on a box of insects and watching for me, and he hopped up with relief to let me in. "Now I can tell you all about it. Damn an old telephone," he said. It appeared that his sister had fallen on her way to market the night before and had been brought home by "three able-bodied men" quite in her senses but with a broken leg. After a sleepless night on the part of both of them, with him scolding her because she couldn't sleep, he had managed to get her off to the hospital in an ambulance. After that he had had to have someone to tell his troubles to and had telephoned to me. "It is the best place for her to be in a hospital though it does cost $6 a day," he said. Then he showed me the crowded back room of the basement. "You just wait now, I'm going to get rid of all the old stuff that she has been hoarding while she is gone." He opened the furnace door and threw in a couple of old pieces for a start.

He lived for nearly two years after this. Occasionally he would visit the Museum. He finished a revision of the North American species of *Phyllotreta* and was at work on a paper on *Lixus*, which Buchanan gathered together and published after his death. The last time that I saw him was on one hot July day when we took him to our place in Virginia to hear the wood thrush. He always was deeply interested in birds and loved most of all the song of the wood thrush. My small daughter toddling about him as he sat on the porch tumbled over his feet. I picked her up saying, "Poor little girl." I remember what he said. "Why do you call her *poor?* It is we old ones that are *poor*. She has all her life to live." A few weeks later, less than a year after Schwarz's death, he died rather suddenly. His sister said, "Frank had no idea that he was going to die. Mother had always told him that he would live to be 90 too."

A NEW NAME FOR Geotrupes (Peltotrupes) chalybaeus LeCONTE, WITH A DESCRIPTION OF THE LARVA AND ITS BIOLOGY

(Scarabaeidae)

By Henry F. Howden
North Carolina State College, Raleigh, N. C.

Geotrupes chalybaeus is the name under which a large Floridian species has been known since it was described in 1878 by LeConte. It appears, however, that the name of *chalybaeus* was used in *Geotrupes* by Mulsant in 1842 and that the *chalybaeus* of LeConte is therefore preoccupied. Since there are no subsequent synonyms available, it must be renamed.

Geotrupes (*Peltotrupes*) *profundus*, new name

Geotrupes chalybaeus LeConte, 1878. Additional descriptions of new species *In* Schwarz, Coleoptera of Florida. Proc. American Philos. Soc., vol 17, p. 402. (not *Geotrupes stercorarius* var. *chalybaeus* Mulsant, 1842. Histoire Naturelle des Coléoptères de France. Pt. 2. Lamellicornes, p. 358. Maison, Paris.)

In February 1949 Frank N. Young found a large colony of *Geotrupes profundus* in Putnam County, south of Interlachen, Florida. Young (1950) subsequently published a detailed account of the ecology of the area and the habits of the adults.

Young's directions made it possible for Dr. and Mrs. Henry K. Townes, my wife Anne, and me to find the colony south of Interlachen in the spring of 1951. A second trip to the area was made on November 17-18, 1951, by William B. Fox, Byrd Dozier, and the writer.

During a four-day period (April 1-4, 1951) eight adults (2 males, 6 females) were collected in cans of malt and water. Two other males were taken in a can baited with banana peels and propionic acid. One female specimen was dug from an eight inch burrow and another was collected at 8:30 p.m., April 2. beside a ''push-up'' of sand. Considering the tremendous number of burrows in evidence, adult activity seemed almost past for the season. On November 17-18 there was no sign of ''push-ups'' and no adult activity.

In April, eight old ''push-ups'' of sand were found in a space 6 feet by 3 feet in an open area beside a fallen live oak tree. With Dr. Townes' assistance, a hole encompassing the eight burrows was dug. For the first three feet all of the burrows were closed with sand, but below that they were open. To help follow them, long straws were pushed into six of the burrows and the two others were filled with white surface sand. The first larva (third instar) was found at a depth of 5 feet, 6 inches. Six other second- and third-stage larvae were taken at the following depths: 5 feet, 2 inches; 6 feet; 6 feet, 2 inches; 6 feet, 10 inches; 6 feet, 11 inches; and 7 feet. The eighth burrow was excavated only to a depth of 7 feet but a straw thrust in the burrow indicated that it contained at least two more feet, making a total of 9 feet! (Hence the name *profundus.*)

The next day, April 3, another similar pit was dug in the shade of a pine tree where the burrows appeared to be more recent. Five fresh cells, 2 containing an egg each and 3 cells with larvae, were found at the following depths: 4 feet, 2 inches; 4 feet, 3 inches; 4 feet, 6 inches; 5 feet, 3 inches; and 6 feet, 8 inches.

Seven months later, on November 17, Dozier and the author dug a pit 3 feet by 10 feet and 6 feet deep near the April 3rd pit in the woods. This excavation produced three fresh cells, two of which contained third-stage larvae. The first cell with a larva was at a depth of 2 feet, 8 inches, with no other cells below it. The second cell found was at a depth of 4 feet, 2 inches and also contained a larva. Eight inches below this was another fresh cell, but no larva was found in it.

Larval Cell and Food

At the end of each burrow, the passage made a sharp bend and expanded to form a larval cell parallel to the ground surface. Each cell was between 6 and 7 inches long and 1½ to 2 inches in diameter. In one case beneath a fresh "push-up" two cells were found at the end of a single burrow, opposite each other, an inch apart in depth. Each of these contained an egg within ½ inch of the terminal end of the cell. In all other cases, with the possible exception of the two cells 8 inches apart, found in November, there was only a single cell at the end of each burrow.

The larval cells were loosely packed with surface litter. In the open area the surface litter was composed mainly of fragments of live-oak leaves (*Quercus virginiana* Mill.), a few turkey oak leaves (*Quercus laevis* Walt.), and a small quantity of pine needles and bark fragments from sand pines. In the area under the sand pine (*Pinus clausa* Sarg.) the litter was almost entirely pine needles, male pine cones, and pine bark. The adult beetles seemed to use any surface litter near the burrow to provision their larval cells. Three of the larvae that were kept alive fed indiscriminately on surface litter collected later from various sources at Raleigh, N. C.

The larva of *Geotrupes profundus* had one very interesting adaptation to its sandy habitat. As the larva ate its way through the cell litter, it used its own fecal material to construct a tube around itself. The anal lobes of the larva were kept on the edge of the tube while the larva extended its body from the fecal tube and pulled the litter to it. As the larva increased in size the tube increased in diameter to as much as one inch. The tube was very fragile and in all cases only large fragments of the tube were recovered. However, the three larvae kept alive in 2-ounce, metal, salve boxes (2½ inches in diameter by ⅞ inch deep) all constructed similar fecal tubes. The tubes were brown with an even, pebbly appearance due to the fact that each fecal pellet retained its shape. This tube prevented the food material or sand from caving-in on the larva. By the second visit in November all the larval food material had been consumed and one

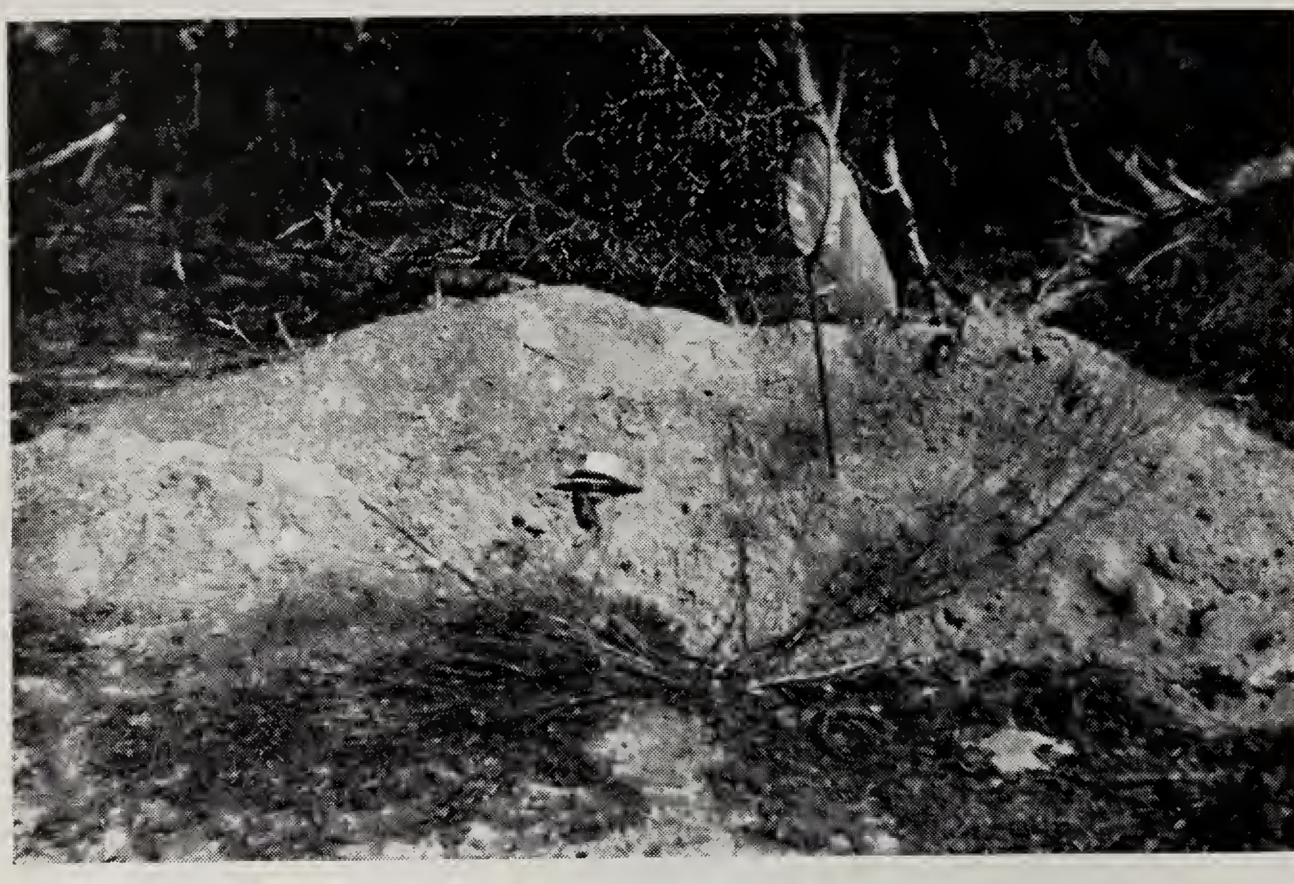

Figure 1.—The first excavation at Interlachen, Florida.

Figure 2.—Third stage larva of *Geotrupes profundus,* showing the reduced metathoracic leg and greatly swollen abdomen.

larva had walled-off its fecal tube, making a cell about 2 inches long by an inch in diameter.

The life cycle of *Geotrupes profundus* appears to take one year. Unfortunately, none of the eggs was reared to third instar, but the early development appears to be very rapid. According to Young, adult activity starts in February. During our first visit in April, second- and third-stage larvae were found in one area, eggs in burrows below fresh "push-ups" in another area. From the appearance of the mounds of sand at that time, it seems unlikely that any burrows were more than two or three months old. (*Geotrupes blackburnii* Fab. and *Geotrupes splendidus* Fab. larvae take only slightly over one month to develop to third-stage larvae.)

Since the mounds of sand were no longer in evidence in November, it also indicated that the mounds seen in April were made only a month or so before. The larvae of *Geotrupes profundus* remain as third instar for seven or eight months, since they were still third instar in November. Also, the three specimens kept alive in salve boxes were still third-stage larvae in December, a period of eight months. Since the adults emerge in February, the pupal period of necessity must be rather short.

Description of the Immature Stages

Descriptions based on the following material. Two eggs, 1 first-stage larva, 4 second-stage larvae, and 6 third-stage larvae collected April 3-4, 1951, Interlachen, Fla. Two third-stage larvae collected November 17, 1951, Interlachen, Fla.

Third Instar

Maximum width of head capsule 4.4–4.7 mm. Surface of cranium light brown, shining, and slightly wrinkled. Frons on each side with one posterior frontal seta, 2 or 3 setae at each anterior angle, 1 exterior frontal seta, and 2 or 3 anterior frontal setae (fig. 3.). Clypeofrontal suture absent. Somewhat asymmetrical labrum vaguely trilobed, wider than long; clypeus noticeably asymmetrical. Antennae 3-segmented. First antennal segment widest in diameter, 0.38–0.4 mm. long, with 2 dorsal distal setae, 2nd antennal segment slightly less in diameter, about 0.18–0.2 mm. in length with a single dorsal hemispherical sense organ distally. Third segment reduced to a small hemispherical cap, one half the diameter of the second segment (fig. 3.). Mandi-

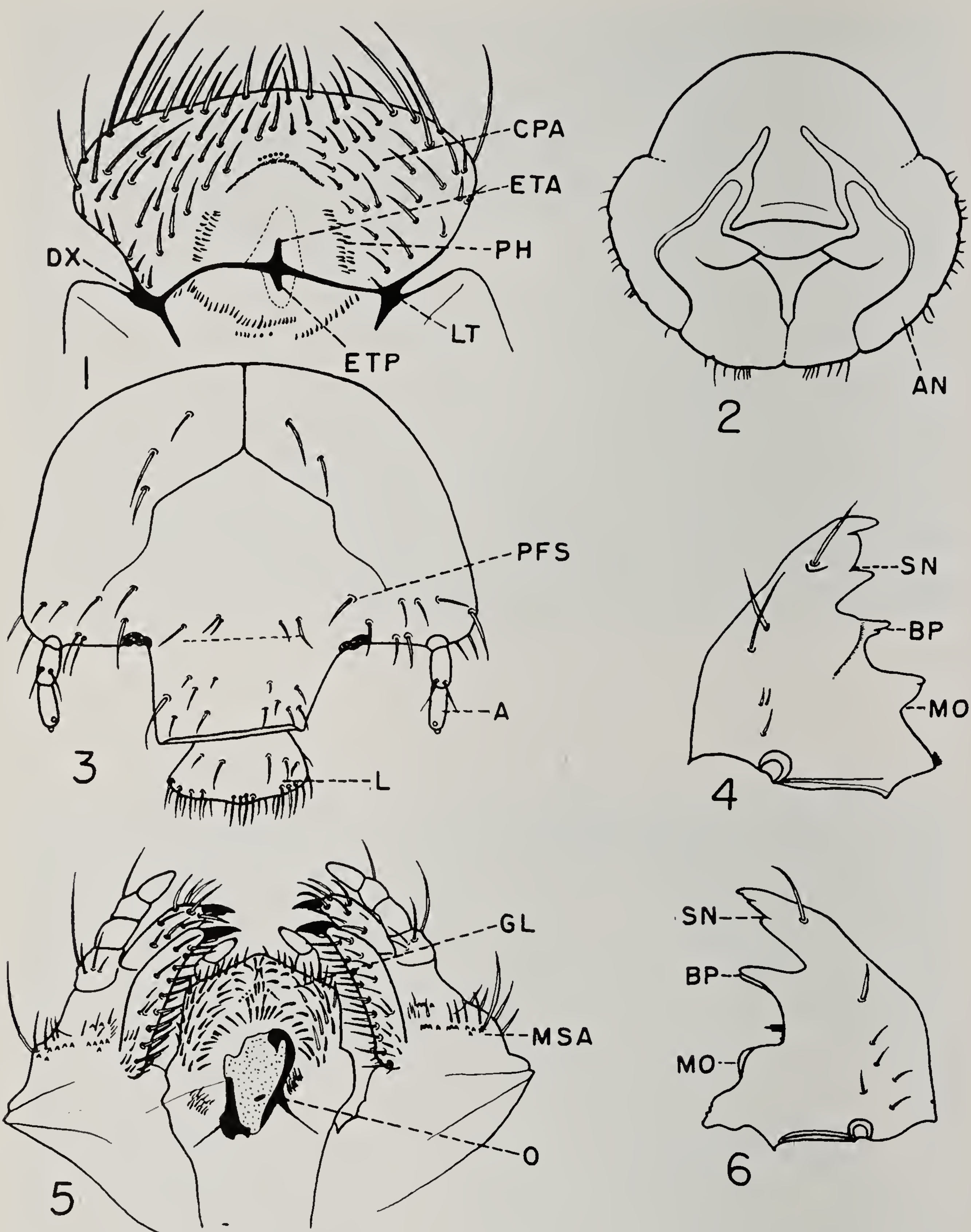

Figure 3.—Third instar of *Geotrupes profundus.* 1—epipharynx; 2—caudal view of last abdominal segment; 3—head; 4—left mandible; 5—maxillae, labium, and hypopharynx; 6—right mandible. Symbols: A—antenna, AN—anal lobe, BP—bifurcate process, CPA—chaetoparia, DX—dexiotorma, ETA — anterior epitorma, ETP — posterior epitorma, GL—glossa, L—labrum, LT—laeotorma, MO—molar region, MSA—maxillary stridulatory area, O—oncylus, PFS—posterior frontal setae, PH—phoba, SN—scissorial notch.

bles (fig. 4 and 6) somewhat asymmetrical, the scissorial areas differing less than the molar areas. Left mandibular scissorial area (fig. 4), above the scissorial notch, of two parts, a narrow blade-like portion and a broadly rounded process, with a posterior tooth-like portion below the scissorial notch. Right mandibular scissorial area (fig. 6) above scissorial notch consisting of a double toothed blade-like structure, and below consisting of a single blade-like structure. Each mandible between scissorial and molar areas with a prominent bifurcate process. Grinding surface of left molar area strongly concave, overhung by an acia having a tuft of small setae on the outer edge; grinding surface of right molar area rather flat. Tuft of setae of unequal length lies between the bifurcate process and the molar area of the right mandible. Maxillary stridulatory area (fig. 5) consisting of an irregularly set row of nine to ten conical teeth on each stipes and a similar row of two to three teeth along the posterior margin of the palpifer. Hypopharynx with two well developed asymmetrical oncyli. Anterior margin of glossa not emarginate. Epipharynx (fig. 1) quite similar to that of *Geotrupes blackburnii* described by Richter (1947, p. 6). Tormae united mesally, posterior and anterior epitormae present, phobae surrounding the spiculate pedium. Each chaetoparia with 25 or more chaetae. Respiratory plates of spiracles crescent-shaped with concave margins facing ventrally or slightly cephalad, similar to *G. blackburnii*. Spiracles cribriform with "holes" arranged in series of definite transverse rows. Spiracles of eighth abdominal segment much smaller than those of first seven. Body greatly swollen posteriorly with anal lobes (fig. 2) protruding slightly on each side of the last abdominal segment. Dorsa of abdominal segments 1 to 8 each with two vaguely defined (dorsal) annulets, with setae present mesally on all annulets; setae pronounced and rather long on anterior annulets of segments 4 to 7 and on all posterior annulets.

Last abdominal segment flattened caudally with slightly protruding lateral and ventral lobes (fig. 2). Defining sclerotized lines ventrad of triangular anal area meeting in the ventral midline, separating the ventral anal lobes by only a vague line.

Legs 3-segmented with pro- and mesothoracic legs long, metathoracic legs much reduced, as in *G. blackburnii* (Richter, 1947, fig. 24 and 28). Last two pairs of legs with stridulatory organs.

those on the mesothoracic legs consisting of a finely striated file on the outer apical part of each coxa and those on the metathoracic legs of a rasp consisting of a row of nine or ten well-defined teeth on the inner surface of the fused trochanter-femur and three or four very minute teeth at the base of the tibiotarsus. Claws absent, but the bases of several terminal setae on each leg have become tuberculate, and evidently serve as claws.

Egg

Yellowish white, almost oval, being slightly larger at one end than the other. Length 4.6–4.7 mm., width at widest point 3.0–3.5 mm. two days before hatching.

First Instar

Structurally differs very little from description of third instar with the exception of the respiratory plates of the spiracles which are reduced to small circular discs. Maximum width of head capsule 2.5 mm. Length of second antennal segment somewhat shorter in proportion to that of third instar. Broadly rounded area of left mandibular scissorial area produced to wide blade-like structure. Posterior portion of abdomen not swollen as in second and third instar.

Second Instar

Very similar to third instar. Maximum width of head capsule 3.5–3.7 mm. Antennal segments proportionately as in third instar. Mandibles quite similar to third instar.

The larvae of *Geotrupes profundus* can be easily separated from other known larvae of *Geotrupes* by the greatly reduced third antennal segment, the presence of tuberculate bases of the setae on the end of the tibiotarsus, and by the shape of the anal lobes.

The author would like to express his appreciation to Dr. P. O. Ritcher, N. C. State College, Raleigh, for his helpful suggestions on the preparation of this paper and to Dr. William B. Fox, N. C. State College, Raleigh, for his identifications of the plants.

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THE COLEOPTERISTS' BULLETIN

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VOLUME 6 AUGUST 1952 NUMBER 4

Published Bimonthly Beginning With February By:

THE COLEOPTERISTS' SOCIETY

THE COLEOPTERISTS' SOCIETY

The Coleopterists' Society was founded on October 12, 1949, to increase interest in the insect order Coleoptera and to improve the study of it, by promoting research, providing for publication, and encouraging cooperation among students.

The annual dues are: $1.00. Members may receive The Coleopterists' Bulletin for $1.25 per volume; members who are students, $.50 per volume. Supporting members pay an additional $4.00 and receive The Coleopterists' Bulletin at no further cost.

THE COLEOPTERISTS' BULLETIN

Published bimonthly beginning with February by The Coleopterists' Society at Washington, D. C. Terms of Subscription: $2.50 per annum, both domestic and foreign, payable in advance. Remittances should be made to The Coleopterists' Society. The Society does not exchange its publications for those of other societies.

The Coleopterists' Bulletin is conducted in the interest of coleopterists for the publication of short papers and other matter in the general field of coleopterology. Insofar as contributors supply suitable material, it is intended to include: (1) original papers on beetles, on methods and procedures, and on principles; (2) short notes about beetles, collecting, collectors, etc.; and (3) bibliographic aids to the student of taxonomic coleopterology.

Manuscripts should be prepared to conform to the style used in the Bulletin and to announcements of style therein. They should be typewritten, double-spaced. All manuscripts should be sent to the editor.

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The Coleopterists' Bulletin

Volume VI AUGUST, 1952 No. 4

ANOTHER EUROPEAN WEEVIL, Pentarthrum huttoni WOLL. IN NORTH AMERICA

By Rose E. Warner

Bureau of Entomology and Plant Quarantine, U.S.D.A.
Washington, D. C.

During the fall of 1951 specimens collected in Quebec by E. R. Bellemare were sent by Brother Adrien Robert, University of Montreal, to the U. S. Bureau of Entomology and Plant Quarantine for determination. These insects were *Pentarthrum huttoni* Woll., a member of the Cossoninae. This is the first record of the presence of the species outside of Europe.

P. huttoni is an interesting little weevil (2-4 mm.) first described in 1854 from specimens taken by H. W. Hutton at Alphington, near Exeter, England, in a piece of hard undecayed cherry wood. In general contour and habits it is more suggestive of a minute *Cossonus* than of anything else. Its glabrous, deeply sculptured surface and slender, cylindrical body, its medially inserted antennae, and its widely separated anterior coxae show a close relationship with *Cossonus.* It recedes from *Cossonus,* however, in the five-segmented funiculus and in the rostrum being of equal breadth throughout (not being dilated at its apex).

P. huttoni shows a distinct tendency to infest floor boards. Dr. K. G. Blair has taken the species in floor boards at Hendon, and in the Power collection at the British Museum (Nat. Hist.) there are specimens from Brussels which were found destroying an oak floor as recently as March 1947. In the original biological notes it is stated that the species is found in the hollows of worm-eaten wood of chests, casks, etc., at Rouen on *Broussonetia papyrifera.* In England the original specimens were found in logs of wood recently cut up for burning, and Mr. Hutton states that it was from a hard and undecayed portion of a cherry tree, in which the winding burrows were very apparent, that he succeeded in extracting them. The specimens received from Quebec were present in a small piece of rotten wood from an old floor; the type of flooring and the extent of the damage are not known, but as far as can be estimated from the small piece of wood, the infestation was severe; 4 larvae and 8 to 10 adults were found in less than 1 square inch of flooring. The wood was almost completely reduced to fine powder. The adults and larvae were found feeding in that rotten wood which was a little wet.

Records show this species distributed in France, England, Holland, and Belgium, chiefly in the towns of the maritime regions.

Thanks are extended to Mr. F. D. Buck for comparing the specimens with material in the general collection in the British Museum (Nat. Hist.).

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COLEOPTERORUM CATALOGUS SUPPLEMENTA

The supplement to parts 158 and 167 of the Coleopterorum Catalogus was issued on July 7, 1952 by Uitgeverij Dr. W. Junk, The Hague. It consists of 32 pages and sells for 8 Dutch Guilders. This is the supplement to the Curculionidae: Mesoptiliinae, Rhynchitinae I and II, Allocoryninae, and Pterocolinae, by E. Voss.

This is really the first supplement to be issued in this new series, the other parts issued to date have been entirely new catalogs. The format is the same as that of the supplements to the Staphylinidae parts.

Coleopterists may be thankful that this company is willing to continue this important project, even in the face of the great expense of printing. This writer hopes therefore, that coleopterists will give their support by buying as many parts as possible, or by subscribing to the entire series.

R. H. A.

BIOLOGY OF DELTOCHILUM GIBBOSUM (FAB.) WITH A DESCRIPTION OF THE LARVA

By H. F. Howden and P. O. Ritcher

North Carolina State College, Raleigh, N. C.

The biology of *Deltochilum gibbosum* (Fab.), the largest of the Coprinae in the southeastern United States, has been practically unknown. This lack of knowledge was noted by O. L. Cartwright (1949) in his interesting description of its egg-ball. It is the purpose of this paper to add to Cartwright's observations and to furnish a description of the larva.

Cartwright noted that the adults were attracted to animal fur, feathers, and human excrement. The authors have also found that fermenting malt and fungi are visited. Fungi seem attractive only in the fall.

While we were using chicken and turkey feathers to attract *Geotrupes,* numerous specimens of *Deltochilum* were noted in the spring of 1950 at Raleigh, N. C. On June 23, 1950, an egg-ball was found in a 2-inch deep, circular, cup-shaped depression in the ground. The depression also was obviously made by the adult. The narcissus-bulb-shaped egg-ball (figure 1) was upright in the center of the depression not touching the sides at any point. As was found by Cartwright (1949), the completed ball was coated with mud and leaves. It measured 42 mm. high, 40 mm. in diameter near the base, and narrowing to a point at the top. In its center was a compact, spherical mass of feathers 15 mm. in diameter, and above this was a cavity containing an elongate yellowish egg 9 mm. long. Unfortunately, the egg did not hatch. No further information on the egg-balls was obtained during 1950. However, 2 pairs of newly emerged adults were found on October 2, 1950.

In the spring of 1951, in a low wooded area six miles west of Raleigh, a plot 10 feet square was surrounded by a wooden frame made of 6-inch boards set on edge and sunk into the ground 2 inches. In the center was placed a pile of chicken and turkey feathers. Adult beetles could gain easy access, but could not roll their feather balls over the board barrier. In fact, there was soon a beaten path worn around the inside of the barrier where the adult *Deltochilum* rolled their balls for a considerable distance. Many of these spherical feather balls were later abandoned and only a few were completed by the beetles.

On July 12, 1951, a narcissus-bulb-shaped egg-ball was discovered hidden under leaves by the edge of a small log. The egg-ball was covered with leaves and mud in typical fashion and set in a cup-shaped depression in the ground. For further observation this ball was placed in a jelly glass partially filled with moist soil, and brought indoors. On July 23, a rope of fecal material was ejected on the outside of the egg-ball. For seven days this continued, a new mass of fecal material appearing each day from a different point near the top of the ball. On August 6, 1951, when no further activity had been noted for a six day period, the writers opened the ball. It was found to contain a pupa which was preserved along with the third-instar skin.

Figure 1. Egg-ball of *Deltochilum gibbosum* (Fab.)

On July 12 a female was observed coating a ball with leaves within the wooden enclosure. This ball was left undisturbed until August 2, when it was also placed in a jelly glass and brought into the laboratory. Two days later a rope of fecal material was noted on the outside of the ball. After the third rope appeared on August 6, the ball was opened and found to contain a large third-stage larva, which was immediately preserved.

Larval growth evidently is extremely rapid, taking in this case from about July 12 to August 6, a period of 25 days, to develop from the egg to third instar. This fact was substantiated when a third ball was collected on August 8, 1951. As the enclosure had been carefully examined on August 2 with no evidence of this ball, it probably was constructed between August 2 and August 8. When opened on August 22, 1951, it was found to contain a third instar. In this case it took no more than 20 days to develop from egg to third stage larva. A fourth ball, not present on August 8, 1951, was found to contain a callow adult when discovered and opened on October 29, 1951.

Deltochilum gibbosum (Fab.), third-stage larva

Description based on the following material:

Two third-stage larvae, removed from *Deltochilum* egg-balls, one on August 6, 1951, and one on August 22, 1951, at Raleigh, N. C.

Cast skin of third-stage larva, associated with *Deltochilum* pupa, removed from egg-ball, on August 6, 1951, at Raleigh, N. C.

Cast skin of third-stage larva, associated with *Deltochilum* adult, removed from egg-ball, on October 29, 1951, at Raleigh, N. C.

Figure 2. Third-stage larva.

Maximum width of head capsule 5.3 to 5.6 mm. Surface of cranium light yellow-brown, faintly reticulate. Body hump-backed, grayish-white in color (figure 2).

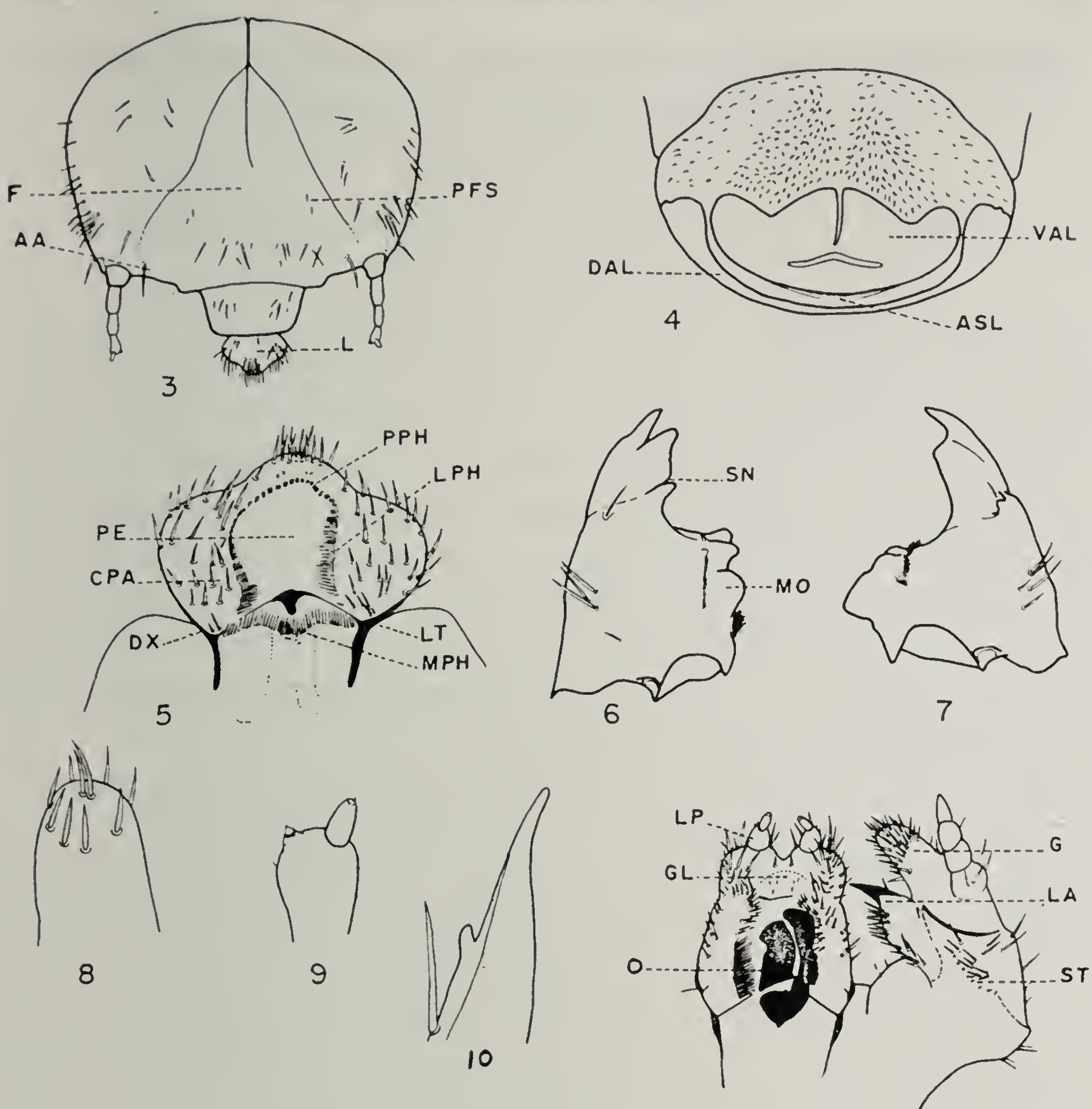
Frons with from 1 to 3 small, posterior frontal setae on each side, a single seta in each anterior angle, and a combined transverse patch of 7 to 10 anterior and exterior frontal setae on each side. Labrum symmetrical, strongly trilobed (figure 3). Pedium of epipharynx bare (figure 5). Each chaetoparia covered with from 20 to 25 setae. Tormae symmetrical. Mesophoba monostichous. Anterior epitorma absent. Haptolachus with 4 macrosensilla just caudad of the mesophoba. Maxillary stridulatory area with a row of 5 to 11 conical teeth. Lacinia with a large distal, sclerotized blade-like uncus; uncus with a small, proximal tooth-like projection (figure 10). Galea with a small conical uncus. Glossa, anterior to the oncyli, with a transverse row of spine-like setae (figure 11). Third antennal segment with a small distal subconical sensory organ (figure 9).

Prothoracic shield with an anterior, angular process on each side. Dorsum of third abdominal segment without a projecting wart. Abdominal segments 6 to 8, inclusive, each with 2 dorsal annulets, each annulet with a sparsely set transverse row of short, slender setae. Venter of last abdominal segment covered with numerous (200 or more), short, rather stout, caudally directed setae. Ventral anal lobe entire but with a deep median cleft which, on some larvae, joins a transverse cleft forming an inverted Y or T (figure 4).

Legs each with 1 or 2 apical setae (usually 2) surrounded by a circlet of 8 setae. Claws absent. (Figure 8.)

The larva of *Deltochilum* is quite similar in general appearance to that of other coprine larvae and possesses the characteristics of the subfamily Coprinae as listed previously by the junior author (Ritcher, 1945). *Deltochilum* larvae resemble *Pinotus, Copris, Phanaeus* and *Canthon* larvae in having anterior projections of the thoracic shield, and like *Pinotus* larvae they have 2 terminal setae on the apical segment of each leg. *Deltochilum* larvae resemble some *Copris* larvae in having a cleft ventral anal lobe.

In Ritcher's 1945 key to coprine larvae, *Deltochilum* larvae will key out to the genus *Pinotus*. They may be most easily distinguished from *Pinotus* by the setation of the venter of the last



Figures 3-11. *Deltochilum gibbosum* (Fab.). 3. Head, frontal view. 4. Venter of tenth abdominal segment. 5. Epipharynx. 6. Left mandible, dorsal view. 7. Right mandible, dorsal view. 8. Tip of left mesothoracic leg, side view. 9. Distal portion of right antenna. 10. Uncus of lacinia of right maxilla. 11. Right maxilla, labium and hypopharynx. Abbreviations: AA—Anterior angle, ASL—Anal slit, CPA—Chaetoparia, DAL—Dorsal anal lobe, DX—Dexiotorma, F—Frons, G—Galae, GL—Glossa, L—Labrum, LA—Lacinia, LP—Labial palpus, LPH—Laeophoba, LH—Laetorma, MO—Mola, MPH—Mesophoba, O—Oncylus, PE—Pedium, PFS—Posterior frontal setae, PPH—Protophoba, SN—Scissorial notch, ST—Maxillary stridulating area, VAL—Ventral anal lobe.

abdominal segment, which in *Pinotus* includes 2 polystichous palidia.

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COLEOPTERA FOUND IN THE PADDY FIELDS OF THE NORTH TEMPERATE REGION OF JAPAN

By YOSHIAKI NISHIO

Hokkaido National Agricultural Experiment Station
Kotoni, Sapporo, Japan

Under the direction of Dr. S. Kuwayama, I have had a chance to investigate the insect fauna of the paddy fields of Hokkaido National Agricultural Experiment Station, which is located in the north temperate region of Japan, since the beginning of 1951. About twice a week, I collected all kinds of insects from the fields and found more than 110 species of Coleoptera. These beetles were of the families Cicindelidae, Carabidae, Haliplidae, Gyrinidae, Staphylinidae, Histeridae, Hydrophilidae, Coccinellidae, Heteroceridae, Anthicidae, Chrysomelidae, Curculionidae, and Scarabaeidae (dung beetles only).

In the following list, Staphylinidae, Histeridae and Scarabaeidae are omitted, owing to incomplete identification. It is needless to say that this list is an incomplete one, and many species, harmful or beneficial to the rice culture, will be added by future investigators.

I am grateful to Dr. S. Kuwayama for giving me an opportunity to carry out this investigation and to Mr. A. Habu for helping me throughout the course of this study.

Family Cicindelidae

1. Cicindela transbaicalica Mots.
2. Cicindela elisae Mots. (The adults of this species were abundantly found on the foot paths of fields from June to September and larvae were observed commonly in their holes at the same place during the summer.)

Family Carabidae

1. Omophron limbatus Fabr.
2. Calosoma maderae Fabr. (I found only several adults. Perhaps they were attracted to light traps.)
3. Dyschirius ovicollis Putz.
4. Clivina sp.
5. Bembidion niloticum Dej.
6. Bembidion articulatum Panz.
7. Bembidion paediscum Bat.

8. Bembidion morawitzi Csik. (From May to October, the preceding three species of Bembidion were found abundantly. Fresh adults were observed in August and September.)
9. Tachyta sp.
10. Dolichus halensis Schall.
11. Agonum impressus Panz.
12. Agonum magnum Bat.
13. Poecilus encololus Solsk.
14. Poecilus sp.
15. Pterostichus prolongatus Moraw.
16. Pterostichus thunbergi Moraw.
17. Pterostichus haptoderoides japanense Lutsh.
18. Amara chalcites Dej.
19. Amara sp.
20. Anisodactylus signatus Ill.
21. Harpalus capito Moraw.
22. Harpalus modestus Dej.
23. Harpalus sp.
24. Harpalus sp.
25. Harpalus sp.
26. Trichotrichus longitarsus Moraw.
27. Stenolophus propinquus Moraw.
28. Acupalpus lucidus Moraw.
29. Acupalpus castaneipennis Bat.
30. Chlaenius micans Fabr.
31. Chlaenius posticalis Mots.
32. Chlaenius pallipes Gebl.
33. Chlaenius variicornis Moraw.
34. Chlaenius circumdatus Brull.
35. Chlaenius inops Chaud.
36. Chlaenius xanthopleurus Chaud.

Family Haliplidae

1. Peltodytes intermedius Sharp

Family Dytiscidae

1. Noterus japonicus Sharp
2. Hyphydrus japonicus Sharp
3. Graptodytes natrix Sharp
4. Agabus japonicus Sharp
5. Rhantus pulverosus Sharp
6. Eretes sticticus L.

7. Hydaticus bowringi Clark
8. Hydaticus grammicus Germ.
9. Cybister japonicus Sharp

Family Gyrinidae

1. Dineutus orientalis Mode

Family Hydrophilidae

1. Berosus signaticollis punctipennis Harld.
2. Helochares striatus Sharp
3. Hydrophilus affinis Sharp
4. Hydrophilus libera Sharp
5. Hydrous acuminatus Mots.

Family Coccinellidae

1. Hippodamia tridecimpunctata L.
2. Propylaea japonica Thunb.

Family Anthicidae

1. Notoxus daimio Lew.

Family Chrysomelidae

1. Lema oryzae Kuwayama
2. Crepidodera lewisi Jacobson (I observed many adults of this species eating the pollen of rice plants.)

Family Curculionidae

1. Echinocnemus squameus Billb.

INSECTS OF MICRONESIA

The Pacific Science Board (National Research Council) has been sending entomologists to Micronesia for several seasons on an entomological survey program which is to be completed during 1952. Several museums (Chicago Natural History Museum, California Academy of Sciences, Museum of Comparative Zoology and Bishop Museum) have cooperated in mounting much of the material. Other institutions, such as the United States National Museum and Kyushu University (Japan), are helping by supplying unstudied material from Micronesia.

The above material is being distributed to many specialists for study, and the results are to be published at the Bishop Museum. Those interested in studying particular groups from Micronesia are requested to write to the undersigned at Pacific Science Board, c/o Bernice P. Bishop Museum, Honolulu 17, Hawaii.

J. Linsley Gressitt

LETTER TO MEMBERS

September 1, 1952

Dear Member:

The results of the recent voting on the proposed amendments to the constitution of The Coleopterists' Society are very discouraging. Of the 218 persons eligible to vote on these amendments, only 60 responded. Our constitution requires that we must have a ⅔ majority of the *membership*, not just of those voting, in order to ratify any constitution changes.

This letter is to bring this fact to the attention of all of those who have not as yet voted on these constitution changes. If the ballot previously sent to you is not returned by October 1st, we will assume that your vote is "yes" on all amendments, and it will be so counted.

I am sorry to have to use this method to secure votes, but for the proper conduct of the business of the Society, it is necessary to settle this matter as early as possible. I also know that many of you did not fully realize this querk in our constitution even though it was pointed out in my letter to you. I hope that this method will settle the problem, and that we will be able to have an election of officers this fall.

Sincerely yours
Ross H. Arnett, Jr.
Manager of the Society

CORRECTIONS AND ADDITIONS TO THE MEMBERSHIP AND SUBSCRIPTION LIST

The following changes must be made to bring the list of members and subscribers up to date. The last list was complete through April 30th, 1952. These changes make it complete through July 25th, 1952.

New Members

Boody, Mr. Dennis W., (M), 11211 5th NE, Seattle 55, Wash.
Eastin, Mr. James, (M), 929 South 8th East, Salt Lake City, Utah.
Long, Mr. W. H., (M), Box 5215, State College Station, Raleigh, N. C.
Miller, Mr. William V., (M), University of Wisconsin, Madison 6, Wisc.
Rosales, Sr. Carlos Julio, (M), Apartado 643, Maracay, E. Aragua, VENEZUELA.
Wright, Kenneth H., (M), 445 U. S. Court House, Portland 5, Ore.
Zimmerman, Dr. E. C., (M), Experiment Station of the Hawaiian Sugar Planters Association, Honolulu 14, Hawaii.

Address Changes

Haig, Mr. Thomas R., Jr., (M), Route 2, Box 2357, Carlsbad, Calif.
Nelson, Mr. Harry G. (M), Address given is incorrect. No known address.
Rosenberg, Mr. William, (M), Address given is incorrect. No known address.
Shaw, Mr. C. (M), 115 Fifth Ave., Yorkton, Sask., CANADA.
Smith, Dr. Arthur C. (M), P. O. Box 411, Berkeley, Calif.
Telsch, Mr. Theo. M. (M), 6020 N. "A" St., Philadelphia 20, Pa.
Townes, Dr. Harry K., Jr., (M), MSA—STEM, A.P.O. 928, c/o Postmaster, San Francisco, Calif.
Ebel, Mr. B. H. (M), Address given as incorrect is correct.
Strohecker, Mr. H. F. (M), Dept. of Zoology, Box 488, University of Miami, Coral Gables (Univ. Br.) 46, Fla.
Rockefeller Foundation (S), Agricultural Library, 49 West 49th St., New York 20, N. Y.

