



## TRIBE CATAULACINI.

CATAULACUS INTRUDENS, Smith, var. INTERMEDIUS, Santschi.

Ann. Soc. Ent. France, vol. 85, p. 287, ♂, 1916.

“ ♂. 4.2–4.5 mm. long, the head deflected. Dull. Sculpture a little stronger than in *intrudens*, Smith, but much less pronounced than in *rugosus*, Forel, and *C. Bequaerti*, Forel. The rugae on the head are further apart (about 13 between the eyes), and the transverse rugae form a more distinct reticulation. The declivity of the epinotum (apart from a few transverse striae between the spines) and the anterior face of the 1st node are smooth. The longitudinal sulci on the petiole more regular. The abdomen punctured, also fairly sharply striate at the base and slightly so at the apex. Pilosity white, intermediate in quantity and length between *C. Bequaerti* and *intrudens*. Head a little less narrowed in front than in *intrudens*, more than in *Bequaerti*, relatively smaller than in those two species, with the hind margin straight. Thorax as elongate as in *Bequaerti*, but with the sides dentate as in *intrudens*. The spines are closer together, more clearly parallel and as acute as in *intrudens*. First joint of the petiole subconical as in the latter species, with the upper face smooth and very oblique in front. Second joint as wide as the 1st, with a fairly distinct median groove on the anterior and upper faces. Abdomen a little less convex than in *intrudens*, a little more than in *Bequaerti*. Colour as in those species.”

Bembesi, S. Rhodesia. (S.A.M., R.M., G.A. colls.)

## GENUS CATAULACUS.

I have endeavoured to draw up a key to the six forms which I have seen, but in view of the trifling distinctions on which authors have seen fit to erect new species in this genus, too much reliance should not be placed on it. In fact, a review of these six forms leads me to the belief that we have only two nuclei of species, one of which is *C. micans*, Mayr, with *durbanensis*, Forel, *Lujae*, Forel, and *Marleyi*, Forel, more or less intimately associated with it, and the other *C. Baumi*, Forel, with its allied forms, *batonga*, Forel, *bulawayensis*, Forel, and *intrudens* var. *intermedius*, Santschi.

Key to the ♂♂ *Cataulacus*.

- (10). 1. Head clearly narrowed in front of the eyes.  
 (7). 2. Base of abdomen only feebly striate longitudinally.

- (4). 3. Head not very strongly striate, and with the transverse anastomoses almost obsolete; thorax coarsely and longitudinally rugoso-striate, transverse rugae few, not clearly reticulate . . . *Marleyi*, Forel.
- (3). 4. Head longitudinally striate, also reticulate; thorax clearly reticulate-rugose.
- (6). 5. Inner pair of teeth on occipital angles usually smaller than the outer pair; spaces between the reticulations on the head shallow.  
*Baumi*, Forel, race *batonga*, Forel.
- (5). 6. Inner pair of teeth on occipital angles usually as large, or almost as large as the outer pair; the spaces between the reticulations on the head fairly deep . . . *batonga* var. *bulawayensis*, Forel.
- (2). 7. Base of abdomen deeply sulcate-striate.
- (9). 8. Basal half of abdomen sulcate-striate, the striae continued to the apex, but becoming rather feeble over the middle  
*micans*, Mayr, race *durbanensis*, Forel.
- (8). 9. Basal fourth only of the abdomen sulcate-striate, the striae altogether absent from the middle two-fourths, the apical fourth feebly striate;  
*intrudens*, Smith, var. *intermedius*, Sant.
- (1). 10. Head almost quadrate, or only feebly narrowed in front of the eyes  
*brevisetosus*, Forel, race *Lujae*, Forel.

### TRIBE PHEIDOLINI, Emery.

This tribe includes the two genera *Messor* and *Pheidole*. The former has polymorphic ♂♂, the different forms varying mainly in size, the structure being but little modified. On the other hand, in *Pheidole* the ♂♂ are strongly dimorphic and consist of large-headed ♀♀ and ordinarily shaped ♂♂, the two not being connected by forms intermediate in size or structure except in the small sub-genus *Allophaidole*, in which intergrading forms occur. *Aphaenogaster*, Mayr, *Goniomma*, Forel, *Messor*, Forel, and *Ischnomyrmex*, Mayr, have been reduced to the rank of sub-genera of *Stenamma*, Westwood, by Prof. Emery. They are undoubtedly all closely related, but since they continue to be treated by recent authors as distinct genera, *Messor* is retained as a distinct genus in the following pages.

#### GENUS MESSOR, Forrel.

Ann. Soc. Ent. Belg., vol. 34, C.R., p. lxx, 1890.

*Aphaenogaster* pars Mayr, *Atta*, Latreille, etc.

#### Characters.

♂. Polymorphic. The ♂♂ differ chiefly in size, very little in structure. For convenience one may divide the ♂♂ into major, minor and media, but there are no sharply defined categories in this

caste, a complete gradation existing between the largest at one end of the scale and the smallest at the other. The smaller the worker the smaller becomes the head in relation to the thorax, and the dorsal profile of the thorax tends to a more even and continuous convexity.

♀ major. Antennae 12-jointed, flagellum filiform and without a distinct club. Clypeus nearly flat, the median area produced back between the frontal carinae and hardly raised at all. Frontal carinae short, the free edge usually more or less raised. Eyes rather small. Mandibles triangular and massive, more or less dentate. Thoracic sutures distinct. Thorax narrower than the head; pronotum much larger than the mesonotum; constricted and deeply depressed at the meso-epinotal suture. Epinotum bidentate or unarmed. First segment of petiole conical, pedunculate in front; 2nd segment transversely globose. Abdomen oval, the 1st segment as long as the rest taken together.

♀. Similar to the ♀ major, but the head is smaller and the eyes slightly larger; ocelli small. The thorax is massive, much higher than the head, almost as high in the middle as it is long. Pronotum vertical, not exposed above. Anterior wing with two closed cubital cells.

♂. Antennae 13-jointed; the scape half as long as the head. Mandibles small, distinctly dentate. Clypeus narrow. Eyes not very large and the ocelli much smaller than usual in this sex. Thorax as in the ♀. Nodes of petiole shorter and flatter. Abdomen subglobose, pointed and narrower at the apex.

The members of this genus differ from the closely allied genus *Aphaenogaster* in their diet. The latter, when not entirely carnivorous, have a mixed diet, whereas the species of *Messor* are graminivorous and harvesting ants. *M. barbarus*, as its name rightly indicates, has its headquarters in North Africa, but including its numerous subspecies and varieties has a much more extended range, which comprises all the Mediterranean region.

In South Africa it is represented by the subspecies *capensis* and several varieties of the same.

*M. BARBARUS*, Linn., race *CAPENSIS*, Mayr.

