larly crenate below; hind margin of propod without setæ except tuft at base of the finger; setæ on anterior margin of uniform size, not serrulate; finger strongly curved, with minute setule.

Uropods 1 and 2 with rami equal in length to the peduncle and provided with lateral and apical spines, the peduncle of the first uropod bearing a specially stout spine on the upper side at the extremity. Third uropod of usual size, with ramus much shorter than peduncle.

Telson apparently cleft almost to the base, margins entire and without setæ.

This species appears to come very close to *H. rubra* (G. M. Thomson), but until the female is known it is difficult to speak positively about its relationships.

XLII.—*Ants from British Guiana.*

By W. C. Crawley, B.A.

The following list consists of ants collected recently in British Guiana by Mr. G. E. Bodkin, who made a number of interesting observations which form a valuable addition to our knowledge of the habits of many of the species. Dr. Forel and Prof. Emery very kindly determined several of the species with which I was unacquainted.

I. Subfam. *Ponerinæ* (Lepeletier).

Tribe Ectatommini (Emery).

Ectatomma (s. str.) *quadridens*, F., ☿.

"A common species about the cultivated coast-land areas. The local nickname is 'Kop-Kop.' These ants are invariably found in the cane-fields, where they perform excellent work by carrying off the larvæ of the small Moth Borer (*Diatræa saccharalis*) and the Weevil Borer (*Sphenophorus hemipterus*, L.). They also destroy the egg-clusters of the small Moth Borer which occur on the leaves of the sugar-cane, and a number of other harmful insects are killed by them. When captured they emit a squeaking sound. They also frequent the flowers of certain commonly occurring plants, and have been observed to capture insects visiting these flowers to obtain the nectar. Formicary unobserved. Insects as soon as captured are carried off by the ants apparently to the nest."

Also in Botanic Gardens.

Ectatomma (s. str.) *tuberculatum*, Oliv., ☿.

Rockstone, 27. 12. 14.

"An uncommon species, and apparently only met with in the interior districts."

Tribe PONERINI (Forel).

Subtribe PACHYCONDYLINI, Ashmead.

Neoponera (s. str.) *villosa*, F., subsp. *inversa*, Sm., ☿.

"Not a common species. Formicary observed on two occasions in a hole in the trunk of a Cacao-tree. The communities were not large, consisting of about 500–600 individuals. The species seems to occur more commonly in the interior districts."

Pachycondyla (s. str.) *crassinoda*, Ltr., ☿.

Botanic Gardens, Georgetown, 27. 5. 15.

Pachycondyla (s. str.) *harpax*, F., ☿.

Issororò, N.W. District, 12. 6. 15.

Tribe ODONTOMACHINI (Mayr.).

Anochetus (*Stenomyrmex*) *emarginatus*, F., ☿.

"A fairly common species. Formicarium, which seldom consists of more than 100 individuals, is frequently found in decaying vegetable matter beneath the dead sheathing leaf-bases of several species of indigenous palms."

Issororo, 3. 6. 15.

Odontomachus hæmatoda, L., ☿.

The single specimen has the node evenly striate all round, as in the var. *rugisquama*, For., from Costa Rica and Columbia, but not so coarsely.

Georgetown, 11. 5. 15.

O. hæmatoda, L., var. *laticeps*, Rog. ?, ☿.

A single specimen in a tube containing *Pachycondyla harpax*, F. It answers very well to the description of Roger, but in the absence of more material I place it with hesitation under var. *laticeps*.

Issororo, 12. 6. 15.

Odontomachus hæmatoda, L., var. *pallipes*, var. nov.

☿. Differs from the typical form in being slightly larger, more elongate, the scale slightly broader from back to front, not tapering so gradually into the spine, and particularly in colour, which is entirely ferruginous with the gaster darkest and the mandibles and antennæ lighter, and the legs entirely yellow. The nearest described variety appears to be *palleus*, Wheeler (Bahamas), which is smaller and with a narrower and smoother scale. In var. *pallipes* the scale is faintly striate transversely in front and behind. Pubescence as in typical form.

British Guiana, 20. 4. 15.

II. Subfam. *Dorylinæ* (Leach).

Tribe Ecitini, Forel.

Eciton (s. str.) *hamatum*, F., ☿, ☿.

"This species and *E. burchelli*, Westw., are the two common species of 'foraging ants' in British Guiana. Both occur fairly commonly."

E. (s. str.) *burchelli*, Westw., ☿.

E. (*Labidus*) *cœcum* (s. str.), Ltr., ☿, ☿.

"A common species, but owing to its habit of burrowing beneath the surface of the soil it is not frequently observed."