New Subscriber

San Diego State College (S), San Diego 15, Calif.

This brings our total membership up to 218, and subscribers up to 62, giving a total of 280 members and subscribers.

R. H. A.

DEATH NOTICE

Word has been received that Dr. Johannes Bastiaan Corporaal died on May 28, 1952 at the age of 72. Dr. Corporaal worked for many years on the beetle family Cleridae and was known as the world's foremost authority on that group.

R. H. A.

THE BERNHAUER COLLECTION GOES TO CHICAGO

The famous Max Bernhauer collection of Staphylinidae has been purchased by the Chicago Museum of Natural History and is now in that collection. Dr. Rupert L. Wenzel of the Chicago Museum went to Austria to supervise the packing and shipment of this collection of 100,000 beetles, which contains 5,000 types.

This collection was started in 1898 by Bernhauer, who was a minor public official near Vienna, and he continued to add to it until 1946, when he died of starvation in the Russian Zone of Austria. This collection is valuable not only for its types but also because it contains examples of most of the known species of this large family.

R. H. A.

Bibliographia

CURRENT LITERATURE

Compiled by Ross H. Arnett, Jr.

This section is designed to contain all papers on the Coleoptera of North and South America which are not in the **Catalogue of the Coleoptera of America, North of Mexico** and its supplements, or in the **Checklist of the Coleopterous Insects of Mexico, Central America, the West Indies, and South America** and which have not been previously listed in The Coleopterists' Bulletin.

New publications:

Rev. Chilena Ent.—Revista Chilena de Entomologia.

Ent. Arb. Mus. Frey—Entomologische Arbeiten aus dem Museum G. Frey, München.

Mitt. Münchner Ent. Ges.—Mitteilungen der Münchner Entomologische Gesellschaft.

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THE COLEOPTERISTS' BULLETIN

VOLUME 7, 1953

Published Bimonthly Beginning With February
at Washington, D. C.

THE COLEOPTERISTS' BULLETIN

The Coleopterists' Bulletin is published and edited by Dr. Ross H. Arnett, Jr., c/o Division of Insects, U. S. National Museum, Washington 25, D. C. It is issued six times a year beginning with February.

Subscriptions: The subscription price for each annual volume of six numbers is $4.00 payable in advance. All subscriptions begin with the first issue of the year and those subscribing later in the year will receive the back issues of that volume.

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The Coleopterists' Bulletin

Volume VII FEBRUARY, 1953 No. 1

Published bimonthly beginning with February by Sherwood House, Publishers, P. O. Box 855, Washington 4, D. C. Terms of subscription: $4.00 per year, both domestic and foreign, payable in advance. Remittances should be made payable to Sherwood House. Back numbers are available. All correspondence should be addressed to Box 855, Washington 4, D. C.

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DISTRIBUTION OF CARABUS VIETINGHOFFII IN NORTH AMERICA

By S. D. Hicks
Systematic Entomology, Division of Entomology
Ottawa, Canada

Carabus vietinghoffii Adams, a large and beautiful ground beetle, was originally described from Siberia, where, in its various races and forms, it is widely distributed. The American form has not been compared with the Siberian forms, but according to the literature the species is distributed in northwestern North America from Bering Strait across Alaska north of the sixty-third parallel and through the northern Yukon to the Mackenzie Delta region. Recent collections made in the Canada Northern Insect Survey show that the species also occurs from the Mackenzie River east to Bathurst Inlet north of the sixty-fifth parallel, in which area it inhabits both barren ground and tree country. The following notes are a summary of the distribution of the beetle in North America.

The most westerly record is by Mannerheim (1852), who stated that the species occurs on the beach of Bering Strait. Horn (1876) commented, "This species is found in Alaska and extends its habitat toward British Columbia and also toward the Hudson's Bay region. Numerous specimens were collected by the late Robert Kennicott in Alaska." Hatch (1949) has noted that Horn's statement "is an insufficient basis for listing it from British Columbia as is done by Breuning, Mon. Gatt. *Carabus*, 1935, p. 1212, and Blackwelder, Fourth Suppl. Leng Cat.

Col. Am. n. of Mex., 1939, p. 11." The writer knows of no specimens which would validate the British Columbia and Hudson's Bay region records. Van Dyke (1944) gave the following data for the seven specimens that he studied from Alaska: St. Michael (63°30′ lat., 152°06′ long.), August, one specimen; Rampart (65°30′ lat., 150°09′ long.), May and June, two specimens; Chatanika (65°07′ lat., 147°25′ long.), August, one specimen; Fort Yukon (67°36′ lat., 145°15′ long.), three specimens. The most recent Alaskan record is that of Weber (1950), who recorded the species from Umiat (69°28′ lat., 151°53′ long.), Alaska, "top of valley, 750 feet, July 3, 1949." Hamilton (1894) stated that the beetle occurs in the northern parts of the Yukon. Van Dyke (1944) recorded four specimens in the collection of Owen Bryant. These were taken in the Mackenzie Delta region of the Northwest Territories, two being from Fort McPherson (67°27′ lat., 134°49′ long.) in July, and two from Aklavik (68°15′ lat., 135°02′ long.) on October 1.

From the Northwest Territories, Kirby (1837) described and figured a specimen collected by the Sir John Richardson expedition. The party passed through the Great Bear Lake region, and it is probable the specimen was taken near Fort Franklin in latitude 65°. During the summer of 1949, W. R. M. Mason, Division of Entomology, and the writer collected ten specimens in the immediate vicinity of Norman Wells (65°16′ lat., 126°52′ long.), Northwest Territories, while on Northern Insect Survey work. In this area the dominant growth is forest, consisting chiefly of stands of balsam poplar, birch, and spruce. Many of the trees attain large size. The beetles were taken under debris in the settlement, or under old logs on cleared land northeast of the settlement.

A good series of this species was obtained by the writer during the summer of 1951 at Coppermine (67°49′ lat., 115°08′ long.) in the Northwest Territories. This locality is well north of tree country. Twenty specimens were collected under cover of debris and rock in the settlement and on the tundra within a mile of the settlement. One site seemed to be particularly favorable; about a dozen were taken from under rocks on the talus slope at the base of a south-facing basalt cliff a mile south of the settlement.

Also well north of tree country, the most easterly record is that of one specimen collected in the Northern Insect Survey at Bathurst Inlet (66°49′ lat., 108°06′ long.) in the Northwest Territories during the first week of July, 1951.

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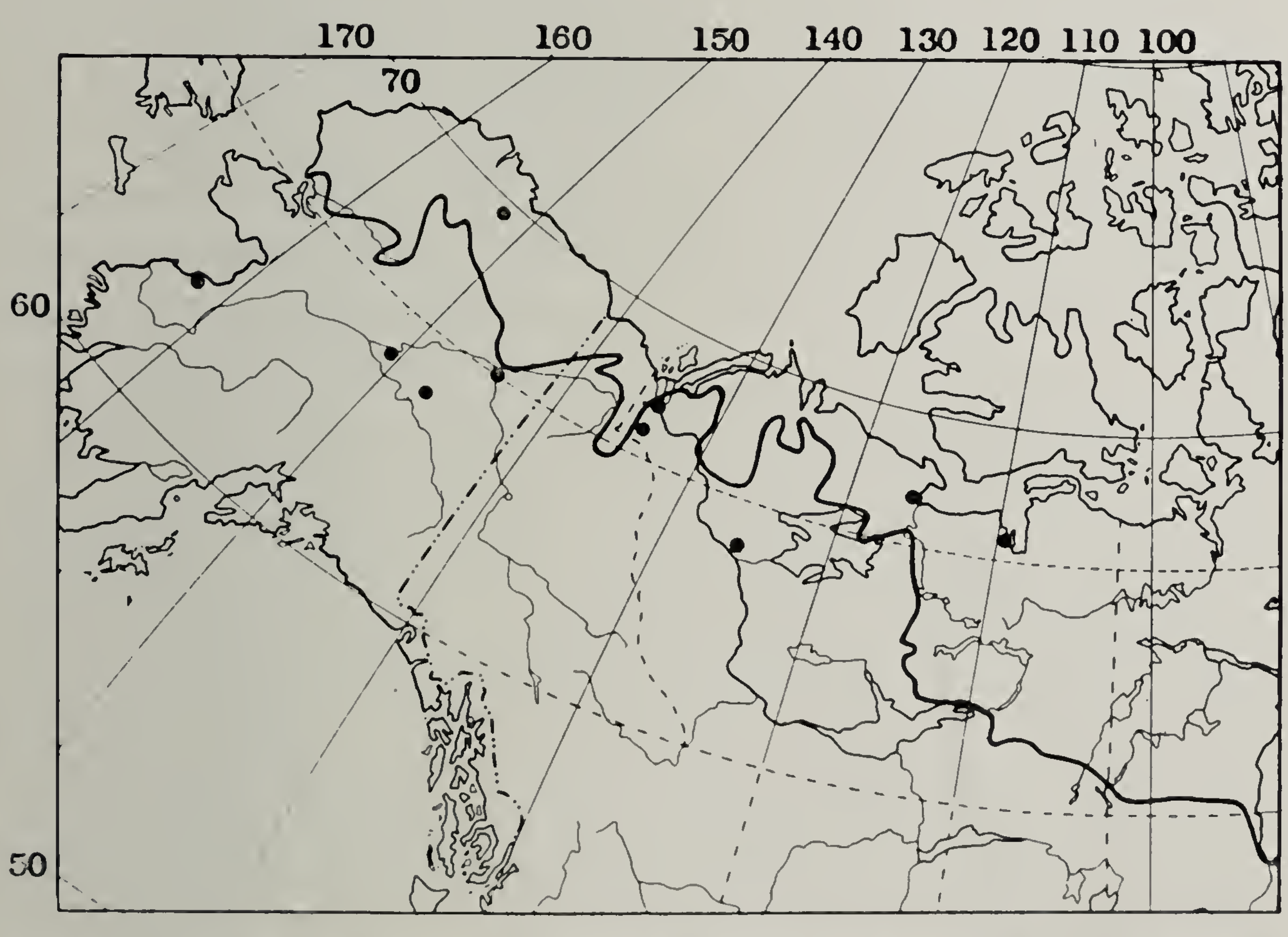

Figure 1. Locality records of *Carabus rietinghoffii* in America. The species has been reported also from Bering Strait and northern Yukon. The heavy line indicates the approximate limit of trees.

THE REAL SOURCE OF AMPHIZOA SECRETIONS

By J. Gordon Edwards
San Jose State College

In all known publications concerning the peculiar adephagous family Amphizoidae (including the author's recent revision[1]) an observational error has been perpetuated. This error is one resulting from the aquatic habit of all species of *Amphizoa*. When specimens are handled or agitated, they emit a viscous yellowish fluid which has an odor not unlike that of over ripe cantaloupes. It has always been believed that this exudation came from the joint between the femur and tibia of each hind leg. Actually it is discharged from the anus and is immediately spread over the entire abdominal surface by the threshing about of the hind legs. Since the femora are just long enough to reach this fluid discharge, the observer always sees the femoral tips well covered with it. The fluid diffuses rapidly throughout the watery film on the abdominal sternites, and it is impossible by any superficial observation to determine its origin. The writer collected large numbers of *Amphizoa* last summer and placed them in glass tumblers to observe their behavior. It was impossible to tell where this yellowish liquid originated, even though the insect was under very close scrutiny at all times during its emission. Therefore a fresh specimen was placed in a dry glass tumbler and left until all of the water had evaporated from its body. It was then dumped out and quickly grasped between thumb and index finger and placed upside down under a stereoscopic microscope. Immediately a distinct yellowish mass of fluid was observed to be forming between the 9th hemitergites (or the paraprocts of the female) and the proctiger. After this bubble had reached considerable proportions, it was discharged with a feeble popping sound, accompanied by a mild spraying effect. As soon as the bubble was expelled the femoral tips were seen spreading the odorous substance over the terminal abdominal sternites, but the true origin of this viscous liquid had at last been satisfactorily determined.

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[1]Edwards, J. Gordon, 1951. Amphizoidae (Coleoptera) of the world. Wasmann Journ. Biol., vol. 8, pp. 303-332.

NOTES ON THE GENUS LACON (ELATERIDAE)

By Ross H. Arnett, Jr.

The type of the genus *Lacon* Castelnau is *Lacon atomarius* (Fabricius), designated by Hyslop, 1921. Unfortunately, the type specimen of this species is unavailable, so that its zoological characters cannot be determined. However, a study of the literature has revealed some evidence which I believe is sufficient for a good working basis for determining the characters to be ascribed to the genus *Lacon*.

In my recent paper on the Nearctic Adelocerina[1] I considered (on page 117) *Elater murinus* Linnaeus, 1758, as the earliest name for *Elater atomarius* Fabricius, 1798, the type of the genus *Lacon* Castelnau, 1836. Further study, given in the notes below, has shown the following synonymy to be probably correct:

Lacon punctatus (Herbst, 1779)
carbonarius (Schrank, 1781)
pulverulentus (Panzer, 1795)
atomarius (Fabricius, 1798)

Synonymical notes. Elater punctatus Herbst, 1779, Beschäftigungen der Berlinischen Gesellschaft naturforschender Freunde, vol. 4, p. 316, pl. 7, fig. 1. The figure agrees with the description of this species and is recognizable as a member of the subtribe Adelocerina. I have found no evidence to indicate any disagreement between the figure and the description, even though Panzer apparently thought otherwise, as is indicated under the note on *Elater pulverulentus* below.

Elater carbonarius Schrank, 1781, Enumeratio insectorum Austriae indigenorum, p. 184. This species is treated by Candèze, 1891 (Catalogue methodique des Élatèrides, p. 12) as the valid name, with *E. atomarius* Fabricius, *E. punctata* Herbst, and *E. pulverulenta* Panzer as synonyms. On the basis of Candeze's synonymy, I here include this species as a synonym of *E. punctatus* Herbst.

Elater pulverulentus Panzer, 1795, Deutschlands Insectenfauna, p. 235 [not Herbst, 1786, *in* Fuessley, Archiv der Insectengeschichte, vol. 7, p. 172, a synonym of *Chalcolepidius porcatus* (L.)]. The Panzer species is a new name for the figure of

[1]Arnett, R. H., Jr. A review of the Nearctic Adelocerina (Coleoptera: Elateridae, Pyrophorinae, Pyrophorini). Wasmann Journ. Biol., vol. 10, pp. 103-126, 1952.

Elater punctatus Herbst, 1779, which Panzer apparently considered different from the description, because he refers to the figure only. So far, as mentioned above, there appears to be no evidence other than this to indicate that the figure of *E. punctatus* is different from the species Herbst described.

Elater atomarius Fabricius, 1798, Supplementum entomologiae systematicae, p. 136. Fabricius lists *Elater pulverulentus* Panzer as a synonym of *E. atomarius*. Apparently Fabricius realized that Panzer's name was a homonym. Panzer's description of *E. pulverulentus* agrees with Fabricius' description of *E. atomarius*, and Candèze treated both of them as synonyms of *E. punctata*. Fabricius gives this species the number 28-9 which means that it is to be inserted between species number 28 and 29 in his Entomologia Systematica, 1792, which contains *E. murinus* L. as number 26, showing that Fabricius considered the two species *E. murinus* and *E. atomarius* as separate species.

Elater murinus Linnaeus, 1758, Systema Naturae, ed. 10, page 406. This species, the type of the genus *Agrypnus* Eschscholtz, 1829, and of *Archontas* Gozis, 1886, is not Nearctic, and belongs in the genus *Adelocera* Latreille, 1829. *E. murinus* was formerly thought to be the type of the genus *Lacon*. This would have placed *Lacon* and *Adelocera* as synonyms because *E. murinus* is congeneric with *E. ovalis* Germar, 1824, the genotype of *Adelocera*. Since it has now been shown that the genotype of *Lacon* is something entirely different, the generic name *Lacon* again becomes available for our Nearctic species. No members of the genus *Adelocera* are found in the Nearctic region. *Adelocera murinus* (Linnaeus) then becomes simply an included species within the old world genus *Adelocera*.

From the above discussion it may be seen that the zoological basis of the genus *Lacon*, if the present synonymy is correct, includes the characters of the species *Elater punctatus* Herbst. The subgenus *Danosoma* Thomson, 1859, then becomes a synonym of *Lacon* because the genotype of *Danosoma* is *Elater conspersa* Gyllenhal, which is congeneric with *Lacon punctatus*.

It has been brought to my attention by several colleagues that the name *Lepidotus* Stephens, 1830 is a homonym of *Lepidotus* Asso, 1801 (Anales de Ciencias Naturales [Madrid], vol. 4, p. 38

(fishes). This unfortunately results in further name changes in the Adelocerina. The subgenus *Lepidotus* Stephens is without a valid name. I therefore here propose the new name *Zalepia* (Gr., very small scales; feminine) to replace the homonym *Lepidotus* Stephens. The genotype of *Zalepia* is automatically the same as that of *Lepidotus* Stephens, which is *Elater varius* Olivier, 1790 by designation of Hyslop, 1921. *Zalepia* includes the Nearctic species, *Z. modesta* (Boisduval), *Z. impressicollis* (Say), *Z. discoidea* (Weber), *Z. aurorata* (Say), *Z. maculata* (LeConte), and *Z. candida* (Fall).

The following is a list of the Nearctic subgenera of *Lacon* as the results of these changes:

Lacon Castelnau 1836; type: *punctatus* (Hbst.)

- Subgenus *Lacon* sensu stricto
  - *Danosoma* Thomson, 1859 (subjective synonym); type: *conspersa* (Gyll.)
- Subgenus *Zalepia* Arnett; type: *varius* (Oliv.)
  - *Lepidotus* Stephens (not Asso, 1801); type: *varius* (Oliv.)
- Subgenus *Diphyaulon* Arnett, 1952; type: *pyrsolepis* (LeC.)
- Subgenus *Aulacon* Arnett, 1952; type: *nobilis* (Fall)

Thus, the fifteen species included in the genus *Lepidotus* in my Nearctic revision are now in the genus *Lacon*; the six species included in the subgenus *Lepidotus* are now in the subgenus *Zalepia*; the four species in the subgenus *Diphyaulon* remain in that subgenus, but as *Lacon* (*Diphyaulon*); the three species in *Aulacon* remain in that subgenus, but as *Lacon* (*Aulacon*), and the two species in the subgenus *Danosoma* are now in the subgenus *Lacon* sensu stricto.

ADULT LONGEVITY IN DIAPERIS MACULATA (TENEBRIONIDAE)

By Edwin W. King and Leslie H. McMullen
Department of Entomology, University of Wisconsin

In routine biological and distributional studies of Wisconsin insects known to be associated with *Chalara quercina* Henry, the fungus which causes oak wilt, certain details of the biology and habits of fungus-feeding beetles are emerging and may be of interest to coleopterists. The present note is concerned with the longevity, in captivity, of the adult of the not uncommon tenebrionid *Diaperis maculata* Olivier.

Two male adults were collected by L. H. McMullen under loose bark of a large dead oak near Plover, Wisconsin, on August 2, 1951. They were found to feed readily on *Chalara* and for the next six weeks were subjected to various experiments to determine their possible role as vectors of the oak wilt disease. They were shown to prefer *Chalara* to *Penicillium* sp. but were eventually abandoned as unpromising leads in the oak wilt problem. However, they were maintained on successive petri dish cultures of *Chalara* in an incubator at 80° F. until late November, when they ceased feeding. They were then placed under refrigeration until early April. With the coming of spring they resumed feeding, and continued to feed through the summer of 1952, again under incubator conditions. Both were found dead on September 18, 1952, after having been last seen alive four days previously. They had lived as adults in captivity on a diet of the fungus *Chalara* for thirteen and one-half months. The condition of their last culture indicated that starvation was not the cause of death.

The work reported here was supported in part by funds administered by the National Oak Wilt Research Committee, to whom grateful acknowledment is made.

The Coleopterists' Bulletin

Volume VII APRIL, 1953 No. 2

Published bimonthly beginning with February by Sherwood House, Publishers, P. O. Box 855, Washington 4, D. C. Terms of subscription: $4.00 per year, both domestic and foreign, payable in advance. Remittances should be made payable to Sherwood House. Back numbers are available. All correspondence should be addressed to Box 855, Washington 4, D. C.

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Entered as second-class matter at the post office at Washington, D. C.

OBSERVATIONS ON THE BIOLOGY OF PSOA MACULATA LECONTE (PSOIDAE)

By J. W. Tilden

San Jose State College, California

This species is found breeding commonly in dying wood of *Baccharis pilularis* De Candolle. More than one hundred specimens were reared from material taken at Alum Rock Park, Santa Clara County, California, on February 23, 1947. The infestation was heavy, many larvae and pupae being found in a single stem. The wood had been eaten so completely that sticks up to one inch in diameter could be broken easily between the fingers.

Most of the infested limbs were ones that had been broken down by some mechanical means but which remained attached by a small part to the bushes. This circumstance insured that the drying of the branches had been slow. Such a condition is favorable to the breeding of this beetle. Nearby shrubs killed slowly by being partly buried by a landslide were also heavily infested. There seems to be no evidence that this species attacks healthy living plants, but rather that attacks are confined to weakened, declining, and slowly dying bushes.

In addition to reared material, numerous specimens were taken in the field by beating on *Baccharis* plants. Laboratory-reared material emerged in March, the earliest date March 2, but material taken in the field ranged in dates from March through May.

Adults are active and nervous, flying readily. Males average smaller than females, and are carried by the females in copulation. Pairs confined in test tubes mated frequently. During copulation the "ovipositor" (actually the telescoped terminal abdominal segments) is withdrawn, and the sternite of the fifth segment is relaxed and moves forward, allowing the genitalia of the male to enter. Often the male tries without success to copulate, the female not relaxing the fifth sternite. Copulation was timed on three occasions and was found to be 42 minutes, 57 minutes and 90 minutes respectively in these three cases. Observation was on pairs isolated in thin glass tubes, by means of binocular microscope.

Females mated on March 3 produced eggs on March 7, four days later. Four gravid females laid 71 eggs between noon, March 7, and 9 a.m. March 8, after being placed on suitable wood which did not shelter previously laid eggs, an average of almost 18 eggs per female in 21 hours. Other matings showed that four days was a normal lapse of time between mating and oviposition. Total egg production of laboratory females was not high, about 37 eggs per female. Females lived from 12 to 14 days in the laboratory, while males averaged 7 to 10 days. No doubt the insects live longer in a natural state, but no method was devised for keeping them alive longer in the laboratory. The adults feed but little on the foliage of the plant, and the food of the adults was not found. Water was taken readily from moist sand or from droplets on leaves.

The eggs average 1.2 mm. in length, and are covered by a very thin flexible chorion, of a whitish color. They are equipped with a slender pointed projection which varies in length in different eggs, but which measures on the average about 0.2 mm. in length. This projection is terminal in the horizontal axis of the egg, and its function was not found. However, in eggs preserved in 70% alchohol, a protoplasmic connection was seen to extend into this projecting process. The chorion is apparently smooth under magnification up to 30 diameters, and shrivels when the egg dries. A moderate amount of desiccation seems to have no ill effect upon the viability of the egg. Eggs isolated in small vials and allowed to dry, shriveled appreciably but hatched as soon as eggs left in the original site of oviposition.

Eggs are laid on either very dead wood or upon fresh-cut wood that has been allowed to stand for several days. Fresh-cut wood is not at once attractive to the females. *Baccharis* wood that has been allowed to stand for several days after cutting develops an aromatic odor that may be the atrahent. The fact that very fresh wood is not attractive to females is in keeping with the observation that the healthy plants are not attacked. However, field observations seem to indicate that eggs laid on completely dead wood do not succeed, while those laid on dying wood do.

Eggs may be deposited either in cracks in the bark or in axils of small branches, and are usually well concealed. The ovipositor is remarkably extensile. Eggs were found inserted under loose bark to a distance of 3.5 mm., measuring from the loose edge. Since adult beetles measure but 6 to 10 mm. in length, it appears that the ovipositor can be extended from one-third to one-half the length of the body. It should be remembered that the ovipositor, so called, of these beetles is in reality the extensible terminal abdominal segments.

Eggs laid on March 10 hatched on March 24. Few sterile eggs were noted. The larvae eclose from the egg by eating away the chorion from the side of the egg that is free of the wood surface. Since the eggs lie on their sides, the larvae thus eclose somewhere on the periphery of the short axis of the eggs. The remaining chorion is not eaten by the larva, which wanders away and soon gains entry to the wood by means of small cracks in its surface. The larva does not go from the egg directly into the food supply, but comes out on the surface and then enters the wood. Those eggs laid on smooth surfaces seem to have a high mortality rate for the larvae, since these larvae are in poor position to enter the wood. The newly hatched larvae are scarabaeiform and poorly adapted to movement on open surfaces. Most of the exposed larvae soon lost footing and fell to the bottom of the containers.

It was not found possible to duplicate in the laboratory the slow drying of the wood in which larvae develop in the field. Old wood from which adults had issued, while oviposited upon, was not suitable for larval development, and larvae that hatched on it soon died, seemingly from starvation, since they became thin and emaciated before completing the first instar. Freshly-cut wood dried too rapidly and soon became very hard, and the larvae completed but two instars, then apparently found the wood too hard to eat, and soon also died.

From field observations it is possible to reconstruct most of the life history. Infested wood examined in July showed only immature larvae, but wood examined in early winter and again in the early spring, showed both mature larvae and pupae. Mature larvae that pupated in the laboratory emerged after a pupal period of about 21 days. From this it is concluded that eggs laid in the early spring hatch in about two weeks, that the larvae feed for about ten months and mature in a single year. Two parasites were reared: *Cryptohelcostizus alamedensis* (Ashmead), and *Eubadizon* sp. Thanks are due Mr. C. F. W. Muesebeck and Dr. H. K. Townes, for the determination of the parasites.

Because *Psoa maculata* LeC. confines its activities to dying or dead plants, it cannot be regarded as injurious to the host plant. Ecologically, its services in reducing these plants is a useful one. It is the only beetle associated with *Baccharis pilularis* that appears to have this particular role.

A NEW BEMBIDION (CARABIDAE) OF ZOOGEOGRAPHIC INTEREST FROM THE SOUTHWEST PACIFIC

By P. J. Darlington, Jr.

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The new *Bembidion* described below comes from a remote part of the world, from the tropical island of Morotai in the Moluccas not far northwest of the ''Bird's Head'' of New Guinea, but nevertheless it has a significance for coleopterists even in North America. It is an example of what is probably a very common thing: an insect from a distant country which may help toward an understanding of something in our own fuana.

The new species belongs to a group, now usually considered a subgenus of *Bembidion*, called *Cillenus* Samouelle. The group in a broad sense (including *Armatocillenus* Dupuis and *Chinocillenus* Netolitsky) is rather diverse in some ways but is characterized by a very large head, long mandibles, deep posterior transverse sulcus of pronotum, and well developed marginal elytral channels. The species of the group have been reviewed by Andrewes (Proc. Roy. Ent. Soc. London, series B, vol. 7, 190-196, 1938). Most of them, in fact all of which the habitat has previously been known, live on the seashore, and they are usually found far below high-water mark. They are thus true inter-tidal insects, and it is this which gives them their unusual interest and special zoogeographic importance. Many of them, like many other sea-side insects, are flightless, and some of them have assumed the characteristic testaceous color of such insects. They are widely scattered over the Old World, species having been found in Europe, China, Japan, Formosa, New Guinea, Fiji, Australia, and New Zealand. They have not yet been found in the New World but the distribution of the group is probably still far from completely known.

How this group has dispersed over its wide range can only be guessed at. Most of the species must be either very salt-tolerant or able to protect themselves against salt water, so they may have dispersed partly on ocean drift. On the other hand the basic stocks of *Bembidion* are winged and can fly, and some of the winged forms have reached very remote islands, including New Zealand and the Hawaiian Islands, so the ancestor of *Cillenus* may have been winged and may have dispersed partly by flight, the wings then atrophying independently in different species in different places. It is in this connection that the present new species is significant. It is certainly a *Cillenus* within the limits set by Andrewes (*op. cit.*), but it is fully winged and (if my memory is correct) it flies, and it does not live by the sea but in gravel bars beside running fresh water. It is therefore the sort of insect from which *Cillenus* has probably been derived and which may have effected its main dispersal before the adaptation of different species to the inter-tidal zone.

This hypothesis, or guess if you prefer, fits in an interesting way into what is known of the pattern of distribution of *Bembidion* as a whole. This enormous genus occurs mostly in the north-temperate zone. There are smaller numbers of species at low altitudes in the south-temperate zone in South America and Australia, but there are very few of them in the tropics, except a few on high mountains. In New Guinea, for example, where thousands of individual Carabidae have now been collected (about 10,000 by myself), no *Bembidion* has yet been found (not even in the mountains!)except one specimen of a *Cillenus* of which the habitat is unknown. And in northern South America, inland from Santa Marta, Colombia, where I lived for more than a year in 1928-29, the only *Bembidion* I was able to find at low altitudes belonged to the *constrictum-contractum* group of the genus and lived on salt flats, where individuals of it were common. (I found two other species of *Bembidion* at high altitudes in the Santa Marta mountains.) Generally speaking, in fully tropical lowlands everywhere in the world *Bembidion* is nearly or entirely replaced by great numbers of *Tachys*, of which different species inhabit all sorts of wet places (including salty ones), dry ground, bark of logs, and sometimes even arboreal habitats. Since *Tachys* rapidly diminishes in numbers northward and to some extent also southward in the temperate zones, its area of abundance is complementary to that of *Bembidion*. What the explanation of this is in terms of tolerances and competition I do not know.

I have found several indications, including the occurrence of *Bembidion* in northern South America as mentioned above, that the few species of the genus that do occur in the full tropics may be salt-loving or salt-tolerant forms. Whether this is the rule, and if so why, would make a fascinating study in ecological zoogeography. If it is the rule, the mere presence of *Cillenus* on tropical Morotai would suggest that the insect is salt-tolerant even though it was not found in the saline habitat, and this is just what we should expect of the ancestor of the inter-tidal species *Cillenus*.

The facts and guesses already presented, that there exists in the Moluccas a winged species which may be guessed from its occurrence in the tropics to be salt-tolerant and which is suitable to have effected the dispersal of *Cillenus* by flight and to have been the ancestor (or to be like the ancestor) from which the inter-tidal species may have been derived in different places, are perhaps sufficiently interesting to justify the publication of this short paper in the *Coleopterists' Bulletin*. But all this may have a more direct application to our fauna. We have on the west coast of North America, in California, an inter-tidal *Bembidion* (*tigrinum* LeC.) which lacks the technical characters of *Cillenus* but resembles it in appearance and way of life. In fact it is so much like *Cillenus sinicus* Andrewes of China superficially that I was astonished to find how different it is in detail. The ancestry of this species is unknown, or at least I do not know it. It may possibly be derived from the same ancestor as

Cillenus before the latter's distinguishing characters were evolved. Or it may be independently derived from a different ancestor, and in that case it is only a rather striking example of convergence. But even in that case, an understanding of *Cillenus* should help in understanding the convergent case of *Bembidion tigrinum*.

The new Moluccan species which has instigated the present paper may be called

Bembidion (Cillenus) alatum n. sp.

Rather slender, subparallel, elytra slightly depressed; greenish or aeneous black; elytra each with a sublateral blotch and a variable area near outer apical angle (sometimes including apex) more or less paler; lower surface piceous with epipleurae paler; legs including femora, palpi including penultimate segments of the maxillary ones, and antennae near the base testaceous; outer antennal segments browner; microsculpture distinct (less so in small areas near middle of head and pronotum), nearly isodiametric, slightly transverse on elytra. *Head* formed as usual in subgenus, large almost as wide as prothorax by measurement and appearing slightly wider; mandibles long; eyes moderately prominent; frontal sulci rather wide, deep straight, parallel, continued onto clypeus; antennae slender in genus, with middle segments (seen from side) about twice as long as wide; mentum almost edentate (if tooth is considered present, it is very short, wide, often irregular). *Prothorax* convex, cordate, one fifth or one fourth (by measurement) wider than long; base slightly (about one tenth) narrower than apex, more or less arcuate (variable), slightly emarginate near sides, not distinctly margined; sides vaguely crenulate posteriorly, moderately rounded anteriorly, sinuate posteriorly well before almost right, scarcely blunted posterior angles; apex truncate or nearly so, not margined; lateral margins each with a seta at basal angle and another far forward, before anterior fourth; median line fine; basal transverse sulcus deep but not distinctly crenulate, running into small basal foveae at sides. *Elytra* one fourth or less wider than prothorax, rather long, subparallel, subdepressed, with normally prominent humeri; basal margin joining bases of fifth striae (same on both sides in all specimens), at most weakly subangulate at humeri; sides with a small but rather abrupt sinuate emargination before apex in both sexes; striae entire, rather deep, fifth and eighth deeper at apex; intervals moderately convex, eighth narower and more convex, third 2-punctate (punctures near or slightly before middle and behind apical fourth). Inner wings fully developed. Prosternal process lightly longitudinally impressed; metasternal process not margined; metepisterna long, very narrow posteriorly; posterior trochanters about one half length of femora, only bluntly pointed, not produced in male. Male with first two segments of each front tarsus slightly dilated, with squammules below. Length about 4.0 (only slight variation); width about 1.4 mm.

Holotype (M. C. Z. Type No. 29,020) and 11 paratypes all from the southern lowlands of Morotai Island, Moluccas, September, 1944, taken by myself by throwing water over gravel bars in a clear, flowing stream. I think the beetles flew actively, but perhaps my memory is not to be trusted on this point.

This new form is evidently related to *Bembidion* (*Cillenus*) *albertisi* Putzeys, which is known only from the unique type from Sorong, New Guinea. I have not seen the specimen, but it has been redescribed by Andrewes (*op. Cit.* p. 192). Whether or not *albertisi* is fully winged is not stated. Careful comparison of my specimens with Andrewes' description of other characters reveals several differences of which the most important may be that, in *albertisi*, the basal margin of the elytron reaches the fourth stria, while in my series it reaches only the fifth, but this difference could be an individual one or a mistake by Andrewes. A less important but more certain difference is that in *albertisi* the penultimate segment of the maxillary palpi, and also apparently the femora, are dark, while in my specimens they are pale. My specimens apparently differ from *albertisi* also in having the basal transverse sulcus of the pronotum not distinctly crenulate (but the difference may not be very great), and there are apparently other small differences hardly worth mentioning and certainly not worth emphasizing. I am reasonably sure that the new form is different from *albertisi*, but I am not so sure whether it should stand as a full species or as a geographical subspecies. Time and more material will tell, and in the meantime the Moluccan form, because of its ecological and zoogeographical interest, should be made known and should have a name.

The Coleopterists' Bulletin

Volume VII JUNE, 1953 No. 3

Published bimonthly beginning with February by Sherwood House. Publishers, P. O. Box 855. Washington 4, D. C. Terms of subscription: $4.00 per year. both domestic and foreign. payable in advance. Remittances should be made payable to Sherwood House. Back numbers are available. All correspondence should be addressed to Box 855, Washington 4. D. C.

The general policies of The Coleopterists' Bulletin are determined on the recommendation of the following Advisory Board: Dr. Ross H. Arnett, Jr., U. S. Department of Agriculture (Manager); Dr. Richard E. Blackwelder. U. S. National Museum (Editor); Dr. P. J. Darlington, Jr., Museum of Comparative Zoology: Dr. Henry Dietrich, Cornell University; Dr. J. Gordon Edwards, San Jose State College.

Manuscripts dealing with any phase of the study of beetles, including descriptive material, are invited.

Entered as second-class matter at the post office at Washington, D. C.

THE PECULIAR CLASPING MECHANISMS OF THE PHALLUS OF MALES OF PRIACMA (CUPESIDAE, OR CUPEDIDAE)

By J. Gordon Edwards

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During the examination of the forty male specimens of *Priacma serrata* (LeConte) which were attracted to the odor of Super Suds in Glacier National Park, Montana[1], some very interesting discoveries were made by the writer. It seems safe to state that the phallic structures of these males are more fantastic than any previously described from a beetle. Complete details of the external morphology of the abdomen, the genital segment (9th abdominal segment), and the male terminalia of *Priacma* are to appear soon in the Bulletin of the Institut Royal des Sciences Naturelles de Belgique. It is believed, however, that American coleopterists display sufficient interest in the structure of beetle terminalia to warrant inclusion of a brief discussion of the phallus of a male priacmid beetle in this publication. The primary purpose of this article is the discussion and illustration of the musculature of the clasping organs of these males, which are similar in many ways to the volsellar structures of some hymenopterous insects.

In Figure 1 the phallus is shown from the dorsal aspect, with the various parts bearing numbers which are interpreted in the

[1]Edwards, J. G. Cupesid beetles attracted to soap in Montana. Col. Bull., vol. 5, pp. 42-43. 1951.

legend beneath that figure. The other illustration in this figure represents a sagittal view of the same phallus, with the median lobe and the lateral plates and appendages of the right side removed to reveal the muscles which operate the pinching mechanism of the left volsella. The numbers affixed to the parts of this drawing correspond to the same numbers on the drawing of the dorsal aspect.

There is little likelihood of controversy concerning the nomenclature of the *median lobe,* the *parameres,* or the *parameral plates.* However, the proposed nomenclature for the other structures may not meet with universal approval. No structures are known to the writer, in any other beetle, which are homologous to #1, #4, or #5. There is considerable similarity between these parts and the parts of the phalli of some kinds of male bees, though, and rather than coin new terms for the organs in question the author suggests the use of hymenopterous terminology for them. Thus the slender ventral basal plates (#1) are here referred to as the *volsellar plates.* These plates extend posteriorly as a hollow, semi-tubular arm on each side. Each arm curves inward and dorsally, then curves outward and finally anteriorly, terminating in a heavy, hooked tip. By virtue of their ventral origin, each of these appendages is termed a *digitus volsellaris* (even though in Hymenoptera the volsellar digiti are usually the movable portions of the volsellar tip and initiate the pinching or clasping action). The smaller, sharp-pointed structure (#5) which is attached to the mesal base of each paramere by a thin, sclerotized petiole, is believed to correspond most closely with the hymenopterous *cuspis volsellaris* because of its anatomical position dorsal to the base of the corresponding digitus volsellaris.

These volsellar cuspes are the muscled, movable structures of the pinching mechanism of *Priacma* male terminalia. A great number of muscle fibres are inserted upon the slender, pointed, free anterior apodeme of each cuspis volsellaris. These muscle fibres originate on the concave inner side (lumen) of the lateral wall of the semi-tubular base of each digitus volsellaris or volsellar plate. By manipulating the muscle fibres with dissecting needles under a powerful binocular microscope, the author discovered that the effect of the shortening (or contracting) of these muscle fibres is a movement of the sharp, slightly-hooked

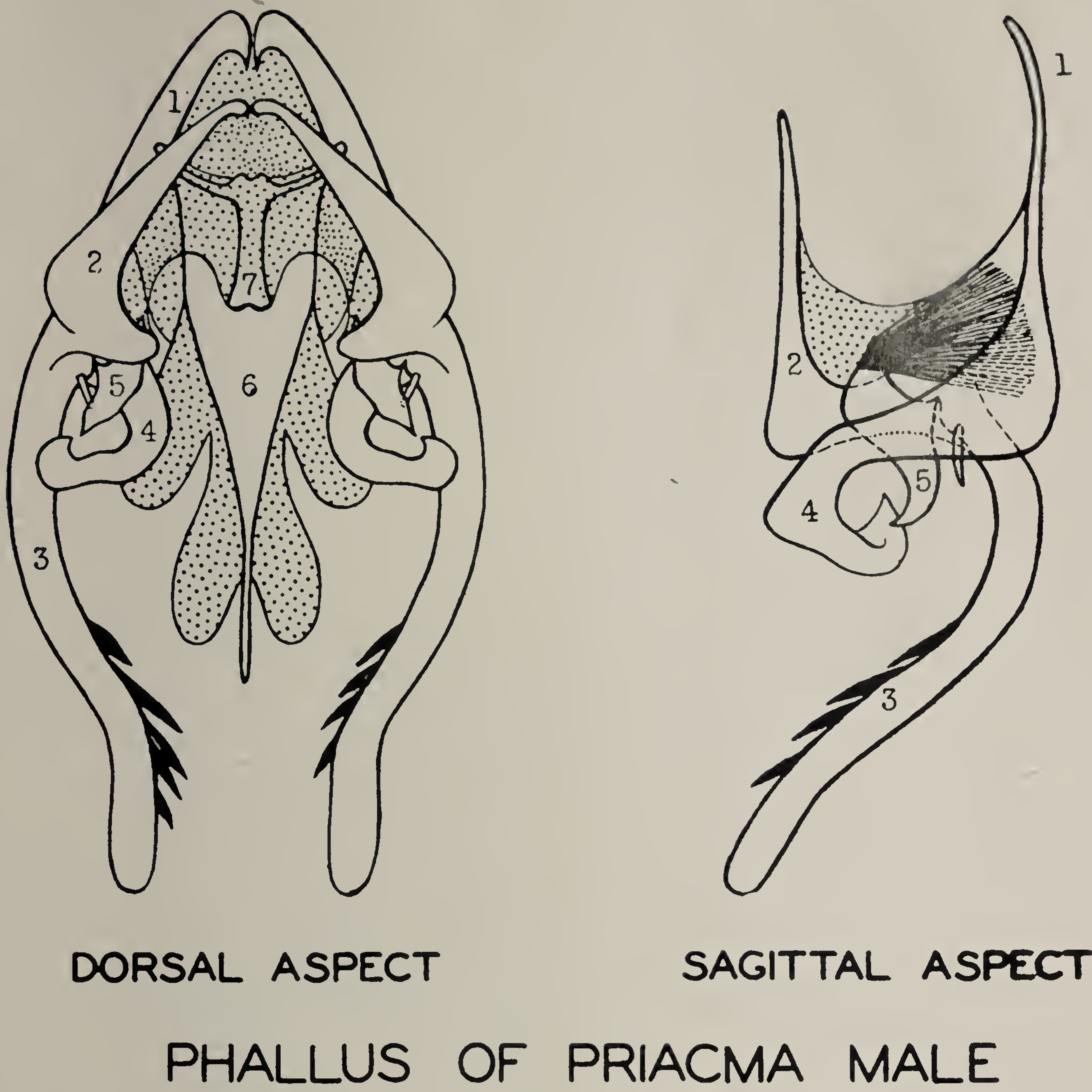

Fig. 1. Phallus of *Priacma* male (x34). Dorsal aspect, 1, volsellar plate; 2, parameral plate; 3, paramere; 4, digitus volsellaris; 5 cuspis volsellaris; 6, median lobe; 7, reflexed base of median lobe. Sagittal aspect, with median lobe and lateral plates and appendages removed, revealing muscles originating in hollow lumen of base of digitus volsellaris and inserting on anterior apodeme of cuspis volsellaris.

posterior tip of the cuspis volsellaris toward the heavy hook at the tip of the digitus volsellaris. As a result of favorable leverages, only a slight shortening of these muscle fibres is necessary to pinch the tips slightly together. Undoubtedly, these pinching structures grasp some part of the female terminalia (or perhaps membranes in the region of the vulva) and thereby hold the copulatory organs in their correct position during coitus. When the muscle fibres relax, the cuspis volsellaris quickly returns to its original position, apparently because of the resiliency of the slender, sclerotized stalk, or petiole, by which it is joined to the mesal portion of the parameral base. No other muscle fibres were discovered attached to the volsellar cuspes of these males, so it is assumed that this recovery is due entirely to the action of the resilient petioles.