Syst. Nat. Ed. 12 *a*, vol. ii, p. 962, ♀, 1767.

Leach, Entom. Archiv., vol. i, p. 4, ♀, ♀, ♂, 1827.

(Race) Verh. Zool. Bot. Ges. Wien, vol. 12, p. 743, ♀, 1862.

” ” ” ” ” ” vol. 16, p. 896, ♀, ♂, 1866.

” Reise d. Novara, Zool., vol. ii, Formicid., p. 87, ♀, 1865.

“ ♀. 6-11 mm. ♀ major brownish-black, frontal carinae, apex



of the scape, flagellum, articulations of the legs and the tarsi castaneous; ♀ minor brown, mandibles, flagellum and tarsi yellowish-brown; mandibles strongly striate; head very closely striate. Thorax as in *Aphaenogaster structor*, striate; epinotum with two tubercles; nodes striate or rugulose, the 2nd node smoother; abdomen smooth and shining. . . . The yellowish and outstanding pilosity is moderate, on the legs fairly abundant. The mandibles are fairly coarsely and longitudinally striate, in the smaller ♀ ♀ with about 12 teeth, edentate in the larger ♀ ♀. The head has a silky gloss, and in the ♀ major is very closely and longitudinally striate, the striae curving round the eyes and antennae sockets; in the ♀ minor the striae are less regular and unequal, weaker and not so straight on the frons, transverse on the vertex. The feebly shining thorax is like that of *A. structor*. The pronotum above is transversely and at the sides longitudinally striate; the mesonotum rugulose; the epinotum above transversely, at the sides longitudinally striate, not quite dentate above on each side, but nevertheless angularly dilated. The nodes are rounded above; in the ♀ major transversely striate and partly rugulose at the sides; in the ♀ minor very shallowly rugulose, almost smooth and shining. Abdomen smooth and very shining. Cape of Good Hope.

“♀. 15 mm. Brownish-black, head dark ferruginous, partly castaneous; articulations of the legs and tarsi rufescent; very sparsely pilose; head as in the ♀ major; pronotum densely and longitudinally striate, mesonotum shining, longitudinally striolate, scantily punctured, and with three large and smooth patches; scutellum shining and almost smooth, the sides striate; epinotum elongate and bituberculate, the sides strongly striate; nodes of the petiole striato-rugulose; abdomen very shining, smooth and almost glabrous.

“♂. 8.3 mm. Black, shining, mandibles and articulations of the legs and tarsi fuscous; not very densely pilose, the abdomen sparsely pilose; mandibles striate, clypeus with transverse rugae; cheeks, antennal foveae and the frons partly longitudinally striate, the middle of the latter finely rugulose; the vertex near the anterior ocellus radiately rugose, behind and outside the ocelli very finely and shallowly rugulose-punctate; pronotum finely rugulose-punctate; mesonotum longitudinally rugoso-striate, with some scattered punctures, smooth in the middle in front; disc of scutellum smooth; epinotum oblique, obtusely tuberculate, finely and transversely striate at the base; sides of thorax striate; nodes of petiole very finely rugulose; abdomen smooth in front, very finely and shallowly coriaceous behind; wings subhyaline, stigma and costa ochreous.”

Some specimens which have been determined by Dr. Forel as belonging to the above variety differ from Mayr's description in certain minor details, but in view of the tendency to variation exhibited by this species, I am unwilling to separate them as a well-marked variety by the use of a distinct name. To supplement Mayr's description, which refers mainly to the sculpture, a fuller description of these specimens is added herewith. ♀ major. 11 mm., head including closed mandibles 2.9 mm. long × 2.5 mm. wide. Dark brownish-black, mandibles dark reddish-brown, the epinotum sometimes a little lighter than the rest of the body, tarsi reddish-brown. Head, thorax and abdomen very sparsely pilose, the hairs yellowish, short and semi-erect, pubescence absent except on the mandibles, legs and antennae.

Head longitudinally striate, the striae as wide as the finely punctured interspaces; the striae converge somewhat in the middle, but bend outwards at the anterior and posterior corners, and converge inwards on the anterior margin of the clypeus. The mandibles are longitudinally striate, with elongate punctures between the striae. Pronotum longitudinally striate above, at the sides more or less concentrically, the striae less regular than on the head. Nodes of petiole finely rugulose, and also very finely and transversely striate, especially on the sides and near the posterior margins. Head and thorax dull, but the spaces between the striae slightly shining; legs very shallowly and sparsely punctured, slightly shining.

Head, excluding the mandibles, quadrate, almost rectangular, the sides and posterior angles feebly convex, the hind margin very shallowly concave or nearly straight. Eyes convex, rather small, placed a little behind the middle of the sides. Anterior margin of the clypeus straight. Frontal area well defined. Frontal carinae short. Scape of antenna thin, incrassate apically, strongly curved in its basal half, extending back as far as the hind margin of the head; all the joints of the flagellum longer than wide. Mandibles with about 5 very blunt teeth.

Thorax much narrower than the head. Pronotum as wide as long in the middle. Mesonotum narrow, almost cylindrical, higher than the lateral portions of the pronotum; the dorsal profile of the pro-mesonotum forms a continuous convexity. Pro-mesonotal suture distinct but shallow, the meso-epinotal suture deep. Dorsum of epinotum straight, rising slightly from base to apex, quite twice as long as wide, shallowly excavated lengthwise, the sides subvertical, the posterior angles prominent and almost dentiform, the declivity vertical and concave transversely. First joint of petiole with a moderately long

peduncle, seen from the side bluntly wedge-shaped; the anterior face of the node vertical, the posterior dorsal face convex and shallowly grooved lengthwise in the middle; 2nd node wider than the 1st, more or less campaniform. Abdomen elongate ovate, the apical margins of all the segments pale brownish.

♂ media, 7 mm. ♀ minor, 5-5.5 mm. These differ from the ♀ major as follows: The striation of the head and thorax is weaker; the head is a trifle longer than wide (in the ♀ major a little wider than long), the sides of the pronotum less convex, the emargination of the posterior dorsal face of the first node less pronounced, the sides of the second node less convex.

Willowmore, Cape Prov.; Durban. (S.A.M., R.M., G.A. colls.)

Var. PSEUDOÆGYPTIACA, Emery.

Ann. Mus. Civ. Genoa, 2, vol. 1, p. 384, ♀, 1884.

"Not exceeding 8 mm., smaller than the race. Head and thorax more or less ferruginous, with the sculpture of the duller varieties of *ægyptiaca*. On the head the sculpture is close and even, with fine and prominent longitudinal striae, often interrupted and lightly undulated. The thorax is dull; the epinotum hardly angular, without prominent teeth. Cape Prov."