Berlice, 3. 3. 15.

E. (*Acamatus*) *pilosum*, Sm., ☿.

"This is not a common species of *Eciton*; it seems to be more partial to the forest areas."

Rockstone, 27. 12. 14, &c.

III. Subfam. *Myrmicinæ*, Lep.

Tribe Pseudomyrmini, For.

Pseudomyrma biconvexa, For., ☿.

"From bark of *Sapium jenmanni*, Hemsl.," Botanic Gardens, Georgetown, 1. 3. 14.

"A fairly common species. Formicarium unobserved."

Ps. gracilis, F., ☿.

British Guiana, 20. 4. 15.

This is a most variable species. Forel (Biol. Cent.-Amer., Formicidæ) says it nests in hollow stems, where the ☿ ☿ rest one behind the other, and varies in colour from yellow through red to black with every imaginable pattern.

Ps. elegans, Sm., ☿.

British Guiana, 24. 5. 15.

Tribe PHEIDOLINI, Emery.

Pheidole fallax (s. str.), Mayr., ☿ ☿.

"This species is of fairly common occurrence in British Guiana. Formicarium constructed beneath the soil."

Tribe CREMATOGASTRINI, For.

Crematogaster stolli, For., var. *guianensis*, var. nov., ☿, ☿.

L. 3·2–7 mm.

These examples of this extremely polymorphic *Crematogaster* differ from the typical form as follows: Head and thorax a lighter chestnut-brown, with the gaster a much darker brown; the head much smoother, with hardly any of the irregular punctures so noticeable in Forel's duplicates, ocelli in ☿ major distinct, the pro-mesonotum with finer and more regular longitudinal striation; the basal surface of epinotum longitudinally striate fanwise (irregularly and transversely striate in *stolli*), spines of epinotum rather longer. In the ☿ minor the sculpture is also finer and more regular, and the striation on the epinotum similar to that in the ☿.

This variety does not appear to be the var. *amazonensis*, For., from the Amazon and also Costa Rica, as the description only refers to the colour and spines, and makes no mention of the sculpture.

Tribe SOLENOPSIDINI, For.

Subtribe MONOMORIINI, Eur.

Monomorium floricola, Jerd., ♂, ☿, ☿.

"In coconut," Botanic Gardens, Georgetown, 7. 4. 14.

A cosmopolitan species.

Subtribe SOLENOPSIDINI, For.

Solenopsis geminata (s. str.), F., ☿.

"In hollow stems of plants, and in houses," 1913 and 1915. This is the typical American form (dark). It appears, however, to be becoming cosmopolitan, like the var. *rufa*, Jerd., for Sautschi records it from Africa (Gabon, Liberia), and says that in certain districts it is ousting the local species (Ann. Soc. Ent. Belg. lvii. 1913).

S. pylades, For.

Port Mourant, 1915, and elsewhere.
"Nest in soil at bottom of sugar-canes."

S. corticalis, For., subsp. *amazonensis*, For., ☿.

"This is one of the commonest ants in British Guiana. It is almost exclusively found in human habitations, and is fond of all food-stuffs, especially sweet oils, sugar, and milk. In the entomological laboratory it is impossible to breed insects unless the benches are kept with the legs standing in kerosene oil, for they speedily discover the presence of living larvæ or other forms of insect life in the breeding-cages, and will then enter and destroy them. The formicarium, which is often hard to find, is constructed in crevices in wood-work and is never large, consequently they are difficult to destroy. They do not hesitate to use their sting, which, for the size of the ant, is surprisingly sharp and powerful. I have frequently observed small masses of them floating on the surface of water by means of surface-tension; their object in doing this is not apparent."

Tribe TETRAMORIINI, Emery.

Tetramorium guineense, F., ☿.

"A common species, especially in the cane-fields. Formicary is usually constructed in the earth at the base of the canes, and varies in size. The larger formicaries form roughly conical mounds about a foot and a half high and a foot in diameter. These mounds are intersected internally with innumerable galleries. The smallest formicaries are only slightly raised above the surface of the ground. The common coccid or 'Mealy Bug' of the sugar-cane (*Ripersia* sp.) is invariably attended by this ant. Considerable inconvenience is caused at times to the cane-cutters by this species owing

to its sharp and painful sting, the effects of which last for some time. As soon as the nest is disturbed the ants swarm out with their abdomens raised and readily attack the intruder. If the nests become flooded the ants ascend the canes and there construct a temporary shelter of fine earth-particles cemented together, which form a covering. This species has been also observed to attend the coccid *Pseudococcus citri*, Risso, when occurring on cacao pods."