The muscle fibres were stained with Van Gieson's Connective Tissue Stain while they were submerged in alcohol. This useful stain consists of 7.5 cc. of 1% acid fuchsin with 50 cc. saturated aqueous picric acid. It is not a very persistent stain, but will permeate the muscle fibres long enough to facilitate their observation and identification.

No other member of this family which has been dissected to date has male phallic structures resembling those of *Priacma.* Other genera examined include *Tetraphalerus*[2], *Cupes,* and *Omma*[3].

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[2]Illustrated in the following publication: Monros, F. and M. *Las especies Argentinas de Cupedidea.* Anal. Soc. Cient. Argentina, vol. 154, pp. 19-41, 30 figs. 1952.

[3]Illustrated in the following publication: Sharp, D. & Muir F. *The comparative anatomy of the male genital tube in Coleoptera.* Trans. Ent. Soc. London, 1912, pp. 477-642, 36 pls. 1912.

BIOLOGICAL NOTES ON TRIRHABDA FLAVOLIMBATA

(Chrysomelidae)

By J. W. Tilden

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The species *Trirhabda flavolimbata* (Mannerh.) has been found feeding in the larval stage on various composites and upon plants belonging to other families as well. Known host plants are *Artemisia, Solidago, Senecio, Aster,* and *Baccharis,* among the composites. Blake (1931, pages 1-36), in her revision of the genus, records it from *Baccharis pilularis* in the vicinity of Searsville Lake, near Stanford, Santa Clara County, California, and in smaller numbers on *Eriodictyon* (Hydrophyllaceae).

In the coastal region of California it is abundant on *Baccharis pilularis* and is by far the most common and destructive chrysomeloid on this plant. Next to the moth *Bucculatrix variabilis* Braun, it is the most important defoliator of *Baccharis* in this area.

First instar larvae were found in February of 1946, 1947, and 1948. Larvae removed to the laboratory on February 23 measured 3.5 mm. in length and were unicolorous black. Ecdysis took place on February 27, and the larvae then measured 4.55 mm. and retained the black coloration. Thirteen specimens under study all molted within twenty-four hours of each other.

The third instar was assumed on March 7, and on March 10 the larvae measured 10.3 mm. (average of 13). The color change with this molt was from grayish black in some specimens to iridescent bluish green in others. It was found that larval color in the older larvae is extremely variable, whereas the young larvae are always black. The larvae are 11 to 16 mm. in length when mature. While feeding, the larvae are decidedly sluggish and sedentary, but just previously to pupation they became restless and wander from the food to the ground. Iridescent individuals become dull in color at this time, perhaps because of the loosening of the cuticle previous to the prepupal molt.

After a period of time that varies from two hours to two days, the larva enters the soil to a depth of from one to four centimeters, and forms a cell. No secretions are used, the cell being merely a cavity in the soil. The larva curls in this cell, head to anus, and after a period of time that averages five days, the last larval skin splits dorsally and is worked back to the anal end of the body, revealing the pupa. The pupa is at first colorless and soft, with appendages very little developed, though present. The beetle becomes pigmented and developed in 8 days on the average, while extremes were 6 to 13 days.

The beetle then rests in the cell, moving the appendages slowly, for not less than two days. At the end of this time, which serves apparently to harden the appendages, the beetle begins to dig with its mandibles, lifting the soil and depositing it behind itself, or pushing it aside. In many cases where larvae were reared in individual glass vials, pupation occurred near the side of the vial, and all of the behavior of the insect could be seen, from the time of soil entry to emergence as an adult.

After emergence from the soil, the newly emerged adult climbs the plant and sits on a tip for some time, often a day or two, without feeding. Feeding consists of eating into leaves from the edges, the palpi being used constantly to feel the edges of the plant and, it would seem, to guide the mandibles. The edge of the leaf is palpated until one palpus of each pair is on each side of the leaf, and then the mandibles are brought into play. The beetles often foul the leaves on which they are feeding, but then refuse to eat the material so contaminated. This habit results in the necessity of frequent food changes in the laboratory, both to insure sufficient food and to prevent mold growth in the vials.

Four pairs of the adults from the previous rearing were placed in a large jar and fed and observed daily. All had emerged on April 17-18 after pupal periods averaging 8 days, plus a period of four or five days spent in hardening the appendages and digging out of the cells. Little feeding took place during the first two days, but on the third day they began to feed avidly and continued to do so up to April 23. On this date one pair was found in copula and was removed to a separate container. For seventeen days, up to May 9, no oviposition was observed, though the female became gradually gravid. On the afternoon of May 9, the female was found at the base of the food branch, at the point where the branch had been thrust into moist soil. The abdomen was inserted into the ground along side of the branch. This process was alternated with periods of feeding until May 15. Then the beetles were removed to another container and the twig examined. Numerous eggs were found in small clusters just below the surface of the soil.

The eggs are oval in form, from 1.1 to 1.2 mm. in length. They are yellow when first laid, drying to pale brown, and are roughly and coarsely reticulated, ornamented with raised tubercles, and covered with a thick tough chorion.

This female lived for a period of fifty-four days, up to June 9, and laid a total of seventy-three eggs. Another female of the same generation lived for 68 days but laid only 43 eggs, unless some were overlooked. No eggs were found above ground. The eggs remained without hatching until the project had to be abandoned, but many of them contained well-formed embryos. It would appear from this that eggs laid during the spring do not hatch until the following February. There would appear to be but one scattered brood, and a long period of oviposition seems to account for the long seasonal occurrence of larvae. The drier part of the year is passed in the egg, although adults live for a long time and may possibly overwinter once. Occasional adults may be taken late in the year, far past the peak population, which is reached in May and June. Since four instars were undergone in the laboratory by the most minute of the field-taken larvae, it would appear that the number of instars is five. No parasites were reared.

Defoliation by this beetle was frequently observed. At Pilarcitos Creek, San Mateo County, plants defoliated by *Bucculatrix* in January were again defoliated by *Trirhabda* in March and April, by which time the plants had scarcely recovered from the attacks of the moth. Observations at later dates on these same plants showed that they were not killed, but recovery was poor and growth was thin and scanty. Many *Baccharis* shrubs show a scraggly growth that is due to the combined attacks of these two species.

Plants that have a heavy infestation of black scale, *Saissetia oleae* (Bernard), in addition to having been attacked by both *Trirhabda* and *Bucculatrix,* may be seriously injured or killed. These declining plants are very subject to the attack of *Chrysobothris bacchari* Van Dyke, while plants that are actually dying are attacked by *Psoa maculata* LeConte. This sequence seems to be a common one in normal stands of *Baccharis pilularis,* and a normal part of the succession in the area.

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Compiled by Ross H. Arnett, Jr.

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The Coleopterists' Bulletin

Volume VII August, 1953 No. 4

Published bimonthly beginning with February by Ross H. Arnett, Jr., U. S. National Museum, Washington 25, D. C. Terms of subscription: $4.00 per year, both domestic and foreign, payable in advance. Remittances should be made payable to Ross H. Arnett, Jr. Back numbers are available.

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Entered as second-class matter at the post office at Washington, D. C.

DESCRIPTIONS OF NEW EXOTIC SPECIES OF STAG-BEETLES (LUCANIDAE)

By Bernard Benesh
Burrville, Tennessee

The purpose of the present contribution is to record descriptions of a hitherto undescribed female of *Hexarthrius aduncus* Jord. & Rothsch. and a new *Figulus* from Tonkin, and to correct an erroneous synonym of two closely related Indian species of *Prosopocoilus* (*Dorcus* Arrow, not MacLeay).

Hexarthrius aduncus Jord. & Rothsch.

Figure 1.

Nov. Zool., I, 1894, p. 484, pl. 13, fig. 1 ♂.

In Arrow's posthumous contribution, The Fauna of India, Coleoptera, Lamellicornia, Volume IV, 1950, Lucanidæ and Passalidæ, appears the statement (p. 74) that the female of the above cited species is unknown. To fill this gap in our knowledge, I submit a description of a female which was taken in association with two males and received by exchange through the kindness of Mr. Eugene Dluhy of Chicago, Illinois. One of the male specimens is, unfortunately, composite, having the head of *Prosopocoilus*[1] *giraffa* (Fab.) and the thorax and abdomen of *H. aduncus;* the specimen is being preserved for genitalic studies. The female may be characterized as follows:

[1]*Cladognathus* van Roon, Coleop. Catalogus, Pars VIII, 1910, Lucanidae, page 21.

Head transverse, 5.3 mm. long and 8.7 mm. wide, rugose throughout; anterior margin bisinuate, antero-lateral angles obtuse, diagonal to ocular canthus; post-ocular portion of head converging towards the pronotum; front gently sloping from vertex; ocular bosses not prominent, each with an adjacent circular shallow depressoin, the latter, granulate within. Clypeus produced, basal half parallel-sided, thence obliquely convergent to apex; apex bilobate. Canthus obtusely angulate anteriorly of the eye, diagonal, parallel to the eye, apices rounded and extending well beyond the center of the eyes. Eyes large, parallel. Mandibles slender, porrect, 3.6 mm. long, feebly keeled their entire length, closely punctured; base broad, median portion straight and half as wide as the base, apical portion gently bent inwardly, apices acute; inner margin of right mandible with a strong, median, acute tooth that is directed inwardly at a right angle to mandible; left mandible similarly armed with a bicuspid tooth, the cusps one above the other. Antennæ with scape shorter than the funicle and clava combined, black, glabrous; fourth funicular segment produced anteriorly into a point, which bears a cluster of four setae; clava composed of five, opaque, oblongo-lobate, pubescent segments.

Pronotum convex, broader than long (12.6 x 7.0 mm.), punctured throughout with remote fine punctures, these progressively enlarged laterally; anterior margin bisinuate, densely fringed with short, orange-red setae; laterally thickened, and margined by an impressed line; disc simple, without sculpture. Antero-lateral angles slightly produced, broadly rounded; pronotal sides nearly parallel to postero-lateral angles, which are obtuse, thence semi-circularly excised to basal angles, the latter somewhat pointed, basal margin straight; lateral margins reflexed and crenate; basal and lateral angles, as well the base, strongly margined by an impressed line.

Scutellum triangular in outline, broader than long (1.8 x 1.4 mm.), with a median longitudinal sulcus and a basal, transverse cluster of punctures. *Elytra* nearly one and one-half times as long as broad (19.1 x 13.4 mm.); sides feebly, almost imperceptibly, divergent to basal third, thence feebly convergent to apical third, thence gently convergent and rounded; humeri right-angled, sub-acute; lateral margins feebly explanate. The puncturation of the elytra differs from that of the pronotum in being closer and of more uniform size, thus giving the elytra a more polished aspect.

Legs slender, femora with fine remote punctures; tibiae linearly sculptured. Anterior tibiae furcate and externally dentate, with four distant teeth and serration between; intermediate and posterior tibiae with a single, median spine.

Mentum somewhat pentagonal in outline, hollowed medially from base to the center, rugose throughout. Prosternal process produced, rounded on top, truncate posteriorly. Venter with sculpture similar to that of the dorsum, but less shining.

In comparison with allied *davisoni* Waterh. female, the two species can be tabulated as follows:

aduncus	*davisoni*
concolorous, black, with a faint brownish bloom	head and pronotum black, elytra dark brick-red, suture darker
canthus strongly angulate befor the eyes	canthus less prominent, rounded; hiatus broader
mandibles slender; left with a bicuspid tooth	mandibles shorter and stouter, symmetrical
pronotal sides parallel	pronotum narrow anteriorly and dilated towards the rear
elytra nearly parallel	elytra distinctly ovate
mentum pentagonal	mentum parallelogrammic

Allotype: Female, Assam, without precise locality, from collection of E. Dluhy; in possession of the writer, to be incorporated eventually in the Benesh Collection in the Chicago Natural History Museum.

Prosopocoilus cardoni Didier.

Prosopocoelus Cardoni Didier, Études sur les Coléoptères Lucanides du Globe, fasc. 5, 1929, pp. 119-121, figs. 73 (♂), 74-76 (♂ genit.), 77 (♀).

In 1943[2] the late Dr. Gilbert J. Arrow announced the synony-

[2]Proc. Roy. Ent. Soc. London, Ser. B, vol. 12, p. 138, 1943.

my of *P. cardoni* with *P. buddha,* indicating that a cotype of *P. cardoni* in the British Museum (Nat. Hist.) had been used in the comparison and found to be conspecific with *buddha;* this record, without alteration, appears again in the Fauna of British India.[3] In the latter publication, the two insects are photographically reproduced and figured, alongside each other, on plate XV; figure 8 depicts *P. buddha* (Hope) ♂, figure 9 *P. cardoni* Didier, and figure 10 what is purported to be a female *P. buddha.*

A cursory examination of the excellent figures, represented to be in natural size, will suffice to convince any student that the two insects are distinct, the two male forms indicating maximum development of the two species in question. Precise measuring of the figures discloses so many characters, at variance with variation known to occur in the plastic Lucanidæ, that one is compelled to deny the validity of Arrow's opinion; the synonymy is untenable. Comparative measurements, in millimeters, obtained from the figures,[4] give us the following data:

	buddha	*cardoni*
	length x width	
head	6.0 x 12.5	7.5 x 11.0
mandibles[5]		
right	16	15.5
left	17	16
pronotum	8.0 x 15.0	6.5 x 12.25
elytra	19.0 x 8.5	19.0 x 7.5

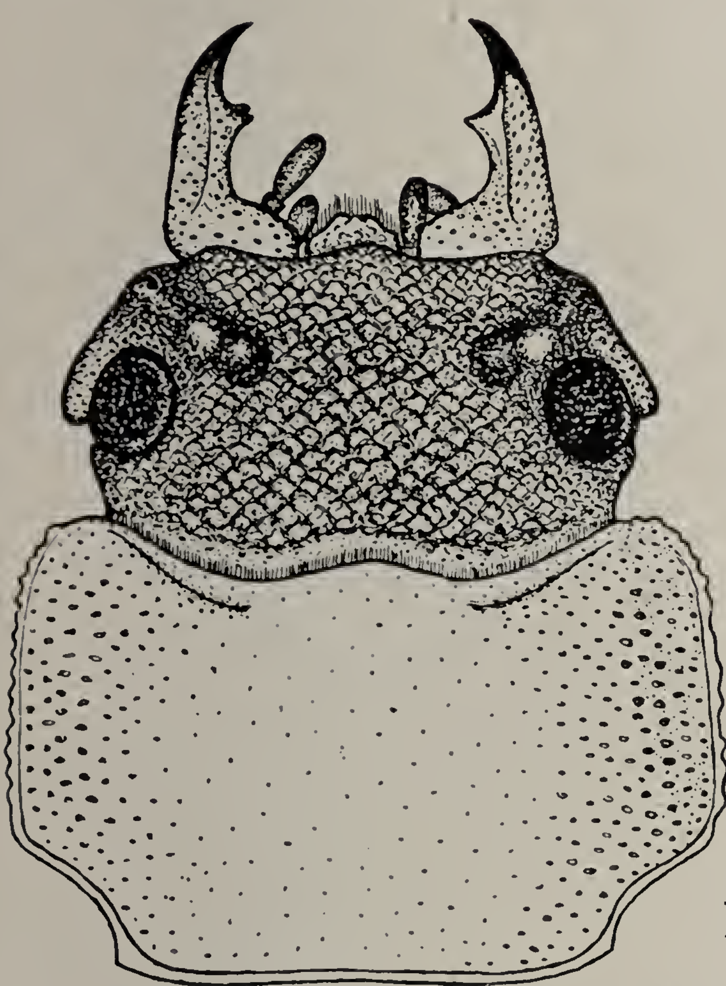
The figures and their measurements indicate and prove that: *Cardoni* is smaller and more slender. The anterior margin of the head is semicircularly excised in *buddha*, in *cardoni* the mar-

[3]Fauna of British India, Coleoptera, Lamellicornia, vol. IV, p. 141. 1950. [It should be noted here that the foregoing title appears only on the back of the volume, the title page bears simply Fauna of India.]

[4]It must be emphasized here the measurements apply only to the figures, and may or may not be the actual measurements of the two insects in question.

[5]Measured from base (outer margin) to tip of mandibles.

gin is straight and laminate, with a small median notch.[6] The head of *buddha* is broadest behind the eyes, in *cardoni* anterior to the eyes, with canthi more prominent. The pronotum in *buddha* is dilated to posterior angles, thence diagonally truncate to base; the pronotal sides in *cardoni* are parallel, the posterior angles nearly square. Base of pronotum, straight in *cardoni*, is medially produced in *buddha*. The elytra are distinctly more parallel and longer in *cardoni*, in proportion to the size of the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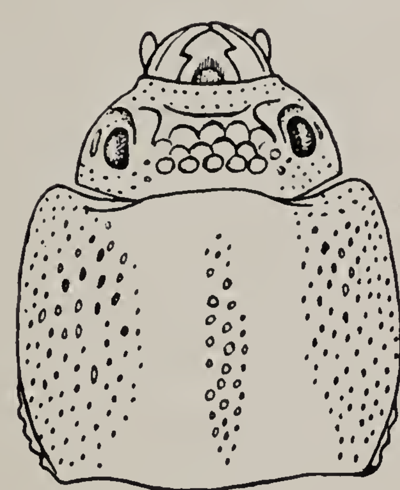
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Fig. 1. *Hexarthrius aduncus* Jord. & Rothsch.
Fig. 2. *Figulus delislei* n.sp.

insects. A female of *buddha*, in the writer's collection, that was determined by Dr. Arrow appears to be more elongate than the female which Arrow portrays; the latter, however, seems to agree

[6]The notch occurs in several species of *Prosopocoilus*. Sometimes it is prolonged into a groove that is paralleled by a nodule on each side, and this situation seems to be confined solely to males of maximum development; in such individuals the spination of legs is frequently aborted or absent. For this group of species Hope and Westwood (Cat. Lucan. Coleop., 1845, p. 30) proposed the subgenus *Metopodontus*; however, as the characters are confined to specimens of maximum development, it is of little value in systematics of Lucanidae.

in every respect with the fine figure of ♀ *cardoni* that accompanies Didier's description. The question hence arises as to whether or not the female figured by Arrow is really *buddha*; it could just as well represent *cardoni*; it positively does not agree with the specimen in Benesh Collection, even though it was named *buddha* by Arrow.

Figulus delislei Benesh, new species

Figure 2.

Black, shining; allied to *F. acutangulus* Arrow.

Head transverse, twice as broad as long (2.1 x 0.9 mm.), anterior margin straight; antero-lateral angles nearly obsolete, slightly emarginate, posterior to these angles, gently, arcuately divergent to posterior angles of the canthus—which are nearly right angles and situated well beyond the eyes—thence converging obliquely to occipital foramen. Surface of head declivous in front, cribripunctate, declivity demarcated anterior to the ocular bosses by a transverse, raised shelf; disc, posterior to the shelf, with a shallow, circular excavation, ocellately punctate to occiput; posterior to the eyes, towards basal angles, with sparse, simple punctures. Clypeus inconspicuous, rounded. Canthus of a nearly perfect quarter-circle in outline, is, as broad, opposite the eye, as the transverse diameter of the eye. Mandibles short (0.5 mm.), robust, inner edge medially unidentate, apices blunt. Antenna of usual figuline aspect, consisting of nine segments; scape, funicle, and clava blood-red, glabrous; clava flattened, sensory area pubescent, opaque.

Pronotum broader than long (2.9 x 2.5 mm.), broadest in posterior third, depressed; anterior margin feebly sinuate, anterolateral angles slightly produced and broadly arcuate, sides gently dilated to posterior third, thence converging to basal angles, which are obtuse; basal margin nearly straight. Disc highly polished and shining, with a median, longitudinal, punctate fovea, which does not attain the base; laterial declivity coarsely punctured, puncturation diminishing in size toward the lateral margins of the punctate fields; basal portion of laterial margins crenate. Scutellum not evident.

Elytra nearly twice as long as broad (5.5 x 3.1 mm.), broadest in basal third, gently converging to apical third, thence regularly semicircular; punctate-striate, punctures ovate, interstices broad and flat; lateral margins somewhat irregularly punctured; striation consisting of six striae between suture and humeri, the latter obscurely mucronate; apical declivity strongly tumular, the post-declivous area rather strongly and closely punctured, much as in *F. manillarum* Hope & Westwood.

Legs short and stout, with femora and tibiae blood-red, knee and tarsi black; anterior tibiae strongly furcate distad and, externally, with 4 or 5 equidistant teeth; intermediate and posterior tibiae armed in distal half with two unequal spines.

Venter black, shining, excepting the mentum and gula, which are blood-red.: Mentum slightly broader than long, broadest anteriorly, feebly bilobate, sides rounded and converging to base, latter produced and straight; central area circularly hollowed and scarified; lateral margins each with a median tubercle. Metasternum with a median, longitudinal, impressed line; closely punctured laterally. Prosternal and mesosternal process not prominent, sloping. Inflexed portion of the elytra strongly punctured; abdominal segments rather coarsely and strongly punctured, the punctures diminishing in size and strength towards the mid section of the segments, which is highly polished and shining, but has a few, fine, remote punctures.

Length: 9.3 mm.; breadth: 3.1 mm.

The distinguishing characters between *F. delislei* and *acutangulas*, the most nearly allied of the previously described species, can be tabulated thus:

delislei	*acutangulus*
anterior margin of head nearly straight	margin semicircularly excised
front of head simple	front with a median tubercle
antero-lateral and basal angles of pronotum rounded	pronotal angles angulate
pronotal fovea not reaching basal margin	fovea attaining base, with pronounced lateral ridges
strial punctures small, interstices broad, flat	punctures larger, interstices narrower, convex
hollow of mentum cicatricose; sides ridged, each with a median tubercle	hollow of mentum rugulose; nontuberculate laterally

Holotype: Example of undetermined sex, Hoa-Binh, Tonkin (from the collection of Melchior de Lisle); at present in possession of the writer, to be incorporated eventually in the Benesh Collection in the Chicago Natural History Museum.

Received in a small lot of undetermined insects from Monsieur M. de Lisle, director of public works, Douala, French Cameroon. The new species is gratefully dedicated to the donor, who, very generously, permitted the retention of the type by the writer.

AGABUS VANCOUVERENSIS IN ALASKA

By Borys Malkin
University of Washington, Seattle

The published records of this species (H. B. Leech, Canadian Ent., vol. 77, p. 77, 1945) show the distribution limited largely to southern British Columbia, Vancouver Island, and Mt. Baker, Washington. A specimen from Mt. Rainier, Wash., in the collection of Dr. M. H. Hatch extends its range considerably to the south while its northern distribution is extended greatly by the following Alaskan material in my collection: Deer Mtn. nr. Ketchikan, July 23, 1952, elev. 2000-3000 feet; and 1 specimen from Knight Island, Prince William Sound, August 1952, elev. 1500-2000 feet (*H. Shippen*). There is an interesting feature concerning its ecological preference. Leech reports it as being partial to the pools formed by melting snow. The Deer Mtn. series (over 200 specimens) I collected in just such situation, and Mr. Herbert S. Shippen, who collected the Knight Island material, tells me that he found them in an analogous situation. While other records are all from about 4000 feet and above, the Alaskan records come from much lower elevation, which shows that the beetle follows the climatic conditions quite closely.

The Coleopterists' Bulletin

Volume VII October, 1953 No. 5

Published bimonthly beginning with February by Ross H. Arnett, Jr., U. S. National Museum, Washington 25, D. C. Terms of subscription: $4.00 per year, both domestic and foreign, payable in advance. Remittances should be made payable to Ross H. Arnett, Jr. Back numbers are available.

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NEW SPECIES AND A NEW GENUS OF NEW WORLD ELMIDAE WITH SUPPLEMENTAL KEYS

By Milton W. Sanderson
Illinois Natural History Survey, Urbana

In my revision of the North American species of *Stenelmis* (1938) I included *S. geayi* Grouvelle (1908) from Guiana, and *S. nevermanni* Hinton (1936) from Costa Rica to complete the treatment of the known New World species. Representatives of both these species from the type series were examined and they appeared to be associated with the North American components of the genus by the absence of a patch of tomentum on the anterior tibia. In spite of this similarity these species did not appear closely related to each other or to the North American species. Hinton later (1939) proposed the new genus *Stegoelmis* for *geayi* and added a second species. A restudy of *S. nevermanni* has disclosed a patch of tomentum on the anterior tibia. This was not clearly noted until the leg was treated in sodium hydroxide. On the basis of the presence of tibial tomentum in addition to other characteristics, a new genus is proposed for *nevermanni.* With *geayi* and *nevermanni* removed to other genera. *Stenelmis* in the New World is known to occur only in the United States and Canada.

Stegoelmis Hinton

In addition to the two known species a third is described here. In general appearance, two of the three species, *geayi* and *hintoni* n. sp., resemble small weevils such as *Listroderes* and *Listronotus*. The third species of the genus, *verrucata* Hinton, is smaller than the others, measuring but 3.7 mm. in length, and it is described as feebly shining and rufopiceous in color. However, they all agree in the external generic characters set forth by Hinton except that each anterior tibia of *geayi* and *hintoni* has a small but distinct patch of tomentum at the apex on the inner side. The patch is not as extensive as in many other genera of Elmidae but is discernible even in dry specimens.

Key to species of *Stegoelmis*

1. Elytra broadly rounded at apex; elytral tubercle near lateral margin in apical fourth acute; head with strong median impression; median lobe of male genitalia (Hinton, 1939, p. 32, fig. 27) as long as lateral lobes and evenly narrowed from base to apex. Brasil, French Guiana
verrucata Hinton

Elytral apexes divergent, acute, and slightly reflexed; elytral tubercle right angled or broadly rounded; head at most with faint median impression; median lobe of male genitalia shorter than lateral lobes and constricted before apex 2

2. Pronotum with a strong swelling on each side of meson in basal third; apex of constructed portion of median lobe of male genitalia (id. fig. 30) acute; lateral lobe (id. fig. 31) in lateral view nearly evenly curved to apex. Guiana
geayi Grouvelle

Pronotum evenly convex on each side of meson in basal third; apex of median lobe of male genitalia (fig. 2) evenly rounded; lateral lobe, (fig. 2a) hooked at apex. Ecuador
hintoni n. sp.

Stegoelmis hintoni n. sp.

Male. Length 5 mm.; width 2 mm. Body above dull, mottled with gray and grayish brown patches. Head rather flattened on front and very faintly longitudinally impressed between antennae. Labrum with a transverse patch of long and dense yellow hair. Underside of head with a dense patch of long yellow hair on each side of gula. Antennae and palps reddish brown, the antennae longer than greatest width of elytra. Pronotum with length and width subequal, widest a little behind middle, margins slightly convergent to base, more strongly convergent to apical angles; median longitudinal impression running full length of pronotum; lateral submarginal oblique swelling poorly defined; punctures on disc shallow, very fine and close. Elytra nearly 2¼ times longer than pronotum; humerous faintly prominent; submarginal tubercle conspicuous and right angled; elytral apexes separated, each bluntly acute and slightly reflexed; striae shallow, the punctures near suture small and deep, separated longitudinally by 3 to 5 times their diameters; strial intervals slightly convex and without punctures. Prosternum narrow, as in Hinton's fig. 21 (1939, p. 31), but rounded at apex, and with margins beveled and longitudinally striate; surface rugose and concave at apex. Metasternum and first abdominal sternite between coxae together broadly depressed. Anterior tibia with a small but dense patch of tomentum at apex; inner margins of each tibia at apical fourth with a fringe of about 15 flattened acute spines; first four tarsal segments with a dense patch of tomentum on lower surface. Genitalia having each lateral lobe curved, and distinctly hooked at apex (fig. 2a); median lobe nearly parallel in basal three-fourths then narrowed and constricted to form a short bluntly rounded apical piece.

Female. Similar to male but a little longer, measuring 5.7 mm.

Holotype male and allotype female, Oriente e. Rio Napo water shed, Jatun Yacu, Ecuador. 700 mtrs. Mar. 28, 1937, Clark MacIntyre. Types in the Snow Collection, University of Kansas.

Portelmis n. gen.

Head with a transverse ridge close to posterior margins of each eye and joining on the vertex, the area behind ridge smooth and contrasting with the roughly sculptured surface on front; antenna 11-segmented, slender, a little longer than pronotum; maxillary palpus 4-segmented, the galea finger-like; labial palpus 3-segmented; mandible with three apical teeth, and a large flattened prostheca. Pronotum longer than wide, distinctly wider in basal third, with a shallow median longitudinal groove, and without lateral carinae or swellings; prosternum (fig. 3) very long in front of coxae, 2½ times longer than posterior process and broadly transversely depressed at middle; hypomera apparently without tomentum. Elytron without carinae and with 10 nearly complete rows of punctures; lateral margin of elytron deeply sinuate before apex which is obliquely truncate. Mesosternal lobes overlying anterior margin of metasternum between coxae; mesosternum shallowly grooved for the prosternal lobe; metasternum with a very narrow and deep median longitudinal groove in basal half. Abdomen (fig. 4) with median portion of basal segment acutely triangularly prolonged between posterior coxae; fourth sternite slightly prolonged at posterior angles; last sternite with posterior angles each rounded and slightly prolonged beyond posterior margin of last sternite. Tarsal claw simple, without basal tooth; each tibia with a thin fringe of tomentum in about apical three-fifths; anterior femur with broad tomentose area on anterior surface in basal half, middle femur with similar area on posterior surface in basal half, posterior femur without tomentum.

Type species: *Stenelmis nevermanni* Hinton (1936, p. 424). Costa Rica.

Although faintly superficially resembling some of the North American *Stenelmis, Portelmis* does not appear to be closely related to them. It differs especially from *Stenelmis* by having hairy tomentum on the tibiae, by the presence of a deep, lateral, marginal excavation near the elytral apex, accompanied by the prolonged lateral margin of the fifth sternite which fits into this excavation, and by the presenec of a transverse ridge on the head. It appears to come nearest to the Cuban *Xenelmoides simplex* Darlington (Hinton, 1936, p. 5) which, like *Portelmis,* is described as having no lateral pronotal carinae. However, *Xenelmoides* has the pronotum wider than long, the surface is finely and evenly punctured and pubescent, and the four inner elytral striae are almost obsolete. *Portelmis* has the pronotum longer than wide, the dorsum is very roughly scabrous in posterior two-thirds, and all the elytral striae are distinct.

Cylloepus Erichson

This genus was included in my key to the genera of Elmidae occurring in the United States (1938) but no species was given. At that time it was believed that *Elmis ferrugineus* Horn was our only representative, but Hinton (1940) placed it in his new genus *Hexacylloepus*. However, *Elmis abnormis* Horn and an undescribed species, both occurring in Arizona, belong to this genus. Other species occur in Mexico, Central and South America, and the West Indies. The two United States species key to *Cylloepus* (Sanderson, 1938) and agree with the generic diagnosis given by Hinton (1940).

Key to the United States species of *Cylloepus*

Dorsum uniformly dark reddish brown; pronotum slightly longer than wide; fifth elytral innerspace in part carinate; metasternum depressed but without a posterior median carina .... *abnormis* Horn

Dorsum black, each elytron with two large reddish spots; pronotum distinctly wider than long; fifth elytral innerspace not carinate; metasternum with a short carina at middle near posterior margin .... *parkeri* n. sp.

Cylloepus abnormis Horn

Elmis abnormis Horn (1870-38)

A female, labeled Ariz., has been examined in the collection of the Academy of Natural Sciences in Philadelphia. It bears the additional label, Paratype *Elmis abnormis* G. H. Horn, 3265. The specimen was cleaned and found to differ from Horn's description as follows: elytra shining and not opaque as described, length 3.5 mm., not 4 mm., fifth elytral innerspace carinate for third the length of third, not for half the length of third. The sixth and eighth (seventh of Horn) elytral innerspaces are carinate for 3/4 and 5/6 of the elytral length. In addition to the foregoing characteristics, the body above is uniformly dark reddish brown, first two segments of the antenna are yellowish, distinctly paler than the remaining segments which are brown. Front of head dull, coarsely granulate and uneven, slightly bituberculate on vertex. Clypeus very broadly and shallowly emarginate; labrum truncate. Pronotum very slightly longer than wide, widest at basal two-fifths, a little wider at base than at apex; surface strongly shining with distinct punctures between lateral carinae; median longitudinal groove deep, occupying central half of pronotum, sparsely punctured in bottom of groove; lateral carina extending full length of pronotum, slightly depressed and constricted at basal two-fifths by a curved oblique groove arisng at the posterior margin near scutellum; carina a little broader on each side of constriction than third elytral innerspace at base; pronotum at base with a large rounded prominence between oblique groove and lateral carina, the prominence and adjacent area nearly punctureless and shining. Second elytral innerspace slightly raised in basal seventh, third strongly raised, fourth flat, fifth slightly raised in basal eighth, sixth and eighth innerspaces evenly but narrowly raised; surface between punctures finely granulate but shining; lateral margin of elytron finely crenulate; apex of elytron slightly emarginate on side margin, oblique before inner margin. Prosternum bluntly angled on sides at anterior margin, broadly transversely depressed at middle, narrow and parallel between coxae, broadly longitudinally grooved, bluntly rounded behind. Metasternum depressed at middle in posterior three-fourths but slightly raised on each side of narrow median impressed line. First abdominal sternite deeply and broadly excavated at middle, the lateral margins of excavation carinate to posterior margin of sternite; second sternite evenly convex; last sternite evenly rounded at apex. Anterior tibia with a single line of tomentum on inside in apical half; middle tibia with one line of tomentum on inner apical half and another adjacent line occupying apical fourth; posterior tibia with a single line of tomentum in apical two-thirds.

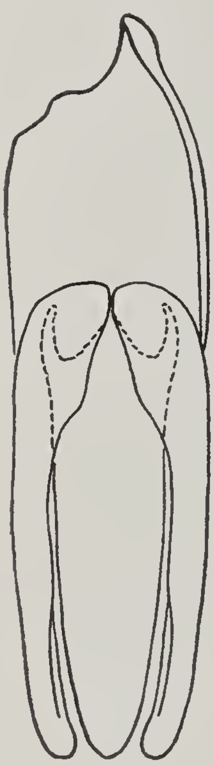
Cylloepus parkeri n. sp.

Male. Length 2.3 to 3 mm.; width 1.2 mm. Body above black, dully shining, each elytron with two large reddish spots. Head evenly convex with closely set and evenly spaced rugosities separated by about their own widths; fronto-clypeal suture straight, distinctly impressed; anterior margin of labrum evenly rounded; antenna nearly $1\frac{1}{4}$ times greatest width of head across eyes, very dark brown except the first two segments which are a little lighter; last four antennal segments distinctly wider than each of preceding five segments, each enlarged toward apex. Scutellum flat. Pronotum about $\frac{1}{8}$ wider than long, widest behind middle of lateral margin, the margin narrowed but broadly emarginate before the acute posterior angle, more strongly narrowed but margin straight to the acute anterior angle; lateral margins of pronotum strongly crenulate; median pronotal groove deep at middle, becoming shallow and disappearing at about apical sixth, strongly narrowed posteriorly, the lateral margins of the groove together forming a flat ridge which reaches the posterior pronotal margin; lateral pronotal ridge extending from basal margin nearly to apical margin, each ridge depressed at about middle, narrowed toward anterior pronotal margin, the posterior half of ridge more strongly elevated than anterior half; inner margin of ridge nearly vertical. Each elytron with two large reddish spots, the anterior spot occupying basal fourth of elytron, the apical spot covering central part of apical half, both spots extending from second to about eighth innerspace; third innerspace slightly elevated in basal eighth, sixth elevated for ¾ length of elytron, eighth elevated for 9/10 elytral length; surface of elytra and pronotum with many small asperities, these larger on sides and humeral region of elytron; lateral margin of elytron crenulate, slightly emarginate before apex, the elytra subtruncate at apex. Prosternum between coxae nearly parallel, acute at apex. Metasternum broadly and triangularly impressed in posterior two-thirds, with a short but high median carina on the meson near the posterior margin at middle. Abdomen narrowly glabrous on meson, glabrous area narrowed posteriorly; first visible segment broadly depressed at middle between the longitudinal ridges which extend to posterior margin. Each leg with a dense patch of hairy tomentum occupying anterior half or more of tibia; middle femur with patch of tomentum on inside in basal half; tarsal segments without dense patches of hairs or spines. Genitalia (fig. 1) with median and lateral lobes nearly equal in length, simple in design.

Female. Similar to male and apparently indistinguishable by external characters.

Holotype male, allotype female, 26 male and female paratypes, Bloody Basin, Yavapai Co., Arizona, June 8, 1947, F. H. Parker. The types have been deposited in the collection of the Illinois Natural History Survey through the courtesy of their collector. Paratypes are in the collection of Mr. Parker, the Philadelphia Academy of Sciences, and H. P. Chandler.

In Hinton's key to the Mexican and Central American species of *Cylloepus* (1940), *parkeri* keys to *proximus* Hinton described from Mexico. It differs from *proximus* and the closely related *sexualis* Hinton principally by its much broader median lobe of the male genitalia (fig. 1). Hinton's illustrations for his species (Hinton, 1940, p. 363, figs. 314, 317) have been used for comparison.



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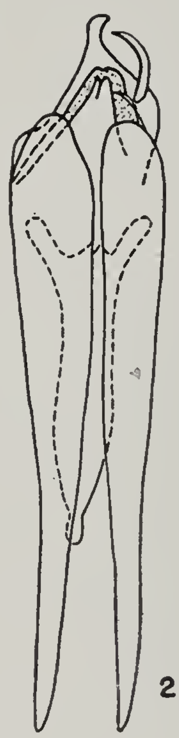

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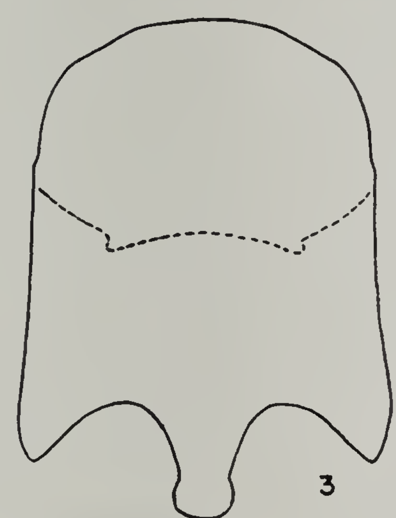

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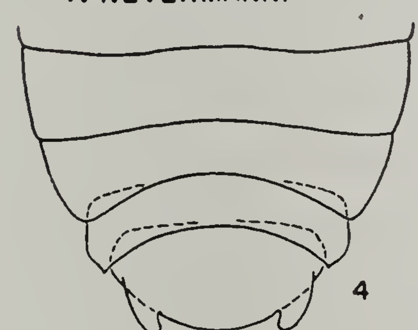
P. NEVERMANNI



4

C. PARKERI

STEGOELMIS HINTONI

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Fig. 1. Cylloepus parkeri n. sp. Male genitalia, dorsal aspect.

Fig. 2. Stegoelmis hintoni n. sp. Male genitalia, dorsal aspect. 2a, lateral aspect.

Fig. 3. Portelmis nevermanni Hinton. Prosternum.

Fig. 4. Portelmis nevermanni Hinton. Abdomen.

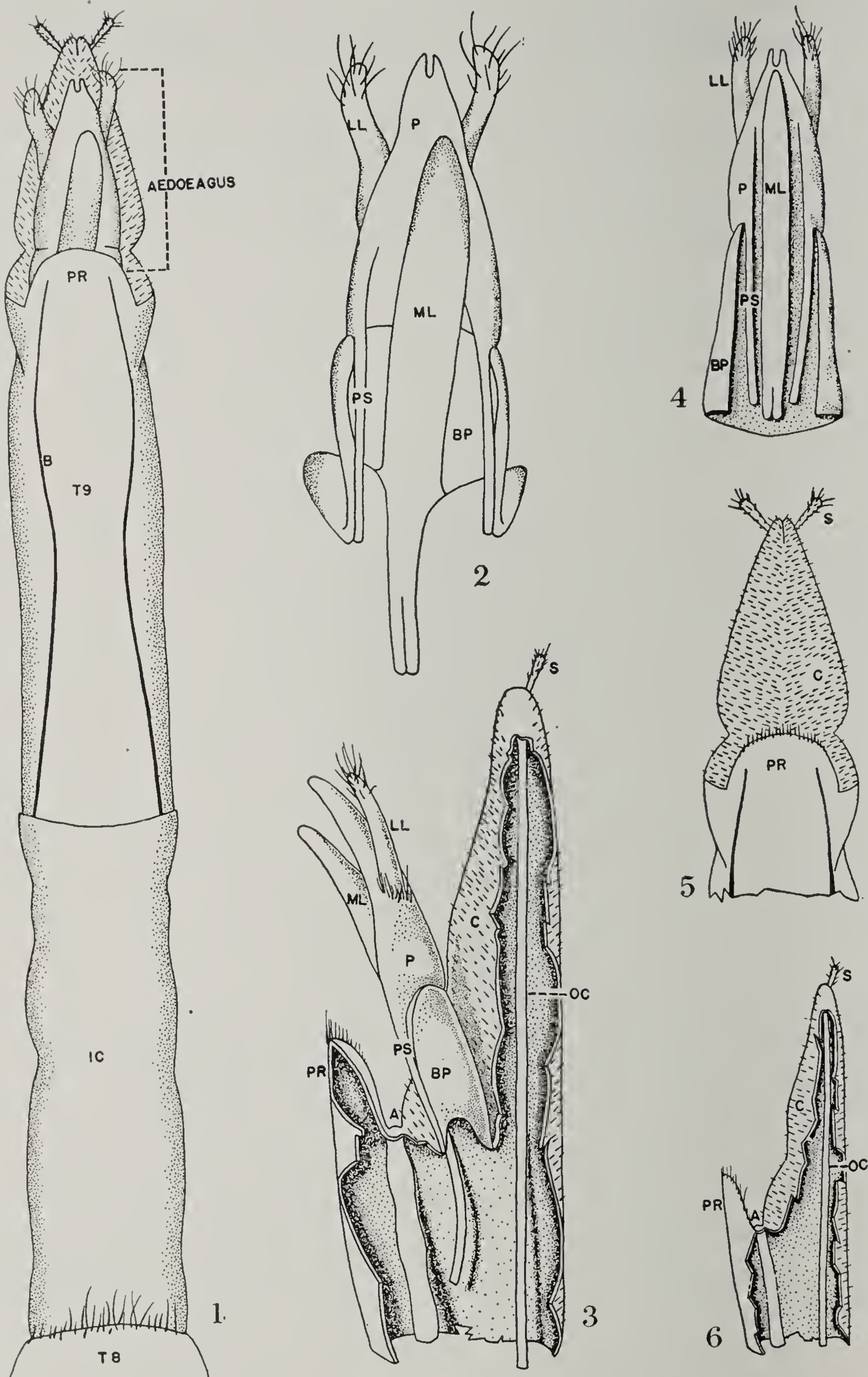
AN ODD CASE OF GYNANDROMORPHISM IN THE EXTERNAL GENITALIA OF BOROS DISCICOLLIS (SALPINGIDAE)

By T. J. Spilman
Department of Entomology, Cornell University

Entomological and genetical literature contain many descriptions of gynandromorphs, most being of Lepidoptera and *Drosophila*. Thus, few accounts of coleopterous gynandromorphs were found in a bibliographic search conducted after finding a bisexual specimen of *Boros* (*Lecontia*) *discicollis* (LeConte), 1850. The specimen was collected at Alton Mill, Mass., and is owned by the Museum of Comparative Zoology at Harvard.