The commonest form of *capensis* in S. Rhodesia has been referred to the above variety by Dr. Santschi, to whom I sent some typical examples of a series which had previously been determined by Dr. Forel as simple race *capensis*, from which they obviously differ not inconsiderably in certain features. Nevertheless, they do not quite agree with Emery's variety, since they attain a greater size and have the thorax a good deal more coarsely sculptured than in the few examples of *ægyptiaca* which I have seen. They are also very much like var. *proba* (Forel), to judge by the description only, so that for the present I prefer to place them with the variety to which Dr. Santschi has assigned them. They are characterised as follows:

♂ major. 9.5 mm. Head, including the closed mandibles, 3 mm. long × 3 mm. wide. Head, thorax and petiole varying from brick-red to reddish-brown, abdomen piceous, the extreme base of the first segment sometimes with a reddish tinge; legs brownish-red, the tarsi and tibiae a little darker. The striation of the head is much more feeble than in *capensis* (*i.e.* those forms from Willowmore and Durban described above), and the pronotum is transversely rugulose instead of longitudinally striate. The pro-mesonotum is much more convex and much higher above the level of the epinotum, and its

dorsal profile is not a continuous convexity, being broken at the anterior third of the mesonotum by a shallow depression. The dorsum of the epinotum is more deeply excavated longitudinally and has wider and more obtuse lateral angles; the declivity is oblique, not vertical as in *capensis*. The first node of the petiole is thinner above, the posterior dorsal face longer and sloping more steeply backwards; the second node is much more transverse and more convex from back to front and is one and two-thirds wider than long.

♀ media, 8 mm. ♀ minor, 5.5 mm. These differ from the ♀ major in having the head longer than wide. The dorsal profile of the promesonotum forms a continuous curve in the ♀ minor, and is barely interrupted in the ♀ media. The first node is higher, the summit very feebly emarginate; the second node is longer, quite as long as wide in the ♀ minor, and almost so in the ♀ media.

♀. 14 mm. Pronotum very finely striate and somewhat rugulose. The mesonotum without any distinct impunctate areas.

♂. 9.7 mm. Abdomen smooth and shining all over. Epinotum without a trace of tubercles; mesonotum shallowly punctate, only the posterior fourth feebly and longitudinally striate.

Otherwise Mayr's description of the sexes of *capensis* applies equally well to these specimens. However, the following characters should also be noted. In both sexes the mesonotum overhangs the pronotum so that the latter is not visible from above. The mesonotum and scutellum have a median longitudinal impression, less pronounced in the ♂ than in the ♀. In the ♂ the dorsum of the epinotum is very oblique and joins the declivity in a gradual curve. In the ♀ the sides of the declivity are marginate, the margins ending above in slight angles (hardly tubercles). The petiole of the ♀ is like that of the ♀ major, but the peduncle of the first joint is shorter, the node more deeply emarginate above, its anterior face vertical, the posterior face rounded and subvertical. The nodes in the ♂ are much flatter and more quadrangular than in the ♀ or ♀. Legs of the ♂ long and slender. Wing nervures in both sexes yellowish-brown.

This variety is very common in the neighbourhood of Bulawayo. It is eminently a harvesting ant, usually collecting the seeds of one particular kind of grass. The rejected husks of these seeds are deposited in a circle all round the entrance of the nest, one half of the circle being generally deeper than the other, which may be due to the prevailing winds. These rubbish heaps when made by a populous colony sometimes reach very large dimensions, covering as much as one square foot of ground, and from one to three inches deep. The site of such a nest is very plainly indicated by these accumulations, since

the husks are bleached almost white by the action of the sun. The nests of this ant appear to be very free of myrmecophilous insects, and even the ubiquitous Thysanuran is rarely to be found in them. The ants appear to have definite foraging grounds, to which access is obtained by well-marked and smooth paths leading from the nest in various directions.

Var. SCHENCKI, Forel.

Schultze, Reise Süd. Afrika, vol. iv, p. 13, ♂, 1910.

"♂ major. 9 mm. Entirely black. Sculpture a little less close and coarse; pilosity on the body scantier. Pronotum with less pronounced lateral humps. Epinotum rounded, without teeth. Head evenly and longitudinally striate. Petiole as in the race.

"Bethanien, Great Namaland. (Schenck.)"

Var. DECIPIENS, Forel.

Ann. Soc. Ent. Belg., vol. 49, p. 177, ♀, 1905.

"♀. 4.5-9 mm. Head of the ♀ maxima of 8-9 mm., transversely rectangular, one-sixth wider than long. Epinotum cuboid, rounded between the two faces, usually unarmed, sometimes bidentate. First node as in the type of *capensis*, but with a shorter peduncle than in the other races; both nodes thick. Head and thorax fairly strongly and irregularly striate. A few striae on the nodes. Abdomen with a few large piligerous punctures at the base. Like *capensis*, to which it stands in the same relation that the race *capitatus* does to *barbarus*, but much smaller, and entirely black. ♀ 10-11 mm. Like the ♀.

"Natal and Cape Colony (Wroughton)."

Var. PROBA, Forel.

Sitzungsb. K. A. Wiss. Munich, p. 266, ♀, 1911.

"♂ major. 10-11 mm. Black, head red, thorax with reddish-brown markings. Epinotum entirely unarmed. Pronotum rounded as in the var. *decipiens* Forel. Head sharply striate, but not, as in the type of *capensis*, reticulate-punctate in between the striae. Thorax and petiole more coarsely and sharply sculptured than in *decipiens*.

"Bothaville, O.F.S. (Dr. Brauns)."

BARBARUS, Linn., race LUBBERTI, Forel.

Schultze, Reise Süd. Afrika, vol. 4, p. 13, ♀, 1910.

“ ♀. 5–8 mm. Shape like that of race *capitatus*, but somewhat more robust. Head of the large ♀ wider, distinctly wider than long, strongly concave behind. Scape also similar but shorter; the joints of the flagellum shorter and thicker. Sides of the head straight as in race *capensis*, Mayr. Thorax as in *capensis*, but the epinotum is not cuboid but rounded, the dorsum merging into the declivity, with two feeble, elongate and ridge-like tubercles. First node much thinner than in *capensis* and its var. *decipiens*, emarginate above, and behind with a longitudinal impression which joins the emargination above.

“ Head closely longitudinally striate as in *capensis*, but not so deeply, somewhat finer and more shining, not so strongly reticulate-punctate between the striae. The pro-mesonotum is much more finely and closely reticulate-rugose, duller, also less angular and evenly rounded. Epinotum transversely striate. Nodes dull, finely reticulate-punctate. Abdomen shining, finely and shallowly reticulate, with scattered punctures. The upper surface of the body almost glabrous, with only rare bristly hairs. Under surface of the head with some not very long bristly hairs. Legs and scapes with decumbent pubescence, much more abundant than in typical *barbarus*. Red, the posterior two-thirds of the abdomen dark brown. Antennae and legs reddish-brown.