This interesting account of this cosmopolitan species shows very different habits from those exhibited in hot-houses in this country. I have observed the habits of this ant in hot-houses at West Leake, Leicestershire, in 1908 and 1909, and at Kew in 1910; in the former locality the nest appeared to be in the crevices of the walls, and the ants ran about on the floor and among the plants. The females, which are ergatoid, and only slightly larger than the workers, were running about among the workers. The ants probably attended coccids, though they were not observed to do so. A species of *Ripersia* (*formicarii*, Newstead) is common at Seaton, Devon (1912), and at Porlock, Somerset, in the nests of *Lasius niger* and *flavus*, and is highly myrmecophilous. I found the ants always removed the coccids when the nest was disturbed, often before their own larvæ.

Tribe CRYPTOCERINI (F. Smith).

Cryptocerus pusillus, Klug., ☿.

"This species is frequently found moving about on the branches and twigs of smooth barked trees. It is a common species."

Georgetown, and Botanic Gardens, Georgetown, 1914.

C. minutus, F., ☿.

"A common species. A very sluggish ant which will remain absolutely motionless on a leaf for hours together. It has been observed to attend the following Coccidæ: *Pulvinaria pyriformis*, Ckll.; *Coccus hesperidum*, L."

Botanic Gardens, Georgetown, 1914.

C. atratus, L., ☿.

"A common species. Formicary has been observed in a large hollow in the trunk of a tree (*Pachira insignis*). The community is large, consisting of several thousands of individuals. The species has been observed to attend the

following species of Coccidæ: *Pseudococcus citri*, Risso; *Coccus hesperidum*, L.; *Saissetia nigra*, Nietn."
Botanic Gardens, Georgetown, 1914.

C. maculatus, Eur., ♀.

"On leaves of mango tree," Botanic Gardens, Georgetown, 1915.

Tribe DACETINI, For.

Daceton armigerum, Ltr., ☿.

"Fairly common in some districts. When captured with the forceps and placed in alcohol it emits from time to time a sharp click, which continues for some time after being placed in the liquid. Has been observed to attend the Coccid *Pseudococcus citri*, Risso, on cacao pods. Formicary unobserved."
British Guiana, 1914.

Tribe ATTINI (F. Sm.).

Atta (s. str.) *lævigata*, Sm., ☿, ☿ media.

"This species appears to inhabit the sandy soils of the interior. The process of cutting up leaves and carrying them into the nest is carried on exclusively at night, commencing shortly after sundown and ceasing just before dawn. I have always observed this species to carry pieces of dead and dry leaves into the nest, not green leaves as with other species of leaf-cutting ants."
Rockstone, 1914.

A. (s. str.) *cephalotes*, L., ☿.

"The common leaf-cutting ant of British Guiana. The local name is 'Coushi' or 'Acoushi' ant. It seems to prefer the lighter sandy soils for its nests, and these are frequently found in the large sand-reefs which intersect the heavy clay soils in some districts. The formicaries are usually very large and have long underground galleries. This species works at leaf-cutting exclusively at night, though in the daytime some of the smaller forms may occasionally be seen carrying off particles of sand and depositing them at the exits of the galleries. Slight disturbances, such as those caused by a person walking about on the surface of the nest, are sufficient to arouse the ants, including some of the largest

forms, which swarm out to the attack. They speedily ascend the legs of the intruder, and having secured a good grip with their jaws, retain it with a bull-dog tenacity. They are specially fond of all kinds of cultivated plants, and it is almost impossible to cultivate any kind of plant in some districts owing to their depredations. The leaves of the Para Rubber Tree (*Hevea braziliensis*) are readily attacked despite the exudations of the sticky sap which often proves fatal to other insects. No reliable method for their extinction has yet been devised. I have frequently observed, though have never been able to capture, a small species of fly (apparently a Muscid) which hovers over the ants while working in the daytime. From time to time the ants excrete from the tip of their abdomens a tiny globule of liquid, and as soon as this appears the fly darts down and rapidly absorbs it; the ants, though apparently uneasy, make no attempt to drive away the intruder.

Atta Acromyrmex octospinosa, Reich., ☿.

Issororo, N.W. District, 1915.