External sexual dimorphism exists in *discicollis* in the form of a pilose area on the prosternum of the female but not the male; the specimen had this female characteristic. It possessed parts of both male and female genitalia, which were extruded in the pinned specimen (fig. 1). These genitalia were removed from the abdomen, treated with caustic potash, and examined. Ovaries, but not testes, were found in the abdomen. The external female genitalia were like the usual type (figs. 5 and 6) in that they possessed perfectly formed segments 8 and 9, the appendages of the latter segment, fused coxites and styli, and the oviductus communis. Of the complete aedoeagus figured by Spilman (1952), the gynandromorph had the basal piece, paramere, and median lobe, but not tegmenite (fig. 2). The basal piece and paramere deviated from the normal type (fig. 4) in being abbreviated and flattened, and the lateral lobes were sinuate. The median lobe, however, was of usual length and projected proximad of the basal piece. On making a lateral longitudinal incision, a complete egg conduit, but no ejaculatory duct, was found (fig. 3). From the morphology of all parts studied, I concluded that this gynandromorph was probably a functional female, with some rudimentary and nonfunctional external male genitalic parts.

As far as I am able to determine, this is the first record of gynandromorphism in the genitalia of a beetle, but the true import of the specimen, realized quite some time after its discovery, is the evidence it furnishes for the derivation of male coleopterous genitalia. To understand this importance we must refer



Normal and gynandromorphic genitalia of *Boros* (*Lecontia*) *discicollis*.
1, Dorso-lateral view of external genitalia of gynandromorph. 2, Dorsal view of aedoeagus of gynandromorph. 3, Lateral cutaway view of apex of gynandromorph. 4, Dorsal view of normal male aedoeagus. 5, Dorsal view of

to two accounts of the derivation of external female genitalia: Singh Pruthi (1924A) on an ontogenetical study of *Tenebrio molitor* L., and Tanner (1927) on a comparative study of the Coleoptera, with *Pytho strictus* LeC. as the salpingid example. Their views on the parts important in this gynandromorph are basically similar. In a typical female, segment 8 is short and unspecialized. Segment 9, according to Tanner, is the membranous tube next distad, and the baculi are its appendages. Singh Pruthi, whose interpretation I have adopted, terms the area containing the baculi segment 9 and the membranous tube the intersegmental connection. Both authors consider the fused coxites to be appendages of segment 9. Tanner interprets the proctiger, a sclerite forming the dorsal lip of the anus, to be tergite 10 and the linear longitudinal sclerite located medially on the ventral side of the fused coxites to be sternite 10. If we follow Tanner's explanation of segment 10, we may deduce that the appendages of sternite 9, the coxites with styli, have migrated dorsad of sternite 10. However, Singh Pruthi was not able to trace the development of the larval segment 10, itself uncertain, to the adult; I have accepted this as evidence that segment 10 is not present in the adult female. Thus, segment 9 is the ultimate segment.

Next we must turn to the work of Singh Pruthi (1924) on the ontogeny of the male *Tenebrio molitor* wherein he demonstrated that the aedoeagus develops from an evagination of the membrane between the anus and sternite 9. The location of the aedoeagus of is absent in the adult male salpingids, the aedoeagus is situated between the anus and sternite 9. The location of the aedoeagus of this adult gynandromorph between the anus and the female appendages of sternite 9, the fused coxites, is held to be additional evidence of the origin of external male genitalia from the membrane between sternites 9 and 10. This, then, is the greatest significance of the gynandromorph. The absence of the tegmenite,

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apex of normal female genitalia. 6, Lateral cutaway view of apex of normal female genitalia.

Legend: A—anus, B—baculum, BP—basal piece, C—coxite, IC—intersegmental connection, LL—lateral lobe, ML—median lobe, OC—oviductus communis, P—paramere, PR—proctiger, PS—parameral strut, S—stylus, T8—tergite 8, T9—tergite 9.

said by Arnett (1951) to be a part of the tegmen, might be an indication of its derivation from a different genitalic part. It should be noted, however, that there is very little space for a tegmenite between the basal piece and coxites.

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CURRENT LITERATURE

Compiled by Ross H. Arnett, Jr.

This section is designed to contain all papers on the Coleoptera of North and South America which are not in the **Catalogue of the Coleoptera of America, North of Mexico** and its supplements, or in the **Checklist of the Coleopterous Insects of Mexico, Central America, the West Indies, and South America** and which have not been previously listed in The Coleopterists' Bulletin.

Cleridae

Barr, W. F. 1952. New species of Cymatodera from the southwestern United States and northern Mexico (Coleoptera, Cleridae). American Mus. Nov., No. 1572, 9 pp. 1952. A revision of the species belonging to the new clerid genus Araeodontia (Coleoptera), American Mus. Nov., No. 1573, 17 pp., [Illus., key.] **Nye, W. P. & Bohart, G. E.** 1952 A larva of Trichodes ornatus from a pollen trap on a hive of honey bees [Cleridae]. Pan-Pacific Ent., vol. 28, p. 6. **Vaurie, Patricia** 1952. The checkered beetles of the Bahama Islands, British West Indies (Coleoptera, Cleridae). American Mus. Nov., No. 1547, 5 pp. [Illus.]

Cocconellidae

Svihla, Arthur. 1952. Two-spotted lady beetles biting man. Journ. Econ. Ent., vol. 45, p. 134.

The Coleopterists' Bulletin

Volume VII | December, 1953 | No. 6

Published bimonthly beginning with February by Ross H. Arnett, Jr., U. S. National Museum, Washington 25, D. C. Terms of subscription: $4.00 per year, both domestic and foreign, payable in advance. Remittances should be made payable to Ross H. Arnett, Jr. Back numbers are available.

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Manuscripts dealing with any phase of the study of beetles, including descriptive material, are invited.

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SOME CORRECTIONS IN THE NOMENCLATURE OF CLYTRINAE (CHRYSOMELIDAE)

By F. Monrós

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In checking bibliographical references for a new edition of the Clytrinae in Junk's Coleopterorum Catalogus. some nomenclatural mistakes have been detected which are worth considering in some detail.

A. GENONYMS THE AUTHORSHIP AND DATE OF WHICH MUST BE CHANGED.

1. Published by Chevrolat in Dejean 1837 but commonly attributed to later authors. [The acceptance of Chevrolat's names is based on conclusion 13 of the International Commission on Zoological Nomenclature (Bull. Zool. Nomen., vol. 4, pp. 78-80, 1950).]

Macrolenes Chevr., 1837, p. 419.[1] Type: *ruficollis* (Fab.), by present designation. This genus is usually attributed to Lacordaire, 1848. No genotype was fixed until now.

[1]The pagination here indicated refers to the real third edition of Dejean's Catalogue. There is another "3d. edition" issued at the same time in which 24 pages must always be added to the ones here given; the latter edition is the one Lacordaire refers to in his Monographie and is quoted by most later authors.

Lachnaia Chevr., 1837, p. 418. Type: *variolosa* (L.), by present designation. This genus, commonly spelled *Lachnaea*, is usually attributed to Redtenbacher, 1845.

Melitonoma Chevr., 1837, p. 419. Type: *decempunctata* (Oliv.), by present designation. This genus is usually assigned to Lacordaire, 1848.

Cheilotoma Chevr., 1837, p. 420. Type: *bucephala* (Fab.), by present designation. The present genus is usually referred to Redtenbacher, 1845, and generally spelled *Chilotoma* in spite of being originally written *Cheilotoma*.

Labidognatha Chevr., 1837, p. 419. Type: *coerulans* (Fab.), monobasic. Attributed to Lacordaire, 1848, as are the following four names.

Coptocephala Chevr., 1837, p. 419. Type: *melanocephala* (Oliv.), designated by Jacoby, 1908.

Megalostomis Chevr., 1837, p. 416. Type: *boopis* (Germ.), by present designation.

Babia Chevr., 1837, p. 417. Type: *quadriguttata* (Oliv.), by present designation.

Ischiopachys Chevr., 1837, p. 416. Type: *bicolor* (Oliv.), by present designation.

2. Published by other authors. [Revalidation based on conclusion 22 of the ICZN (Bull. Zool. Nomencl., vol. 4, p. 149).]

Labidostomis Germ., 1817. Type: *cyanicornis* Germ., monobasic. This genus is commonly attributed to Redtenbacher, 1845, and *L. taxicornis* (Fab.) was cited as genotype by Jacoby (1908, p. 96). This species not being included in the originally delimited genus, it cannot be maintained as genotype.

B. GENONYMS WHICH MUST BE CHANGED BECAUSE OF PRIORITY.

Smaragdina Chevr., 1837, p. 420. Type: *menetriesii* Fald., designated by Chevrolat in d'Orbigny, Dict. Univ. Hist. Nat., vol. 11, p. 648, 1848. *Calyptorhina* Lacord., 1848 (type: *C. chloris* Lac. by monotypy) is a synonym. Because of priority, *Smaragdina* Chevr. replaces *Gynandrophtalma* Lacord. as the name of the genus, but *Gy-*

nandrophtalma remains as a valid subgenus. In spite of priority, *Cyaniris* Chevr., 1837, p. 420 (type: *collaris* Fab. by present designation) cannot replace *Gynandrophtalma* Lacord., 1848, p. 256 (type: *nigropunctata* Lacord., fixed by Jacoby, 1908), because of homonymy with *Cyaniris* Dalman, 1816.

C. GENERA WHICH REQUIRE NEW NAMES BECAUSE OF HOMONYMY.

Lacordairella n.n. pro *Camptolenes* Lac., 1848 (nec Chevr., 1837). Type: *Camptolenes fastuosa* Lac., by present designation. *Camptolenes* was used first by Chevrolat in Dejean (page 419) to designate a genus the type of which is *Clytra rugosa* Fab. by present designation and which therefore must be considered a synonym of *Clytra* Laich., 1781, since *rugosa* Fab. belongs to the genus *Clytra* without any doubt. *Camptolenes* Lac., 1848, corresponds to a quite different group of species than those put together by Chevrolat, and, having a different meaning from Chevrolat's genus, it requires also a different name. The synonymy would be as follows:

Lacordairella n.n. Type: *Camptolenes fastuosa* Lac.
Camptolenes Lac., 1848 (nec Chevr., 1837). Type: *C. fastuosa* Lac.

Clytra Laich., 1781. Type: *Clytra quadripunctata* Laich.
Camptolenes Chevr., 1837 (nec Lac., 1848). Type: *Clytra rugosa* Fab.

Tellenina n.n. pro *Tellena* Lac., 1848 (nec Fleming, 1822). Type: *Clythra varians* Sahlb. Synonyms are:

Acidalia Chevr., 1837, p. 417. Type: *Clythra varians* Sahlb., monobasic. Invalidated because of homonymy with *Acadalia* Huebner, 1919, a genus of Lepidoptera.

Tellena Lac. 1848. Type: *Clythra varians* Sahlb., monobasic. This name is invalid because of homonymy with *Tellena* Fleming, 1822, which was proposed as emendation of *Tellina* L., a genus of Mollusca.

D. GENONYMS WHICH, IN SPITE OF PRIORITY, CANNOT BE EMPLOYED BECAUSE OF HOMONYMY.

Anomoea Agassiz, 1846. Type: *laticlava* Forst., by objective synonymy: *Anomoia* Chevr., 1837, p. 419. Type: *obsita* Fab. [= *laticlava* Forst.], monobasic. The prior name cannot be accepted because of *Anomoia* Walker, 1835, a genus of Diptera.

E. THE DACHRYS-COMPLEX.

In 1847, Erichson (p. 164) used for the first time the name *Dachrys* for his species *succincta*, originally described in 1834 in the genus *Clytra* and which thus becomes the genotype by monotypy. So, *Dachrys* must be assigned to Erichson, 1847, for the only species *succincta* (Er.). All the remaining species, later included in *Dachrys* by Lacordaire and other authors, differ sufficiently from the genotype as to make it necessary to separate them in another genus, for which the name *Temnodachrys* Monrós, 1951, p. 150, must prevail (type: *aeneofasciata* Lac.). The bulk of the species included in *Dachrys* sensu Lacordaire are worthy of being separated in a new subgenus, for which the name Eudachrys is here proposed (type: *Dachrys cruciata* Lac.).

In the following key, the differences between the genera and subgenera of *Dachrys* s. lat. are briefly expressed.

1. Sides of prothorax curved and strongly convergent towards the head, so that the base is nearly twice as broad as the apex. Pronotum red, with only the basal lobe and an anterior narrow band black. Elytral pattern consisting of transverse black bands on reddish ground surface. Species limited to the Chilean area .....
..... *Dachrys* Er. [type: *succincta* (Er.)][2]

Sides of prothorax less convergent towards the head so that the base is not much more than ⅓ broader than the anterior margin. Pronotum black or metallic bluish or greenish, rarely (*Dachrys scutellaris* Lac. from Mexico) with a narrow reddish margin. Elytra unicolorous red or black with hu-

[2]A more complete description of *Dachrys* and allied genera will appear in my revision of the Argentine Clytrinae, now in press.

meral and apical spots or reddish with longitudinal black markings; the black bands never transverse. Species all over the Neotropical Region .....

..... *Temnodachrys* Monrós [type: *aeneofasciata* (Lac.)]

a. Interocular space with a well-marked transverse sulcus reaching from eye to eye .....

..... subgen. *Temnodachrys* s. str.

b. Interocular space without such sulcus; sometimes with a punctiform depression which never reaches from one eye to the other .....

..... subgen. *Eudachrys* nov. [type: *cruciata* (Lac.)]

F. SPECIFIC NAMES WHICH MUST BE CHANGED BECAUSE OF PRIMARY HOMONYMY.

Labidostomis mannerheimi n.n. pro *L. bipunctata* (Mannerh.), 1825, described as *Clytra* and therefore homonymous with *Clytra bipunctata* Foersb., 1821, which probably belongs to the genus *Miopristis*.

Aspidolopha buqueti Lac., 1848, replaces *A. bifasciata* Ill., 1800, described as *Clytra* and homonymous with *Clytra bifasciata* Degeer, 1778. The first synonym of the species, *Clytra bicolor* Web., 1800, is also homonymous with *Ischiopachys bicolor* (Oliv.), described as *Clytra* in 1791, and for that reason the second synonym must be employed.

Diapromorpha (*Peploptera*) *hottentota* n.n. pro *D. quadripunctata* Jac., 1897, nec *D. quadripunctata* Jac., 1887.

Clytra binominata n.n. pro *C. laticollis* Weise, 1889, nec *Tituboea laticollis* (Oliv.), 1808, described as *Clytra*.

Clytra gambiensis Lac., 1848, replaces *C. notata* Klug, 1835, homonymous with *C. notata* Gebl., 1830, which is a synonym of *Labidostomis lucida* (Germ.), 1823.

Clytra oblita n.n. pro *C. succincta* Lac., 1848, nec *Dachrys succincta* Er. 1834, described as *Clytra* in 1834.

Clytra weisei n.n. pro *C. cingulata* Weise, 1898, nec *Euryscopa cingulata* (Latr.), 1811, described as *Clytra*.

Clytrasoma balyi n.n. pro *C. distinguenda* (Baly), 1865, described as *Clytra* and homonymous with *Clytra distin-*

guenda Rosenh., 1847, which is a synonym of *Labidostomis pallidipennis* (Gebl.), 1830.

Babia costalis (Foersb.), 1821, replaces *B. humeralis* (Fab.), 1801, described as *Clytra* and homonymous with *Labidostomis humeralis* (Schneid.), 1792, also described in the genus *Clytra*.

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WESTERN RECORDS OF SILPHA SURINAMENSIS

By Borys Malkin

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No records of this species west of the Rocky Mountains appeared in its latest discussion in the literature (Arnett, 1946). How far west the species extended was not clear, although Carr (1920) reported it from Edmonton, Alberta, and Hatch (1933) from the Hill and Gallatin counties in Montana. Mr. Hugh Leech (in litt.) tells me of specimens in the collection of the California Academy of Sciences with the following data: "Pouce Coupe, B. C. 18. VI. 1927, *P. N. Vroom.*" A number of records west of the Rocky Mountains came to my attention. These are as follows: in the collection of the University of Utah: Salt Lake City, Utah, 1 Nov. 1951 (*Jorgenson*) 1 specimen; and Dennison, Utah, 1951 (*Solander*) 2 specimens; in the collection of the Utah State Agricultural College: Logan, Utah, Aug. 6, 1948, (*J. H. Judd*), 1 specimen; and Green Canyon, Utah, May 1951, 2 specimens; in the collection of M. H. Hatch: College Place, Walla Walla, Wash., May 4, 1949 (*G. H. Nelson*), at light, 2 specimens; and Cheney, Wash., June 1951 (large series); in the collection of the University of Idaho: "Moscow Mtn., Ida., May 5, 1949. Taken at the base of the mountain. W. F. Barr collector''; finally in my own collection: 1 specimen from Eugene, Ore., July 1946 (*B. Malkin*). Records from Alberta, Montana, and British Columbia represent probably indigenous occurrence. Pouce Coupe, B. C., is located about 60 miles east of the Rocky Mountains. The indigenous occurrence of the species west of the Rockies is not likely. The records from all three western states are recent, isolated and sporadic and, except for the Cheney, Wash., series, were always of either one or two specimens. The Eugene, Ore., specimen I found on a dead cat on a city streets, but although I returned several times to the cat in the course of several days no more specimens were to be found. It seems most likely that the beetles are transported accidently by human agency. Another possibility would be a migration from Alberta to the Northwest and then to Utah. This however is pure conjecture and only additional material may solve the riddle.

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Hatch, M. H. 1933. Canadian Ent., Vol. 65, pp. 5-15.

NEEDED FOR IMMEDIATE PUBLICATION

There still is room for field notes, news, book reviews, and exchange notices for publication in the February and later issues of the Bulletin. Illustrations of beetles, or beetle habitats are particularly desired. Now is your chance for immediate publication. Send your contributions to Ross H. Arnett, Jr., U. S. National Museum, Washington 25, D. C.

CHARLES M. BARR 1919 - 1952

Entomology has lost a very devoted student in the untimely death of Charles M. Barr on September 6, 1952. He was professionally employed with a paper firm in Washington, D. C. and pursued entomology as a beloved hobby.

He was born October 19, 1919 at Holyoke, Massachusettts, and his interest in insects began in that New England town where he collected Lepidoptera. In 1935 he moved with his parents to Easton, Maryland where he continued collecting and began shifting emphasis to the Coleoptera and Hemiptera. For the next six years, his summers were spent at ''Solitude'', a delightful waterfront farm ten miles from Easton. This environment must have contributed greatly to the firm establishment of his interests in insects and natural history.

He enrolled at the University of Maryland in the College of Business Administration in 1937 and received his Bachelor of Arts degree in 1941. In October of their freshman year, Mr. Barr and the writer became fast friends; and thenceforth collecting trips were made together at every available opportunity during the school years in the vicinity of College Park. During World War II, Mr. Barr served forty months with the Transportation Corps of the U. S. Army in England and France. He attained the grade of First Sergeant.

Between 1946 and the time of his death, Mr. Barr had become a valued friend of a number of entomologists and botanists in the vicinity of College Park and Washington, D. C. He was a frequent guest at Plummer Island and accompanied the late H. S. Barber, W. S. Fisher, and the writer on a number of trips to the Blue Ridge Mountains in Virginia. There was also a memorable trip to the coastal area of North Carolina in quest of *Trachykele*. Mr. Barr accompanied entomology students from the University of Maryland as well as the writer on collecting trips in the vicinity of College Park and into the wilds of Southern Maryland along the tidewater Potomac and its tributaries. Collecting trips were always made for the day or over weekends with camping over night.

In addition to providing congenial and stimulating companionship to entomologist friends in the field, Mr. Barr made available his expert knowledge of fine quality papers and printing methods to those who were interested in printed labels for their collections and in high quality bristols for card point mounting. His suggestions and advice along these lines resulted in marked improvement in the preparation of a number of private and institutional collections.

To Mr. Barr, entomology was not a means for gaining personal distinction, but rather it was a subject to be enjoyed for the wonderful world it opens up to the sincere student. It was a means for him to get out into the field and forest with friends of kindred interests. This endeavor he seemed to enjoy above all else. Second only to his love for the out of doors was his satisfaction gained from preparation and study of his collections at home in the evenings and on days when weather was forbidding for collecting trips. An added measure of satisfaction for him was gained in producing the homemade pinning trays and drawers used to house his collections. Utilizing his knowledge of paper technology, he ingeniously fashioned these of cardboards and papers with pinning bottoms of pulped newspapers. Mr. Bass published no papers on entomology.

His extensive insect collection has been donated as the Charles M. Barr Memorial Collection to the Holyoke Museum of Natural History and Art by his father, Charles H. Barr, and his brother, F. Allen Barr who survive him. Composed mostly of Maryland fauna, the collection contains approximately 7,500 specimens of Coleoptera and Hemiptera and about 1,000 specimens of Lepidoptera. All of this material is meticulously mounted and is in an excellent state of preservation. Also, a file of several thousand papered specimens, mostly duplicates, and a small amount of alcoholic material are included. A valuable feature of the collection is the wealth of biological data accompanying the specimens. In addition to the usual locality and date labels, a serial number on each mounted specimen refers to careful collecting notes. While the collection contains no type material, it is a valuable source of biological and distributional records and should be consulted by workers interested in such data. The collection which is accurately classified and in great part named will be a valuable source of information and inspiration to entomologically inclined people of the Holyoke area.

To those that knew him, he will always be remembered for his quiet unassuming manner, his sincerity and modesty, and his kind consideration of others. He was a faithful correspondent to his friends, and his letters are examples of choice rhetoric. A few excerpts from some of the letters received by the writer bear out Mr. Barr's fine human nature and interests:

April 22, 1951

"Yesterday, a bright sunny day, I went out to the Paint Branch area, where I spent a lot of time just wandering. It is very pleasant there at this time of year, as you know. Brought back a few beetles, nothing unusual. Caught a tree frog in some damp grass near the end of the path where our beach used to be. Brought it home and the *Triatoma* (*lecticularius*) seemed to like it. Two of the smallest *Triatoma* were put in with it over night, and this morning both were fully engorged. I replaced them with two more little fellows. Am afraid to feed the big nymphs until the little ones have fed because they may drain the frog dry. Am using the semicircular cheese boxes for the feeding cage because the lids are not tight. Keep the box in a closed paper bag in case the bugs escape which they didn't do last night. . . ."

July 30, 1951

"You will recall my mentioning that in the Flora of D.C. the author lamented the growth of Washington out into the Georgetown area and beyond, just as you and I have squawked about the apartment houses going up all over our old stamping grounds. Flora of D.C. was written I think in about 1917. In the Easton library I found a book on ferns written in 1899 which contained exactly the same sort of comment. And that was fifty years ago! So maybe Caesar was yapping about the Romans putting marble columns up all over his domain, if the right book be looked in. So you see, George, our bellyaching is not new. It has just become more acute. In the 1899 book they spoke of taking a train and a three-day expedition to locate some ferns growing about 25 miles away. Before automobiles the country was unspoiled, but for the very reason that it was inaccessible. Can't have our cake and eat it too. . . ."

November 28, 1951

"The monkeys, parrots and other forms, not least of all the lizards must really be something to see in nature. The giant lizard prancing around frisky as a pet dog was one of my vivid memories of visits to the Washington Zoo. It just didn't seem possible.

"Discovered the new glue I used on the trays has a tendency to rust pins. Have an experiment in progress to determine with certainty that the fault is with the glue. Am glad I kept dates and construction details on the bottoms of trays. It makes it easy to spot the lots that must be watched. Will have to switch back to using Cico paste on the pinning surface. Will continue the new glue on the other portions. Am undecided what action to take on the existing bad trays. Oiling or paraffin on pin tips may cure the trouble. All the pins do not rust, but enough to annoy me and that's plenty. The pins that have been in Cico glued trays for fours years have no sign of rust. The bad trays start in January 1950 when Arabal paste was begun."

December 13, 1951

"Thought I had been hearing suspicious noises in my desk for the last couple evenings. I looked through some loose paper bags and found an elaterid captured November 22 had revived. He certainly waited a long time before making his presence known."

April 27, 1952

"It is raining cats and dogs and (I hope) bugs. Has been for about four days. Last week summer landed with 85 degree temperature. Now it is cold again. First day of sun after all this rain will bring all the lawnmowers out in a hurry."

"A couple weeks ago on blossoms of pear trees (which I had overlooked in previous years) found extensive series of *Orsodacne* of which I previously had only one specimen. Found on nearby willow blossoms numerous pairs showing inter-breeding of all so-called "varieties" of which Blatchley lists quite a few. There were black males mated with stiped females and vice versa. Also black males and females and stiped males and females. Makes an interesting array. Extreme variability."

GEORGE B. VOGT, *U. S. Department of Agriculture.*

BOOK REVIEW

THE COLEOPTERA OF THE GALAPAGOS ISLANDS, by Edwin C. Van Dyke. Cal. Acad. Sci., XXII, 1953, 181 pp. 7 plates figuring 55 species.

This posthumous publication by the beloved coleopterist of the California Academy of Sciences is a list of the 200 species and subspecies of beetles taken in the Galapagos Islands since Charles Darwin began to collect in the region in 1835. Of the 167 endemic forms known from the archipelago, 23 were named by George R. Waterhouse in 1845 in the initial report on Darwin's collection; 22 were named in 1928 and 1933 by K. G. Blair; and 80 are described as new by Van Dyke in the present paper. Van Dyke suspects that many additional species remain to be discovered in the islands. The 200 forms listed represent 37 families, but about three-fifths of them belong to five families: Tenebrionidae (46), Carabidae (24), Curculionidae (20), Cerambycidae (18), Elateridae (14). Of the 200 forms cited, 167 (83%) are endemic, 3 are probably recorded from the archipelago in error, and 30 (15%) occur elsewhere. Almost the only truly cosmopolitan species recorded are *Necrobia rufipes* DeG., *Dermestes carnivorus* F., *D. maculatus* DeG., and *Gnathocerus cornutus* F., and the influence of man on the fauna must so far be relatively slight.

Dr. Van Dyke believes that the modifications exhibited by Galapagos beetles is not the result of "haphazard distribution" but of a "gradual isolation . . . such as could be produced by the breaking up of large islands into smaller ones. . . . It would appear as if a . . . portion of western South America was isolated by the subsidence of the intervening area. . . . This land mass was later broken up into small islands." The islands then are "continental" and not "oceanic" as considered by Alfred Russel Wallace.

The reviewer queries whether the orderly distribution noted by Dr. Van Dyke may not be possible over ocean stretches as well as over continuous land areas. Moreover, are not the 200 species of Coleoptera known from the Galapagos Islands an improbably small number if the islands are viewed as fragments of a former continent?

MELVILLE H. HATCH, *University of Washington.*

The Coleopterists' Bulletin

A BIMONTHLY PUBLICATION DEVOTED TO THE STUDY OF BEETLES

VOLUME 8, 1954

Published by THE DEPARTMENT OF BIOLOGY
SAINT JOHN FISHER COLLEGE
ROCHESTER, NEW YORK

THE COLEOPTERISTS' BULLETIN

The Coleopterists' Bulletin is published by the Department of Biology, Saint John Fisher College, Rochester, New York, and edited by Ross H. Arnett, Jr., Head, Department of Biology, and Associate Professor of Biology, Saint John Fisher College. It is issued six times a year beginning with February.

Subscriptions: The subscription price for each annual volume of six numbers is $4.00 payable in advance. All subscriptions begin with the first issue of the year and those subscribing later in the year will receive the back issues of that volume.

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EDITORIAL POLICY

Any article, note, or news items likely to be of interest to readers of the **Bulletin** will be considered. Articles with illustrations are particularly desired, and in most cases, descriptions of new species must be illustrated. Descriptions of new species or genera must contain keys or be correlated with existing keys. Photographs, with or without text, suitable for printing on the front cover of each issue are desired.

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Nos. 5 & 6 (pp. 69-84), January 21, 1955

The Coleopterists' Bulletin

Volume VIII February, 1954 No. 1

Published bimonthly beginning with February by Ross H. Arnett, Jr., U. S. National Museum, Washington 25, D. C. Terms of subscription: $4.00 per year, both domestic and foreign, payable in advance. Remittances should be made payable to Ross H. Arnett, Jr. Back numbers are available.

Manuscripts dealing with any phase of the study of beetles, including descriptive material, are invited. For notice to authors and editorial policy, see title page for each volume.

Entered as second-class matter at the post office at Washington, D. C.

FIREFLY IN FLIGHT

(Figure 1)

A Flash Photograph of a male *Photinus pyralis* (L.) in free flight taken with an Eastman Bantam Kodak with an accessory lens of 4 inch focal length, on Super-XX film, 1/50 sec., f. 4.5, using a number 5 bulb in a standard flashholder. On the original negative, the insect is about 10 mm. long, the usual life-size being 12-13 mm. The range of the wing beat, the position of the posterior legs, and the angle of the luminous area to the horizontal may be noted, and also that the antennae are in motion, particularly the tips.

FRANK A. McDERMOTT, *Wilmington, Del.*

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A BIMONTHLY PUBLICATION DEVOTED TO THE STUDY OF BEETLES

Editorial

We take this opportunity to thank all of those who have graciously contributed their time and efforts in helping us to plan and prepare this issue of the Bulletin. Without their co-operation, such would not be possible. We hope that you, the reader, find this publication both useful and interesting. Your continued suggestions and help will make it grow.

Our intention is not to fill this space with matters concerning the production of the Bulletin, but a few introductory remarks seem in order with this issue. We are happy to report that for the first time in our seven year history, we ended the year nearly in the black. A contribution of twenty dollars, and another of twenty-five left us with only a few dollars short. It seems that with the present trend of subscription increase, we will be able to continue printing 32-page issues. BUT, we are far from the goal now, so if you like this issue and want to see more of them, do your best to help us build up the subscription list!

Many workers have agreed to help us with a seasonal summary for coleoptera. Many more have not commented. A few have suggested that such a summary is useless, or impossible. Further comments on this controversal subject are invited. Discussions of such subjects will be printed in a section to be initiated in future issues.

We again invite you to send in manuscripts on any phase of beetle study. Editors never have too many, and as long as space permits, we plan to be informal with much of the material in an attempt to increase the interest in the study of beetles.

Your suggestions are always welcome, but seldom received!

Contributing Editors

The following persons are Contributing Editors for the Bulletin. Their main responsibility is to provide a complete coverage of news about the activities of Coleopterists and Institutions within their area. This is possible only with the cooperation of all persons in these areas. News including death notices may be sent either to the Contributing Editor for the area, or directly to the News Editor of the Bulletin, Prof. Henry F. Howden, Department of Zoology and Entomology, University of Tennessee, Knoxville. For the complete address of the editors, see the directory of coleopterists published in the Bulletin.

T. J. Spilman, Cornell University; W. H. Anderson, U. S. National Museum; W. M. Kulash, N. C. State College; H. F. Strohecker, University of Miami; M. W. Sanderson, Illinois Natural History Survey; Henry F. Howden, University of Tennessee; Lawrence S. Dillon, A. and M. College of Texas; T. O. Thatcher, Colorado A. and M. College; Floyd Werner, University of Arizona; M. H. Hatch, University of Washington; Paul O. Ritcher, Oregon State College; J. Gordon Edwards, San Jose State College; W. J. Brown, Canadian Department of Agriculture; F. Monrós, Instituto Miguel Lillo, Argentina; W. Wittmer, Buenos Aires, Argentina; C. H. Lindroth, Zoological Institute, Lund; H. Klapperich, Bonn; J. L. Gressitt, Bishop Museum.

A NEW SPECIES OF DENDROCTONUS FROM GUATEMALA (Scolytidae)[1]

Publication No. 6

By T. O. THATCHER[2]

In May 1951, Dr. Gunther Becker of Berlin, Germany, investigating forest insects in Guatemala for the United Nations F.A.O., collected some very large specimens of a species of *Dendroctonus.* These were sent to the author for identification along with other collections from the same locality. Upon examination of the specimens, it was immediately apparent that this was something not previously encountered. For one thing, the first specimens seen were strikingly large and although they superficially resembled *Dendroctonus valens* LeC., they were separated from this species by the obviously dark prothorax and body. Further investigation and checking showed that this was a new species.

FIG. 2. *Dendroctonus beckeri,* n. sp.

The new species can be separated from other species in Hopkins (1909) as follows:

The constricted pronotum places this species in Division II in which it falls in Subdivision C (Front usually with posterior impression; pronotum w/large and small punctures intermixed.) In C it keys to Section a4 because of the very shallowly impressed declivital striae and the irregular punctures on the pronotum. The proepisternal area is granulate-punctate over all (but the epimeral area immediately behind it is impunctate.) This keys to Subsection b4 in which the fine strial punctures on the declivity set the species into Series c3 where Hopkins has placed *D. rufipennis* (Kby) and *D. murrayannae* Hopk. Separation beyond this point is by the following modification of Hopkins' synopsis:

---

[1]Scientific Journal Series No. 413, Colorado Agricultural Experiment Station.
[2]Colorado A. & M. College, Fort Collins, Colorado.

Series c3

1. Pronotal punctures at most moderately dense, rugosities of elytral interspaces coarsely spaced to sparse, length less than 7.5 mm., declivity convex 2
   Pronotal punctures very dense (separated by less than own diameter), irregular in size and shape, interspaces densely asperate-rugose; length greater than 7.5 mm. (to 9.6 mm.), declivity flattened to either side of suture .... **D. beckeri n. sp.**
2. Elytral striae scarcely impressed, punctures moderately coarse, rugosities of interspaces sparse; pronotal punctures irregular; length 5 to 7.3 mm .... **rufipennis (Kby.)**
   Elytral striae moderately impressed, punctures coarse, shallow; rugosities of interspaces rather coarsely placed; pronotal punctures not distinctly irregular; length 5.4-6.5 mm. .... **murrayanae Hopk.**

Dendroctonus beckeri, new species

(Figure 2)

Length 7.75–9.6mm., average approximately 2.4 times as long as wide, color black, elytra rich red-brown, legs piceous black to dark brown, antennae dark red-brown; vestiture amber, moderately thick, rather long on disc, shorter laterally.

Head: Frons wider than long (ratio 1.65 to 2.45), shining, densely punctate-tuberculate, tubercles more numerous around margins, moderately clothed with stiff, amber setae of moderately short length, flattened on rectangular area occupying almost entire frons; distinctly raised transverse median carina, rather broad with ends raised more than center, bearing shining callosities; dorsal margin of frons with distinct broad conical tubercle on median line, impunctate at apex; shallow transverse impression between the transverse carina and marginal tubercle; epistomal process shining, black edged, depressed in center with prominences on each side of depression; ventral margin faintly, rather irregularly bisinuate along deepest portion of depression; dense brush of amber hairs extending ventrad from lower margin, hairs laterally more sparse and longer. Eyes elongate, front margin almost straight giving D-shaped appearance; facets moderately large; vertex, sides of head and genae rather coarsely, densely rugose-punctate; narrow curved sulcus beginning just below posterior middle of eye and extending ventrad toward gular area; gula coarsely aciculate, surface irregular on ventral median area; mandibles shining black, rather blunt with small second tooth which carries on to anterior surface as a shallow, sharp ridge; maxillae quite densely clothed with fairly stiff, moderately long setae.

Antennae: Scape approximately .396 of total length, slightly curved, strongly enlarged toward distal end, appearing short and heavy, bearing a few rather fine, short hairs; pedicel pyriform, about as wide distally as third funicular segment; second segment distinctly longer than pedicel englarging evenly to distal end, narrower than pedicel or any of the succeeding segments; segments 3, 4 and 5 short and each wider than the previous one; the few setae of the funicle short on the pedicel, successively longer on following segments; club dark red-brown, shining, rounded oval, wider than long with two distinct moderately arched, faintly bisinuate sutures; first segment of club occupying almost half of area; second segment short; third slightly longer; funicle and club subequal in length, funicle being very slightly longer, proportion of total length being respectively .313 and .291; club naked except for extremely short setae along margins.

Pronotum: Very dark brown to black, somewhat paler on disc; strongly constricted anteriorly, distinctly impressed just behind anterior margin, distinctly wider than long (ratio 56 to 78) widest at posterior angles; very densely punctate, punctures variable in size, irregular in shape, somewhat smaller and slightly more uniform in size laterally, very seldom separated by their own diameter; anterior margin strongly bisinuate; sharply elevated median carina, tapering to obscurity anteriorly, shining and widest just anterior to basal third of pronotal length; lateral callosities at approximately one-third of pronotal length from posterior margin, low, moderately shining, shallowly curved backward to middle; setae short, somewhat finer than on elytral disc, somewhat longer anteriorly and laterally; pleural areas shallowly, closely granulate–punctate, setae very short, fine and inconspicuous.

Elytra: Considerably longer than wide (ratio 1 to 1.46); sides parallel, very slightly wider than pronotum; base arcuate, most strongly curved toward center line, armed with raised, oblique, somewhat asperate teeth; a second, less obvious row of such teeth parallel to and slightly behind the marginal row; scutellum very small, below level of elytra and sharply sloped downward anteriorly, black with extremely fine punctures on apical portion; disc distinctly longer than width of elytra, surface moderately shining, distinctly asperate-rugose with the striae very shallowly impressed, divergent from suture posteriorly; punctures moderate, shallow, circular, somewhat indistinct anteriorly, larger posteriorly and again smaller and less distinct on declivity; interspaces flat to very faintly rounded, densely asperate-rugose on disc to granulate-punctate laterally; setae longest on disc to very short laterally; declivity faintly flattened on either side in median area; sutural striae sharp but shallow and very narrow, lateral striae less distinct; all interspaces armed with minute, dark-tipped denticles which are arranged serially on first interspace, scattered and more dense on lateral interspaces; declivital setae rather sparse, very short and fine to moderate and coarser (probably abraded).

Ventral surfaces black, shining, rather closely, finely punctate, moderately clothed with long, fine, appressed, ashy-yellow setae; epimeron sub-quadrate, only slightly narrower in middle than at either end, somewhat more densely punctate than other ventral surfaces; dorsal margin with narrow impunctate band; abdominal segments 1 and 5 subequal, very dark brown on median area, 2 slightly longer than 3 or 4, 2, 3 and 4 black with yellow posterior margin; all segments closely, finely, shallowly punctate centrally, very densely, very finely granulate laterally; legs piceous black, shining, dark brown distally, punctures very fine and shallow, sparse; fore tibiae with three long, acute marginal teeth, the proximal slightly smaller than the other two, 4 apical teeth, the outer two distinctly larger; middle tibiae with two marginal teeth, the distal being larger, and five apical teeth, the outer two largest; hind tibiae with two marginal teeth, the proximal much smaller and blunter, and four subequal apical teeth.

Holotype: Female. Length 9.6 mm. (U. S. National Museum collection).

Paratypes: 10, same data as type.

Type Locality: Totonicapan, Guatemala.

Host: Unknown.

Distribution: Known only from Guatemala.

Five paratypes are in Dr. Becker's collection, and five paratypes are in the author's collection.

Reference

Hopkins, A. D. 1909 (June). The Genus *Dendroctonus*, Contributions toward a monograph of the scolytid beetles, part I. U. S. Department of Agriculture, Bur. Ent. Tech. Series No. 17, Part I.

AN EUROPEAN WEEVIL IN U. S.

An European weevil, *Stomodes gyrosicollis* Boh., has become established in the United States. Specimens of this important economic species were collected in 1952 and 1953 by the author at Augusta, Maine. It is a potential pest of alfalfa and other crops. The determination of this species has been confirmed by Miss R. E. Warner of the U. S. Department of Agriculture.

A. E. Brower, *Augusta, Maine*

OUTSTANDING ECONOMIC COLEOPTERA ACTIVITY—1953[1]

By Joseph W. Gentry[2]

Several coleopterous insects were exceptionally abundant on cereal and forage crops over wide areas during the 1953 season. Clover leaf weevil (*Hypera punctata* (F.)) was unusually numerous and destructive in many sections. Widespread abundance was recorded on clovers in Delaware, Ohio, and Missouri; and on alfalfa and clover in Kansas, Indiana and Illinois. The insect caused serious damage to alfalfa in Colorado and was more damaging than for many years in Utah. There were scattered reports of alfalfa weevil (*H. postica* (Gyll.)) damage; however, Utah had less than normal. This insect, which was recently discovered in the eastern states, caused heavy loss to alfalfa in several counties of Maryland. Severe injury to first-crop alfalfa was noted in South Dakota. The corn flea beetle (*Chaetocnema pulicaria* Melsh.) appeared in unusual numbers during the spring in several eastern and mid-western areas. The infestation was greater than at any time in the last 20 years in Illinois, and seriously damaged many early-corn plantings. Indiana and Ohio reported abnormally heavy infestations. Stewart's disease, which followed the flea beetle attack, was severe and widespread on corn in Ohio and caused heavy loss to this crop in Indiana. A high incidence of the disease was also reported from New Jersey and Massachusetts.

Corn billbugs (*Calendra* spp.) caused severe damage to corn in isolated plantings in Ohio, Missouri and Indiana. Adults of corn rootworms (*Diabrotica longicornis* (Say) and *D. undecimpunctata howardi* Barb.) were abundant in corn in Iowa in July and adults of the latter species were abundant on several crops in southern Missouri. *Diabrotica virgifera* LeC. adults damaged corn in areas of Colorado and in many counties of Nebraska. This species was also abundant in northern Kansas, while an undesignated species caused some injury to corn in eastern South Dakota. Heavy flights of May beetles (*Phyllophaga* spp.) were observed in Wisconsin and Kansas and at Brookings, South Dakota. False wireworms (*Eleodes* spp.) caused an estimated loss of 2 million dollars to spring and winter wheat in eastern Washington. Adult collections indicated that at least three species were involved. Although sweetclover weevil (*Sitona cylindricollis* Fahr.) injury was less than 1952 in Kansas, the insect was extremely abundant and de-

[1]This summary was compiled from the Cooperative Economic Insect Report.
[2]Economic Insect Survey Section, U. S. Department of Agriculture.

structive to second-year clover in South Dakota. Damage was also noted in Flathead County, Montana. Rather heavy infestations of vetch bruchid (*Bruchus brachialis* Fahr.) occurred at Grand Rapids, Paw Paw and Wixom, Michigan. Clover root borer (*Hylastinus obscurus* (Marsh.)) was exceptionally abundant in second-year clover near Huntington, Indiana; and second-crop red clover was seriously reduced in Ohio by this pest and dry weather during the summer.

Damage to red clover in Williamette Valley, Oregon, by a nitidulid (*Meligethes seminulum* LeC.) was more severe than in past years. This insect, not known to occur in the United States outside of Oregon according to reports, is extremely difficult to control. The adults attack the seed crop of clovers. Heavy populations of southern masked chafer (*Cyclocephala immaculata* (Oliv.)) were found in wheat fields in some area of Kansas during the fall. As high as 35 grubs per square foot of soil were recorded in Rice County. Very early-planted wheat was destroyed to the extent that some replanting was necessary.

Although there was no general outstanding coleopterous damage to fruit crops, some of the activity was noteworthy. Green June beetle (*Cotinis nitida* (L.)) adults were extremely abundant in orchards and corn in southwestern Missouri in July and caused heavy damage to ripening fruit. Large populations were also reported from several areas of North Carolina and Fayette County, Pennsylvania. There was a general infestation of grape flea beetle (*Altica chalybea* (Ill.)) in Chautauqua County, New York during June and an extremely heavy population around Fairview, Pennsylvania. This insect caused damage in an extensive area around Meridian, Mississippi, where infestations were serious on both muscadine and bunch grapes. Plum curculio (*Conotrachelus nenuphar* (Hbst.)) was unusually abundant in the Hudson Valley of New York.