“ G.S.W.A. (Lübbert); Okahandja (Peters).”

M. DENTICORNIS, Forel.

*Loc. cit.*, p. 14, ♀, ♀, ♂.

“ ♀. 5.5–11 mm. Slender, with a relatively small head (in the largest ♀ ♀ 2.8 mm. long and wide), but with the typical mandibles of the genus. Mandibles strongly curved, with two stronger teeth in front, indistinctly dentate behind (often quite plane through use), with a very broad terminal margin, fairly closely striate. Anterior margin of clypeus convex. Frontal area very large, rounded behind. Frontal carinae straight, feebly convergent posteriorly. Head somewhat longer than wide in the ♀ min. only, a little wider in front than behind (in the larger ♀ even wider behind than in front), the sides almost straight, the posterior margin fairly convex in the ♀ minor or straight in the ♀ major, the posterior angles strongly rounded. Eyes distinctly large, convex, placed in about the middle, shorter than their distance from either the front or back of the head. The scape extends

beyond the posterior margin by about one-fourth of its length in the ♀ minor, and by about one-seventh in the ♀ major. Close to the base it has a transversely-placed projection or tooth . . . ; the scape is widely curved beyond the level of the projection. Flagellum without a distinct club, all the joints subequal in length, the first about three times longer than wide. Pro-mesonotum evenly arched. The long and slender mesonotum is almost cylindrically narrowed. Epinotum almost cuboid, the dorsum horizontal, nearly twice as long as wide, the declivity almost vertical; between them are two broad flat teeth, or two sharp and nearly dentiform angles, the space between the angles excavated. First node wedge-shaped, with a broad peduncle in front, as high as thick at the base, emarginate above, and with a longitudinal impression behind. Second node also narrowed above. Legs very long, thin and slender. Head, pronotum and petiole feebly shining, in the ♀ minor closely, finely and rather irregularly reticulate, in the ♀ major fairly coarsely striate in addition; mesonotum and epinotum (including the declivity) coarsely and transversely rugose or striate, the sides longitudinally striate below. Abdomen shining, shallowly and finely coriaceous. Pilosity sparse, reddish and short. Legs and antennae with decumbent, or sometimes oblique, long hairs. A fringe of long red hairs on the anterior margin of the clypeus and some not very long ammochaetae under the head. More or less dark brown or brownish-black; mandible and tarsi yellowish to reddish, flagellum and legs brownish-yellow to reddish-brown.

“♀. 10.3–13 mm. Thorax almost as wide as the head. Disc of mesonotum smooth, with sparse, piligerous punctures; the rest of the thorax coarsely and unevenly rugose. The epinotum with very feeble and broad tubercles. Wings fairly long, almost vitreous (slightly tinged with yellow), costa and nervures brown. Otherwise just like the ♀ major but often with a more brightly coloured head. The tooth on the scape of the antenna a little smaller. Legs often quite red.

“♂. 8.5 mm. The tooth on the scape very distinct. Mandibles with 7 or 8 teeth. Head longer than wide, with a very distinctly, feebly convex hind margin. Second joint of the flagellum longer than the first. The epinotum forms a complete oblique plane, hardly convex. Head reticulate-punctate, almost dull. Thorax irregularly and fairly coarsely rugose, shining. Otherwise like the ♀ minor. Black; legs, base of the mandibles, antennae, apical margins of the abdominal segments and the pilosity brown; apical half of the mandibles reddish.

“A harvesting ant (*Aristida* grass, *Augea capensis*, etc.).

“Luderitzbucht, Kammagas and Steinkopf, Little Namaland (Schultze); Steckstown, Cape Prov. (Wartmann).”

Also at Kimberley, and Ababis, S.W. African Protectorate (R. W. Tucker). These agree with Forel's description in every way except the colour, which is darker, almost pitch-black, the tarsi and the apex of the flagellum dark reddish-brown. From an examination of these specimens and of a co-type (♀ *media*) in my possession, it appears to me that the emphasis laid on the presence of a tooth on the scape is somewhat misleading. Unless seen at a certain angle from above, this dentiform projection at the base of the scape is by no means conspicuous, and moreover, a similar though smaller tooth occurs in *capensis* and its var. *pseudoaegyptiaca*. *Denticornis* differs from the latter species chiefly in its much more shining integument, in its feebler and more superficial sculpture of the head, and by its narrower form.

Var. PARVIDENS, Forel.

*Loc. cit.*, p. 15. ♀.

“♀. Differs from the type by the much smaller tooth on the scape. Some specimens have also more obliquely exerted hairs on the tibiae.

“Kubub, Great Namaland; under stones (Schultze).”

Var. BRUNNI, Forel.

*Ann. Soc. Ent. Belg.*, vol. 54, p. 444, ♀, 1910.

“♀. 6–8.5 mm. Allied to var. *parvidens* but smaller, of a light brownish-red, with the tarsi, antennae and mandibles yellowish-red or reddish-yellow. The sculpture of the head is finer and closer, and the occiput is transversely striate (longitudinally so and more rugose in the type of the species and var. *parvidens*).

“S. W. Africa (Brunn); Steckstown, Cape Prov. (Wartmann).”

M. BRAUNSI, Forel.

*Ann. Soc. Ent. Belg.*, vol. 57, p. 138, ♀, 1913.

♀. 5.5–8.3 mm. Head and abdomen yellowish-brown, paler in the ♀ *media* and *minor*. Thorax and petiole brownish-yellow in the ♀ *major*, dirty ochreous in the smaller ♀ ♀. Legs and antennae ochreous, mandibles light brownish-red, the masticatory margin dark brown. Pilosity coarse, erect and reddish; a very fine pubescence



only on the legs and antennae. Head and thorax moderately, the abdomen very shining. Head finely longitudinally striate, the striae almost obsolete on the occiput. Thorax and nodes feebly reticulate, the pronotum also feebly striato-rugulose transversely. Epinotum strongly and transversely striate. Abdomen and legs smooth. In the smaller ♀♀ the sculpture is almost entirely effaced except on the epinotum.

Very similar to *denticornis*, Forel, with which it should perhaps be placed as a race. It differs from that species as follows: It is smaller and more robust. The thorax is shorter and the pro-mesonotum more convex; the epinotum is also more convex, rounded and without teeth, not angular between the two faces. The nodes of the petiole are more convex above and not so high; the 2nd node is as long as wide (slightly wider than long in *denticornis* in the ♀ major). The scape is toothed at the base, but the tooth is less acute.