A. (*A.*) *mölleri*, For., subsp. *meinerti*, For., var. *globoculis*, For. (in litt.).

☿. "This species appears to inhabit the interior; it has never been met with on the coastlands. The communities are never large, but frequently a number of communities are met with in a small area. Formicarium with fungus-chamber is invariably found within a decaying log of wood, either just under or slightly above the soil-surface, and easily accessible. I have always observed this species to utilise freshly cut pieces of leaves and they are daylight workers. This species also enters human habitations and will carry off particles of food-stuffs. On one occasion the greater part of a half-pound packet of dried raisins were carried off by these ants. They have a distinct partiality for the foliage of Para Rubber (*H. braziliensis*)."

N.W. District, 1913.

It would be interesting to know whether the number of communities in a small area, spoken of by Mr. Bodkin, all belong to the same colony, or are separate colonies. As far as is known, the colonies of *Acromyrmex* are much less populous than those of *Atta*, sensu stricto.

IV. Subfam. *Dolichoderinæ*, For.

Tribe Dolichoderini, Em.

Dolichoderus (s. str.) *attelaboides*, F., ☿.

Konawaruk, 1914.

D. (*Monacis*) *bispinosus*, Oliv., ☿.

D. (*M.*) *debilis*, Em., ☿.

"The formicary of this species was observed in the nest of the termite *Entermes costaricensis*, Holmgr. The termite nest was situated on the stump of an old tree about four feet from the ground, and was partly inhabited by termites and partly by this species." 1913.

D. (*M.*) *gagates*, Em., ☿.

"This appears to be another uncommon species occurring in the interior. Observed to feed on the honey-dew given out by a Sassid nymph." 1914.

D. (*Hypoclinea*) *bidens*, L.

"A common species of ant throughout the colony. Small nests are constructed by slightly drawing together the edges of a leaf and covering the intervening space with a thin covering of dark-coloured vegetable substance of paper-like consistency, though somewhat more fragile. Any plant whose leaves are suitable for this purpose is utilised by this species as a dwelling-place. Coffee-trees (Liberian coffee), if not properly pruned, are particularly liable to infestation. The picking of the coffee is then rendered a difficult matter, as the slightest disturbance causes the ants to sally forth and attack the intruder by inflicting exceedingly sharp bites. This species has been observed to feed on the honey-dew of the coccid *Pseudococcus citri*, Risso, on cacao pods."

N.W. District, 1913, &c.

D. (*H.*) *lutosus*, Sm., ☿.

"A fairly common species, invariably found beneath the bark of trees. Formicary unobserved."

Botanic Gardens, Georgetown, 1914.

Tribe TAPINOMINI (Emery).

Azteca schimperi, Em., ☿.

"I have only once taken this species. It appears to infest the belt of low-growing trees termed 'Courida' (*Avicennia nitida*), which fringe the seashore in British Guiana. In this particular instance the ants were attending the coccid *Lecanium æquale*, Green; which had infested several trees. Formicarium unobserved."

A. chartifex, For., subsp. *laticeps*, For., ☿.

"A common species. Forms large carton nests on the trunks of trees, and is especially fond of the mango for this purpose. Some nests are as much as two feet in length This species inflicts a very sharp bite, and on the slightest disturbance the ants swarm out to attack the intruder, making an audible rustling sound. The nests may be easily destroyed by fire, but a breeze is required to keep the conflagration smouldering until the nest is entirely consumed. Within six months, however, the ants will be found to have made considerable progress in the construction of another nest, frequently in the same spot."
West Bark, 1914.

A. instabilis, Sm.

British Guiana, 20. 4. 15.

A. trigona, Em., subsp. *subdentata*, For.

Aruka River, N.W. District, 5. 6. 15.

A. alfaroi, Em., var. *ovaticeps*, For., ☿.

"An uncommon species. Inhabits the medullary cavities of the trumpet-tree (*Cercropia peltata*)."
Rockstone, 1914.

A. velox, For., ☿.

British Guiana, 20. 4. 15.

Tapinoma melanocephalum, F., ☿.

Cosmopolitan. In houses, 1914.

Tapinoma sp.

V. Subfam. *Camponotinæ*, Forel.

Section EUCAMPONOTINÆ, Forel.

Tribe PRENOLEPIDII, Forel.

Prenolepis longicornis, Ltr., ☿.

"A commonly occurring and very widely distributed ant in British Guiana. To be found as an inhabitant of most houses. Is especially fond of sugar and dead insects of all kinds. I have also frequently observed it to infest steamers and other craft which call at the port of Georgetown. Formicarium usually constructed just beneath the surface of the soil at the base of posts, walls, &c., or in crevices in wood-work; they are usually small. Houses may be successfully cleared of them by exposing a mixture of molasses and arsenic or by hunting for the nests and destroying them with carbon bisulphide."