On truck crops, Colorado potato beetle (*Leptinotarsa decemlineata* (Say)) was unusually heavy and difficult to control on Long Island, New York, and more abundant than usual on tomatoes in upstate areas. North Dakota also reported difficulty in controlling this insect on potatoes in the Red River Valley area. Vegetable weevil (*Listroderes costirostris obliquus* Klug) was a major pest of vegetables in Louisiana during the spring. Populations of pea weevil (*Bruchus pisorum* (L.)) were lowest in many seasons during June in northern Utah. *Brachyrhinus* spp. were a chronic problem on strawberries as well as other small fruits in Washington. Rose chafer (*Macrodactylus subspinosus* (F.)) infestations were very heavy in vicinity of Burlington, Vermont. Strawberry weevil (*Anthonomus signatus* Say) was very abundant and damaging in strawberry plantings in the southern counties of Minnesota. Seventy-five percent of buds were cut in plantings south of Minneapolis. Wireworms (Elateridae) caused severe injury to crops in areas of Minnesota during June. *Conoderus vagus* Cand. was found to be the species responsible for major wireworm damage in Charleston, South Carolina and Hastings, Florida areas.

As usual, boll weevil (*Anthonomus grandis* Boh.) was of major concern in many of the cotton-growing states. Infestations were unusually heavy in the cotton areas of Virginia, North Carolina, South Carolina, Georgia. Alabama and Tennessee also had very heavy infestations. The infestation in North Carolina was the heaviest since 1950.

Although complete data on outstanding forest insect conditions for 1953 are not yet available, the following notes are of interest and importance. Heavy infestations of Black Hills beetle (*Dendroctonus ponderosae* Hopk.) in some national forests of Colorado and Wyoming were treated during the year. The insect continued in outbreak numbers in forests of southern Utah. Southern pine beetle (*Dendroctonus frontalis* Zimm.) appeared in outbreaks in certain central western North Carolina counties, and very heavy infestations of Engelmann spruce beetle (*D. engelmanni* Hopk.) were reported from some national forests of Colorado. Elm leaf beetle (*Galerucella xanthomelaena* (Schr.)) abundance and damage occurred in many states.

New Records and Extension of Infestations

Heavy infestations of a dermestid (*Trogoderma granarium* Everts) were discovered in stored-grain elevators in Tulare County, California, during November, 1953. So far as can be determined, this is the first record of occurrence of this insect in the Western Hemisphere; however, surveys subsequent to the discovery in California showed that the species may be quite widely distributed in the State. It was found that heavy infestation occurred in a warehouse in Fresno as early as 1946, reaching a peak in 1949. Previous known range of this beetle is Eurasia, including England and Japan; Philippine Islands; Madagascar, and Australia. It is probably native to southern Asia. Recorded hosts and foods include all stored grains; cereal products; malt in breweries; dry animal matter, such as hair and hide.

The occurrence of sweetclover weevil (*Sitona cylindricollis* Fahr.) in Idaho was established for the first time in 1953. Specimens collected at Pocatello and Arco in 1950, at Hot Springs, Owyhee County, in

1951-52, and Idaho Falls in 1953 were identified as this species by R. E. Warner.

Sand wireworm (*Horistonotus uhlerii* Horn) was found on corn in Robeson and Bladen Counties, North Carolina. This is believed to be an extension of the known range of this insect in the State. Adults of yellow-margined leaf beetle (*Microtheca ochroloma* Stal) were collected for the first time in Marengo County, Alabama. These specimens were found feeding on Irish potato, which is believed to be a new host record. Smaller European elm bark beetle (*Scolytus multistriatus* Marsh.) was collected in Los Angeles County, California, and Kay County, Oklahoma for the first time. Several new infestations of white-fringed beetles (*Graphognathus* spp.) were reported from infested states, including North Carolina, South Carolina, Alabama and Mississippi. Japanese beetle (*Popillia japonica* Newm.) was found in conspicuous numbers in Newton County, Indiana and Iroquois County, Illinois. The extent of the infestation indicates that introduction occurred at least 6 years ago. The insect is well established in a typical corn belt. New county records for alfalfa weevil (*Hypera postica* (Gyll.)) include Jackson County, South Dakota and Chester and Delaware Counties, Pennsylvania. A northward expansion was recorded in Montana. Vegetable weevil (*Listroderes costirostris obliquus* Klug) severely damaged tobacco plants in the field in Horry and Dillon Counties, South Carolina. Although larvae have been known in tobacco plant beds in this State since 1940, this is the first instance, so far as known, of damage to field plants. According to available reports, this insect was recorded feeding on tobacco plant beds in Virginia for the first time in 1953.

PYTHO PLANUS, Herbst IN OREGON

About 25 specimens of pupae and freshly emerged adults of this beetle I collected from under bark of Western Yellow Pine (*Pinus ponderosa,* Lawson) in the vicinity of Union Creek, Jackson county, Oregon. In the course of repeated visits between September 3-12, 1951 the beetles were found emerging only under bark of one large log of slight degree of disintegration. No larvae however were present during that time. Since *Pytho planus* had not been reported in the literature from Oregon this record presumably represents its first occurrence in that state.

Borys Malkin, *University of Washington*

NOTES ON THE TRIBE CALOSPASTINI, WITH DESCRIPTION OF A NEW SUBGENUS AND SPECIES OF CALOSPASTA (Meloidae)[1]

By Richard B. Selander

With few exceptions each tarsal claw of adult Meloidae consists of two separate, parallel blades. It seems likely that this "cleft" condition serves a function in aiding the beetles to secure a foothold when climbing on vegetation. In what appears to be the primitive condition the blades are nearly equal in size and are smooth. In its more specialized form the dorsal blade has one or two rows of dentes, while the ventral blade is thinner and sometimes shorter than the dorsal one.

In some North American genera the ventral blade is not only shorter than the dorsal one but is solidly fused to it basally, so that the claws appear to have a ventral tooth (Plate I, fig. 3). Since the line of fusion is visible in most species, there can be little doubt that the tooth is homologous to the ventral blade of the more primitive claw. In most genera the ventral tooth is elongate and nearly parallel to the dorsal blade. In *Megetra, Cysteodemus,* and *Tegrodera* it is short and divergent.

The fused condition of the tarsal claw was used by Van Dyke (1928) in characterizing the tribe Calospastini. As defined by him the tribe is a good phyletic group, but it now appears that this condition of the tarsal claws is not unique to it, since two species having fused blades and previously assigned to the genus *Calospasta* actually belong in the tribe Lyttini, where they are congeneric with *Lytta vesicatoria* (Linnaeus).

These two species, *Lytta moesta* (Horn), NEW COMBINATION, and *Lytta morrisoni* (Horn), NEW COMBINATION, differ from the Calospastini in having moniliform, rather loosely articulated antennal segments. In addition, the males have the intermediate antennal segments slightly incrassate, a condition not found in the Calospastini but present in many species of *Lytta*. Finally, both species are larger than most species of *Calospasta* and are so *Lytta*-like in general appearance that specimens have almost invariably been identified as species of *Lytta* in collections. It is only by examining the tarsal claws that one would suspect that the species might have been described in the genus *Calospasta*. *Lytta funerea* (Fall) shows an approach to this condition in having the

[1]This paper is a joint contribution of the Section of Faunistic Surveys and Insect Identification, Illinois Natural History Survey, and the Department of Entomology, University of Illinois.

ventral blade of the tarsal claws definitely shorter than the dorsal one, although it is not fused to it.

It is possible that *L. morrisoni* and *L. moesta* represent a phyletic line ancestral to the Calospastini. However, until more evidence is obtained I prefer to consider that the fusion of the tarsal claw blades has taken place independently in the Calospastini and in *Lytta* and to retain tribal status for *Calospasta* and its allies.

The combination of filiform, closely articulated antennal segments, sharply curved second A_3 vein, and fused tarsal claw blades will suffice to distinguish members of the tribe Calospastini from the Lyttini, although none of these characters is distinctive when applied singly. Further work, especially larval studies, will undoubtedly disclose additional characters to distinguish the two groups.

Within the tribe Calospastini the monotypic genus *Eupompha* LeConte, erected for *E. fissiceps* LeConte, has been distinguished from other genera on the basis of certain strongly developed secondary sexual characters of the male head and fore tarsi. Actually, *E. fissiceps* is nothing more than a highly modified *Calospasta*. The characters used to separate it are found in various stages of development in several species of the latter genus, including the genotype, *C. elegans* (LeConte).

A few species of *Calospasta*, as *C. viridis*, have the head and fore tarsi of the male unmodified. In *C. elegans* the first segment of the fore tarsi is swollen in the male, while the second to fourth segments are very slightly enlarged. All segments are normally pubescent dorsally. The head of the male has the frontal region swollen, with a rather broad impression along the midline. In *C. histrionica* the head of the male is similar to that of *C. elegans*, but the first three fore tarsal segments are swollen and glabrous dorsally, with the first segment sulcate dorsally and the second and third segments with an indication of a sulcation. The fourth segment is only slightly swollen.

Passing next to *C. sulcifrons* we find that the head of the male is strongly swollen and deeply impressed from the clypeus to near the occiput. The first four segments of the male fore tarsi are glabrous dorsally and more strongly swollen than in *C. histrionica*, although not sulcate. Finally, in *E. fissiceps* the male fore tarsi are very much like those of of *C. histrionica* but more distinctly sulcate dorsally and more strongly swollen. The head is similar to that of *C. sulcifrons*, except that the impression is deeper and narrower and extends to the occiput. On the basis of these data and the lack of any other characters to justify its separation, I consider *Eupompha* as a synonym of *Calospasta*. *Eupompha fissi-*

ceps LeConte then becomes *Calospasta fissiceps* (LeConte), NEW COMBINATION.

With the above changes I now regard the genus *Calospasta* as containing the following species: *C. decolorata* Horn, *C. edmundsi* Selander, *C. elegans* (LeConte), *C. fissiceps* (LeConte), *C. fulleri* Horn, *C. histrionica* Horn, *C. imperialis* Wellman, *C. macswaini,* n. sp., *C. nemognathoides* Horn, *C. schwarzi* Wellman, *C. sulcifrons* Champion, *C. viridis* Horn, and *C. wenzeli* Skinner.

In two of these species a peculiar condition of the tarsal claws has been found. Thus in *C. nemognathoides* and *C. macswaini* a long, heavy, somewhat spatulate process arises from the base of the ventral tooth and extends parallel to the outer surface of each claw (Plate I, fig. 3). Apparently these processes are immovable; I propose to call them ungual spines.

An examination of all species except *Calospasta fulleri* and *C. decolorata* has failed to disclose the presence of ungual spines in any other members of the tribe Calospastini. Furthermore, they apparently have not been reported for any other Meloidae. It is probable that the spines developed in the Calospastini after the fusion of the ventral blade and that they now serve the same function as that structure does in its free condition in other Meloidae.

Primarily on the basis of the possession of these ungual spines I propose to separate *C. nemognathoides* and *C. macswaini* from the rest of the members of the genus *Calospasta* as follows:

SPASTONYX, new subgenus

Ungual spines present on tarsal claws. Fore tarsal segments of male neither swollen nor dorsally glabrous. Head not swollen, lacking longitudinal furrow or broad impression on vertex and frons. Lateral lobes of male genitalia with a large lightly sclerotized area surrounded entirely by darker, more heavily sclerotized cuticle. Colors not metallic.

Genotype: *Calospasta nemognathoides* Horn, by present designation.

KEY TO SPECIES

Distal antennal segments one and two-thirds as long as broad; elytral pubescence confined almost entirely to sides and apex; ungual spines hardly surpassing apex of ventral tooth; male genitalia as in Plate I, fig. 4; female genitalia with styli two and three-fifths times as long as broad .... **nemognathoides** Horn

Distal antennal segments twice as long as broad; elytral pubescence more conspicuous, evenly distributed; ungual spines surpassing apex of ventral tooth by almost half their length; male genitalia as in Plate I, fig. 8; female genitalia with styli three and one-half times as long as broad .... **macswaini**, n. sp.

In most of the specimens of the two species examined some of the ungual spines are broken off near the base.

Calospasta (*Spastonyx*) *nemognathoides* Horn
(Plate I, figs. 1-6)

Calospasta nemognathoides Horn, 1870, 3:92; Horn, 1878, 7:60 (in key); Horn, 1891, 29:102; Wellman, 1909, 20:24.

Brownish black. Head black or brownish black. Prothorax orange. Pubescence dark. Length: 7.5-9 mm.

Male: Head as broad as long, one and one-tenth times as broad as pronotum (Plate I, fig. 2). Sides weakly divergent dorsad of eyes, rather suddenly rounded at tempora, which are well marked. Frons with three shallow, subcontinuous impressions between eyes. Midline finely impressed on vertex. Surface of vertex and frons smooth, shiny, very sparsely and minutely punctate, glabrous (actually with a few very minute, erect setae visible under high magnification). Antennae reaching beyond middle of pronotum, twice as long as pronotum. Third to tenth segments filiform, closely articulated. Distal segments slightly longer and broader than basal segments, one and two-thirds as long as broad. Eleventh about one and one-third times as long as tenth.

Pronotum subcampanulate, as broad to nearly one and one-tenth times as broad as long, broadest at middle. Sides much more strongly convergent apically than basally. Disk very evenly convex, smooth, shiny, nearly impunctate, glabrous; midline not impressed. Elytra moderately shiny, irregularly rugose, with a few short, scattered setae confined almost entirely to sides and apex. Wings colorless. Vein R_1 brown, except basally; rest of veins yellow; vertical vein bowed toward wing base.

Lateral hind tibial spurs moderately robust, expanded at apex, obliquely truncate; mesal spurs shorter, slender, spiniform, one-third to one-half as broad as lateral spurs (Plate I, fig. 6). Fore tarsi with pads a little larger than on rest of tarsi. Tarsal pads sericeous, except on first segment of hind tarsi, which is entirely dark-pubescent. Tarsal claws long, slender, the ventral tooth three-fourths to four-fifths as long as dorsal blade. Ungual spines hardly surpassing apex of ventral tooth (Plate I, fig. 3).

Thoracic sternum and abdomen very sparsely and even more minutely punctate than vertex, clothed with short, subrecumbent, fine setae. Fifth visible abdominal sternite moderately deeply, semicircularly emarginate. Sixth (Plate I, fig. 1) cup-like, appearing obliquely truncate in lateral aspect, with a deep, rather narrow, V-shaped emargination; a broad area along emargination lightly pigmented; lateral lobes densely clothed with rather long pubescence.

Genitalia as in Plate I, fig. 4. Lateral lobes very acute at apex. Median lobe with two ventral hooks of similar size. Ninth sternite as in Plate I, fig. 5.

Female: Fore tarsal pads not larger than rest. Fifth visible abdominal sternite entire. Sixth not cup-like, truncate, lacking lightly pigmented area. Styli of genitalia two and three-fifths times as long as broad.

Recorded Distribution: CALIFORNIA: Owens Valley (type locality). ARIZONA: "near Fort Yuma."

Specimens Examined: ARIZONA: Andreas Bolter Collection (Illinois Natural History Survey), 2 males, 5 females; Phoenix, 1892-1907, R. E. Kunze (British Museum (Natural History)), 1 male, 2 females. CALIFORNIA: 1000 Palms, April 10, 1937, G. C. Varby (British Museum (Natural History)), 1 female.

The color pattern and rather broad pronotum give this species a superficial resemblance to some species of *Nemognatha,* as noted by Horn. The specimens examined are much larger than those of *C. macswaini,* but measurements given by Horn (1891) (5.5-8 mm.) and Wellman (5.4 mm.) for *C. nemognathoides* indicate that there is an overlap in length of the two species.

Calospasta (*Spastonyx*) *macswaini,* n. sp.

Plate I, figs. 7-9

Similar to *C. nemognathoides,* except as follows:

Brownish black. Head and prothorax orange or brownish orange, the head darker and either unicolorous or suffused with piceous on vertex, or head and pronotum brownish black. Antennae, mouthparts, tibiae, tarsi, and sometimes apex of femora fulvous. Pubescence pale. Length: 4.5-5.5 mm.

Head about one and one-tenth times as broad as long, one and one-fourth to one and one-third times as broad as pronotum, broadest across eyes. Sides from eyes rounded smoothly into tempora, which are subsequently not well defined. Frons flat or with a small, shallow impression on each side near eyes. Midline not impressed on vertex. Vertex and frons very sparsely clothed with short, suberect, much more conspicuous setae. Antennae narrower. Distal segments twice as long as broad. Eleventh one and two-fifths times as long as tenth.

Pronotum in one specimen with a shallow fovea on each side behind middle. Elytra clothed with longer setae, which are regularly distributed over surface and much more conspicuous. Wing veins entirely yellow.

Fore tarsal pads not larger than rest. Tarsal pads sericeous on all segments, not as well differentiated, the setae longer and sparser. Ventral tooth of tarsal claws not more than three-fourths as long as upper blade, generally about one-half as long. Ungual spines surpassing apex of ventral tooth by almost half their length.

Fifth visible abdominal sternite a little less deeply emarginate in male. Sixth not as strongly cupped, moderately deeply, semicircularly emarginate in male (Plate I, fig. 7).

Male genitalia as in Plate I, fig. 8. Lateral lobes less acute. Median lobe with a single, well developed ventral hook at apex, the subapical hook obsolescent. Ninth sternite of male as in Plate I, fig. 9. Female genitalia with styli three and one-half times as long as broad.

Holotype male and 3 *paratype* females: Yuma, ARIZONA, March 26, 1940, R. H. Crandall. *Allotype* female and *paratype* male: Same data, but March 27, 1940. Holotype and allotype (in alcohol and on slides Nos. 404-406 (RBS)) deposited in the collection of the California Academy of Sciences, paratypes in the collections of the University of Arizona and R. B. Selander.

This is the smallest species of *Calospasta* known and one of the smallest of any of the Meloidae. As indicated above, it is closely related to *C. nemognathoides*. It can best be distinguished from the latter by the characters given in the key.

It is with pleasure that I name this species in honor of J. W. MacSwain, who has contributed much to our knowledge of the Meloidae. Dr. MacSwain independently recognized it as undescribed and graciously made specimens in his possession, from the California Academy of Sciences, available to me. I want to express my appreciation also to L. A. Carruth for the loan of specimens from the University of Arizona collection and to E. B. Britton for specimens of *C. nemognathoides* from the British Museum (Natural History).

Explanation of Plate I

Figs. 1-6. *Calospasta nemognathoides* Horn, ♂

Fig. 1. Sixth visible abdominal sternite: a. caudal aspect; b. ventral aspect; c. sinistral aspect. Fig. 2. Head (antennae omitted). Fig. 3. Hind tarsal claws. Fig. 4 Genitalia: a. tegmen, ventral aspect; b. median lobe, lateral aspect. Fig. 5. Ninth abdominal sternite. Fig. 6. Hind tibial spurs, mesal aspect.

Figs. 7-9. *Calospasta macswaini*, n. sp., holotype ♂

Fig. 7. Sixth visible abdominal sternite, ventral aspect. Fig. 8. Genitalia: a. tegmen, ventral aspect; b. tegmen, lateral aspect; c. median lobe, lateral aspect. Fig. 9. Ninth abdominal sternite.

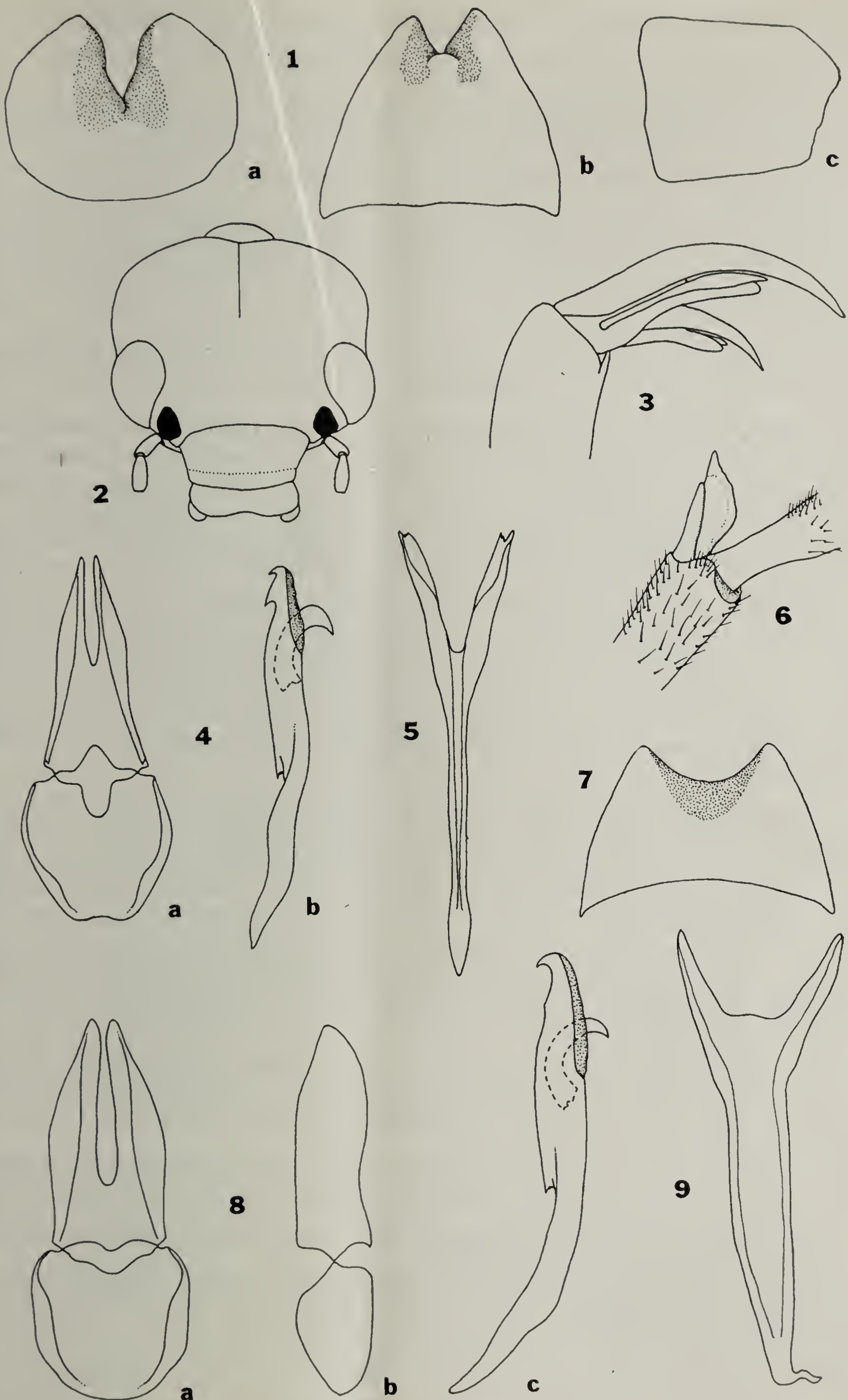

PLATE I. *Calospastini.*

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OCCURRENCE OF PUPAE OF ALTICA TOMBACINA MANN. UNDER BARK IN BRITISH COLUMBIA

In August, 1953, I had an opportunity to collect insects in the mountainous country north of Squamish, British Columbia. I had torn a large section of loose bark three inches thick from a Douglas fir log and was surprised to see numerous yellow chrysomelid pupae scattered over the sawdust-like surface. The pupae were resting on a thick bed of moist, coarse, chewed wood that had accumulated from the excavations of many large wood-boring larvae. I thought that possibly the pupae were those of the leaf beetle that is common on fireweed, *Epilobium angustifolium* (L.), in the area. There were hundreds of plants of this species a short distance from the log, and their leaves had been noticeably chewed by beetle larvae. Several days later my supposition proved to be correct. Pupae which I had placed on top of the sawdust-like material in a glass-topped tin matured to the adults of the flea beetle *Altica tombacina* Mann. (=*evicta* Lec.).

In my collecting experience I had not seen chrysomelid pupae under bark before. The literature on the habits of chrysomelid larvae does not reveal a parallel case. Packard,[1] referring to the alder flea beetle (*Haltica alni* Harris), stated, "It is evident that in nature the larva falls to the ground to transform, the pupae entering the ground." Woods[2] wrote concerning three species of *Altica* in Maine, "When full grown, the larvae enter the ground where they transform . . .," and further concerning a fourth species, "The larvae when full fed enter the ground to pupate." These references demonstrate the usual habits of *Altica* larvae and pupae.

It is likely that the larvae were forced to wander away from the unsuitable dry sandy soil below their host plants and found a favorable medium to pupate on the moist layer of chewed wood, well protected from drying by the thick layer of bark.

S. D. HICKS, *Department of Agriculture, Ottawa*

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[1]Packard, A. S. 1890. Fifth report of the United States Entomological Commission. U. S. Dept. Agr., Washington.

[2]Woods, W. C. 1918. The biology of Maine species of *Altica*. Maine Agr. Expt. Sta. Bull. 273, pp. 149-204.

OBSERVATIONS ON THE BIOLOGY OF AMPHIZOIDAE

By J. Gordon Edwards[1]

During the summer of 1953, while employed as a ranger-naturalist in Glacier National Park, Montana, the author continued his investigations into the biology of members of genus *Amphizoa* (family Amphizoidae). Several new observations resulting from this work are here published.

Amphizoa is the sole genus of the family and is represented by only five known species, two of which occur in Glacier National Park. The genus occurs in North America from Colorado to southern California and to Alaska, and another species is known from Tibet. The species found in Glacier National Park are *A. insolens* Leconte and *A. lecontei* Matthews, both being commonly represented in streams at elevations of 3,000 to 4,000 feet in this area. They coinhabit the same streams and are often found together on the same piece of drift-wood, yet the species are very distinct, their members differing in the external morphology of adults and larva as well as male and female genital appendages. It is indeed unusual to find two distinct species of a single rare genus so closely associated in habitat and geographic range, with their members competing for a single source of food.

The adult beetles are dark brown or black, about 12 mm long (*A. insolens*) to 14 mm long (*A. lecontei*), and live submerged beneath the icy waters of mountain streams, being most abundant on driftwood floating in frothy eddies, or along the banks of the stream where grass roots of the undercut banks drag in the water. (In the Olympic Peninsula of Washington a favored habitat is in masses of submerged pine needles where they accumulate among the small rocks along the shore of quiet stretches of streams such as the Soleduc River.) These beetles are highly regarded as collectors' items, yet most western Coleopterists could probably find them in this type of habitat during the summer, if they would search carefully for them.

EGGS

Amphizoa eggs never have been recorded prior to this report. The nearest relatives of *Amphizoa* belong in genus *Pelobius*. Their first larval stage is said to be truly aquatic, resembling the nauplius stage of some aquatic Crustacea and possessing gills, hence they look quite unlike the later stages. It was impossible to say what the first larval stage of *Amphizoa* would look like until eggs were discovered and the emerging larvae observed. Last winter Mr. Harry P. Chandler, of Red Bluff

[1]San Jose State College, San Jose, California.

California, gave the writer some larvae of *Amphizoa insolens* which measured only 4.5 to 5 mm in length. These larvae seemed too large to have hatched very recently from eggs of beetles which are only 12 mm long as adults, hence there was still considerable speculation about the possibility of finding a nauplius-like first instar larval stage of these insects. Considerable time was spent searching for eggs or smaller larvae early last summer. Near the end of August larvae as small as those collected by Mr. Chandler became suddenly abundant, but none were any smaller than that. At last, however, a piece of floating wood in a quiet eddy was examined and found to be adorned with nine large insect eggs which were elliptical and were fastened loosely into small cracks on the under-surface of the weathered drift-wood. Each egg was about 2.1 mm long and 1 mm in diameter. Close examination revealed six dark ocelli showing through each side of some of the eggs, and these ocelli were spaced exactly like those of the young *Amphizoa* larvae. In hopes that they would hatch, the eggs were kept in a tumbler of water for several days, with the water changed frequently to keep it cold and well aerated. No changes were seen during that time, so two of the eggs were carefully teased open and the premature larvae were removed. They were *Amphizoa* and were identical in structure with the small ones already collected but were still completely white, except for the darker ocelli. They were tightly tucked up in the eggs, but when straightened out each measured over 3.5 mm long. Both were lifeless, so the remainder were preserved as eggs in alcohol. These observations cleared up the mysteries about the nature of the egg and the first larval stage of these fascinating beetles, all in a single interesting week.

LARVAE

During the month of July *Amphizoa* larvae were quite abundant in Swiftcurrent Creek, and considerable time was devoted to their study. In the revisional study of family Amphizoidae[2] is was stated that the larvae when dislodged float helplessly, seeming to be unable to swim effectively. In view of their sluggishness, it was suggested that they probably feed upon dead insects and other small bits of organic material which are washed into their immediate surroundings. Larvae of various sizes were placed in glass tumblers and kept under observation for periods of a week or more each. In each tumbler containing an *Amphizoa* specimen a short twig was placed so that it rested in one corner of the container and extended out of the water, leaning against the dry side of the upper portion of the glass. The adults normally remained entirely submerged, but the full-grown larvae invariably crawled up the twig until their bodies were entirely out of the water. During their imprisonment they were offered a variety of foods, including many types of dead animals and several kinds of living creatures. All larval stages displayed alacrity in grabbing Plecoptera (stonefly) naiads, or nymphs, which were introduced into their containers, but never showed any interest in dead insects or in insects other than stoneflies. Adults were subsequently found to share these tastes, and on one occasion a full-grown larva competed with an adult *Amphizoa* for a Plecoptera naiad. They soon chewed it into pieces, after which each individual ate the part it had retained. Naiads usually died in a few minutes after being placed in the unoxygenated water of the tumbler, after which neither the adults or larvae of the beetles displayed any interest in them. To summarize, it may now be stated that both larvae and adults of the genus are predaceous, and that they seem to restrict their diet to the immaure stages of Plecoptera (stoneflies).

Upon studying the young larvae closely, in their natural surroundings, it was discovered that when dislodged they assume a characteristic position, while floating in relatively quiet water. This position is one which: (1) enables them to respire while afloat, through the enlarged spiracles situated on prominences of the eighth abdominal tergite; (2) to quickly capture prey in their powerful jaws if any victim comes within reach; and (3) to immediately grasp (with their legs) any solid object they touch. The position which affords all of these advantages is one with the abdomen in the normal horizontal position (spiracles of the eighth abdominal tergite located at the surface of the water) and with the thorax and head tucked under the abdomen so that the mandibles lie beneath the abdominal tip. The young larvae were especially quick to assume this position when afloat, and older specimens also showed a distinct tendency toward this behavior.

As mentioned earlier, the larvae in captivity always crawled up the wooden twig or onto a floating piece of wood until entirely out of the water (but near it) and there they might stay for days. If a live stonefly naiad were placed in the water the larva would quickly enter the water, capture it as it swam past, and retire to the twig to eat the victim. The naiads were usually grasped near the middle of the dorsum and eaten while the larva clung to the twig, head upward. As the mandibles worked from side to side each chewing movement would usually tuck a

[2]Edwards, J. G. 1950 (1951). "Amphizoidae of the World," Wasmann Jour. Biol. 8:303-332, 4 plates.

little more of the prey into the larva's mouth, until finally only the head and tail remained visible, then they too disappeared.

PUPAE

Full grown larvae were seen leaving the water of the stream in late July and early August and crawling up the muddy banks until several inches from the water's edge. Several were watched until they hid under rocks or small pieces of wood, but unfortunately their ultimate goal was never ascertained. Perhaps they pupate underground or in the masses of debris which are deposited along the stream-bank during the high spring waters, or perhaps they overwinter as large larvae and pupate the following spring. At any rate, the pupae of these beetles are as yet unknown to entomologists. Mr. Harry P. Chandler reports (in personal correspondence) that he found two full-grown *Amphizoa* larvae at the north fork of the Fresno River (4,000 ft. elevation) in Madera County, California, on June 21st, 1953, under conditions which probably would soon have led to pupation. The fully-extended larvae were enclosed in protective cases which were lodged in debris-filled crevices between logs, one at a distance of about 1½ feet above the water and the other about 4 feet above the water level and 2 feet back from the edge of the stream. Thinking that they must be nearly ready to pupate, he carried them home to Red Bluff, California, to try to rear them to adult-hood, but the heat in the San Joaquin and Sacramento valleys killed them both en route. Nobody really knows how long the larvae normally live, how long the entire life cycle requires, or anything concerning the longevity of adults of this family. The author's collection data would lead to the assumption that the first or second instar larvae overwinter and then become full-grown early the following spring. Adults are most abundant in middle and late August, and oviposition takes place near the end of that month. More complete data will be sought next summer concerning these matters.

ADULTS

Respiration of adults: *Amphizoa* adults, like all beetles, lack gills and cannot respire unless air is frequently in contact with their spiracles. It was previously believed that they would drown unless they stayed near the surface of the water, so they could thrust the large spiracles of their eighth abdominal tergite into the air occasionally. Consequently, it was interesting to observe them surfacing briefly, then carrying down a large air bubble at the tip of their body when they submerged. The air bubble surrounded the tips of the elytra but was mostly held beneath the elytral apices. Accurate timing was not attempted, but these insects can certainly remain submerged for at least ten minutes, and probably many times that long. There may be an interchange of gases between the air enclosed in the bubble and the surrounding water, through the wall of the submerged bubble (with the CO_2 in the bubble being altered to O_2) so that there should be almost no limit to the length of time the beetles could remain submerged. Definite timing records are planned for next summer to determine how often these beetles come to the surface for fresh air bubbles.

Feeding habits of adults: It has often been suggested in the past that these beetles were scavengers, due to their selection of habitats where dead insect bodies frequently float nearby. This belief was definitely found to be fallacious last summer in Montana. The writer captured many *Amphizoa* adults and kept them in glass tumblers, under observation. Many kinds of food were introduced into the tumblers in an effort to discover what the beetles preferred. Never did any specimen make a move toward non-living insect specimens, even when the dead organisms were agitated with a straw or a thread. They quickly captured living stonefly naiads, however, usually after the victims had made only one or two circuits of the inside of the tumbler. The beetles displayed amazing speed in capturing these agile nymphs, grasping them in their stout mandibles, then moving back to the support of the twig in each glass tumbler. They then clung to the twig and began to chew on the naiad. Their original grip was usually at about the middle of the victim's back, and as they chewed on their prey they pulled a little more of it into their mouth with each closure of the jaws, just as the larvae of this genus do. The head and tail of the victim were normally the last parts to enter the mouth. Occasionally a naiad would be chewed in half, after which the beetle would usually allow the two halves to sink to the bottom of the glass and would ignore them from then on. Thus it seems that the adults of *Amphizoa* (as well as the larvae) are predators, never scavengers, and that they prefer the naiads of Plecoptera to any other prey offered them during these observations. Evidently they frequent their preferred habitats because those ecological niches are shared by many Plecoptera naiads, upon which the beetles feed greedily.

CONCLUSIONS

The study of the biology of *Amphizoa* beetles is still very incomplete. It is hoped that next summer's work in Glacier National Park will reveal the answers to some of the perplexing problems listed below:

1. What kinds of food are acceptable and/or preferred by adults and larvae of *Amphizoa?*
2. Do some of the early-instar larvae overwinter? If so, where do they hide?
3. Where do the full-grown larvae go after they leave the water, and how do they behave?
4. What type of secretion do they use in cementing together the protective case in which they may pupate?
5. Where is the pupal stage passed, how long does it last, and what does it look like?
6. How long does each life stage require, and what is the longevity of adults?
7. How long can *Amphizoa* adults remain submerged without suffocating?
8. How long can *Amphizoa* larvae remain submerged without suffocating?
9. What morphological and biological characteristics may be used to separate the larvae of our four species of *Amphizoa* in the United States?

All information from readers of the Coleopterists' Bulletin, concerning these beetles and their larvae, will be gratefully acknowledged by the author in future notes dealing with them.

A NEW RECORD OF EPICAUTA STUARTI

Epicauta stuarti LeC. is an unusual, rather rare species with a strong superficial resemblance to *Tetraonyx quadrimaculata* (Fabr.). Dillon (Amer. Midland Nat., 48:416, 1952) considered *stuarti* distinct enough to propose a new genus, *Maculicauta,* for it. It has been reported from the Texas panhandle, eastern New Mexico, eastern Colorado, and Kansas. No host plants are recorded for it.

On September 10, 1953, in a prairie pasture 3 miles west of Chappell, Nebraska, near the northeastern corner of Colorado, five specimens of *stuarti* were collected on a composite, *Gutierrezia sarothrae* (Pursh). The beetles were feeding on pollen, in association with two other species of *Epicauta, callosa* LeC. and *pennsylvanica* (DeG.), and an extremely abundant cantharid, *Chauliognathus limbicollis* LeC. The general color pattern of *stuarti* is so similar to that of the *Chauliognathus* that it was easy to confuse the two without close inspection when individuals were crawling through the bushy host plant. The resemblance here is striking enough to warrant the hypothesis that the color pattern in *stuarti,* so unique for the genus *Epicauta,* is the result of mimicry.

RICHARD B. SELANDER, *University of Illinois, Urbana*

A REVIEW OF THE SUBGENUS GNATHOSPASTA OF THE GENUS EPICAUTA (MELOIDAE)

By F. G. Werner[1]

The species of *Epicauta* in which the male has a comb, or row of small teeth, on the inner side of the apex of the posterior tibiae form a very distinctive subgenus. The species *E. mimetica* (Horn) falls into this subgenus, and so the generic name *Gnathospasta* proposed by Horn for this species becomes available for the name of the subgenus.

Epicauta (*Gnathospasta*) Horn (NEW COMBINATION)

1875, Trans. American Ent. Soc., 5: 154.

Type of subgenus: *Gnathospasta mimetica* Horn, l.c. (monobasic).

Horn's definition needs revision if *Gnathospasta* is to be used in the sense of the present author. Horn used the elongate mandibles, deeply excised labrum and modified maxillae as the diagnostic features. Only *E. mimetica* (Horn), *labialis* (Dugès) and *E. alpina* Werner show any tendency for this modification of the mouth parts. The present author does not believe this modification to be of great significance. (vid. Werner, 1945, Bull. Museum Comparative Zoology, 95: 423.)

As here redefined, the subgenus *Gnathospasta* includes all of the species of *Epicauta* in which the male has a row of small teeth on the inner side of the apex of the posterior tibiae. (Werner, l.c., fig. 8) The species occurring in the United States and Baja California have already been listed. (Werner, l.c., p. 425, div. AA—*E. atrivittata* should be removed from this division.) Certain other tendencies should be noted. The antennae taper toward the apex and may be slightly flattened; they are never ensiform. The pronotum tends to be campanuliform. Both of these tendencies can be found in other species of *Epicauta* and should not be considered as diagnostic.

On the form of the male antennae certain members of the subgenus were formerly placed in *Macrobasis*, both in the group with segment I straight and in the group with segment I curved and subapically excavated. *Macrobasis* is not available as a subgeneric name because of the designation of *Lytta albida* Say as the genotype by Wellman (1910, Canadian Entomologist, 42: 396). *Epicauta albida* (Say) must fall in the nominate subgenus since it lacks the row of small teeth on the male posterior tibiae.

Except for *E. dohrni* (Haag) and *E. flagellaria* (Er.), which occur

[1] Department of Zoology, University of Vermont

in Colombia, and *E. torsa* (LeC.), which occurs in our Gulf and Atlantic states, the subgenus is confined to the region from Southwestern U. S. to Panama.

Below is an attempt to arrange the known species into species groups. The sharpest division seems to be between the groups with a simple first antennal segment and those in which this segment is excavated externally near the apex. In each division the groups are arranged according to increasing modification of the first two segments of the male antennae and the tendency for the first segment of the male anterior tarsi to be shortened and contorted. Other arrangements attempted, using the modification of the male antennae or anterior tarsi for the first division, seem to bring more diverse elements together.

Table of Species Groups

Antennal I not excavated externally near apex, even slightly.
  Male anterior tibia with 2 spurs; anterior tarsus I longer than II, straight.
    Species from Southwestern U. S. and Northern Mexico .... Tenella-Group
    Species from Colombia and Panama .... Dohrni-Group
  Male anterior tibia with 1 spur (usually none in *E. alastor*)
    Antennal II as long as III or shorter.
      Male anterior tarsus I as long as II, straight .... Ingrata-Group
      Male anterior tarsus I shorter than II, contorted .... Alastor-Group
    Antennal II longer than III; male anterior tarsus I shorter than II, more or less contorted .... Diversicornis-Group
Antennal I excavated externally near apex, at least slightly.
  Male anterior tibia with 2 spurs; anterior tarsus I as long as II, straight .... Uniforma-Group
  Male anterior tibia with 1 spur.
    Male anterior tarsus I straight, as long as II.
      Antennal II as long as III or shorter .... Funesta-Group
      Antennal II distinctly longer than III.
        Male antennal II thick, not flattened .... Torsa-Group
        Male antennal II with a tendency for antero-posterior flattening .... Purpurea-Group
    Male anterior tarsus I shorter than II, more or less contorted
      Antennal II as long as III or shorter.
          Male anterior tarsus I compressed, only slightly modified .... Virgulata-Group

Male anterior tarsus I strongly contorted; male anterior tibia with a tuft of erect pubescence at the outside of the base .... OCHREA-GROUP

Antennal II distinctly longer than III .... DISPARILIS-GROUP

List of Species

Tenella-Group

tenella (Lec.)
merkeliana Horn—possible synonym of *tenella.*

Dohrni-Group

dorhni (Haag)
=*bimaculosa* (Kirsch)
=*bogotensis* Pic

Ingrata-Group

ingrata Fall

Alastor-Group

alastor Skinner

Diversicornis-Group

lauta (Horn)
=*compressicollis* Champ.
=*macroflexi* Dillon (NEW SYNONYMY)
ssp. *rossi* Werner
tenuicornis (Champ.)
humeralis (Dugès)
polingi Werner
arizonica Werner
liebecki Werner
forticornis (Haag)
diversicornis (Haag)
=*flavens* (Dugès)
candèzi (Haag)
beckeri (Dugès)
isthmica Werner
flagellaria (Er.)
=*intermedia* (Haag)

Uniforma-Group

uniforma Werner
alpina Werner
stigmata (Dugès)
melanochroa Wellm.
=*nigra* Dugès nec Woodh.
leoni Dugès
tripartita Champ.
atricolor Champ.
niveolineata (Haag)
mimetica (Horn)
labialis (Dugès)

Funesta-Group

funesta (Chevr.)
punctum (Dugès)
cinereiventris Champ.
atripilis Champ.
pacifica Mayd.
croceicincta (Dugès)

Torsa-Group

torsa (Lec.)

Purpurea-Group

purpurea (Horn)
distorta (Champ.)
maculifera (Mayd.)

Virgulata-Group

virgulata (Lec.)
hirsutipubescens (Mayd.)
linearis (Lec.)

Ochrea-Group

ochrea (Lec.)
=*protarsalis* (Dugès)
=*moniliformis* Dillon
gissleri (Horn)
parkeri Werner

Disparilis-Group

disparilis (Champ.)

NOTES ON THE MALACHIIDAE

Collops vittatus (Say): It is a matter of economic interest that this species has been taken in large numbers from alfalfa, in the neighborhood of Yuma, Arizona. Occurring with it, in much smaller numbers, were specimens of *C. marginellus* Leconte and *C. femoratus* Schaeffer, but these two species cannot be considered of economic importance, since they are both very limited in distribution, whereas *C. vittatus* is the most widely distributed member of the family in North America. It remains for the economic entomologists to determine what, if any, damage to the alfalfa is produced by this insect. Dr. Donald M. Tuttle, of the Agricultural Experiment Station at Yuma, informs me that "most of the workers in this area classify *C. vittatus* as beneficial." Dr. George D. Butler, Jr., of the University of Arizona, states that he has observed "an adult *Collops*" (probably *C. vittatus*) "voraciously devouring mites on alfalfa" and adds that it is a "big question" where the larvae may be found. The weight of evidence at present seems to be in favor of classing *C. vittatus* as a beneficial, rather than a noxious, insect.