Willowmore, Cape Prov. (Dr. Brauns). (S.A.M., R.M., G.A. colls.)

#### GENUS PHEIDOLE, Westwood.

Ann. Mag. Nat. Hist., vol. 6, p. 87, 1841.

#### *Characters.*

♂. Antennae 12-jointed, usually very short in proportion to the length of the head; club 3-jointed, fairly distinct. Head extremely large, disproportionately so compared with the rest of the body. The back of the head usually deeply emarginate, so as to divide that region into two lobes; a median occipito-frontal sulcus usually well defined. Clypeus short, especially at the sides, the median portion produced backwards between the frontal carinae. The frontal area generally depressed. The frontal carinae short, raised at the sides so as to furnish a slight depression in front to accommodate the base of the scape. Mandibles broad, triangular, indistinctly dentate. Pro- and mesonotum much raised above the level of the epinotum and forming a hump. The pronotum is usually more or less angularly produced at the sides, or even bituberculate. Mesonotum frequently with a transverse impression, behind which lies a more or less distinct scutellar region. This is sometimes margined above by a transverse torus or hump. Behind the scutellum a fairly well-defined portion of the metanotum is often present (in the majority of ants not visible in the ♀). Epinotum armed with two spines or teeth. First node of petiole wedge-shaped or conical, the peduncle in front very short. Second node with the sides produced into angles

or spines, seen from above, more or less lenticular or lozenge-shaped. Abdomen oval, the 1st segment larger than the remaining segments taken together.

♀. Antennae 12-jointed, usually very long, rarely shorter than the head and thorax together. Head of normal proportions, the occiput not emarginate, but generally convex. Thorax longer than in the ♂; the pro-mesonotum not gibbous as in the ♂, but nevertheless retaining (on a much reduced scale) the general features exhibited in that caste; the scutellum hardly defined, the metanotum not at all. Epinotum bispinose or bidentate. First node of petiole with a fairly long peduncle, the node much thicker above than in the ♂; the 2nd node globose or campaniform, rarely transverse. Abdomen relatively longer than in the ♂.

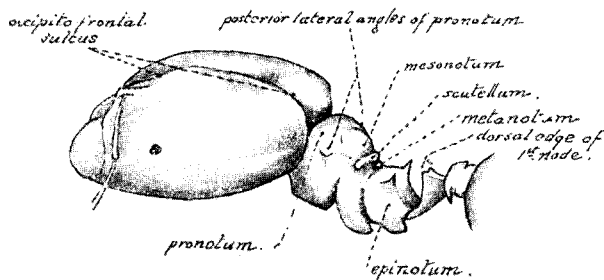


FIG. 20.—Head and thorax of *P. excellens*, race *rhodesiana*. ♀.

♀. Antennae 12-jointed. Head not wider, or very little wider than the thorax, not emarginate posteriorly, but rather convex or only feebly concave. Pronotum without tubercles or prominent angles, not exposed above. Mesonotum usually flat above in its posterior half. Dorsum of epinotum short and declivous; the spines or teeth generally broader and relatively much shorter than in the ♂ and ♀. Petiole very similar to that of the ♂. Abdomen elongate-ovate, not very convex above, with more or less pronounced basal angles. Wings fairly long, with two closed cubital cells.

♂. Antennae 13-jointed, the scape very short, rarely more than half as long as the long diameter of the eyes, flagellum filiform, the 1st joint globose. Head much wider in front than behind. Mandibles small, usually dentate. Eyes and ocelli large. Median area of clypeus convex. Frontal carinae very short, ill defined. Thorax similar to that of the ♀, but the mesonotum is more convex

and projects further forwards in front. Dorsum of epinotum generally very short, the teeth obsolete and indicated only by obtuse tubercles. First joint of petiole barely or not at all pedunculate, the node flattened, the posterior face usually dorsal in position. Second node more or less hemispherical, sometimes laterally dentate as in the ♀. Wings as in the ♀.

This genus occurs in both hemispheres and includes a very large number of species, many of which break up into numerous varieties and races. All the South African species with which I am acquainted are omnivorous, with a marked fondness for sugary substances, but some species, *e.g.* *excellens*, *crassinoda* and *Arnoldi*, are mainly graminivorous, harvesting the seeds of grass in the same way as the species of *Messor*. They do not appear, however, to limit themselves so exclusively to the seeds of one particular kind of grass as in that genus, nor are their stores of seeds so large. Nearly all the species which I have seen usually nest in the ground, and the nest entrances are generally clearly indicated by irregular craters of earth around them. A few species may sometimes be found nesting in hollow trunks of trees, but such a situation is uncommon. The duties of the large-headed soldiers appear to be mainly to remove to and from the nest any matter which is too bulky to be handled by the ♀♀, and with their powerful mandibles to dismember the bodies of their insect prey. For purposes of defence they appear to be of very little use, being far less courageous than the small worker. This is easily seen on digging up a nest, when it will be found that the workers attack the intruder, stinging and biting to the best of their ability, while the soldiers immediately seek shelter among the *débris*, or in the deeper parts of the nest. Nevertheless, if they are sufficiently irritated, they will also attack, and bite so firmly to the skin of the hand that they will allow themselves to be torn in half rather than loosen their hold.

The species of this genus are pre-eminent in their readiness to harbour other insects in their nests. In Rhodesia it is in the nests of *P. punctulata* that one may most frequently find such myrmecophiles, especially Paussidae, Clavigeridae and Pselaphidae. Amongst the ♀♀ and ♂♂ of the genus, there is a general uniformity of structure which renders the determination of the different species a difficult matter, so that it is essential that examples of the ♂ caste should be obtained, in which a greater specific diversity is apparent.

In the treatment of this genus I have endeavoured to arrange the species into groups, such grouping being based chiefly on the

structure of the ♀♀. Although I believe that the arrangement adopted is a fairly natural one for our South African species, yet it is not claimed that it definitely indicates a natural or close relationship amongst the components of each group.

(N.B.—In measurements of the length of the head the mandibles are excluded. Contrary to the method adopted in the case of *Strumigenys*, etc., it is more convenient in dealing with this genus to include the occipital lobes in the measurement; the latter is, therefore, taken from the level of the anterior margin of the clypeus to the level of the apices of the occipital lobes. The width of the 2nd nodes of the petiole is measured across its widest part, *i. e.* including the lateral teeth or spines. The length of the 1st segment of the petiole should be taken along the ventral surface of the segment.)

(A) PUNCTULATA Group.

♀. Head very convex above and at the sides, and (neglecting the mandibles and occipital emargination), more or less round in outline. Occipital sulcus rarely deep. The posterior half or less of the head smooth and shining. Second node of the petiole not sharply spinose at the sides.