A well-known cosmopolitan species.

Tribe CAMPONOTINI, Forel.

Camponotus (*Myrmothrix*) *abdominalis*, s. str., F., ☿.

"Inhabiting the disused sacs of the larva of the moth *Œceticus kirbyi*."

Georgetown, 1915.

C. (*M.*) *abdominalis*, F., var. *mediopallidus*, F., ☿, ♀.

Issororo, N.W. District, 1914.

C. (*M.*) *abdominalis*, F., subsp. *stercorarius*, For., ♀, ☿.

These specimens answer very well to Forel's description and appear identical with examples received from him.

"Nesting under leaf-sheaths of sugar-cane," Botanic Gardens, Georgetown, 1914.

(*C. M.*) *femoratus*, F., ☿.

Issororo, N.W. District, 1913.

C. (*Myrmosphincta*) *sexguttatus*, F., var. *ornatus*, Emery.

Botanic Gardens, Georgetown, 1914, 1915. ☿ major and minor.

These specimens answer perfectly to Emery's description. From small carton nest on underside of palm-leaf.

APPENDIX.

The following species have previously been collected in British Guiana, and identified by the Imperial Bureau of Entomology :—

Paraponera clavata, F.

"A fairly common species. The local name is 'Muniri.' Formicarium observed on two occasions at the base of young trees. The soil is carefully cleared away from around the base of the trunk to a considerable depth, and this serves as the means of communication to the nest. It is only necessary slightly to tap the trunk of the tree, when the ants swarm out making the stridulating noise common to the species. They soon return to the nest, however. The sting as exceedingly painful, and will bring on fever in a susceptible individual."

Odontomachus hæmatoda, L.

O. affinis, Guér.

Eciton burchelli, Westw.

E. cœcum, Ltr.

Cryptocerus clypeatus, Oliv.

"A fairly common species. The formicary has once been observed beneath the loose decaying bark of a tree ; the community consisted of about 1000 individuals."

Atta fervens, Say.

"This species seems occasionally to occur in the interior districts ; it has never been taken near the coast."

Camponotus maculatus, F., subsp. *picipes*, Oliv.

Note on Claviger testaceus.

Donisthorpe has recently (Ent. Rec. xxviii. 2, p. 34, 1916) commented on my experiments with this myrmecophilous beetle and the queens of *Lasius niger*, *flavus*, and *umbratus* (Ent. Rec. xxvii. 9, p. 205, 1915). My remarks, owing to their brevity, have evidently given rise to a misapprehension. The beetles, as I have previously observed myself, sometimes rest on the queens in nests of *L. flavus*, their normal host,

but the point I wished to make is that, in my experiments last year, the queens of *L. umbratus* appeared to possess an attraction for the beetles superior to that possessed by the queens of *L. flavus*, or *L. niger* (with which *Claviger testaceus* is occasionally found, *e. g.* Seaton, 1912, Porlock, 1915). The nest of *L. flavus* referred to, which contains four queens and fourteen *Claviger*, and is in a small frame, so that the beetles are continually coming across the queens, has been in my possession for eleven months, under daily observation, and it is curious that I have never seen any of the *Clavigers* resting on the queens. On the other hand, when a few of these beetles and others taken at the same time, were put into nests containing *L. umbratus* queens, the beetles were constantly clinging to the queens, and for weeks never appeared to change their resting-place. The striking contrast in this behaviour of the *Claviger* appears to me to be additional evidence that the parasitic queens (*L. umbratus*, *fuliginosus*, &c.) have a body-secretion which renders them attractive to other species of ants and myrmecophiles.

XLIII.—*Descriptions of new Species of Lepidoptera.*

By G. T. Bethune-Baker, F.L.S., F.Z.S.

Rhopalocera.

Lycænidæ.

*Liptenin*æ.

Epitola crowleyi.

There is an interesting variety of the male of this species in the Joicey collection from the Cameroons.

The primaries are entirely brown, with a very few blue scales near the base on the fold; the secondaries have also less blue than usual, a reduction of the area taking place at the anal angle and along the inner margin. The underside of the secondaries is much whiter, with but little of the bronze hue. The specimen is also small.

If it is a constant variety it might, perhaps, be known by the name *Epitola crowleyi semibrunnea*.

Lycæninæ.

Turania cytis, Chr.

I made this genus (*Turania*) in the 'Entomologists' Record,' 1914 (vol. xxvi.), p. 160, with *cytis*, Chr., as the