Fall[1], following his description of *C. necopinus,* states: "It possesses very nearly the structural characters of *vittatus* and may be an extreme form of that variable species" and in his key to the species of *Collops,* in the same paper, he separates the two by the fact that in *vitattus* the pale margins of the elytra are entire. In a series of about forty specimens of *vittatus,* from northern Utah, there are several specimens, collected with typical *vittatus,* in which the dark discal vitta invades the lateral margin to a greater or lesser extent. In the darker individuals, the color pattern becomes almost, if not entirely, identical with *C. necopinus* and I am unable to satisfactorily separate them from that species, since the only other distinguishing character, the relative length and width of the second antennal segment in the male, appears to be subject to considerable variation. This observation would appear to lend strength to Fall's suspicion that *necopinus* is a form, probably a subspecies, of *C. vittatus.*

Malachius aeneus (Linnaeus): The occurrence of this introduced species in northern Utah is of definite economic significance, since it is the only member of the family that has been classed as injurious, it having been reported as damaging wheat in Europe, its native habitat. It was formerly known to have extended its range in this country from New England, where it was originally introduced, clear across the southern tier of Canadian provinces, the great wheat belt of the continent, as far as British Columbia. Its presence in northern Utah would seem to justify the statement that it almost certainly occurs also in Montana and Idaho.

The following locality records are in addition to those previously reported: *Collops bridgeri* Tanner, Utah; *Malachius aeneus* (Linnaeus), Utah; *Tanaops malkini* Marshall, Idaho; *Anthocomus mirandus* (Leconte), Idaho; *Attalus futilis* Fall, Utah; *A. difficilis* Leconte, Utah; *A. tucsonensis* Marshall, Utah.

M. Y. Marshall, M.D., *Murfreesboro, Tenn.*

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[1]Fall, H. C. 1912. A review of the North American species of *Collops.* Journ. New York Ent. Soc. 20: 249-274.

Reviews

The Coleopterists' bookshelf is not overloaded with books and monographs, which perhaps is to be regretted, and perhaps not. When we are blessed by the birth of a new publication, we cannot help but shout in the highways and byways, for such are to be read. The good will take their place among the honored names, and the bad will fall by the wayside.

THE MALTHINI OF NORTH AMERICA (COLEOPTERA, CANTHARIDAE)

By Kenneth M. Fender. 1951. American Midl. Nat. 46: 513-629, 252 figs.

This paper is a study of an obscure group of beetles by one of America's dwindling band of amateur entomologists. Its author is a rural mail carrier in McMinnville, Oregon, and an enthusiastic and competent coleopterist. He and his wife, Dorothy, have assembled a very fine collection of Oregon Coleoptera and a continent-wide collection of the Lampyroid-Cantharoid families, on which they specialize. This paper is a revision of the 3 genera and 119 species of Malthini so far found north of Mexico. At the time Mr. Fender began his studies 40 species were known from our area, of which 21 had been described by LeConte between 1854 and 1884, and 16 by Fall in 1919. Mr. Fender has added 79 species of which 71 are described as new in the present monograph. The species have been separated in important measure on the basis of the structure of the complexly modified terminal segments of the abdomen in the male, and most of the 252 figures are devoted to illustrating these modifications. In view of Mr. Fender's findings, one can hardly doubt but that many more speices still remain to be detected.

Melville H. Hatch
University of Washington

AN ILLUSTRATED SYNOPSIS OF THE PRINCIPAL LARVAL FORMS OF THE ORDER COLEOPTERA.

By Adam G. Böving and F. C. Craighead, 1953. Brooklyn Entomological Society.

It is with considerable satisfaction that we examine a copy of the new printing of this most comprehensive work on the larvae of the Coleoptera. It is nicely bound and beautifully printed, exactly as it appeared originally in 1931 in the first four numbers of vol. XI of Entomologica Americana. All entomologists working with the larvae of Coleoptera should be grateful to the Brooklyn Entomological Society for reprinting and again making available this invaluable book.

It is perhaps to be regretted that the original authors were not persuaded to revise the book to make corrections of the few inaccuracies of the original and to add the results of recent research.

For those unacquainted with it, the volume includes a three page introduction discussing the relationships of the different families based on their larval characters; sixty pages of keys to the suborders, superfamilies and series, families, subfamilies and occasionally tribes; references to the more important previous works on larval Coleoptera; a list of abbreviations used on the figures; and 125 plates, each carrying from ten to twenty-five figures. The keys are very full, clear and understandable, and include considerable detail. Many footnotes add further discussion of relationships, similarities, and exceptions. The plates, with figures unsurpassed in clarity and detail, are practically all from original drawings representing the results of over fifteen years of continuous and exacting research.

O. L. Cartwright
U. S. National Museum

News

COLEOPTERA SECTION, OTTAWA

The staff of the Coleoptera Section, Systematic Unit, Division of Entomology of the Canadian Department of Agriculture includes: W. J. Brown, E. C. Becker, S. L. Wood, S. D. Hicks, R. de Ruette. Groups receiving special attention at present are Chrysomelidae (Brown), Elateridae (Becker), and Scolytidae (Wood).

W. J. Brown
Department of Agriculture, Ottawa, Canada.

ENTOMOLOGICAL MUSEUM, LUND

The Entomological Museum of the Zoological Institute, University of Lund, Lund, Sweden, is first and foremost trying to build up a complete collection of Swedish insects. But during the last few years, as a result of expeditions made by members of the staff, it has started specialization in two other fields: North American Coleoptera, especially Carabidae, and South African insects, especially Gyrinidae and other freshwater forms. Attention is also brought to the fact that the old collections of J. W. Zetterstedt (1785-1874; mainly Diptera) and C. G. Thomson (1824-1899; mainly Hymenoptera) belong to this museum. Here are also housed a considerable number of coleopterous types.

Carl H. Lindroth
Zoological Institute, Lund

COLEOPTERISTS GATHER

The Sunday evening Smoker held by the Society of Systematic Zoology and the Society for the Study of Evolution in the offices of Dr. A. S. Romer, Director of the Museum of Comparative Zoology, during the Boston meeting of the American Association for the Advancement of Science turned up more Coleopterists than most of us have ever seen in one place before. Those that I had a chance to talk to are: Phil Darlington, Barry Valetine, Frank Young, Dick Balckwelder, Floyd Werner, R. R. Driesbach, Bill Brown, Henry Howden, and probably one or two others who have since slipped my mind. We just missed F. Monros, but saw him again in New York on the way home. We also had a visit in New York with Mont Cazier, Mrs. Vaurie, and John Pallister. I cannot help but hope that someday we can have a national meeting of Coleopterists.

R. H. Arnett, Jr.
U. S. Department of Agriculture

Notes

ERRATA, VOLUME 7

Vol. 7, pages 43, line 26 should read: "between sternite 9 and 10. Because sternite 10, as in the female."

THE RENE OBERTHUR COLLECTION

René Oberthur, an Alsatian, was born in 1852. Although he died in 1944, his collection did not attain permanent deposition until about the end of 1952 when it was acquired by the Muséum National d'Histoire Naturelle in Paris. During the interim the collection was inaccessible for some time. Attempts were made to purchase the collection from outside the country, but it was declared a national treasure.

René's brother Charles Oberthur amassed one of the largest collections of Lepidoptera ever assembled, but it was dispersed on the latter's death.

During the summer of 1953 the Muséum National d'Histoire Naturelle presented an exposition entitled "Splendeur et diversité du monde des insects," centered around the René Oberthur collection, and also including other historical information on entomology, particularly in France, and general information on insects and entomology.

René Oberthur acquired, largely by purchase over a long period, the largest private collection of beetles ever assembled. His collection came to include those of many of the important coleopterists of the 19th century from all over Europe. Thus it contains a very large number of type specimens, well into the thousands. The collection, as catalogued by the Muséum d'Histoire Naturelle, numbers five million specimens, the greater part Coleoptera. The collection is housed in twenty thousand large boxes, most of them double boxes holding at least three times as much as a "Schmitt box." In some groups the arrangement of species is somewhat confusing, with later acquisitions being inserted in gaps between original series of earlier major collections, such as those of Henry Walter Bates or James Thomson. Thus it is often difficult to tell what specimens were actually studied by the earlier authorities, though generally the type specimens are so labelled. It is thus possible to find several species in a row following the identification label of a former important authority. Often the confusion exists at both ends of the series, since in some collections the name label is placed below the series in the box. The effect of the delay in disposing of the collection is suggested by occasional specimens damaged by museum beetles, though this might have happened at another time. In general, however, the collections are in excellent condition, though not in insect-proof boxes, and not in cases.

The principal collections making up the Oberthur collections are those of the following:

T. V. Wollaston, A. F. Kuwert, M. Vauloger de Beaupre, L. Fairmaire,, J. B. Géhin, J. W. Lansberge, J. Van de Poll, H. W. Bates, A. Sallé, L. J. Reiche, M. de Chaudoir, James Thomson, G. Von Mniszech, H. de Bonvouloir, F. de la Ferte-Senectère, W. Moellenkamp, A. Dejean, H. Deyrolle, A. Raffray, E. von Harold, H. L. Gory, F. Laporte de Castelnau, Ch. Sternberg, E. Fleutiaux, J. Desbrochers des Loges.

The secondary collections include a very large number, but among them are those of the following:

P. Lorquin, G. Allard, G. Buquet, A. Théry, A. Chevrolat, H. Dupont, Quedenfeldt, G. Power, F. Parry, W. W. Saunders, W. Rothschild, D. Sharp, W. B. Pryer, C. G. Semper, Schmidt, E. Hintz, Wehncke, O. Mohnike, W. Steinheil, F. von Gebler, L. Schaufuss, F. Faldermann, H. v. Rothkirch, J. Waterstradt, W. G. Rosenauer, etc.

Among the most important professional collectors, missionaries or others who submitted important collections were Boucard, Thieme and Germain in South America, A. David, F. Biet, B. J. Ferrié, J. C. Exoffier, A. Desgodins in eastern Asia, C. Delagrange in India, J. Bouchard in Sumatra, Perrot in Madagascar and others.

According to Guy Colas[1] the acquisition of the René Oberthur collection brings the Coleoptera collection of the Muséum National d'Histoire Naturelle in Paris (Muséum de Paris) to first place in the world.

J. Linsley Gressitt
Bishop Museum, Honolulu

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[1]Acquisition de la collection René Oberthur par le Muséum de Paris. Bull. Mus. Paris (ser. 2) 25: 298-300, 1953.

CURRENT LITERATURE

This section is designed to contain all papers on the Coleoptera of the world which have not been previously listed in The Coleopterists' Bulletin. Every effort is made to give complete coverage from the year 1953 to date. Also included here are papers which have been omitted from the **Coleopterorum Catalogus** and the **Coleopterorum Catalogus Supplementa.**

The excellent cooperation indicated by the response to the call for volunteers to help with the current literature section will make possible a complete coverage of the world's literature on Coleoptera. Because of this surprising response, I have not attempted to carry on the section as in previous numbers of the Bulletin, but will wait until the new organization has become established before the first listings are made. At that time a new list of the publications covered, and also a list of the Current Literature section compilers will be published.

R. H. Arnett, Jr., *Editor.*

DIRECTORY

Additions to the directory of persons interested in the study of beetles, and institutions maintaining collections of and libraries containing literature on beetles are listed below, including changes of address. The complete directory is published separately and is revised as needed to keep it up-to-date. The separate list is arranged by institutions, groups of beetles, worker, and area. This directory service is open to all workers and institutions.

INSTITUTIONS

Facultad de Agricultura, Biblioteca, Apartado 4579, Maracay, Edo. Aragua, Venezuela.

Kansas State College Library, Manhattan, Kansas.

San Jose State College Library, San Jose, Calif.

ADDRESS CHANGES

De Leon, Dr. Donald, 16 Oviedo Ave., Coral Gables, Fla. [Scolytidae, U. S., Mexico, and Central America.]

Coher, Dr. Edward I., 12 Harvard Terrace, Allston 34, Mass.

Dozier, Herbert L., Jr., c/o Mr. G. W. Taylor, R. F. D. 3, Castle Haven Rd., Cambridge, Md.

NOTICES

Wants, exchanges, and requests for information, but not advertisements for the sale of specimens and equipment, will be published here provided it pertains to beetles. This service is free. Notices will be published as space permits.

OEDEMERIDAE: Wish to borrow material for determination and study from any part of the world. R. H. Arnett, Jr., U. S. National Museum, Washington 25, D. C.

SILPHIDAE: Wish to exchange and borrow specimens. Raymond Q. Bliss, Central YMCA, 1420 Arch St., Philadelphia 2, Pa.

EROTYLIDAE: Will determine North American material. Wish to buy or exchange North American forms for exotic erotylids. W. Wayne Boyle, Department of Entomology, Cornell University, Ithaca, N. Y.

COLEOPTERA, North American. Excanges desired. J. F. Brimley, Wellington, Ont., Canada.

COLEOPTERA, Maine. Will exchange for moths of the genus Catolala, Aegeriidae and other Lepidoptera. A. E. Brower, 5 Hospital St., Augusta, Maine.

COLEOPTERA: Will exchange local Coleoptera for Cicindelidae, Cerambycidae, Scarabaeidae, and Buprestidae from other areas of U. S. R. C. Casselberry, 55 Edgemont Rd., Scarsdale, N. Y.

The Coleopterists' Bulletin

Volume VIII | April, 1954 | No. 2

Published bimonthly beginning with February by Ross H. Arnett, Jr., U. S. National Museum, Washington 25, D. C. Terms of subscription: $4.00 per year, both domestic and foreign, payable in advance. Remittances should be made payable to Ross H. Arnett, Jr. Back numbers are available.

The general policies of The Coleopterists' Bulletin are determined on the recommendation of the following Advisory Board: Dr. Ross H. Arnett, Jr., U. S. Department of Agriculture; Dr. Henry Dietrich, Cornell University; Dr. J. Gordon Edwards, San Jose State College; Mr. Eugene J. Gerberg, Insect Control and Research, Inc., Baltimore, Md.; Dr. Melville H. Hatch, University of Washington, and Mr. George B. Vogt, U. S. Department of Agriculture.

Manuscripts dealing with any phase of the study of beetles, including descriptive material, are invited. For notice to authors and editorial policy, see title page for each volume.

Entered as second-class matter at the post office at Washington, D. C.

MEET THE COLEOPTERISTS

WARREN SAMUEL FISHER, Vienna, Virginia, for thirty-six years an entomologist, employed by the U. S. Department of Agriculture, retired in 1948. Mr. Fisher is well known by his 134 papers on Buprestidae, Cerambycidae, and Bostrichoidea. Though not professionally trained, he was able, through his interest and ability in Natural History, to go from a job with a steel company to one of the top positions in taxonomy. He is now enjoying life on his small farm near Washington, D. C. where he is still able at the age of 76 to do a days work which many a younger man would envy. He carries on some research at home and is a frequent visitor at his old office in the National Museum.

ED. NOTE.—This is the first of a series of pictures and short sketches of living Coleopterists. It is not designed to praise or criticize, but to acquaint.

ARTICLES

NOTES

SPECIAL NOTICE

This issue contains the title page and table of contents for volume 6, 1952. It may be separated from the center of the issue. Please call this to the attention of librarians. Also please note that volume 6, 1952 has *only* four numbers, and that number 5 and 6 will *not* be published.

A BIMONTHLY PUBLICATION DEVOTED TO THE STUDY OF BEETLES

Editorial

What is a useful description? Assuming the individual worker is sufficiently acquainted with his group to be able to supply all of the morphological and allied data necessary for ''adequate'' treatment, is the description of a new species useful after it is published? One may write a description several pages long and not include the information necessary to recognize the form without use of the type, and another may describe the species by a few lines and make recognizable the species without recourse to the type. Obviously then, it is not the quantity of descriptive phrases which are included, but the quality which make a description useful.

The frustration of keying a specimen through the one existing key only to find that the specimen belongs somewhere between two species is a common experience. The backlog of isolated descriptions of species not included in this key is often discouraging, particularly when it is learned that most of these descriptions do not refer to the key or use comparable characters. Moreover, in these descriptions, the species to which the new form is compared is likely to be one which it superficially resembles and not one which has characteristics in common with the new form. The only possible course is to try and key the description through the key, and if enough characters are given, it may be possible to determine where these post-revision forms fall in the key, and then one is able to decide whether the forms in question belong to a described species, or are undescribed. But more likely than not, the post-revision descriptions will not give the characters necessary for such a procedure. The only recourse then is the types, several hundred to several thousand miles away.

In order for a description to be useful, the author must supply all of the information necessary for another biologist to recognize the form without reference to the type. Idealistically, the examination of types should be considered only as a final check and not as a routine procedure.

To describe a new species adequately, it is necessary to know all of the previously described species in the genus, at least from an area large enough to be reasonably sure that the form has not previously been described. This is done by means of keys and previous descriptions. If a worker has before him specimens which do not key to a species in existing keys, or agree with the description of any of the species not included in the key, assuming competence, accuracy of keys, and descriptions, the forms in question are considered to be undescribed. The worker then proceeds to describe this new form.

A species description in order to be adequate, must include the generic characters, either by actually stating them, or by indication in some manner such as reference to a description of the genus, but not by simply implying that such is the case just because the specific name is preceded by the generic name. Then the character which separates the new species from *all* of the other species included in the genus should be clearly stated. Follow this by a comparison with the species it most closely resembles, and finally, indicate how the species keys out in the most comprehensive key, and how it is separated at the point where it falls in the key. This is all that is necessary for an adequate and useful description of a species. Looking at the literature, how many isolated descriptions meet these requirements?

CARABIDAE COMMON TO EUROPE AND NORTH AMERICA

By CARL H. LINDROTH[1]

John Hamilton was not the first coleopterist interested in comparisons between the New and Old World fauna—previously J. L. LeConte (1848, 1850) and F. W. Mäklin (1853, 1855) had touched this question —but Hamilton, in 1889 (revised in 1894), gave the first list of species of beetles common to Europe and North America which pretended to be tolerably complete. His papers were shortly afterwards discussed by Fauvel (1889) and Champion (1895) but very little was added by them. Later comparisons of this kind have concerned single species only or, in the case of Brown (1940, 1950), only European species introduced into North America.

In the family Carabidae Hamilton (1894) listed 45 "Eur-American" species, 16 of which must be cancelled as due to wrong determinations. On the other hand, a considerable number of new members have gradually been added to this distribution-group, most of them previously hidden under different names on the two continents. However, not a few species formerly regarded as truly Palaearctic have been discovered in America. Some of them are recent introductions. Others are indigenous and circumpolar, as a rule in high latitudes.

In the present list the number of carabids common to Europe and North America is increased to 78, or 91 if those showing clear subspecific differences are included. Of these, 40 species (perhaps even 43) are recent introductions in North America.

Hamilton, in both his lists (1889, 1894), included also the species of Coleoptera common to North America and Asia but unknown in Europe. Due to my insufficient familiarity with the carabid fauna of Siberia I am not prepared on this occasion to give a revised list of species belonging to this very numerous group of distribution.

The main part of my work on this list has been done at the Museum of Comparative Zoölogy, Cambridge Massachusetts, where a generous Rockefeller grant enabled me to spend 3 months during the spring of 1951. I am greatly indebted to Dr. P. J. Darlington Jr., Fall Curator of Coleoptera, for valuable assistance and suggestions. My original project was the identification of carabids collected in Newfoundland in 1949 with a grant from the Arctic Institute of North America, but eventually the study was enlarged to cover all species common to both continents. Complementary investigations were made at the museums in Washing-

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ton, New York and Ottawa. I am especially indebted to Professor Melville H. Hatch of Seattle, Washington, who generously sent me specimens of the numerous European species found in the Pacific Northwest.

The following list must be regarded as preliminary and I would much appreciate any corrections or additions sent to me at the address given above.

In most cases the identity—or the contrary—of North American with European specimens has been confirmed by microscopic examination of the male genitalia, which is indicated by an asterisk (*). Species stated or suggested to be introduced into North America by human agency are marked with a cross (†), in doubtful cases placed in brackets.

The arrangement of species, with a few exceptions, follows Leng (1920). If a different name is used for a species, subgenus, or genus, the Leng name (or the name used by other recent North American authors) is given as a synonym.

For further information about the new synonyms the reader is referred to my paper "Random notes on North American Carabidae," in the *Bulletin of the Musêum of Comparative Zoology,* vol. III (3), pp. 117-161, 1954.

Abbreviations used are:
AMN = American Museum of Natural History, New York.
BMN = British Museum, Natural History, London.
DAO = Department of Agriculture, Ottawa.
MCZ = Museum of Comparative Zoölogy. Cambridge, Massachusetts.
NMW = National Museum, Washington, D. C.
UMH = Zoölogical Museum, University, Helsingfors, Finland.
! = personal examination by myself.
States and provinces are abbreviated as in Leng.

A. Species identical on both continents

† *Carabus granulatus* L.—B. C., Wash. (Hatch 1933b; 1945, p. 143; 1946b). E. St., E. Can. (Brown 1940, p. 69; Van Dyke 1945, p. 128). —Europe, Asia E. to the Pacific (incl. Japan). It is interesting to observe that this species appears in America in two different, well defined forms. First is the *f. typica* of N. and C. Europe (Breuning 1932-37, p. 534). To this belong all specimens from New England and the Pacific Northwest, and also 1 example from Norman Wells, N. W. T., "among frozen strawberries from B. C.", and 1 example from Toronto, Ont., "in shipment from Holland" (both in DAO!). The second is a larger form,

with the carinae and tubercles of the elytra less elevated and more strongly microsculptured, which gives the whole surface a smoother and duller appearance. This form, of which I have seen 45 American examples, all from N. B. and N. S., is not mentioned by Breuning but it is known in the British Islands as *"interstitialis"* (though not identical with the true *f. interstitalis* Dft. from S. E. Europe). A study of the material available at the British Museum revealed pronounced *"interstitialis"* from Ireland, where it is widely distributed and predominant, and 1 example each from Loch Maree in N. W. Scotland and North Uist in the Hebrides. From England and the rest of Scotland at most intergrading forms were found. It seems clear from all this that *granulatus* has been introduced into North America more than once, from different European—though perhaps always from British—ports.

† *Carabus memoralis* Müll.*—Pacific N. W. (Hatch 1933b; 1946b; 1949a, p. 144; Leech 1935, p. 120; Van Dyke 1945, p. 127). E. St. E. Can. (Brown 1940, p. 69).—Europe only, in the Old World.

† *Carabus cancellatus* Ill.—Wis. (Leng 1920). In MCZ 3 examples labeled N. C. (Coll. F. A. Eddy)!—Europe, Siberia E. to Lena River. It is doubtful whether this species is established in America (*vide* Van Dyke 1945, p. 88).

† *Carabus auratus* L.—New England: Mass., several examples; Vt. 1 example; Me. 1 example (MCZ !). Probably established at least in Mass.—Europe (excl. the E.).

† *Calosoma sycophanta* L.—Atl. St., successfully introduced from Europe (Burgess & Collins 1917, p. 65).—Europe. N. Africa, W. Asia.

Elaphrus lapponicus Gyll.* (*obscurior* Kby., *obliteratus* Mnh.).—Transamerican in high latitudes.—N. W. Europe, E. Siberia (Lena River, Kamtschatka). The penis agrees completely in outer structure as well as in the inner, very complex armature in 6 males from the following localities: lecto-holotype of *obliteratus* Mnh., Kadjak, Alas. (UMH); Churchill, Man. (DAO); Battle Harbour, Labr. (Lth); Lofoten, Norway; Finnish Lapland; "Siberia." The lecto-allotype of *obliteratus* (UMH) is larger, 11.2 mm. (a paratype in coll. Lec. is 10.2 mm.) and very broad especially the prothorax. In Scandinavia and Siberia ("var. *elongatus* Eschz.", UMH !) the speices has a constantly narrower prothorax, but so have the Labrador specimens, the lecto-holotype of *obliteratus*, and the female type of *obscurior* Kby. (BMN !). The size of Scandinavian *lapponicus* is 8.5-10 mm. The N. W. American population seems more than usually variable, but there is no reason to maintain *obliteratus* even as a subspecies.

Elaphrus riparius L.*—Transamerican.—Europe, N. Asia E. to Kamtschatka.

Diachila polita Fald.*—Alas. (NMW ! MCZ !). N. W. T. (Reindeer Depot, Mackenzie Delta, DAO !).—On the Eurasian tundra from Kola Peninsula to Kamtschatka.

Blethisa eschscholtzi Fisch.—Tex. ("5 mi. e. Sanderson," 29. VIII. 1935, Chas. E. Burt, 1 ♀, NMW !).—S. E. Russia, W. Siberia. The capture of this west-palaearctic species in America is remarkable, but the accurate label seems reliable.

Loricera pilicornis Fbr.* (*coerulescens* auct., *neoscotica* Lec.).—Transamerican.—Europe, N. Asia E. to Kamtschatka.

Notiophilus aquaticus L.* (*hardyi* Putz.).—Transamerican.—Europe, N. Asia E. to Kamtschatka.

† *Notiophilus biguttatus* Fbr.*—Nfld. only.—Europe, Caucasus.

Pelophila borealis Payk.*—Transamerican.—N. and W. Europe, Siberia E. to Kamtschatka. The North American population is very heterogeneous, and will probably be divided into subspecies in the future. On the other hand I completely agree with Bänninger (1930): 1, that all American *Pelophila*, except *rudis* Lec., belong to one species, *borealis* Payk.; and 2, that, at least in Alaska, series occur which cannot be subspecifically separated from the Palaearctic form.

† *Nebria brevicollis* Fbr.—Miquelon S. of Nfld. (1 example, Mus. Paris !).—Europe, W. Asia.

Dyschirius politus Dej.* (*aureolus* Notm.).—W. Nfld. (Deer Lake district *). N. H. (♂ * Rumney, 18. VII. 30, Darlington !). N. Y. (Schoharie *, Notman).—Europe, Siberia E. to River Lena.

Dyschirius helleni J. Müll. (*secretus* Fall)*.—Alas. (Anchorage, Fall 1926, p. 130 !). Man. (Churchill 1947, R. W. Fisher, DAO !). Labr. (Forteau, Lth.).—Fennoscandia, Siberia (Jenissei). In the 3 American examples seen the wing-rudiment is slightly larger than in Fennoscandian ones.

† *Clivina fossor* L.*—Wash. (Hatch 1949b, p. 118; Brown 1950, p. 198) E. Can. (Fall 1922; Brown, l. c.). Since Hatch (*l.c.*) has confused *fossor* and *collaris* his other records are uncertain.—Europe, N. Asia E. to Kamtschatka.

† *Clivina collaris* Hbst.* (*elongata* Rand.).—Mass., well established (Randall 1838, p. 34; Brown 1950, p. 198) ! Ottawa, and Hull, Que. (DAO !).—Europe (except in the North), W. Asia.

(†) *Nomius pymaeus* Dej.—Widely distributed in N. America.—Europe, N. Africa, W. Asia.

† *Asaphidion flavipes* L.—N. Y. (Cooper 1930) . Seen from L. I.: Queens (AMN) and Flushing (NMW).—Europe, N. Africa, W. Asia.

Bembidion (*Chrysobracteon*) *lapponicum* Zett.* (*bryanti* Carr).—Alas. (Lower Yukon, 1 ♂, NMW !). N. W. T. (Mackenzie River, DAO ! MCZ ! NMW ! BMN !).—N. Europe, Siberia E. to Kamtschatka. The specimens of *bryanti* from N. W. T. are more similar to *lapponicum f. typ.* than the single Alaskan ♂, which comes near to sbsp. *latiusculum* Mtsch. of E. Siberia (*vide* Lth. 1939-40, p. 67).

† *Bembidion* (*Metallina*) *lampros* Hbst.*—B. C. (Hatch 1949a, p. 145 !). Nfld. !—Europe, W. and N. Asia E. to River Lena.

† *Bembidion* (*Metallina*) *properans* Steph.*—N. S. (4 locs., all since 1947) !—Europe, N. Asia E. to Amur.

Bembidion (*Blepharoplataphus*) *hasti* Sahlb.*—B. C. (Chilikat Pass, Mason & Hughes, ♂ *, DAO !). N. W. T. (Kazan, A. E. Porsild, 2 ♂ * ♀, DAO !). Man. (Churchill, W. J. Brown, abundant *, DAO !). H. B. T. (Ungava Bay, L. M. Turner, 3 examples, NMW !). Que. (Great Whale River, J. R. Vockeroth, ♀, DAO !).—N. Europe, W. Siberia (probably also in the eastern parts).

Bembidion (*Plataphus*) *hyperboraeorum* Munst.*—Alas. (Sitka, "cotype" ♀ of *planiusculum* Mnh., UMH !). N. W. T. (Baker Lake, A. E. Porsild, ♂ *, DAO !).—N. Europe, Siberia (Jenissei and Lena).

Bembidion (*Daniela*) *mckinleyi* Fall * (*scandicum* Lth.).—Alas. (McKinley Park, Fall 1926, p. 132 !).—Previously known only from 2 loc. in northern-most Scandinavia.

Bembidion (*Peryphus*) *grapei* Gyll.* (*picipes* Kby. nec auct., *nitens* Lec.).—Transamerican.—N. Europe, Siberia E. to Kamtschatka, Greenland.

Bembidion (*Peryphus*) *yukonum* Fall* (*grapeioides* Munst.).—Alas. (Mt. McKinley, F. W. Morand, brachypterous ♂ *, NMW !). Yukon Terr. (Dawson, macropterous ♂ *, Fall 1926, p. 132; MCZ !). N. W. T. (Mackenzie Delta, Reindeer Depot W. J. Brown, brach. ♂ *, DAO !).—N. Fennoscandia, Siberia (Jakutsk).

Bembidion (*Peryphus*) *dauricum* Mtsch.* — Alas. (between Rapid River and Rampart House, J. M. Jessup, ♂ * 2 ♀, NMW !). N. W. T. (Mackenzie Delta, Reindeer Depot, W. J. Brown, ♀; Padley, R. E. Duckworth, ♂ * ♀; DAO !). Man. (Churchill, W. J. Brown, several*, DAO !).—N. Fennoscandia, N. Asia E. to Ochotsk. This speices shows wing-dimorphism in America.

† *Bembidion* (*Peryphus*) *stephensi* Crotch* (*canadense* Hayw.).—Mass., E. Can., Nfld.—Europe only.

Bembidion (*Peryphus*) *petrosum* Gebl.* (*lucidum* Lec., *substrictum* Lec., etc.).—Transamerican.—N. Fennoscandia, W. and C. Siberia. The form from Europe and W. Siberia has been called *siebkei* J. Müll., but it is not a well defined subspecies.

† *Bembidion* (*Peryphus*) *ustulatum* L.* (*tetracolum* Say; vide Fassati 1950).—B. C., Wash. (Hatch 1949 a, p. 144 !). E. St., E. Canada.—Europe, N. Africa, W. Asia.

† *Bembidion* (*Peryphus*) *rupestre* L.*—E. Can., Nfld.—Europe, Siberia E. to River Lena. Old records of "*rupestre*" from America belong to *ustulatum* L.

Bembidion (*Peryphus*) *obscurellum* Mtsch.* (*fuscicrus* Mtsch.).—N. W. America S. to Col., Ut. and N. Mex.—Denmark, N. E. Europe,, N. and C. Asia. The penis has been compared in specimens from the following localities: Salida, Col. (2 ex.); Coeur d'Alene, Id.; The Dalles, Oreg.;—Kola Peninsula (2 ex.); West Sujetuk; Shigansk, Lena inf., Siberia; Tashidzom, Tibet. Only the last-named example shows slight differences in details of the internal sac and probably belongs to a different subspecies (possibly *pamirense* Bates). In all other specimens the highly complicate armature seems absolutely identical. It is thus a circumpolar species with slight differences between the populations in colour characters only. The valid species name is *obscurellum* Mtsch. 1845 (vide Netolitzky 1935, p. 33; 1942-43, p. 116).

Bembidion (*Diplocampa*) *transparens* Gebl.* (*sulcatum* Lec.).—Transamerican.—N. and E. Europe, Siberia E. to River Lena.

† *Tachys parvulus* Dej.*—Wash. (Hatch 1950, p. 105). 2 ♂ from Seattle seen.—S. and C. Europe. Several sbsp. described from N. Africa and Mediterranean Asia.

Patrobus septentrionis Dej.—Transamerican (Darlington 1938, p. 166).—N. and C. Europe, Siberia E. to Kamtschatka, Bering Island, Greenland. The N. American population is very heterogeneous and will probably become divided into different sbsp. in the future. At least some of the Alaskan specimens seem to agree completely, however, with the form occurring in the North of the Palaearctic region.

† *Trechus* (*Lasiotrechus*) *discus* Fbr.*—E. Can. (Brown 1940, p. 69). Seen from Granby, Que. (1939) and Mer Bleue, Ont. (1937).—Europe, Asia E. to Japan. The American specimens belong to the *forma typica* (vide Jeannel 1928, p. 97). The internal sac of the penis contains a very characteristic hairy field and dorsally, in the proximal part, a strongly chitinized, backwards directed tooth, omitted in Jeannel's figure.

† *Trechus obtusus* Er.*—Wash. (Hatch 1933b, p. 119; 1949a, p. 146;

Jeannel 1941, p. 329). 4 examples from Seattle seen (all macropterous).—W. and C. Europe, N. Africa.

† *Trechus rubens* Fbr.*—Que.! N. S.! Nfld.! The old record from N. S. (Horn 1875, p. 131) is correct (cf. Jeannel 1931, p. 425).—N. and C. Europe, Siberia E. to River Lena.

† *Petrostichus* (*Omaseus*) *melanarius* Ill.* (*vulgaris* auct. nec L.).—Pacific N. W. (Hatch 1933b, p. 119; 1949a, p. 148)! E. Can. (Brown 1950, p. 198). Nfld.—Europe, N. Asia E. to Amur.

Pterostichus (*Lyperopherus*) *vermiculosus* Men.* (*innuitorum* Brown).—N. W. T. (Brown 1949).—Eurasian tundra, W. to Petschora River. Subfossils show that the species inhabited Scandinavia at least during the last interglacial period (Lth 1948, p. 10). The genitalia of 1 example of *innuitorum* (Chesterfield, N. W. T.) have been compared with slides of Siberian specimens from the following localites: Nikandrovsk (Jenissei); Irkutsk; Batylim (Lena River); the two last-named examples have red femora and are labeled "*rubripes* Mtsch." (nomen nudum). Agreement was found in outer form of the penis and in the foldings of the internal sac. The Siberian material is more variable than the Canadian in the form of the penis apex, and especially in the form of the prothorax, which sometimes has pronounced hind angles (Batylim) and variably shaped basal foveae. On the other hand I have seen a ♀ from Nikandrovsk with a prothorax in every respect like that of *innuitorum*. Also the more or less regular sculpture of the elytra varies greatly in Siberian specimens. In the related *punctatissimus* Rand. the penis is more asymmetric, with a more acute terminal tooth and somewhat different inner foldings.

Pterostichus (*Cryobius*) *brevicornis* Kby.* (*mandibularis* auct. nec Kby., *fastidiosus* Mnh., *arcticus* J. Sahlb.).—Transamerican.—Eurasian tundra and taiga from Bering Strait to Kola Peninsula.

† *Pterostichus* (*Argutor*) *strenuus* Panz.*—Nfld. only.—Europe, N. Asia E. to Amur.

Pterostichus (*Bothriopterus*) *adstrictus* Eschz.* (*luczoti* Dej., and several other synonyms).—Transamerican.—N. and W. Europe, N. Asia E. to Kamtschatka.

† *Stomis pumicatus* Panz.—Que. (Darlington 1940)! — Europe, Asia Minor, Caucasus.

Amara (*Cyrtonotus*) *torrida* Ill.* (*rufimana* Kby., *brevilabris* Kby., *cylindrica* Lec., *reflexa* Putz., and several other synonyms).—Transamerican.—N. Europe, Siberia E. to Kamtschatka.

† *Amara* (*Cyrtonotus*) *aulica* Panz.*—N. S. (Fall 1934). Nfld. (Brown

1950).—Europe, W. Asia.

Amara (*Cyrtonotus*) *hyperborea* Dej.* (*peregrina* Mor., *elongata* Lec., *imperfecta* Brown, *Harpalus simulans* J. Sahlb.).—Transamerican in high latitudes.—N. E. Fennoscandia, N. Asia.

† *Amara* (*Bradytus*) *fulva* DeG*.—E. Can., Nfld. (Brown 1940, p. 69; 1950, p. 198.)—Europe, W. Asia.

(†) *Amara* (*Bradytus*) *apricaria* Payk.* (*putzeysi* Horn).—Probably transamerican (incl. B. C. !).—Europe, Asia E. to Amur.

Amara (*Celia*) *interstitialis* Dej.*—Only in the extreme Northwest: Alas. (Nulalo, Harrington, ♂*, NMW !). Yukon Terr. (Dawson, W. W. Judd, ♂* ♀, DAO!). Other American records refer to *patruelis* Dej. which is specifically distinct.—N. Europe, N. Asia E. to Kamtschatka.

Amara (*Celia*) *erratica* Dft.*—Transamerican.—Europe (boreoalpine), Caucasus, Siberia E. to Kamtschatka.

Amara (*Celia*) *Quenseli* Schh.* (*remotestriata* Dej.).—Transamerican.—N. and C. Europe, N. Asia E. to Kamtschatka.

† *Amara* (*Celia*) *bifrons* Gyll.*—N. S. and Nfld. (Brown 1950, p. 198) ! —Europe, W. Asia.

(†) *Amara* (*s. str.*) *lunicollis* Schio.* (*vulgaris* auct. p. p., *marquettensis* Csy., *carriana* Csy.).—Probably transamerican and indigenous, but also introduced in the N. E. (Brown 1950, p. 199).—Europe, N. Asia E. to Kamtschatka.

† *Amara* (*s. str.*) *aenea* DeG.* (*devincta* Csy.).—N. E. U. S. (Darlington 1936). E. Can., Nfld. (Brown 1950, p. 199).—Europe, N. Africa, W. and C. Asia.

† *Amara* (*s. str.*) *familiaris* Dft.* (*humilis* Csy.).—Pacific N. W. (Hatch 1949a, p. 150). N. E. U. S., E. Can., Nfld. (Darlington 1936; Brown 1950, p. 199).—Europe, N. Africa, W. Asia.

† *Amara* (*s. str.*) *anthobia* Villa.*—Wash. (Hatch 1949a, p. 149) !—S., C. and W. Europe, Asia Minor, Caucasus.

† *Licinus silphoides* Fbr.—Mass. (Leconte 1873, p. 324; Horn 1880; Wickham 1896, p. 47), 1 ♂ in coll. Lec. (MCZ!), completely agreeing with specimens from France and Italy. The species was apparently accidentally introduced and soon extinct.—S. Europe, Mediterranean Asia.

† *Calathus fuscipes* Gze.*—B. C. (Vancouver; Hatch 1949a, p. 151) !—Europe, N. Africa, W. Asia E. to Persia.

† *Pristonychus terricola* Hbst.—Que., N. B., N. S., Nfld.—Europe, Caucasus.

† *Pristonychus* (*Laemosthenes*) *complanatus* Dej.—Pacific Coast (Leech 1935, p. 122; Gray & Hatch 1941, p. 13; Hatch 1949a, p. 152) !—Almost

cosmopolitan: S. Europe, Mediterranean Asia, N. and S. Africa, Australia, S. America.

† *Agonum* (*Anchomenus*) *ruficorne* Gze.* (*albipes* Fbr., *clemens* Lec.). —Me., N. B., N. S., Nfld.—Europe. Mediterranean area.

† *Agonum* (*s. str.*) *mülleri* Hbst.* (*hardyi* Lec.).—B. C. (Vancouver, Leech 1935; DAO!). Mass., Me. (MCZ!). E. Can., Nfld. (Brown 1950, p. 199).—Europe, Caucasus, W. Siberia.

Agonum (*Agonodromius*) *quadripunctatum* DeG.*—Transamerican. —Europe, Asia E. to Kamtschatka.

Agonum (*Agonodromius*) *bogemanni* Gyll.* (*obsoletum* Say, *strigicollie* Mnh., etc.).—Transamerican.—Europe (extremely rare), Siberia.

Agonum (*Europhilus*) *thoreyi* Dej.* (*picipenne* Kby. nec auct., *gemellum* Lec.).—Transamerican.—Europe, Asia E. to Amur.

Agonum (*Europhilus*) *consimile* Gyll.* (*invalidum* Csy.).—Transamerican.—Fennoscandia, Siberia, Kamtschatka.

Agonum (*Europhilus*) *exaratum* Mnh.* (*aldanicum* Popp.).—Alas., N. W. T. (Mackenzie Delta, DAO!).—Kola and Kanin Peninsulae, E. Siberia.

† *Perigona nigriceps* Dej.—Widely distributed in U. S. A. (Fender & Hatch 1949).—Cosmopolitan.

† *Plochionus pallens* Fbr.—Pa., Fla., Calif.—Cosmopolitan.

† *Harpalus* (*Pseudophonus*) *rufipes* DeG.* (*pubescens* Müll.).—E. Can., Nfld. (Brown 1940, p. 70; 1950, p. 199).—Europe, N. Africa, Asia E. to Lena River, ? Japan.

† *Harpalus* (*s. str.*) *affinis* Schrk.* (*aeneus* Fbr., *viridiaeneus* Beauv.). —E. St., E. Ca.—Europe, N. Asia E. to River Lena.

Harpalus (*s. str.*) *fuliginosus* Dft.*—Transamerican.—Europe, N. Asia E. to Kamtschatka and Japan.

† *Anisodactylus binotatus* Fbr.*—B. C., Wash. (Hatch 1949a, p. 153)! —Europe, N. Africa, W. Asia.

† *Acupalpus meridianus* L.*—Wash. (Hatch 1946a)!—Europe, W. Asia.

Trichocellus cognatus Gyll.* (*ruficrus* Kby.).—Transamerican.—N. and C. Europe, Siberia E. to River Lena, Greenland.

B. Species occurring as different subspecies

Carabus truncaticollis Eschz. 1829.—N. W. arctic America.—In Siberia and N. E. Europe (Petschora) is sbsp. *polaris* Popp. 1906. Breuning (1932-37, p. 775, 777) treats the two forms as different species and summarizes the distinguishing characters which, however, seem to have merely subspecific value (cf. Van Dyke 1945, p. 98).

Blethisa multipunctata L. 1758.*—In E. Siberia and N. America is sbsp. *aurata* Fisch. 1828 (*hudsonica* Csy. 1924). The *f. typ.* occurs through Europe and Siberia but apparently does not reach the Pacific.

Diachila arctica Gyll. 1810.*—In E. Siberia and N. America (Alas.! H. B. T.! Labr.!) is sbsp. *amoena* Fald. 1835 (*subpolaris* Lec. 1863). The *f. typ.* is in N. Europe and W. Asia.