- (2) 1. Mandibles strongly and fairly closely punctate-striate *Foreli*, Mayr.
- (1) 2. Mandibles finely and sparsely punctured.
- (8) 3. Posterior half of the head shining and without sculpture.
- (5) 4. Occipital emargination of the head shallow, its apex not angular; sides of the head behind the eyes moderately convex  
*punctulata*, Mayr.
- (4) 5. Occipital emargination much deeper; the sides behind the eyes very convex.
- (7) 6. Occipital emargination angular at its apex; a distinct trace of the anterior ocellus is present in a pit-like depression *rotundata*, Forel.
- (6) 7. Occipital emargination arcuate at its apex; no trace of the anterior ocellus present . . . . . *rotundata* var. *Ilgii*, Forel.
- (3) 8. Less than half of the head posteriorly shining and without sculpture.
- (10) 9. Only the posterior fourth of the head smooth and shining, occipital emargination wide and very shallow; second node angulated at the sides . . . . . *victoris*, Forel.
- (9) 10. Posterior two-fifths of head smooth and shining; occipital emargination narrow and fairly deep; sides of second node convex.
- (12) 11. Length 4.5 mm.; mandibles shallowly punctured; dorsal edge of first node emarginate . . . . . *tenuinodis*, Mayr.
- (11) 12. Length 5.3 mm.; mandibles deeply punctured; dorsal edge of first node entire . . . . . *tenuinodis* var. *sipapomae*, Arnold.

## (B) PRELLI Group.

♂. Head less convex than in Group A, the outline, seen from above, not round but more or less quadrate; the occipital sulcus deep and continuous with the frontal sulcus. Sides of the head behind and above the eyes sometimes fairly deeply and obliquely excavated (this feature is much more distinct than in any member of Group A). Frontal carinae prolonged back as far as the posterior third of the head, or further. A trace of a scrobe present, and sometimes also of the anterior ocellus. Second node angular at the sides, sometimes acutely so, but not spinose.

- (4) 1. Whole head sculptured and dull; occipital emargination not very deep.  
 (3) 2. Apices of the occipital lobes fairly angular; head not parallel-sided; scapes short . . . . . *Prelli*, race *redbankensis*, Forel.  
 (2) 3. Apices of the occipital lobes rounded; head parallel-sided; the scapes long, extending to the posterior fifth of the head . . . . . *Maufeii*, Arnold.  
 (1) 4. Occipital lobes smooth and shining, their apices strongly rounded; occipital emargination deep . . . . . *redbankensis* var. *politocciput*, Santschi.

(C) ALLOPHEIDOLE Group (subgenus *Allophoidole*, Forel).

♂. More or less like Group B in the shape of the head of the ♂, but having forms intergrading between the ♂ and ♀; some of these have the head wider in front than behind. Second node dentate or nearly spinose at the sides

*cuitensis*, Forel, race *reddersburgensis*, Forel.

## (D) ARNOLDI Group.

Small species, especially in the ♀ caste.

♂. Head longer than wide, slightly wider in front than behind and nearly parallel-sided, or the sides only feebly convex; the occipital emargination fairly deep. Posterior two-thirds of the head smooth and shining. Second node of petiole sharply spinose at the sides, the spines curved a little backwards or sharply angular.

- (2) 1. ♂. Head a little more than a quarter longer than wide; ♀, head and thorax dull . . . . . *Arnoldi*, Forel.  
 (1) 2. ♂. Head at least two-fifths longer than wide; ♀, head and pronotum shining . . . . . *strator*, Forel, race *fugax*, Arnold.

## (E) CAPENSIS Group.

♂. Very similar to Group D, but the posterior emargination of the head is less deep and less angular. The head is longer than wide, not wider in front than behind, almost parallel-sided. Second node

sharply angular or obtusely spinose at the sides. An oblique depression above and behind the eyes is more or less noticeable.

1. Sides of second node merely angular; transverse torus on the mesonotum feeble; epinotal teeth small . . . . . *capensis*, Mayr.
2. Sides of second node obtusely spinose; transverse torus on the mesonotum strong; epinotum armed with fairly long spines  
*rocensis*, Forel.

(F) SPINULOSA Group.

♂. Head longer than wide, the sides moderately convex or nearly straight, the occipital emargination wide, not deep, arcuate at its apex. Posterior half of the head shining. Second node acutely dentate or spinose at the sides.

1. Head as wide in front as behind, its sides straight and subparallel  
*Schultzei* var. *gwaiiensis*, Forel.
2. Head narrower in front than behind, its sides convex  
*spinulosa* Forel.

(G) SCULPTURATA Group.

Usually rather large forms in ♂ and ♀ castes.

♂. Head longer than wide, the sides fairly straight. Occipital emargination deep, its apex angular. Second node of petiole strongly spinose at the sides.

♀. Second node more or less distinctly angular at the sides.

- (6) 1. The whole of the head dull and sculptured, at the most only the apices of the occipital lobes smooth and shining.
- (3) 2. Posterior third or half of the head with obliquely transverse rugae extending outwards from the occipital sulcus; epinotum usually armed with long spines in the ♀  
*Liengmei*, Forel, and races and varieties.
- (2) 3. Posterior third or half of the head not transversely rugose; epinotum armed with short teeth in the ♀.
- (5) 4. Small species, ♂ less than 5 mm. long, the head less than 2 mm. long  
*Akermanni*, Arnold.
- (4) 5. Larger species, ♂ more than 5 mm. long, the head at least 2.7 mm. long  
*sculpturata*, Mayr, and races and varieties.
- (1) 6. Posterior third or half of the head smooth and shining  
*excellens*, Mayr, race *rhodesiana*, Forel.

(H) CRASSINODA Group.

♂♂ and ♀♀ large.

♂. Head distinctly convex at the sides and above (somewhat resembling the ♂ of the *punctulata* group), much wider behind than

in front, and, excluding the mandibles, about as long as wide. Posterior half of the head smooth and very shining. Occipital emargination wide but not deep. Second node of petiole angular at the sides, its anterior margin nearly semicircular or very convex

*crassinoda*, Emery, and races.

P. PUNCTULATA, Mayr. (Plate VI, fig. 67.)

Verh. Zool. Bot. Ges. Wien, vol. 16, p. 899,  $\mu$ , 1866.

$\mu$ . 4.2-4.5 mm. Head and thorax varying from dark reddish-brown to light brownish-red, the head always darker than the thorax, especially near the anterior corners and along the middle of the vertex; abdomen yellowish-brown, legs and antennae dirty ochreous, masticatory margin of the mandibles dark brown. Antennae with a fine and pale pubescence, absent elsewhere. Pilosity sparse, composed of long, yellowish and semi-erect hairs, oblique on the tarsi. Mandibles and posterior half of the head very shining, the latter sometimes less so owing to a fine alutaceous sculpture. Anterior half of the head faintly shining, with widely spaced longitudinal striae, the spaces between the striae finely reticulate, punctate or aciculate. Mandibles strongly and sparsely punctured. Clypeus with a few longitudinal striae in front, the middle one strongest, forming almost a carina.