Nebria nivalis Payk.*—The true *nivalis* occurs in N. Europe and W. Siberia, E. at least to River Ob. The sbsp. *femorata* Mtsch., if at all separable, represents the transition to sbsp. *bifaria* Mnh., described from Kamtschatka and distributed throughout the northernmost parts of N. America, E. to Baffin Island, Newfoundland and (isolated) on Mt. Katahdin, Me. Sbsp. *bifaria* is pronouncedly variable and there is little doubt that the recent record of true *nivalis* from Alaska (Britton 1950, p. 60) refers to *bifaria*. The repeated records of *nivalis* for Greenland are false and due to a confusion with the red-legged form (*balbii* Bon.) of *gyllenhali* Schnh.[1]

Nebria gyllenhali Schnh.—Represented in the New World by the transamerican sbsp. *castanipes* Kby. (*moesta* Lec., *labradorica* Csy., *prominens* Csy., *curtulata* Csy.) (vide Bänninger 1925. p. 259, 279). The *f. typ.* occurs in Europe (boreoalpine) and the main parts of N. Asia. In E. Siberia is the transitional form *besseri* Fisch. (*dubia* R. F. Sahlb.) (vide Holdhaus & Lindroth 1939, p. 132-135).

Bembidion (*Plataphodes*) *crenulatum* F. Sahlb.* (*laevistriatum* Mtsch., acc. to Netolitzky 1935, p. 23).—According to the inner penis structure of a paratype, *farrarae* Hatch (1950, p. 99; Wash.) must be regarded as a subspecies of *crenulatum* (described from Ochotsk, E. Siberia). In N. E. Europe this species occurs as sbsp. *ponojense* J. Sahlb. (vide Lth 1939-40, p. 75, fig. 15-16).

Bembidion (*s. str.*) *quadrimaculatum* L.*—I am able to confirm the opinion of Fassati, communicated in a letter to me, that the North American population of this species differs from the Palaearctic form by constant differences in prothorax and in the penis. Thus Say's *oppositum*, hitherto regarded as a synonym, must be raised to the rank of a subspecies. It is probably transamerican in distribution.

Tachyta nana Gyll.*—The North American *inornata* Say (*picipes* Kby.) has been regarded by some authors (e.g. Andrewes 1925, p. 486; Csiki 1933, p. 1650) as a pure synonym of *nana*, while Casey (1918, p.

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[1]The records for *Carabus chamissonis* Fisch. and *Pterostichus* (*Cryobius*) *arcticola* Chd. from Greenland are likewise wrong.

215) treats them as different species. In fact, the two seem to agree completely in form and inner armature of the penis (*falli* Hayw. and *angulata* Csy. are quite different) but the true Palaearctic *nana* possesses a rudiment of a carina in the hind angle of the prothorax which is totally lacking in *inornata*. So it seems most appropriate to regard the American form as a subspecies of *nana*.

Amara (*Cyrtonotus*) *alpina* Payk.*—The transamerican *brunnipennis* Dej. (*obtusa* Lec.) differs from the true *alpina* only by having less pronounced hind angles of the prothorax and somewhat brighter antennae. It is extremely variable (Brown 1937) and is connected by transitional forms in E. Siberia with the true, trans-eurasian *alpina*.

Calathus micropterus Dft.*—Hatch (1938, p. 146) regards *ingratus* Dej. as a pure synonym of *micropterus*. This is not correct. There are constant differences in the apical part of penis but, on the other hand, these have hardly more than subspecific value. The *f. typ.* is widely distributed in Europe and N. Asia; sbsp. *ingratus* is transamerican.

Agonum mannerheimi Dej.*—The transamerican sbsp. *stygicum* Lec. is larger and darker than the *f. typ.* but the penis is almost identical. It is remarkable that the *f. typ.* is known only from N. Europe and W. Siberia.

Miscodera arctica Payk.*—In N. America is sbsp. *americana* Mnh. (*hardyi* Chd.). *Erythropus* Mtsch., notwithstanding Hatch (1933a), is a (doubtful) subspecies from E. Asia. The *f. typ.* is probably trans-eurasian.

Harpalus nigritarsis Sahlb.*—In N. America is sbsp. *proximus* Lec. (*recensus* Csy.) which has a transamerican distribution. The *f. typ.* is known from N. Fennoscandia (extremely rare, not taken within a century) and, doubtfully, from Siberia.

C. Species cited in error as Eur-American by Leng 1920, or later

Trachypachys zetterstedti Gyll.*—Hatch (1933b, p. 117) regards the American *holmbergi* Mnh. (*inermis* Mtsch.) as a pure synonym of *zetterstedti*. This is incorrect. The penis form is very different (fig. 3). Though I have had no opportunity to examine the single type of *holmbergi* (it went to Chaudoir, vide 1857, p. 76) it is easy to see that the specimens from the Pacific N. W. usually passing as *inermis* fit Mannerheim's description. Externally, *holmbergi* differs from *zetterstedti* by having a smooth head without (or only with traces of) frontal foveae, by having more prominent front angles of the prothorax which is more flattened laterally and has the carinae inside the hind angles strongly diverging from the side margins, and by having the elytra longer, with less rounded sides. Hatch based his opinion of the synonymy of the American form on comparison with a Siberian specimen. It is therefore possible that *holmbergi* occurs in E. Asia. This seems to me unlikely, however, because the small form described as *transversicollis* Mtsch., according to a male from Aldan, Siberia (UMH !), is in all essential respects, including the penis, completely in agreement with the true European *zetterstedti*.

Carabus problematicus Hbst. (*catenulatus* auct. nec Scop.).—In Leng's 4th supplement (1939) this species is cited from California on the authority of Breuning (1932-37, p. 823), who listed *californicus* Mtsch. under *problematicus* (vide also Csiki 1927, p. 81). But Breuning expressly states that the locality given by Motschulsky must be wrong. This has already been pointed out by Van Dyke (1945, p. 88).

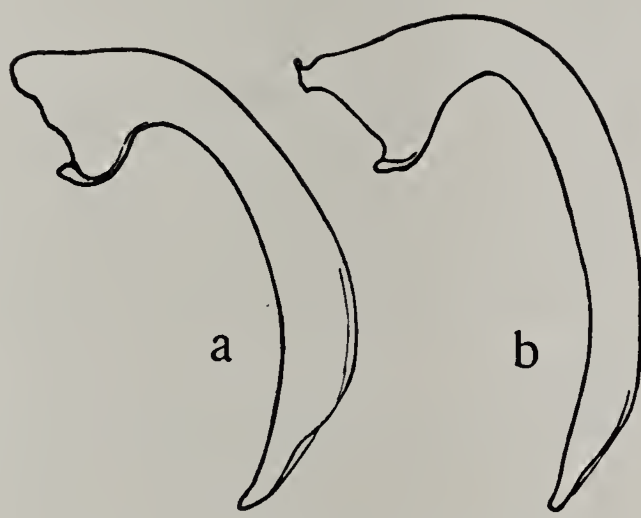

FIG. 3. Penis of: *a Trachypachys zetterstedti* Gyll. (Målselv, Bjerkeng, Norway), *b T. Holmbergi* Mnh. (*inermis* Mtsch.) (Mt. Adams, Wash.).

Leistus piceus Fröl.*—The specimen upon which the supposed occurrence in America was based (Hamilton 1889, p. 93) is a ♂ in coll. Leconte (MCZ!) labelled "Fitchburg, Mass.". It is not the European species. The penis is extremely characteristic and identical with that of *ferruginosus* Mnh. (acc. to specimens from Alas. and Wash.). By Leng (1920), the American "piceus" was doubtfully synonymized with *nigropiceus* Csy., which in turn is a pure synonym of *ferruginosus* (according to a genital slide of one of Casey's ♂ paratypes, NMW), as already suggested by Hatch (1949b, p. 115).

Nebria carbonaria Eschz.—The record for Europe in Leng (1920) is wrong. It is an E. Siberian species (Bänninger 1925, p. 264).

Dyschirius aeneus Dej.*—This is not the same as *integer* Lec. The latter, according to the type, is well defined by the rough sculpture of its front. More closely related to *aeneus* is *nigripes* Lec., but there are clear differences in the penis.

Bembidion (*Chrysobracteon*) *litorale* Ol.* (*paludosum* Sturm).—The distinctness of the American species passing under this name has already been pointed out by Fall (1910, p. 94) and Netolitzky (1942-43, p. 51). But Fall was wrong in selecting as a substitute the name *lacustre* Lec. which, according to the type, is a synonym of *inaequale* Say. The only name available for the American "*litorale*" is *carrianum* Csy.

Bembidion (*Eupetedromus*) *nigripes* Mnh. (nec Kby.)*.—Netolitzky (1942-43, p. 76) has reported this species from Europe on account of an incorrect determination of *tinctum* Zett. (vide Lth 1944). In fact, *nigripes* Mnh. is a synonym of *incrematum* Lec. (*arcuatum* Lec.), a species unknown outside N. America.

Bembidion (*Eupetedromus*) *dentellum* Thunb.*—Doubtfully synonymized with *incrematum* Lec. by Leng (1920) and several older authors. All N. American *Eupetedromus* show clear differences in the male genitalia from the Palaearctic *dentellum*.

FIG. 4. Penis and parameres of *Amara brunnea* Gyll. (Hälsingborg, Scania, Sweden).

Amara (*Celia*) *brunnea* Gyll.*—As suggested by Hatch (1949c, p. 82), the true *brunnea apparently* does not occur in America. The numerous specimens seen by me under this name in American collections belong with few exceptions to either of two species, both from the Pacific N. W. One is very similar to *praetermissa* Sahlb. but (like *brunnea*) lacks an ocellate puncture at the base of elytron and has a penis different from both. This is probably *amplicollis* Mnh., synonymized with *brunnea* by Horn (1892, p. 40; and also by Csiki 1927-33, p. 447). Unfortunately, the Mannerheim species is not represented in UMH, the type apparently having been given to Chaudoir (Putzeys 1866, p. 197). The second "*brunnea*" is more similar to *subaenescens* Cki. (*subaenea* Lec.) but differs, among other ways, by the well developed ocellate puncture of elytron. According to the description it is probably *exlineae* Minsk and Hatch (1939, p. 215). The only American species with a prothorax of true *brunnea*-type is *muscula* Say, but the penis and parameres of this are quite different. In the genuine Palaearctic *brunnea* Gyll. the right paramer has a very characteristic tip (fig. 4; *cf*, the misleading figure in Jeannel 1942, p. 926).

Badister bipustulatus Fbr.*—The 2 ♂♂ from Vancouver on which the American record was founded (Leconte 1880, p. 165) are in coll. Leconte (MCZ !). They are identical with the common *neopulchellus* n. nom. (*pulchellus* auct. nec Lec.), a species more related to the Palaearctic *unipustulatus* Bon. than to *bipustulatus,* but clearly distinct from both.

Agonum impressum Panz.—Doubtfully synonymized with *perforatum* Lec. in Leng (1920). The type and a paratype of the latter (H. B. T., MCZ!) show clear difference from the European *impressum,* for example in the form of the prothorax and the tip of the elytra, and in the much stronger microsculpture.

Agonum obscurum Hbst.*—Hatch (1933b p. 121) has shown the clear specific difference between *pusillum* Lec. (*americanum* Lec. nec Lap.) and the Palaearctic *obscurum.* In addition the penis is quite different (fig. 5), and the parameres of *pusillum* are of unequal length.

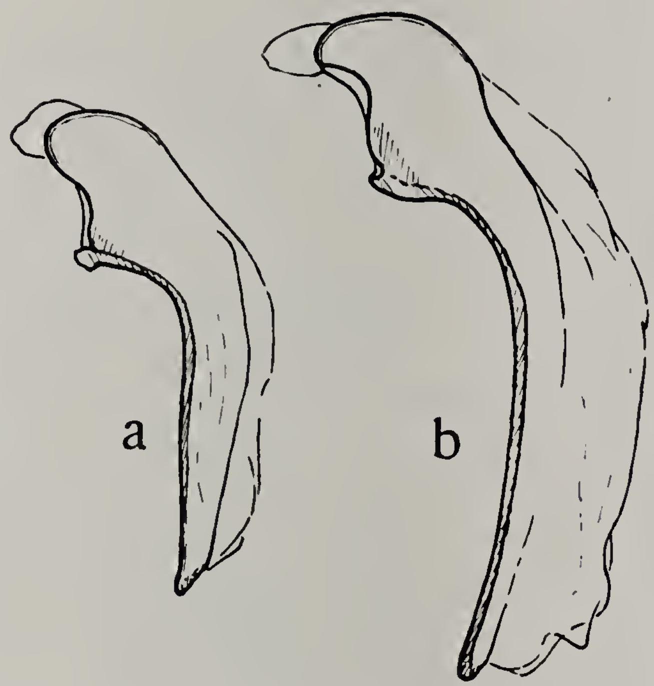

Fig. 5. Penis of: *a Agonum obscurum* Hbst. ("Europe"), *b A. pusillum* Lec. (Cambridge, Mass). Length of insect: 5.4 viz. 5.5 mm. Internal sac partly everted, especially in *b.*

Microlestes minutulus Gze.* (*Blechrus glabratus* Dft.).—Under "*Blechrus nigrinus* Mnh." in coll. Leconte (MCZ!) there are 3 species of *Microlestes* (incl. *linearis* Lec., regarded by himself as a synonym), all perfectly characterized by differences of the penis. I am unable to settle the correct names of these species. None of them is identical with the Palaearctic *minutulus.* Holdhaus (1912, p. 62) has already denied the occurrence of any Palaearctic *Microlestes* in America.

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NOTICES

Wants, exchanges, and requests for information, but not advertisements for the sale of specimens and equipment, will be published here provided it pertains to beetles. This service is free. Notices will be published as space permits.

COLEOPTERA: Cornell is very glad to loan material for study if student will have curator write. Henry Dietrich, Comstock Hall, Ithaca, N. Y.

CERAMBYCIDAE, Acanthoderini of North America desired for a revisional study. Lawrence S. Dillon, Biology Department, A. & M. College of Texas, College Station, Texas.

COLEOPTERA: Would be glad to lend material for study in most families. N. M. Downie, 1621 Purdue St., Lafayette, Ind.

COLEOPTERA: I am interested in exchanging in all groups of beetles. R. R. Dreisbach, 301 Helen St., Midland, Mich.

CUPESIDAE: Borrow for study from any place in the world; will exchange if desired. J. Gordon Edwards, Department of Natural Sciences, San Jose State College, San Jose, Calif.

ANOBIIDAE: Desire specimens from anywhere in exchange for Hawaiian Coleoptera. Everett J. Ford, Jr., Box 340, Honolulu, Hawaii.

LYCTIDAE: Desire specimens for identification and study from all over world. Eugene J. Gerberg, Insect Control & Research, Inc., Johnnycake Rd., Baltimore 7, Md.

PHYTOPHAGA: Will exchange some groups of beetles from Orient, India, or Pacific for Phytophaga from similar regions. Wish to borrow Pacific-Orient species for study. J. Linsley Gressitt, Bishop Museum, Honolulu 17, Hawaii.

SCARABAEIDAE, Geotrupinae. Exchange named specimens of the larger families of coleoptera for Geotrupinae. Henry F. Howden, Department of Zoology & Entomology, University of Tennessee, Knoxville 16, Tenn.

CURCULIONIDAE: Wish to exchange determined material from Northeastern U. S. for Curculionidae of the world. David G. Kissinger, R. D. no. 4, Reading, Pennsylvania.

The Coleopterists' Bulletin

Volume 8 June and August, 1954 Nos. 3 & 4

Published bimonthly beginning with February by the DEPARTMENT OF BIOLOGY, SAINT JOHN FISHER COLLEGE, Rochester 18, New York. Terms of subscription: $4.00 per year, both domestic and foreign, payable in advance. Remittances should be made payable to Ross H. Arnett, Jr. Back numbers are available.

Entered as second-class matter at the post office at Rochester, N. Y.

NOTICE TO SUBSCRIBERS

The Coleopterists' Bulletin has resumed publication with this issue at its new home in the Department of Biology at Saint John Fisher College. Under the circumstances of the change in location of the editor, there was a necessary delay in publication. The completed volume 8 is now off the press, and the first issue of volume 9 is already in the hands of the printer and will be issued on schedule in February 1955.

The good response to the subscription campaign last spring made it possible to publish eighty-eight printed pages during 1954. The budget for 1955 assures 100 printed pages. We seem to have reached economic stability and there is every hope for continued growth.

We hope you will note the change in address and send all future correspondence to Rochester, New York.

CONTENTS

A BIMONTHLY PUBLICATION DEVOTED TO THE STUDY OF BEETLES

Review

THE BEETLES OF THE PACIFIC NORTHWEST

By MELVILLE H. HATCH. Part I: In- of the Pacific Northwest, Part I: Introduction and Adephaga. Publications in Biology, vol. 16, pp. 1-340, 37 pl. University of Washington Press, Seattle. December 20, 1953. $5.00.

Most coleopterists in this country are aware of Professor Hatch's recent travels around the country in search of new records of Northwestern beetles, and in checking types of beetles known to occur in this area. We have been anxiously awaiting for the first parts of this unique guide to the beetles of British Columbia, Washington, Idaho, and Oregon. The first volume treating the families, Cupedidae, Carabidae, Haliplidae, Amphizoidae, Dytiscidae, Gyrinidae, and Rhysodidae has appeared. The University of Washington Press is to be congratulated for their foresight in undertaking the publication of what promises to eventually be a large set of volumes. The industry of the author is attested by the treatment of 660 species in this part, and an estimated 3,000 species will be keyed and described by the time the work is completed.

The short introduction reviews the author's philosophy of systematics, history of the study of beetles in the area, including the activities of the coleopterists now living in the area, the anatomy of beetles, the geography and ecology of the area, and brief notes on introduced species, and species of economic importance. The remainder of the work is a series of keys which include the descriptions, range, and literature on the genera and species. The volume is concluded by a bibliography, a set of 37 plates, and indices to generic, subgeneric, and trivial names.

I am not in a position to give a critical analysis of the treatment of these groups. I expect the various specialists will quarrel with Professor Hatch over his treatment of one group or another. These things are inevitable in any comprehensive work. That spells progress. The important thing is that the work is now available, and it is much, much easier to improve an existing work than to write the original. I for one hope that the details of the book will be carefully studied and all corrections sent to the author promptly so that the supplement which he plans to include with the final volume will be as complete as possible.

Now that the precedent has been set, let us hope that others will undertake similar projects for other areas so that eventually we will have guides to the entire continent. Professor Hatch has demonstrated that it is not an impossible task, although I am sure he will admit that it is not easy.

Realizing the difficulty of meeting the printers bill perhaps more than most of my readers, I parenthetically suggest that an order for this volume directed to the publisher by each of you would help insure the completion of this work!

R. H. ARNETT, JR.

U. S. Department of Agriculture

AN ADDITION TO THE LYCID FAUNA OF THE UNITED STATES (Coleoptera)[1]

By JOHN WAGENER GREEN

The author is indebted to Dr. R. H. Beamer, of the University of Kansas, for the privilege of describing the following remarkable addition to the lycid fauna of the United States. It is represented by a single specimen collected in Arizona by Dr. Beamer, and named in his honor. A new genus in the tribe Lygistopterini is required for its reception.

CALOPTOGNATHA Green, new genus

Eyes small, widely separated. Antennae distant at base, compressed, less than half as long as body; vestiture sparse, moderately short, decumbent. Front horizontal, not rostrate, anterior margin truncate; mouth anterior, mandibles small, extending slightly beyond clypeus, thinly compressed in horizontal plane, in dorsal aspect stout basally, tips arcuate ninety degrees, rapidly very slender and acute, distant from each other and apparently not meeting when closed; clypeus free, arising from ventral surface of front near anterior margin; palpi slender, terminal segment of maxillary longer than wide; labial palpi similar, terminal segment shorter. Pronotum transverse, not narrowing anteriorly; median longitudinal impression striaform; lateral elevation each side arcuate near middle, transverse internally, longitudinal externally, not attaining lateral margin; hypomera narrow, nearly flat, sides subparallel; anterior coxae distinctly separated; anterior spiracles not prominent. Elytra quadricostate, costae not attaining base or apex, humeral obliterated in basal half; vestiture very sparse, confined mostly to the costae, intervals subglabrous. Tibiae of male arcuate, anterior spur of each slender and free; posterior spur of each stouter, fixed, forming a slightly curving mucro on pro- and mesotibiae, very short and straight on metatibiae.

FIG. 6. Genitalia of *Coloptognatha beameri* Green, new species. From top to bottom—dorsal, lateral, and ventral aspects.

Type.—*Caloptognatha beameri* Green, new species.

[1]California Academy of Sciences.

Caloptognatha beameri Green, new species.

Holotype.—Male; Santa Rita Mts., Arizona, July 10, 1950, R. H. Beamer. In collection of University of Kansas.

Form elongate suboval, elytra gradually wider posteriorly, widest at about apical three-tenths. Body entirely black except mandibles and elytra fulvous, scutellum black. Head, pronotum, and ventral surface smooth, shining, sparsely punctulate and with sparse prostrate pubescence; elytra shining, quadricostate, intervals subglabrous, impunctate and rugulose somewhat as in many Lycostomus. Length 5.5 mm.

Antennae rather stout, four-tenths as long as body, shining, with reticulate sculpture becoming progressively finer, denser, and subgranulose distally; segment 2 short, one-half longer than wide; segment 3 triangular, one-half longer than 2; segment 4 longest, twice as long as 2, trapezoidal; segments 5 to 10 subequal in width to apex of 4, slightly decreasing in length from a little longer than wide to nearly subquadrate; segment 11 longer, oval. Antennal prominences feeble, separated by a narrow impression; front somewhat produced, extending before eyes a distance equal to one and one-half times length of eye; clypeus transverse, sparsely punctate, anterior margin feebly sinuate, fringed with long setae of varying lengths. Maxillary palpi small, scarcely wider apically; terminal segment narrowly subtriangular, nearly twice as long as wide, inner side slightly shorter than outer, apex subtruncate.

Pronotum one-fourth wider than long, widest slightly in front of middle, lateral margins thence nearly straight and feebly converging to hind angles, these narrowly rounded and subrectangular; anterior angles obliterated, lateral margins circularly curving into the flatly arcuate anterior margin; base subtruncate, with extremely feeble lobe in median two-thirds; margins throughout, except anterior margin medially, more or less narrowly and rather abruptly reflexed and feebly thickened; median longitudinal impression narrow, striaform, deeper posteriorly, attaining base but not quite apex; disk with a slightly ante-median transverse elevation, obtuse and poorly defined, feebly sinuate medially, turning backward each side near lateral margin and continuing parallel to body axis, this part narrower and better defined, terminating well in advance of hind angle without interrupting reflexed side.

Elytra four and one-fourth times as long as pronotum and conjointly at apical three-tenths about four-tenths wider, width at humeri equal to base of pronotum; costae obtuse, distinctly elevated but not conspicuous, costae and sutural bead each with irregularly single or double row of fulvous hairs, these curved and decumbent, rather closely placed;

intervals with occasional scattered hairs which are more numerous basally. Abdominal sternite 8 longitudinally humped medio-apically, apical margin neither emarginate nor bevelled, with a medially interrupted fringe of long setae directed caudad. Legs moderately stout, shining, sparsely punctulate and pubescent, tibiae compressed, tarsi slender. Aedeagus with lateral lobes fused above except apically, with deep median longitudinal sulcus expanded near each end, sides narrowly inflexed; median lobe fully exposed beneath, its longitudinal axis slightly diagonal. (In the genitalic drawings the basal piece is missing).

Caloptognatha is unique in the Nearctic Lygistopterid fauna by reason of its sparse and unequally distributed elytral pubescence. Its relationship to the other genera is shown in the revised generic table that follows. *Lygistopterus, Adoceta,* and *Calochromus* are therein used more or less provisionally for the American species.

Key to Nearctic Genera of Tribe Lygistopterini

1. Head rostrate; mandibles small and slender, nearly straight, not or scarcely extending beyond clypeus, their tips distant when mandibles are closed. Clypeus arising from anterior margin of front 2
   Head not rostrate; mandibles well developed, strongly arcuate, extending beyond clypeus, their tips overlapping or approximate when mandibles are closed. Clypeus arising from ventral surface of front near anterior margin 3
2. Tibial spurs free, similar throughout. Anterior coxae subcontiguous. Dorsal pubescence short and decumbent, not differing in the sexes. Hypomera concave and rather wide. Clypeus free .... **Lygistopterus** Mulsant
   Tibial spurs in part rigidly attached and dissimilar. Anterior coxae distinctly separated. Dorsal pubescence long and erect, differing in the sexes. Hypomera narrow and nearly flat. Clypeus connate with the front .... **Lucaina** Duges
3. Tibial spurs in part rigidly attached and dissimilar. Anterior coxae distinctly separated. Elytral pubescence sparse, confined mostly to the costae, intervals subglabrous. Lateral elevations of pronotum parallel to each other .... **Caloptognatha** Green, new genus
   Tibial spurs free, similar throughout. Anterior coxae contiguous or nearly so. Elytra uniformly pubescent. Lateral elevations of pronotum oblique 4
4. Median longitudinal line of pronotum as in Lygistopterus, linear apically, thence broadly impressed, not sharply limited, widest near middle, narrowing to base. Mandibles small, thinly compressed in horizontal plane, their tips briefly overlapping when mandibles are closed .... **Adoceta** Bourgeois
   Median longitudinal line of pronotum linear, striaform throughout, sometimes partially obliterated. Mandibles stout, widely overlapping when closed .... **Calochromus** Guerin

DIRECTORY

Additions to the directory of persons interested in the study of beetles, and institutions maintaining collections of and libraries containing literature on beetles are listed below, including changes of address. The complete directory is published separately and is revised as needed to keep it up-to-date. The separate list is arranged by institutions, groups of beetles, worker, and area. This directory service is open to all workers and institutions.

ADDITIONS

Allen, Robert P., Star Route, La Grande, Calif. [General, Calif.]

Anderson, Dr. Wm. H., U. S. National Museum, Washington 25, D. C. [Scolytidae, larvae of Rhynchophora, world.]

Arnett, Dr. Ross H., Jr., St. John Fisher College, Rochester 18, N. Y. [Elateridae, Tenebrionidae of New World, Oedemeridae of World.]

Beer, Prof. Frank M., 330 Agriculture Hall, Oregon State College, Corvallis, Ore [Buprestidae, Scarabaeidae, Cicindelidae, taxonomy and ecology of N. A north of Mexico.]

Blake, Mrs. Doris, 3416 Glebe Rd. N., Arlington, Va. [Chrysomelidae, Western Hemisphere.]

Bliss, Raymond Q., Central YMCA, 1421 Arch St., Philadelphia 2, Pa. [Silphidae, world.]

Boyle, W. Wayne, Department of Entomology, Cornell University, Ithaca, N. Y. [Erotylidae.]

Brimley, J. F., Wellington, Ont., Canada. [General, N. A.]

Brower, Dr. A. E., 5 Hospital St., Augusta, Maine. [Buprestidae, Cerambycidae, eastern N. A., Coleoptera of Maine, Forest Coleoptera.]

Casselberry, R. C., 55 Edgemont Rd., Scarsdale, N. Y. [Cicindelidae, Cerambycidae, Scarabaeidae, Buprestidae, U. S.]

Chandler, Harry P., Rt. 1, Box 17, Red Bluff, Calif. [Aquatic beetles, larvae & adults, N. A.]

Daggy, Tom, Davidson College, Davidson, N. C. [Immature Coleoptera.]

Darlington, Dr. P. J., Jr., Museum of Comparative Zoology, Cambridge 38, Mass. [Carabidae, world.]

Dawson, Dr. R. W., 96 Riverview Drive, Durango, Colo. [Serica (Scarabaeidae, N. A.]

Dietrich, Dr. Henry, Comstock Hall, Ithaca, N. Y. [General, museum techniques.]

Dillon, Lawrence S., Biology Department, A. & M. College of Texas, College Station, Texas. [Cerambycidae, world.]

Downie, Dr. N. M., 1621 Purdue St., Lafayette, Ind. [General, U. S. A.]

Dreisbach, Robert R., 301 Helen St., Midland, Mich. [General, Mich., U. S. & world.]

Easton, Norman S., 458 High St., Fall River, Mass. [Coleoptera of Northeastern U. S.]

Edwards, Dr. J. Gordon, Department of Natural Sciences, San Jose State College, San Jose, Calif. [Amphizoidae, Cupesidae, Syneta (Chrysomelidae), world.]

Ford, Everett J., Jr., Box 340, Honolulu, Hawaii. [Hawailian Coleoptera, Anobiidae, world.]

Garner, William V., 447 E. Wadsworth St., Philadelphia 19, Pa. [Larvae, particularly Carabidae, world, esp. N. A.]

Gentner, Louis G., 22 S. Groveland Ave., Medford, Ore. [Alticinae (Chrysomelidae), N. A. north of Mexico.]

THE LARVA OF *MICRONASPIS FLORIDANA* GREEN

By F. A. McDermott[1]

A new species of lampyrid firefly, *Micronaspis floridana* Green (1948), was described from Florida. In June 1953, Dr. Henry Field, of Coconut Grove, Fla., sent the writer specimens of an adult lampyrid, which were identified by Mr. Green as *Micronaspis floridana* Green, together with some black glowworms 5 to 10 mm. long. These larvae differed from the common *Photinus* larvae in that they appeared to have four rows of dorsal tubercles, somewhat as described for *Jamphotus tuberculatus* Barber (1941) and for an unidentified lampyrid larva by McDermott (1953). In September several living larvae of the same type were obtained, and an attempt made to rear them, using local garden soil and turf in a small glass jar. They readily attacked small bits of raw beef, partially liquefying it as usual with glowworms, but did not eat the same meat when cooked. One of two small earthworms put in the jar disappeared and was presumably eaten, but a small slug and a small snail were not attacked, nor was soft cheese eaten. Feeding was mainly at night; during the day the larvae crawled under the small pieces of aluminum foil on which food was placed.

After a few weeks it was noted that the larger larvae had burrowed into the soil for a depth of 1 or 2 cm., and had formed cells against the glass.[2] In spite of the dorsal structure these larvae apparently have no difficulty in burrowing in fairly loose soil. A few days later a yellow pupa was found in one of the cells, and still later another. Fourteen days after the first pupa was seen two adults were found in the jar, a female and a somewhat atypical male. The male was glowing feebly when found, but this soon ceased and thereafter it was not seen to give any light; the female was seen to give only one, very short faint flash. Neither sex could be stimulated to luminescence by a small flash-light. Later, two more small males, one defective, emerged. The last pupa died before eclosion. The larvae were rather rarely found giving light, but like our local *Photinus* and *Photuris* larvae, could be stimulated to give a slowly-fading glow by a slight jarring of the rearing vessel. The light of both larvae and adults was distinctly greenish.

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[1]Wilmington, Delaware.

[2]The habit of forming pupation cells against the glass has been noted by the writer for *Photuris versicolor* (Fab.); however, all of the cells formed by *Micronaspis floridana* Green were not against the glass. Tilden (1953) has noted a similar behavior of chrysomelid larvae.

Pupae lie in the cell with the dorsum downwards, and are arcuate. In the freshly-formed pupa the abdominal segments are pinkish; later the whole pupa is yellow, darkening before emergence. One of the pupae was seen to be glowing faintly from the position of the larval organs, and another had a weak generalized glow. Only fragments of the cast skins were found.

One of the juvenile glowworms was found lying on its side, rubbing the anterior ventral segments with the end of the abdomen; the next day this specimen was dead, and was found to have been attacked by two pale mites, one on the femur of a middle leg and one toward the side of a ventral segment. The mites unfortunately became detached in alcohol and could not be found; when attached they were sack- or bottle-shaped, with relatively long proboscides; total length about 0.25 mm. Where the one had been attached to the femur a minute round hole was left in the chitin. None of the other larvae bore mites when examined.

Description of the mature larvae of *Micronaspis floridana* Green:

Dimensions: Over-all length, apex of 9th abdominal segment to apex of prothoracic segment, 11 to 13 mm. Widest at the metathoracic segment, *ca.* 2.5 mm., tapering to *ca.* 1.0 mm. at the 8th abdominal segment. The mesothoracic segment is only slightly narrower than the metathoracic. The prothoracic segment is 1.5 mm. wide in the basal half, narrowing to a broadly rounded apex with a shallow median notch; it has a very narrow median longitudinal line, slightly channeled, and the lateral edges in the basal two-thirds are thickened and slightly reflexed.

Structure and Pigmentation: Dorsally each segment is provided with practically black sclerotized tergal plates, those on the prothoracic and 8th and 9th abdominal segments being single, while each of the other segments have two plates, approximate at the median posterior angles and dehiscent at the anterior angles. On the meso- and metathoracic segments these plates are nearly rectangular; on abdominal segments 1 to 7 they are roughly scutate. Their surface is very finely and evenly punctulate or granular. The plate on the prothoracic segment has two pale translucent areas in the apical and lateral thirds, and two smaller similar areas in the basal angles through which the pink underlying integument shows. Each plate on the abdominal segments bears on the posterior edge two large recurved hooks or projections, directed posteriorly, the inner ones forming two rows along the median third of the width, and the outer ones two lateral rows, thus giving the appearance of four rows of tubercles. At the top of the bend of these hooks is a small tubercle bearing a tapered white seta about 0.12-0.2 mm. long; 3 or 4 similar setae project from the lateral edges of the thoracic segments, and a few are present on the surface of the prothoracic segment. The postero-lateral angles of the plates on the thoracic segments are merely produced to dull points. The 9th abdominal segment has only the two postero-lateral points, and no hooks; there is a small brush of caudal filaments. The underlying integument is pink from the prothoracic to at least the 7th or 8th abdominal segment.

Ventrally the surface is salmon-pink, except for two elliptical dark brown areas where the retractile head is sheathed in the prothoracic segment. Each abdominal segment has rather thick lateral folds, each bearing a pale tubercle with a long seta at the apex; one or two rows of smaller, usually setiferous tubercles are present on the lateral thirds of the abdominal segments, and the median thirds bear a sclerotized and lightly pigmented plate. The 8th abdominal segment bears the usual two elliptical ventro-lateral luminous organs. Juvenile larvae, 5 to 10 mm. long, are black dorsally, and pale with but little or no pink ventrally.

The head is *ca.* 0.9-1.0 mm. long from the apex of the prothoracic segment to the tips of the mandibles, and 0.5 mm. wide, rather flattened, and dorsally mainly black, but with basolateral white membranous areas and some white hairs. The mandibles are long, distally slender and sharp, and appear circularly curved when viewed from above, but are also curved upwards. The antennae are 3-segmented, angular, with the terminal article brown and spatulate, and bearing a few scattered hairs. A single ocellus at the base of each antenna. Maxillary palpi short and stout, almost club-shaped, and dark.

Legs pale yellow, tarsi 3-jointed, ending in a very slender, sharp claw; scattered pale hairs on the flattened femur.

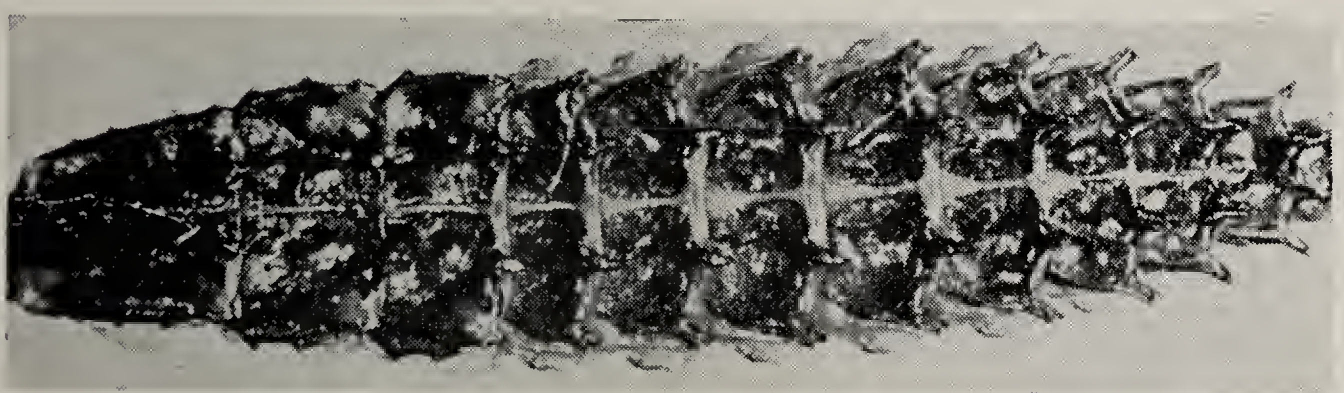

FIG. 7. Dorsal View of the Larva of *Micronaspis floridana* Green.

Pupa: The arcuate yellow pupa became nearly straight in alcohol, and appeared to be tinged with pale greyish pink to the unaided eye, though still yellow under the microscope. It was 9.25 mm. long, and widest across the base of the pronotum, 2.7 mm.; the remaining segments tapered as in the larva. The pronotum was mainly yellow, and the meso- and metathorax salmon pink. The larval dorsal "hooks" were missing from the thoracic segments and replaced by low projections on abdominal segments 1 to 4; on segments 5 to 8 these projections became distinct tubercles, each with a stiff seta, but not hooked. All the abdominal segments have similar tubercles at the posterolateral angles, but again these are not bent or hooked. Ventrally, abdominal segments 2 to 7 have lateral tubercles with setae, similar to the larva, and encased lateral folds. Segment 8 bears the two larval luminous organs, but there was evidence of increased sub-integumentary density on segments 6 and 7. Encased mandibles, palpi, labrum, antennae, and legs were evident, and what is probably the aedeagus also. Eyes brown, reniform as viewed from below. Wing-pads yellow, elytrals tinged brownish.

My thanks are due to Dr. Field for the specimens, and to Mr. Green for identification and for the photograph.

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Tilden, J. W. Coleopterists' Bulletin, 1953, Vol. 7, p. 21.

GENERAL REMARKS ON THE SUBFAMILY CLYTRINAE, AS SUGGESTED BY THE SECOND EDITION OF THE COLEOPTERORUM CATALOGUS (CHRYSOMELIDAE)

My manuscript on the Clytrinae for the second edition of Junk-Schenkling's Coleopterorum Catalogus has been sent to the editor and no doubt will be published in the near future. The present occasion seems appropriate to make some remarks on that chrysomelid subfamily which may be of interest.

Up to December 1953, 1377 species and subspecies of Clytrinae are listed, as against 942 in the first edition of 1913. This means an increase of 435 valid names (or 32% of the total number) in the last 40 years, at an average rate of approximately 10 species per year.

The number of genera has increased from 35 in 1913 to 38 in 1953. To date, sixteen authors have described clytrine genera or subgenera, four of whom have described over 75% of the total. The other 12 authors have described only a single genus each.

Author	No. valid genera and subgenera	No. genera and subgenera currently considered synonyms
Lacodaire	42	3
Chevrolat	10	3
Weise	6	–
Monrós	6	–
Others	12	5

All the infraspecific categories except subspecies are considered as synonyms of the respective species and such categories as "varietas," "aberratio," etc. are not employed as such. This increases the number of specific synonyms to 662, or about half as many as the names retained. In other words, one out of every three names used in the Clytrinae is merely a reminder of wasted time and energy, since the corresponding descriptions usually add little or nothing of value. The example of the Clytrinae, by no means exceptional among chrysomelids, may serve to recall that proper caution in naming and describing is a minimum request.

(*Continued on page* 68)

NOTES ON THE BIOLOGY OF *EPURAEA MONOGAMA* CROTCH (Coleoptera: Nitidulidae)

By Lorin R. Gillogly and G. M. Gillogly

In western coniferous forests the small globular fungus *Polyporus* (*Cryptoporus*) *volvatus* Peck is occasionally seen. It harbors a remarkable number and variety of insect inhabitants. Perhaps the most unusual members of this community are the flat, dark beetles *Epuraea monogama* Crotch. With but one exception they are by far the largest of their genus. They range from 5 to 6 mm. in length, while other members of the genus measure only 2 to 3 mm. long.

The species that shares with *E. monogama* the distinction of being a colossus in the genus *Epuraea* is *E. liebecki* Parsons, which resembles *monogama* but is broader and lacks the explanate margins. The rare *liebecki* is known only from three type specimens taken in the mountains of Arizona. Although there is no data on its host, it may quite possibly be found inhabiting this same species of fungus in that locality.

Epuraea monogama has never been reported from any host other than *Polyporus volvatus* and in fact its range is much more restricted than that of the fungus. From Maine to British Columbia and down the west coast into Mexico the small rounded fungus may be found on decayed coniferous trunks. The nitidulid beetle has been reported only from British Columbia, Idaho, Washington, Oregon, California, Nevada and Texas.

When G. R. Crotch described the beetle in 1874 he remarked that inside a fungus "a pair of the above insects will generally be found, unless a marauding *Trogosita* has taken possession." In British Columbia H. G. Hubbard (1892) found the beetle "occasionally present . . . and always in pairs, as indicated by Crotch."

Because they are not often seen, we were pleasantly surprised to find *Epuraea monogama* adults while we were on an otherwise unsuccessful opening day of trout season at Steely Creek of the North Fork of the Cosumnes River, El Dorado County, California. Down a very steep slope from the settlement of Grizzly Flats the forest becomes dense and dark. There on fallen Douglas fir logs were six of the fungi. Four of them yielded nothing, the fifth contained one *E. monogama*, and the last held a startling find—four adults of the "monogamous nitidulid." In my own previous collecting I had found but a single pair in any one fungus.

This shelf fungus is unique in having the lower margin extended to completely enclose the spore-bearing surface in a large cavity, giving the whole the shape of a somewhat flattened ball. The minute pink spores drop into this cavity and are not scattered by the wind. Near the attachment of the sporophore to the bark there is a small oval-shaped ostiole on the underside through which insects enter to feed upon the spores and to find shelter. Upon leaving they unwittingly carry adhering spores to new locations.

When removing the fungus from a log the insects inside may be effectively trapped if one holds a finger or thumb over the small opening. This is necessary as the nitidulids, especially, are very active and when the fungus is disturbed they will often drop quickly out into the forest litter where they lie perfectly still for some time and are very difficult to find. Once the fungus is detached it can be tapped on the hand and most of the insects will crawl out.

The *Epuraea* larvae and adults live together in the same fungus cavity and both eat the minute spores which drop from the ceiling like manna from heaven. In the 1¼ inch-diameter fungus that contained the four adults there were sixteen larvae. Their color blended exactly with the whitish-pink spores through which they plowed. These beetle larvae ranged in length from 1½ mm to over 7 mm. They were active for a week after collection, but we were unable to keep them alive long enough to pupate. Evidently the moist microclimate of the living fungus is required for their development and when the sporophore is detached from its mycelium it soon becomes too dry for the delicate larvae.

The adult beetles lived for twenty days in a shoe box with a plate glass cover. Three of the five beetles were found dead one morning and a live beetle was observed to approach one that had collapsed on its feet, and deliberately turn it over so that it lay on its back with feet in the air. It seemed strange to us that a beetle might have what appeared to be a consciousness of the fitness of things, so we turned all three of the dead beetles over onto their feet. The next morning we found them all on their backs. It became a game. We righted the beetles again. At 5 p.m. the discerning *Epuraea* was seen to go to each beetle, push it with the side of its elytron and back and flip it over. After this had happened on four successive days we removed the dead beetles lest the *Epuraea* might develop a neurosis. There is apparently only one appropriate position for a dead nitidulid—it must be supine.

When the beetles had been under observation for eleven days we noticed for the first time that one of the adults had two tiny white mites clinging to its metasternum. When disturbed, the mites sped around the beetle to hide until danger was over, then returned to the same spot on the metasternum. After this the beetles were subjected to daily mite inspection and it was found that a nitidulid might be wearing two mites one morning and the next morning none, while the mites roamed over the fungus. The mites were most often to be found on the metasternum, but one male *Epuraea* was burdened not only with a small mite below the right rear coxa, but also with a whole cluster of extremely tiny mites, fifteen in all, at the neck. Both host and guests resisted efforts to dislodge the hangers-on. The mites have been identified as belonging to the family Parasitidae. They were not apprehended on other species of beetles living in the same fungus, although those too were inspected.

An opportunity was made to return to Grizzly Flats in mid-June to search for more fungi and nitidulid beetles because the question of the four beetles in the one fungus was still puzzling. Along the logging road there were fallen trees on which a few *Polyporus volvatus* were found. A little farther along in a shaded location there was an unexpected sight—a large Douglas fir trunk with its bark dotted for the entire length with nearly seventy of the fungi. The sun shone briefly on part of the log and brilliant metallic green ostomid beetles were sunning themselves. We were to see more of these *Temnochila virescens* (Fabr.) inside the fungi, where they were preying upon the nitidulids and the small, brown cylindrical Ciidae, to judge by the discarded elytra and legs that were found.

One third of all the fungi examined contained nitidulid beetles. Several fungi contained one nitidulid and one ostomid; several contained a pair of nitidulids and their larvae, and a number contained a single nitidulid beetle, sometimes with its larvae. In no case did we find more than two *Epuraea* in a fungus. The entire catch consisted of twenty-five nitidulids of which there were nine males and sixteen females.

Ten days later we found the fungi on a ponderosa pine log at the picnic ground at Bijou, Lake Tahoe, but no nitidulids were in evidence. On a fallen Jeffrey pine near Fallen Leaf Lake a single adult female nitidulid and five large larvae were found. Another fungus contained a *Cucujus clavipes* Fabr. which was powdered so liberally with the polypore spores that it appeared light gray instead of its usual bright red color. An ostomid beetle occupied yet another fungus and its fierce 14-mm.-long larva was settled in the upper story of the fungus. Three flat *Aradus* bugs were in a fourth sporophore. As most of the fungi here were very young and soft the ostiole was not yet opened and the insects had not moved into them.

Epuraea monogama in captivity were found to be crepuscular in habit. The beetles invariably stayed inside the fungus during the afternoon and emerged at twilight. Then they ran and flew and were very active until shortly after dark when they again retired to the shelter of the fungus for the night. At the first faint light of dawn a few beetles came out, moving slowly in the chill air. By seven o'clock of a June morning they were out in full force, walking on the bark, flying, and exploring until about nine-thirty, when nearly all of them returned to the dark cavities of the fungi.

A little dab of poster paint had been put on the elytra of each beetle to correspond to the fungus in which it was first found and it soon became evident that the beetles were not always returning to their own fungus, but were spending their afternoons and their nights at various other abodes. One beetle was found in three different fungi at different times during one twenty-four hour period. It was reminiscent of musical chairs except that, in this case, there were frequently fungi that were unoccupied while another nearby might contain eight or ten beetles. A few beetles were now and then found in even the driest fungi. There was no evidence that the beetles were not monogamous but rather it appeared that the pairing-off was replaced by community life and that families had broken up when the fungi dried and were no longer suitable for rearing larvae.

As the season progressed it became clear that the nitidulids were only the first of a fascinating succession of insects to use this fungus as a home. When the spores were no longer being formed and the texture of the pileus became corky, the fungus was attacked by the tenebrionid, *Platydema oregonense* Leconte, which resembles the *Epuraea* in size and color but is convex rather than flat. Lepidopterous larvae mined the fleshy upper part of the fungus. Piles of frass suddenly built up on the surface and tan-colored loopers appeared. A barely visible larva of an undetermined hymenopteran attacked one of the first stage lepidopterous larvae. Small black fungus gnats emerged from the pileus in late June. At times the fungus resembled a boarding house with workers coming and going on the day shift and night shift. There were many visitors, among them a staphylinid, a bark psocid, a *Rhizophagus dimidiatus* Mann., and a small gray spider.

From the middle of June throughout the rest of the summer the little brown *Plesiocis* fungus beetles multiplied tenfold, rearing their families in tunnels in the pileus. They gradually reduced the fungus to a tattered outer shell and a paper-thin hymenophore. With their fungus eaten out from under them and its remnants beaten by rains to the floor of the forest, the adult beetles must hide in bark cracks and under the leaf mold during the winter.

When April comes again the fungus mycelia grow anew and the tiny resinous sporophore of *Polyporus volvatus* swells and grows. By the time it is nearly an inch in diameter a small ostiole has opened on the underside, allowing access to the cavity within. The new apartment is up for occupancy and the smooth, shinning nitidulids, *Epuraea monogama,* are the first tenants.

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NOTICES

Wants, exchanges, and requests for information, but not advertisements for the sale of specimens and equipment, will be published here provided it pertains to beetles. This service is free. Notices will be published as space permits.

COCCINELLIDAE: Will identify from U. S. and Mexico. Borys Malkin, Department of Anthropology, University of Washington, Seattle 5, Wash.

MALACHIIDAE: Would like to exchange for exotic material especially. M. Y. Marshall, Veterans Hospital, Murfreesboro, Tenn.

STAPHYLINIDAE: Wanted for study, exchange or determination. William A. Miller, 309 N. Frances, Madison 6, Wisc.

CHRYSOMELIDAE: From the world wanted in exchange for Neotropical Coleoptera. Some subfamilies identified upon request in advance. F. Monros, Instituto Miguel Lillo, Calle Miguel Lillo 205, Tucuman, Argentina.

COLEOPTERA: Want to exchange all groups of beetles. William Rosenberg, Balsam, N. C.

SCARABAEIDAE, Phyllophaga. New world specimens want to borrow for continuation of revisional studies. Milton W. Sanderson, State Natural History Survey, Urbana, Ill.

MELOIDAE, Lytta: From Mexico and South America desired for study, on loan or by exchange. Can offer southwestern U. S. and Mexican beetles in several families. Richard B. Selander, Illinois Natural History Survey, Natural Resources Bldg., Urbana, Ill.

HYDROPHILIDAE, Tropisternus: Specimens wanted from North and South America. Would like to borrow or will exchange North American Coleoptera for Tropisternus. Paul J. Spangler, Department of Entomology, University of Missouri, Columbia, Missouri.

(*Concluded from page* 62)

No less than 150 authors have described species or infraspecific variants in the Clytrinae at an average rate of 9 valid and 4 synonymous names per author. Among these authors, 125 have described less than 10 names each (including valid names as well as synonyms) and the other 25 have described more than that number. The work of the 25 major describers is tabulated below.

Author	No. valid names	No. currently considered synonyms & homonyms
Lacordaire	272	43
Jacoby	195	54
Pic	167	209
Monrós	118	6
Weise	85	44
Lefèvre	72	19
Burgeon	31	2
Fabricius	26	14
Baly	24	3
Bryant	19	2
Olivier	16	11
Fairmaire	14	–
Chujo	13	5
J. Guérin	13	5
Harold	11	1
Jacobson	10	9
Leconte	10	4
Achard	7	30
Clavareau	7	3
Germar	6	6
Foersberg	6	5
Duvivier	5	5
Escalera	5	5
Kraatz	4	7
Schaeffer	4	12

F. Monrós, *Universidad Nacional de Tucumán, Argentina*

A BIMONTHLY PUBLICATION DEVOTED TO THE STUDY OF BEETLES

The Coleopterists' Bulletin

Volume VIII October and December, 1954 Nos. 5 & 6

Published bimonthly beginning with February by the DEPARTMENT OF BIOLOGY, SAINT JOHN FISHER COLLEGE, Rochester 18, New York. Terms of subscription: $4.00 per year, both domestic and foreign, payable in advance. Remittances should be made payable to Ross H. Arnett, Jr. Back numbers are available.

Entered as second-class matter at the post office at Rochester, N. Y.

A KEY TO THE WORLD GENERA OF MALACHIIDAE

By M. Y. Marshall, M.D.[1]

When attempting to identify specimens of exotic Malachiidae sent to me for that purpose, I have been seriously handicapped by the absence of any published key to all the described genera of the family, an absence which became apparent when I found that there was no volume on the Malachiidae in Wytsman's monumental work on the "Genera-Insectorum." The present paper is an attempt to supply that deficit, which effort has involved the expenditure of considerable time, extending over a period of two or three years, as well as a certain amount of money, in accumulating the original descriptions and actual examples of as many of the genera as possible.

The tentative and preliminary character of the key here offered becomes obvious when it is considered that the most recently published catalog of the family is the volume by Dr. J. Greiner (1937), in the "Catalogus Coleopterorum," and that since that time several additional genera have been described. Mr. A. M. J. Evers, of Krefeld, Germany, has been working for some time on a supplement to that volume and he informs me that it will still be a "couple of years" before the Supplement can be published. When, and if, such a supplement does appear, it is my hope to be able to revise the present key and bring it up to date. Also, there has been considerable controversy, especially between Messrs. Champion and Pic, concerning the status of certain genera and subgenera, so that a critical generic revision of the family, which is much needed, will have to await the accumulation of more material than

[1]Murfreesboro, Tenn.

is at present available to me. In spite of these various drawbacks, and of the imperfections which they necessarily entail, it is hoped that the following key will be found useful to students of this small but interesting family of beetles and that it will serve as a basis and stimulus for further work.

Geographical Distribution

The family Malachiidae, which is most closely related to the Dasytidae and which was combined by Leng (1920) with the latter family under the name Melyridae, appears to have originated in the Mediterranean area, since it is in that area that it is the richest in both genera and species. Greiner (1937) recognized 84 genera in the entire family. Abeille de Perrin (1890-91), in his "Malachides d'Europe et les pays voisins," which is the above mentioned "Mediterranean area," lists 24 genera. Leng (1920) recognizes only 12 genera from North America north of Mexico, an area about comparable in size to that covered by Abeille de Perrin. Champion (1914) lists 9 genera from Mexico and Central America, Blackwelder (1945) lists 14 genera from South America and Lea (1909) lists 6 genera from the Australian area, including New Zealand and Tasmania. These are the only works, to my knowledge, dealing with the Malachiidae of various faunal areas, except, of course, the standard European texts, which are covered by Abeille de Perrin and by Jakobson (1911), in "Käfer Russlands," which latter I have been unable to obtain. It is regretable that there is no volume containing the Malachiidae in the "Fauna of British India," which includes Ceylon and Burma. A search through Greiner's (1937) volume in the "Catalogus Coleopterorum" gives the following results for the remaining large faunal areas. Southern Asia, including India, Maylasia, Indonesia and the Philippines, 26 genera; Oriental area, including China, Japan and Formosa, 9 genera; Pacific area, 3 genera; Africa, exclusive of North Africa, 30 genera; North and Central Asia, 12 genera.

Thus it appears that the family spread from the Mediterranean area through the great land masses, toward the east to southern Asia and toward the south to central and southern Africa. There appears to have been a secondary center of development in southern Africa, with the evolution of a number of small genera centering around the genus *Hedybius,* none of which have extended beyond that area. If one considers only the number of genera, the South Asia area might also qualify as the original home of the family. Two considerations, however, make such a conclusion highly improbable. The first is that many of the largest and most widely distributed genera have only one or two species in this area, whereas they are represented by dozens of species in the Mediterranean area; the second is that, if the South Asia area were the original home of the family, one would expect to find a greater number of genera in the adjacent Australian area. Still a third consideration is that the mere extent of the South Asia area would lead one to expect it to contain a larger number of genera than the Mediterranean area.

The presence of 14 genera in South America might lead one to suppose that continent is as well supplied with Malachiidae as the North American continent, but such is not the case. Mr. Walter Wittmer, of Buenos Aires, who is a world authority on Malachiidae, informs me that these beetles are rarely met with in South America and that he has never taken more than one or two specimens of a species at any time. For instance, in several weeks of collecting, last year, in northern Argentina and southern Brazil, he was able to secure not more than half a dozen specimens in this family. This is quite a contrast to the situation in North America, where many collections contain series of several hundred specimens of the same species. I have also met with the same situation in attempting to arrange exchanges with the leading museums in such places as India, Java, Japan, Madagascar, Australia and New Zealand, the reply being monotonously the same, i.e., their collection of Malachiidae was very small and did not contain over one or two specimens in any one species.

The North American continent appears to have received its malachiid fauna from Europe, just how or when I will not pretend to say; but most of our genera also occur in Europe and we have several species which have been obviously introduced from that area, one, *Anthocomus bipunctatus* Harrer, so recently that it has not yet found its way into our catalogs. There is also a secondary center of development on our Pacific Coast, where such genera as *Endeodes* and *Tanaops* appear, the latter genus obviously an offshoot from the widely distributed *Attalus* and still in a state of considerable lability.

The Pacific area, almost devoid of Malachiidae, has one species each in such widely separated localities as the Solomon Islands, the Marquesas, the Sandwich Islands and Christmas Island. It is a minor mystery how the species *Carphuroides pectinatus,* described by Sharp (1885) as a *Helcogaster,* ever reached its present place of abode in Honolulu. It was obviously introduced, however, since it also occurs, together with its relatives, in the Indonesian and Oriental areas. A careful study of some of the larger genera, of worldwide distribution, such as *Attalus,* would undoubtedly throw more light on the question of distribution but, since this is not primarily a study in zoogeography, I will content myself with the above observations.

In preparing the following key, I have adopted the same characters for the primary divisions of the Malachiinae as were used by Abeille de Perrin, both because his is the most extensive key to date and because I am not able to discover any better characters for the purpose. I have also used his names for these groups, since they are already well known to students of the family throughout the world and since I regard the useless compounding of names as objectionable. It has not been deemed necessary to list the bibliographical references to the original descriptions of the various genera, or to discuss each genus as to its size and detailed distribution, since this key is intended to be used in connection with the most recent catalog of the family, i.e., that of Greiner (1937) in Junk's Coleopterorum Catalogus, which furnishes prctically all of the information in question. Likewise, subgenera have been ignored, as it is not felt that they have a place in keys of this character.

In the case of several genera it has not been possible to determine from the literature whether the genus belongs under the *Malachiaires* or the *Colotaires,* since many authors failed to make any mention of the position of the antennal foveae. Under such circumstances, when there was no specimen available to settle the point, the genus has been placed in both sections of the key. The same difficulty has at times arisen in deciding whether to place a given genus under the *Malachiaires* or the *Troglopaires.* It would help matters considerably if the *Troglopaires* could be separated first but, unfortunately, this cannot be done, since several species of *Malachius* have the head variously grooved and spined. Certain genera, such as *Hedybius,* are necessarily treated under two sections of the key. It is quite possible that this genus should be divided, but I am not sufficiently familiar with the numerous species to express any more definite opinion.

The character used by Abeille de Perrin for separating the *Malachiaires* from the *Colotaires,* i.e., whether the antennae are inserted nearer to the eyes than to the "anterior border of the head," is not entirely satisfactory. Abeille was the only author who consistently noted the position of the antennal insertions in his generic descriptions and it is not clear whether he considered the "anterior border of the head" to be the frontoclypeal suture, the anterior margin of the clypeus or the anterior margin of the labrum. The frontoclypeal suture is often indistinct or wanting and the matter is further complicated by the fact that in many of the genera the membranous connection between the clypeus and the labrum is more or less extended, thus varying the apparent length of the front portion of the head. In case the genus sought is not found under the *Malachiaires,* it is suggested that the student look for it under the *Colotaires,* and vice versa. No difficulty should be encountered with the other characters separating the primary divisions of the family.

Key to the Genera

1. First protarsal segment in the male with a black comb beneath; tarsal joints 2-4, 3 and 4, or 4 dilated and bilobed; terminal abdominal segments in the male simple; elytra abbreviated in both sexes. **Carphurinae.** 2
   First protarsal segment in the male without a black comb. **Malachiinae** 11
2. Elytra strongly dilated; prothorax abruptly constricted at base. New Guinea, Moluccas. .... **Choresine** Pascoe
   Elytra parallel or slightly widened posteriorly 3
3. Elytra (male) sinuate and strongly dehiscent at apex. New Guinea. .... **Brachyhedybius** Pic
   Elytra truncate or rounded at apex 4
4. First antennal segment (male) strongly dilated. Key Islands. .... **Carphuromorphus** Pic
   First antennal segment cylindrical or slightly dilated 5
5. Elytra tuberculate at base. Indonesia, Fiji. .... **Microcarphurus** Pic
   Elytra not tuberculate at base 6
6. Antennae flabellate in the male. Australia, New Guinea, Indonesia. .... **Balanophorus** Macleay
   Antennae not flabellate in the male 7
7. Prothorax narrowed anteriorly and posteriorly, the disc strongly convex; head flattened. New Guinea. .... **Carphurotroglops** Pic
   Prothorax more or less narrowed posteriorly, the disc flat or slightly convex 8
8. Tarsal joints all narrow, joint 4 feebly lobed; head not excavated. Indo-Malaya. .... **Carphuroides** Champion
   Tarsal joints 2-4 or 3 and 4 dilated and bilobed 9
9. Prothorax constricted posteriorly into a narrow neck and deeply excavated before the base; head excavated. Australia, New Guinea, Moluccas. .... **Neocarphurus** Lea
   Prothorax only moderately constricted at the base 10
10. Head (male) usually not excavated; elytra distinctly punctate. Australia, New Guinea, Indo-Malaya. .... **Carphurus** Erichson
    Head (male) strongly excavated; elytra glabrous or nearly so. Australia. .... **Helcogaster** Boheman
11. Antennae distinctly 11-segmented (a few 9-segmented). **Oloceres.** 12
    Antennae apparently 10-segmented, the second segment concealed within the distal end of the first. **Entomoceres.** 77

12. Males with the second protarsal segment simple. 13
Males with the second protarsal segment prolonged in a free lobe over the third. **Attalaires.** 44

13. Antennae inserted at the anterior border of the front; labrum indistinct or very narrow 14
Antennae inserted nearer to the eyes than to the anterior border of the head. **Malachiaries.** 60

14. Front excavated or spined in the males. **Troglopaires.** 15
Front normal or slightly depressed, without spines. **Colotaires.** 26

15. Anterior tarsi 5-segmented in the male 16
Anterior tarsi 4-segmented in the male 23

16. Antennae flabellate in male, pectinate in female. Persia. .... **Condylops** Redtenbacher
Antennae not flabellate or pectinate 17

17. Maxilary palpi with terminal segment securiform 18
Maxillary palpi with terminal segment not securiform 19

18. Prothorax elongate, constricted posteriorly, anterior portion gibbous. South Africa. .... **Chalicorus** Erichson
Prothorax transversely cordate. South Africa. .... **Chalicoroides** Champion

19. Maxillary palpi with terminal segment oblong-attenuate, the tip acuminate or very narrowly truncate 20
Maxillary palpi with terminal segment oval, strongly truncate 22

20. First protarsal segment (male) with a rounded protuberance on the inner side; labrum deflexed, truncate. U. S. A. (Mississippi, Texas) .... **Nodopus** Marshall[2]
First protarsal segment simple 21

21. Tarsi very long; elytra abbreviated; both sexes apterous. Mediterranean. .... **Brachemys** Abeille de Perrin
Tarsi short; elytra long in male, slightly abbreviated in female. Mediterranean. .... **Cephaloncus** Westwood

22. Tarsi short, densely pilose beneath; labrum truncate; both sexes alate. South and East Africa, India, China. .... **Hedybius** Erichson
Tarsi longer, the pubescence normal; females apterous. South Africa .... **Dinometopus** Gorham

23. Elytra abbreviated. Mediterranean. .... **Callotroglops** Abeille de Perrin
Elytra covering the abdomen or nearly so 24

24. Prothorax angularly produced anteriorly. South Africa. .... **Philhedonus** Gorham
Prothorax normal 25

25. Last segment of maxillary palpi strongly truncate. Mediterranean, South Africa, Central Asia. .... **Troglops** Erichson
Last segment of maxillary palpi fusiform, scarcely truncate. Mediterranean. .... **Psiloderes** Peyron

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[2]Marshall, M. Y. 1951. Proceedings California Academy of Sciences, 4th series, 27:92.

26. Antennae 9-segmented; tarsi 5-segmented; elytra broad, covering the abdomen. South America. **Tucumanius** Pic
Antennae 11-segmented 27

27. Male protarsi 4-segmented 28
Male protarsi 5-segmented 31

28. First antennal segment (male) abnormally dilated; front (male) transversely divided, the anterior portion flat, the posterior convex. South Africa. **Colpometopus** Abeille de Perrin
First antennal segment normal; front not so divided 29

29. First antennal segment (male) with a long tooth at the base; joints 3 and 4 of maxillary palpi enlarged, 3 globular, 4 triangular; prothorax strongly narrowed posteriorly; elytra covering the abdomen. U. S. A. **Temnosophus** Horn
First antennal segment normal; joints 3 and 4 of maxillary palpi enlarged and deformed 30

30. Prothorax convex, cordate; both sexes apterous; elytra long, humeri obsolete. South Africa. **Olisterarthrus** Champion
Prothorax transverse; humeri distinct; alate (a few females apterous). Mediterranean, South Africa, South Russia, India, China, Mexico. **Colotes** Erichson

31. Tarsi apparently 4-segmented, the third segment bilobed, the fourth minute, as in **Chrysomelidae** 32
Tarsi distinctly 5-segmented 34

32. First segment of posterior tarsi (male) with a long spine; last segment of maxillary palpi narrowly truncate; labrum rounded; claws without membranes. South America. **Cryptotarsus** Kirsch
Posterior tarsi without spine 33

33. Elytra covering the abdomen; last joint of maxillary palpi oval, narrowly truncate. South and Central America. **Dromanthus** Gorham
Elytra short, four abdominal segments exposed; labrum truncate; last joint of maxillary palpi acuminate; claws with short membranes. South America. **Lemphus** Erichson

34. Elytra (male) without appendices 35
Elytra (male) appendiculate 42

35. Elytra abbreviated 36
Elytra covering the abdomen 38

36. Abdomen with long marginal hairs. U. S. A. **Chaetocoelus** Leconte
Abdomen without long marginal hairs 37

37. First antennal segment abnormally enlarged (male); prothorax strongly dilated anteriorly, constricted and flattened posteriorly. New Guinea. **Falsolaius** Pic
First antennal segment normal; prothorax simply transverse. Mediterranean. South Africa. **Pelochrous** Mulsant and Rey

38. Antennal segments 8 to 11 forming a club; first protarsal segment (male) prolonged in a spine; last joint of maxillary palpi securiform. Usambara. **Malachiolemphus** Pic
Antennae not clubbed 39

39. First segment of all the tarsi minute; last joint of maxillary palpi obconic. Australia. .... **Hypattalus** Blackburn
First segment of tarsi normal............ 40

40. Maxillary palpi with last joint oval, narrowly truncate. Palestine............ **Abeilla** Sahlberg
Maxillary palpi with joints 3 and 4 enlarged and deformed............ 41

41. Elytra explanate laterally; anterior trachanters elongate. South Africa............ **Sphinginopalpus** Pic
Elytra not explanate; trochanters normal. East and Central Africa............ **Pseudocoletes** Abeille de Perrin

42. Elytral appendices spiniform; females apterous; last joint of maxillary palpi narrowly truncate. Mediterranean, North Europe, South Russia, India, Tibet............ **Charopus** Erichson
Elytral appendages auriculate; last joint of maxillary palpi narrowly truncate; both sexes alate............ 43

43. Mediterranean, India, Central Asia, Japan............ **Hypebaeus** Kiesenwetter
North America............ **Pseudebaeus** Horn

44. Antennae 9-segmented; last joint of maxillary palpi narrow, subacuminate; elytra strongly widened posteriorly, short in female, not appendiculate. Central and South America............ **Pseudattalus** Champion
Antennae 11-segmented............ 45

45. Antennae inserted between the eyes; last joint of maxillary palpi fusiform, narrowly truncate; elytra with erect hairs, the apex plicate and with a minute linear appendage. Mediterranean............ **Axinotarsus** Motschulsky
Antennae inserted anterior to an ideal preocular line............ 46

46. Elytra abbreviated in both sexes............ 47
Elytra covering the abdomen or nearly so............ 49

47. Antennae (male) flabellate; maxillary palpi with terminal joint subcylindrical, truncate, prothorax transverse; body covered with semierect hair; females apterous. South Africa............ **Anexodes** Abeille de Perrin
Antennae serrate............ 48

48. Size not over 2 mm.; sutural margins of elytra in contact almost to tips. U. S. A., Mexico............ **Attalusinus** Leng
Size 3 mm. or more; sutral margins of elytra diverging from near the base. California............ **Endeodes** Leconte

49. Front of head excavated or spined............ 50
Front of head convex or slightly impressed............ 53

50. Prothorax unidentate laterally, narrowed posteriorly; antennal segments 1, 3, 4,, and 5 (male) thickened; last joint of maxillary palpi oblong-conic, truncate; tarsal claws lobed; females apterous. South Africa............ **Matopius** Champion
Prothorax not dentate............ 51

51. Prothorax extended in a bilobed hood over the head; last joint of maxillary palpi slender, conical; elytra simple. South Africa............ **Eucerapheles** Champion
Prothorax not extended over the head............ 52

52. Antennal segments 5 and 6 (male) abnormally large; last joint of maxillary palpi cylindrical; labrum subquadrate. South Africa. .... **Illops** Erichson
Antennal segments 5 and 6 are normal; last joint of maxillary palpi oval, truncate; labrum truncate; tarsi short, densely pilose beneath. South and East Africa, India, China. .... **Hedybius** Erichson

53. Prothorax constricted at the base 54
Prothorax not constricted at the base 55

54. Elytra (male) with a short, broad appendix, impressed at the tip; surface with erect hairs. India. .... **Indiattalus** Pic
Elytra not appendiculate and without erect hairs. Mediterranean, Mexico. .... **Sphinginus** Mulsant and Rey

55. Elytra with erect hairs, as well as decumbent pubescence 56
Elytra without erect hairs 59

56. Antennae with "apex" strongly dilated; last joint of maxillary palpi robust, subtruncate; elytral apices subtumid; otherwise as in **Attalus.** East Africa. .... **Lusingattalus** Pic
Antennae with apex not dilated 57

57. Eyes in male very large; antennae (male) ramose; last joint of maxillary palpi slender, subacuminate; elytra without appendages. India. .... **Malachiomimus** Champion
Eyes in male not unusually large 58

58. Elytra appendiculate, each appendage a strong, recurved spine, apparently (but not actually) 3-segmented; antennae (male) strongly serrate; last joint of maxillary palp' ovoid, obtuse. South and West Africa. .... **Urodactylus** Thomson
Elytra very rarely appendiculate and then not as above; last joint of maxillary palpi fusiform, narrowly truncate. Mediterranean, South and East Africa, India, China, Japan, Siberia, North, Central and South America. .... **Attalus** Erichson

59. Antennal segment 4 enlarged, triangular; elytra obovoid, nearly twice as wide posteriorly as at base; prothorax orbicular; otherwise presumably as in **Ebaeus.** India. .... **Periebaeus** Gorham
Antennal segment 4 normal; last joint of maxillary palpi ovate, broadly truncate; elytral appendages auriculate. Mediterranean, South and East Africa, India, Japan, Siberia, South America. .... **Ebaeus** Erichson

60. Antennae 9-segmented; tarsi 5-segmented; elytra broad, covering the abdomen. South America. .... **Tucumanius** Pic
Antennae 11-segmented 61

61. Male protarsi 4-segmented 62
Male protarsi 5-segmented 63

62. Front (male) transversely divided, the anterior portion flat, the posterior convex; first antennal segment (male) abnormally dilated. South Africa. .... **Colpometopus** Abeille de Perrin
Front not transversely divided; head long; first antennal segment normal. Western U. S. A., Mexico. .... **Trophimus** Horn

63. Anterior tibiae (male) with a large, deep impression near the apex, on the anterior face; middle tibiae enlarged, conic, with a rounded fossa near the apex, on the inferior side, the posterior border enlarged and explanate below, terminating in a

strong, obtuse tooth; prothorax with a broad, deep, transverse impression posteriorly. Siberia .... **Mezopezus** Jakobson
Tibiae not modified as above; prothorax not transversely impressed 64

64. Claws without membranes; antennae inserted between the eyes; last joint of maxillary palpi fusiform, acuminate; thorax transverse; elytra without erect hairs, appendiculate (male); females apterous. Syria, Iraq, Iran. .... **Chionotopus** Abeille de Perrin
Claws with distinct membranes 65

65. Prothorax with posterior angles prolonged, the inner margin of the prolongation irregularly laciniate. India. .... **Incisomalachius** Pic
Posterior angles of prothorax not prolonged 66

66. Fourth tarsal joints all dilated or bilobed 67
Fourth tarsal joints normal 69

67. Fourth tarsal joints dilated "en palette"; prothorax gibbous on the disc; elytra with erect hairs and prominent lateral carinae. Madagascar. .... **Falsoanthocomus** Pic
Fourth tarsal joints bilobed 68

68. Head posteriorly constricted into a narrow, short neck; mandibles bifid at apex; last joint of maxillary palpi enlarged, securiform; antennae filiform. Chile .... **Nematocerus** Solier
Head not abruptly narrowed behind the eyes; mandibles bidentate at apex; palpi and antennae as in **Nematocerus.** Chile. .... **Brachidia** Solier

69. Head excavate; elytra with erect hairs, the apex plicate and spinose; tip of abdomen with a long appendage on each side. India. .... **Lobatomixis** Pic
Head not excavate, abdomen without appendages at the tip 70

70. Elytra abbreviated, with short humeral carinae; prothorax constricted posteriorly. New Guinea. .... **Falsolaius** Pic
Elytra covering the abdomen or nearly so 71

71. Second male protarsal segment enlarged and slightly prolonged over the third (but with no free lobe as in **Attalus**); male with ventral abdominal pits; head long. Western U. S. A., Mexico. .... **Tanaops** Leconte
Second protarsal segment normal; male without ventral pits 72

72. Elytra laterally margined; last joint of maxillary palpi truncate; elytra simple and without erect hairs. Celebes. .... **Dromanthomorphus** Pic
Elytra not laterally margined 73

73. Prothorax constricted at the base and at least as long as broad; otherwise as in **Malachius.** Mediterranean. .... **Cyrtosus** Motschulsky
Prothorax not constricted at the base 74

74. Last joint of maxillary palpi broadly truncate 75
Last joint of maxillary palpi acuminate or narrowly truncate 76

75. Elytra (male) appendiculate; erect hairs absent; females apterous. Mediterranean, India, Mongolia. .... **Cerapheles** Mulsant and Rey
Elytra simple, otherwise presumably as in **Cerapheles.** India .... **Pseudocerapheles** Pic

76. Antennae inserted between the eyes; front at times excavate or spined; elytra at times appendiculate, with or without erect hairs. Mediterranean, South and West Africa, India, Siberia, China, Japan, Philippines, North America. .... **Malachius** Fabricius

Antennae inserted in front of an ideal preocular line; elytra without erect hairs, usually appendiculate (male). Mediterranean,, South Africa, India, China, North, Central and South America........ **Anthocomus** Erichson

77. Protarsi (male) apparently 4-segmented; second antennal segment (the true third) in male usually enlarged and deformed. North, Central and South America, Turkestan, Siberia, Manchuria, Zanzibar........ **Collops** Erichson
Protarsi (male) distinctly 5-segmented........ 78

78. Antennae flabellate (male) or pectinate (female), the second segment (male) "long and broadly triangular"; prothorax bisulcate on the disc. Air, French Africa........ **Airomalachius** Pic[3]
Antennae serrate........ 79

79. Habitus ant-like; prothorax elongate, apex bulbous, base constricted, bituberculate; elytra strongly inflated, with base constricted and humeri spinose; last joint of maxillary palpi elongate-ovoid, truncate. Ceylon, Java, Luzon........ **Myrmecophasma** Burgeois
Habitus not ant-like........ 80

80. Antennae (male) with segments 2 and 3 "greatly dilated and subconnate"; male tarsi simple. East and Central Africa........ **Heterolaius** Champion
Antennae (male) simple or with only segment 2 dilated........ 81

81. Last joint of maxillary palpi filiform........ 82
Last joint of maxillary palpi securiform........ 83

82. Protarsi (male) simple; antennae (male) with second segment usually enlarged and deformed. Indo-Malaya, Philippines, Australia, Formosa, New Guinea, China, Japan, East and Central Africa, Marianas, Christmas Island........ **Laius** Guerin
Protarsi (male) with second segment prolonged over the third; antennae simple. Siberia........ **Simoderus** Abeille de Perrin

83. Protarsi (male) with second segment prolonged; antennae simple. Mediterranean, all of Africa, South Russia, China, Indo-Malaya, Philippines........ **Apalochrus** Erichson
Protarsi (male) simple........ 84

84. Antennae simple; elytra oblong. Europe, South Russia, Siberia, East Africa........ **Paratinus** Abeille de Perrin
Antennae (male) with second segment deformed; elytra hemispherical; apterous. Ceylon........ **Zelotypus** Abeille de Perrin

It had been my intention to close this paper at the end of the key, but I find it necessary to make certain remarks concerning several of the genera.

Pseudebaeus G. H. Horn. Horn (1872) established this genus for four North American species which apparently possess the same generic characters as the genus *Hypebaeus*, established by Kiesenwetter (1863). Horn gave no real description of the genus, merely stating his reasons

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[3]Pic, M. 1950. Memoires de l'Institut Francais d'Afrique Noire, No. 10, p. 145.

for considering it to be distinct from *Ebaeus* and *Anthocomus*. He made no mention of *Hypebaeus,* defined nine years previously, and it appears reasonable to assume that he was not acquainted with this genus. I have examples of the two most common European species of *Hypebaeus, flavicollis* Erichson, which can probably be considered as the genotype, and *flavipes* Fabricius. An examination of these fails to disclose any differences between them and the North American species of *Pseudebaeus* which could be regarded as of generic significance. They are all small insects, from 1 to 2.5 mm. in length, blackish piceous in color, with the thorax in some cases and the apical third or fourth of the elytra in most, yellowish testaceous. The elytra in the males are usually narrowed and produced toward the apex and the peculiar structure of the elytral appendages appears to be identical. I conclude that *Pseudebaeus* should be suppressed and the species now included therein be transferred to *Hypebaeus* (NEW SYNONYMY). It is not surprising to find that a genus which is so widely distributed throughout the Old World as *Hypebaeus* should also occur in North America.

Acletus Leconte. Marshall (1949) recognized this genus as distinct from *Attalus,* on account of its strongly pectinate antennae, in the male, also being influenced by the fact that its very different habitus from all other North American *Attalus* had caused its single species, *nigrellus* Leconte, to be redescribed, by R. Hopping, as *Microlipus falli.* Subsequent study of the world genera in the family shows that there are numerous genera which contain species with both serrate and pectinate or flabellate antennae and that this cannot properly be considered a generic character. Horn was evidently correct when he transferred the species *nigrellus* to *Attalus,* in 1872.

Flabellattalus Pic. which was originally proposed by Pic (1923) as a subgenus of *Attalus,* but recognized by Greiner (1937) as a valid genus, is evidently a case simliar to that of *Acletus* and should also be suppressed.

Periebaeus Gorham (1895 p. 320). This genus apparently was never described, the name alone being published by Gorham in connection with his species *Periebaeus punctatus.* However, since it was published prior to Jan. 1, 1931, the genus must stand, described or not, according to the International Rules (Article 25). It was apparently separated from *Ebaeus* by the enlarged fourth antennal segment, since the description of *punctatus* does not mention any other distinguishing character which could be given generic weight. The type of the species is, in all probability, in the British Museum and the genus should be adequately described by someone who has access thereto. It has been assumed, in the above key, that the generic characters not mentioned are the same as in the genus *Ebaeus*.

Mezopezus Jakobson. Since the description of this genus, three lines long in the original, is difficult to obtain, ''Zhuki Rossii,'' usually listed as ''Käfer Russlands,'' not being found in the Library of Congress or in those of several of the larger museums in this Country, and since it is in Russian, with which language the majority of entomologists, including the present author, are not familiar, I am giving herewith a translation of the original description. ''The second segment of the antenna is distinctly visible from below. The forelegs of the male have an impression on the inner side, before the apex; the middle legs are broadened, they have on the inner side at the top a dentate projection with impressions below.'' The clearer description of the tarsal structure, given in the above key, is from Peyron's translation into French (1877), of Solsky's original description of *Apalochrus oberti,* the type species of *Mezopezus.* It is possible that the genus should be placed in the *Colotaires,* but the peculiar structure of the tibiae, which are apparently fossorial in nature, should serve for its easy identification.

The original descriptions of several of the other genera are so very brief, at times only three or four lines, and lacking in mention of most of the generic characters, that it is difficult to place them accurately in the key. Often, in such cases, the description of the genotype is also very brief, with no additional information except as to color and surface sculpture. This situation has probably resulted in some errors in the key which, it seems, can only be corrected by someone who is in a position to examine the isolated types.

Finally, I wish to express my thanks to Monsieur Maurice Pic, of Digoin, France, without whose kind cooperation the present essay would not have been possible. He not only furnished me with reprints of the articles containing most of his generic descriptions, but, where such reprints were no longer available, and in spite of advanced agé, he laboriously copied, in longhand, several of his descriptions of genera and genotypes.

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DIRECTORY

Additions to the directory of persons interested in the study of beetles, and institutions maintaining collections of and libraries containing literature on beetles are listed below, including changes of address. The complete directory is published separately and is revised as needed to keep it up-to-date. The separate list is arranged by institutions, groups of beetles, worker, and area. This directory service is open to all workers and institutions.

Gerberg, Eugene J., Insect Control & Research, Inc., Johnnycake Road, Baltimore 7, Md. [Lycidae, world, especially western hemisphere.]

Gressitt, Dr. J. Linsley, Bishop Museum, Honolulu 17, Hawaii. [Chrysomelidae, Cerambycidae, taxonomy, ecology, old world.]

Guppy, Richard, Wellington, V. I., B. C., Canada [General.]

Haig, Thomas R. Jr., 3021 Highland Drive, Carlsbad, Calif. [Histeridae, world.]

Hatch, Dr. Melville H., Department of Zoology, University of Washington, Seattle 5, Wash. [Coleoptera of the Pacific Northwest.]

Hazeltine, Dr. Wm., 748 Wilson, Coolidge, Ariz. [Larvae & adult Scarabaeidae, N. A.]

Hicks, S. D., Rm. 336, Science Service Bldg., Ottawa, Ont., Canada. [Obera (Cerambycidae), Blepharida (Chrysomelidae), N. A.]

Howden, Dr. Henry F., Department of Zoology & Entomology, University of Tennessee, Knoxville 16, Tenn. [Scarabaeidae, N. A., Geotrupinae (Scarabaeidae), world, taxonomy & biology.]

King, Dr. Edwin W., Department of Biology, Cornell College, Mt. Vernon, Iowa. [Evolution of families of Cucujoidea.]

Kissinger, David G., R. D. no. 4, Reading, Pa. [Curculionidae, world.]

Klapperich, Dr. H., Kaiserstr. 229, Bonn, Germany. [Ptinidae, world.]

La Rivers, Dr. Ira, Biology Department, University of Nevada, Reno, Nev. [Tenebrionidae, western U. S.]

Lindroth, Dr. Carl H., Zoological Institute, Lund, Sweden. [Carabidae, circumpolar distribution.]

Malkin, Borys, Department of Anthropology, University of Washington, Seattle 5, Wash. [Coccinellidae, Colydiinae, carnivorus aquatics, U. S., Mexico.]

Marshall, Dr. M. Y., Veterans Hospital, Murfreesboro, Tenn. [Malachiidae, world.]

Marx, Edward F., 115 Plymouth Place, Merchantville, N. J. [Donaciini (Chrysomelidae), New World.]

Matthews, E. G., 24 Gramercy Park, South, New York 3, N. Y. [General.]

McCowan, Vaughn F., Weyerhaeuser Timber Co., Research Center, P.O. Box 420, Centralia, Wash. [Scolytidae, biology & taxonomy, Pacific Northwest.]

Miller, William A., 309 N. Frances, Madison 6, Wisc. [Staphylinidae, U. S.]

Monros, Dr. F., Instituto Miguel Lillo, Calle Miguel Lillo 205, Tucuman, Argentina. [Chrysomelidae, New World.]

Robinson, Paul F., 425 Barnes St., Bel Air, Md. [Life history, ecology, physiology of beetles.]

Rosenberg, William, Balsam, N. C. [General.]

Sanderson, Dr. Milton W., State Natural History Survey, Urbana, Ill. [Phyllophaga (Scarabaeidae), New World, Chrysomelidae, Staphylinidae, N. A.]

Seevers, Charles H., Roosevelt College, 430 S. Michigan Ave., Chicago, Ill. [Aleocharinae (Staphylinidae), termitophilous & myrmecophilous beetles, world.]

Selander, Richard B., Illinois Natural History Survey, Natural Resources Bldg., Urbana, Ill. [Meloidae, evolution of Coleoptera, world.]

Smith, Ray F., 112 Agricultural Hall, University of California, Berkeley 4, Calif. [Diabrotica and related genera (Chrysomelidae), world.]

NOTICES

Wants, exchanges, and requests for information, but not advertisements for the sale of specimens and equipment, will be published here provided it pertains to beetles. This service is free. Notices will be published as space permits.

TENEBRIONIDAE, Helops: Needed from Mexico and Western U. S., and new world Hemisphere, HEMIPEPLIDAE. T. J. SPILMAN, Department of Entomology, Cornell University, Ithaca, N. Y.

BUPRESTIDAE: Exchange for mounted specimens, especially Acmaeodera new to my collection. J. W. TILDEN, 125 Cedar Lane, San Jose 27, Calif.

ANTHRIBIDAE: World specimens desired for study. Will exchange other North American or Solomon Island Coleoptera for Anthribidae, or will purchase. Can determine North and Central American material, other faunas when time permits. BARRY D. VALENTINE, Biological Laboratories, Harvard University, Cambridge 38, Mass.

MALACHIIDAE, DRILIDAE, PHENGODIDAE, CANTHARIDAE, DASYTIDAE, & PRIONOCERIDAE: Determined, exchanged, or purchased. WALTER WITTMER, Casilla de Correo 1043, Buenos Aires, Argentina.

DESMESTIDAE, would like to exchange Nearctic Dermestidae or material from general collecting in Rocky Mt. area for Dermestidae from other faunal zones. R. S. BEAL, JR. c/o Conservative Baptists Theological Seminary, 1500 East 10th Ave., Denver 18, Colo.

MELOIDAE, desire to exchange beetles for Meloids. Open to offers. Might purchase Mexican and exotics of this family. WILBUR R. ENNS, 106 Whitten Hall, Columbia, Missouri.

CURCULIONIDAE, will exchange California Curculionidae for Baridinae and Raymondionyminae. EDWARD E. GILBERT, 112 Agriculture Hall, Berkeley 4, Calif.

CARABIDAE, willing to exchange European Carabidae for U. S. Carabidae. J. NEGRE, 7 Blvd. de Lesseps, Versailles, France.

SCARABAEIDAE, I wish to exchange and borrow material of Scarabaeidae s. str. (or Coprinae of Junk's cat.), Geotrupidae, Passalidae, and Lucanidae for study. P. FRANCISCO SILVERIO PEREIRA C.M.F., Departmento de Zoologia, Caixa 7172, Sao Paulo, Brasil.

SCOLYTIDAE, exchange western Scolytidae for those from east and south U. S. and northern areas. Will collect other groups for exchange for Scolytidae. Particularly desire good series (in alcohol) and associated adults and larvae. T. O. THATCHER, Entomology Department, Colorado A. & M. College, Fort Collins, Colo.

LIVING BEETLES, especially Scarabaeidae and Tenebrionidae wanted for study of their parasites; please send parcels to DR. J. THEODORIDES, Institute de Parasitologie, 21 rue de l'Ecole de Medicine, Paris 6e, France.

SCOLYTOIDEA, exchange or buy from all parts of the world. DR. STEPHEN L. WOOD, Systematic Entomology, Department of Agriculture, Ottawa, Canada.