Pronotum and mesonotum very finely rugulose or alutaceous, the former slightly shining and with faint transverse striae. Epinotum, sides of mesonotum and upper faces of the nodes finely and regularly reticulate-punctate, the dorsum of the epinotum slightly shining, the nodes dull. Abdomen microscopically reticulate, feebly shining. Legs smooth and shining.

Head not deeply emarginate behind, very convex above in all directions, widest at about the posterior third, as wide as long, narrower in front than behind, the sides and occipital lobes very convex. Seen from the side, the head is higher in front of the eyes than behind them, *i. e.* the front part is much thicker than the part behind the eyes. The sides behind the eyes are slightly hollowed out, but the wide depression so formed is not easily visible except at a certain angle. Clypeus arcuately emarginate in the middle. Eyes placed in front of the middle of the sides. Mandibles broad, convex, the masticatory margin concave and armed with two strong obtuse teeth at the apex. Frontal carinae short, hardly extending beyond the level of the posterior margin of the eyes, widely divergent behind. Scape extending back as far as the middle of the head, the flagellum not much longer than the scape. Pronotum considerably narrowed in front to form a neck, and

behind produced on each side into a prominent angle, which is slightly obtuse at the apex; it is widest between the angles and one-third wider than long. Pro-mesonotal suture feeble. Seen in profile, the pro-mesonotum is very convex, almost angular or rising from in front to the pro-mesonotal suture, thence curving abruptly down to the base of the mesonotum. The latter is subcircular, a little less than half as wide as the pronotum between the posterior angles, and a little wider than long. The metanotal region is not clearly defined. Dorsum of epinotum horizontal, a little longer than wide; the declivity a little longer than the dorsum, and oblique. Epinotal teeth small, not longer than their basal width, directed backwards, upwards and slightly outwards. First joint of the petiole about twice as long as wide, seen from above triangular, the anterior face quite twice as long as the posterior-dorsal, the dorsal edge (*dorsal edge*, see Text-fig. 20), indented in the middle. Second node one-third wider than long, narrowed behind, transversely lozenge-shaped, the sides produced into subacute angles, the anterior face convex. Abdomen nearly circular, the base truncate. All the femora swollen.

♀. 2.7-3 mm. Head varying from light yellowish-brown to dark brown with a slightly reddish tinge. Thorax and petiole varying from ochreous to light yellowish-brown, abdomen light brown to dark brown, the base of the 1st segment always somewhat paler; legs pale fuscous yellow, the tarsi lighter, the antennae brownish-yellow. Head smooth and shining, with a few very shallow punctures. Pro- and mesonotum shining, but less than the head, the mesonotum faintly rugulose above, reticulate and dull at the sides. Epinotum dull and reticulate. Petiole, abdomen and legs almost smooth, slightly shining.

Head subcircular, a little longer than wide. Eyes convex, placed in the middle of the sides. Clypeus narrow at the sides, the median area with a median longitudinal raised line (hardly a carina), the anterior margin convex. Mandibles triangular, the masticatory margin as long as the basal, finely denticulate, the two apical teeth acute. Frontal carinae extending back to the level of the anterior margin of the eyes, rather wide apart and divergent behind. Frontal area triangular, depressed. Scape of the antennae long, incrassate towards the apex, extending beyond the occipital margin by about one-fifth of its length; flagellum long, the 1st joint two and a-quarter times longer than wide, all the other joints also longer than wide, the 3-jointed club a little longer than the rest of the flagellum.

Pro-mesonotum less convex than in the ♂, the dorsal profile forming a longer and lower convexity, the curve of the mesonotum especially



being much less abrupt. It is also much narrower than in the  $\mathcal{U}$ , half as long again as wide, the posterior lateral angles represented only by slight tubercles. Pro-mesonotal suture very indistinct above, the meso-epinotal very deep and wide. Dorsum of the epinotum feebly convex transversely and longitudinally, longer than wide, the epinotal teeth similar to those of the  $\mathcal{U}$ , but smaller. The 1st node of the petiole like that of the  $\mathcal{U}$ , but the dorsal edge rounded, the anterior face oblique. The second node is a little longer than wide, the sides convex; seen from above, it is subconical over its anterior two-thirds. Abdomen oblong-oval, the 1st segment as long as wide and longer than the remaining segments taken together.

♀. 7 mm. Dark reddish-brown or castaneous, the head usually paler or more reddish. Legs and antennae yellowish-red. Mandibles, clypeus and pro-mesonotum shining, head, epinotum and petiole rather dull, abdomen shining but less so than the thorax. Pubescence short, very sparse and inconspicuous; pilosity sparse, not long, yellowish, on the apical segments of the abdomen somewhat longer. Head longitudinally striate, the cheeks and temples (*i. e.* the region between the eyes and the frontal carinae) with some transverse striae which anastomose with the longitudinal ones, the spaces between the striae very finely rugulose. Mandibles triangular, stout, sparsely and coarsely punctured, the masticatory margin blackish, with two apical teeth and one or two obtuse teeth at its base, the space between denticulate. Pro-mesonotum smooth and shining, very sparsely and shallowly punctured, the mesonotum also very finely striate longitudinally, the striae converging posteriorly. Scutellum smooth and shining above, reticulate-striate at the sides, separated from the mesonotum by a deep and clathrate groove. Epinotum, nodes of petiole above and the abdomen more or less reticulate, the abdomen exceedingly finely so. Legs shining and sparsely punctured.

Head widest behind, one fifth wider than long, the sides convex, the posterior margin straight. Eyes very convex, placed a little in front of the middle of the sides. Anterior margin of the clypeus shallowly emarginate in the middle. Frontal area distinct, subtriangular. Frontal carinae slightly divergent behind. The scape extends back as far as the posterior margin of the head. Pronotum not exposed above except the narrow neck portion. Mesonotum a little more than one-quarter wider than long, convex in front, flattened behind, its anterior margin, seen from above, semicircular. Metanotum very short. Epinotum transversely concave between the teeth, sometimes rather deeply so; the dorsum very steep, short, narrowed posteriorly, the declivity subvertical. Epinotal teeth short, acute, not longer than

their basal width. Petiole as in the ♀. Abdomen oblong-ovate, truncate at the base, the lateral angles rounded but distinct, above somewhat flattened, the apex broad. The apical margins of the abdominal segments pale. Wings and nervures yellowish, the stigma brownish-yellow.

♂. 5.5-6 mm. Yellowish-brown, the mandibles and antennae pale ochreous, the space between the mesonotum and scutellum, the epinotum, petiole, pronotum and sides of the meso-metathorax usually much paler or ochreous. Legs yellowish-brown, the articulations and all the tarsi yellow. Head and thorax dull, scutellum, abdomen and nodes above slightly shining. Head strongly and longitudinally striate, the striae curving round behind the anterior ocellus; the sides behind the eyes obliquely striate. Sculpture of the thorax and abdomen similar to that of the ♀ but stronger, especially on the disc of the metanotum and on the epinotum, the latter having some more or less longitudinal striae.

Head subtriangular, much wider in front than behind. Eyes very large, occupying more than the anterior half of the head. Ocelli large, raised, the posterior ocelli more than twice as far apart from each other as they are from the anterior ocellus. Mandibles short, small, the masticatory margin with three acute teeth in front and two smaller teeth behind. Clypeus convex, the anterior margin rounded. Frontal carinae very short. Antennae filiform, finely pubescent, not extending back beyond the base of the mesonotum; the scape very short, not reaching the middle of the eyes when extended laterally and hardly longer than one ocellus. First joint of flagellum subglobose, very little longer than wide, the remaining joints all longer than wide. Mesonotum as wide as the head, as wide as long, the forks of the Mayrian furrow fairly well defined in front, the median furrow obsolete. Scutellum slightly raised posteriorly, not sloping downwards as in the ♀, narrower behind than in the ♀, its sides vertical. Dorsum of the epinotum quite twice as wide at its base as at its apex, about as long as the scutellum and one-third longer than the declivity. Dorsum of epinotum unarmed, the teeth of the ♀ being replaced by two subcarinate ridges. The petiole resembles that of the ♀, but the node of the first joint is thicker above and less raised. Abdomen elongate-ovate, narrowed apically, rounded at the base; the first segment a little wider than long and as long as the remaining segments taken together. Legs long and thin. Wings hyaline, nervures and stigma pale yellow.

Cape Province, common. (S.A.M., R.M., G.A. colls.)

This form was originally described by Mayr as a race of *P.*

*megacephala*, but by general consent it is now accorded specific rank. It is nevertheless closely allied to that species, which is a tropicopolitan form having a very wide distribution. Like it, *punctulata* i. sp. or its geographical varieties is widely distributed throughout South and Central Africa, and in Rhodesia and Natal is one of the commonest and most abundant of ants. Like *megacephala* it is very partial to sugar and other provisions and is therefore a frequent pest in houses. It nests in the ground, and often under the shelter of stones and decayed logs, also occasionally in hollow trunks of trees. Usually many fertile queens are found in each nest. In the nest of var. *atrox*, Forel, I have found on different occasions the following species of Paussidae: *Curtisi*, *cultratus*, *cucullatus* and *Klugi*, also a *Cossyphodes* and a Pselaphid as yet undescribed.

As might be expected in a species with such a wide distribution, *punctulata* is very variable in some minor details of its structure, such as the sculpture, the size and shape of the epinotal teeth, etc., but for each particular character intermediate forms can be found connecting one extreme with the other, even in a series collected over a very small area. For these reasons, the erection of new varieties and races should be undertaken only with the greatest circumspection, and it is probable that with a more thorough knowledge of the range of variation, many of the existing varieties and races will have to be revised or deleted. In addition, the relationship of this species to *P. rotundata*, *tenuinodis* and *victoris* appears to me to be a very close one.

Var. ATROX, Forel.

(As race) Rev. Zool. Afric., vol. 2, p. 328, ♂, ♀, 1913.

♂. 4 mm. Head and pro-mesonotum dark brown, the front of the head a little lighter and redder. Nodes and abdomen brown, the latter paler over the first segment. Head a little longer relative to its width than in the type-species and more shallowly emarginate behind. The scape is a trifle longer and the abdomen is more elongate. The second node is also narrower, being hardly wider than long. Otherwise like the type-species.

♀. 2.2 mm. Piceous, the posterior half of the thorax paler, legs, antennae and mandibles more or less yellowish-brown or brownish-yellow. Head slightly narrower than in the type-species, and the second node narrower. Otherwise similar.

♀. 6.5-7 mm. Body much darker than in the type-species, almost entirely brownish-black. The epinotal teeth are slightly larger and longer, and the dorsal edge of the first node is more deeply emarginate.

♂. 5.7 mm. Head reticulate-punctate on the vertex and between the ocelli. Mayrian furrows more clearly defined, the dorsum of the epinotum much shorter and more oblique than in the type-species; the epinotum is also excavated between the lateral tubercles, which are broader and less prominent. The nodes of the petiole are a little wider. Otherwise like the type of the species.

S. Rhodesia, common; often a nuisance in houses, infesting pantries and provision cupboards. (S.A.M., R.M., G.A. colls.)

PHEIDOLE INQUILINA, Forel.

Bull. Soc. Vaud. Sc. Nat., vol. 50, p. 240, 1914.

This form was described doubtfully by Forel as a distinct species, possibly of inquiline habits. I have recently dissected the abdomen of a specimen and found that it contained a parasitic worm, coiled up and occupying the greater part of the abdominal cavity. This proves that these peculiarly shaped forms are only ♂♂ or ♀♀ whose structure has been modified by the presence of the parasite in the abdomen, and are therefore to be included in the category of "mermithergates." The appearance of the gaster with its contained parasite is precisely like that of *Pheidole commutata*, mermithergate, figured by Wheeler in his 'Ants,' p. 421.

I have found these abnormal forms at Hillside, Bulawayo, in two nests of *P. punctulata* var. *atrox*. The abdomen in these specimens is enormously swollen, having a much greater volume than the head and thorax taken together. The head is much narrower and smaller than in the ♀, having mainly the structure of the ♂ head, but dull and coarsely sculptured. The thorax resembles that of the ♀, the petiole that of the ♂. A little longer than the ♀, 4.5 mm.

P. ROTUNDATA, Forel.

Mith. Schweiz. Ent. Ges., vol. 9, p. 92, ♂, ♀, 1894.

♀. 5.8-6.2 mm. Head 2.3 mm. long × 2 mm. wide. Colour, pilosity and pubescence as in *punctulata*, but the mandibular teeth, sides of epinotum, petiole and abdomen a little darker. The abdomen almost piceous, with the base of the first and apical margins of all the segments paler.

Sculpture stronger than in *punctulata*, and the striae between the frontal carinae more numerous. The shape of the head is similar to that of *punctulata*, but higher and more dome-shaped, and sloping

more steeply downwards in its posterior half. The occipital emargination narrower and deeper, the occipito-frontal sulcus also deeper. In the middle of the vertex, or just in front of the middle, there is a pit containing the median ocellus, very small but entire; behind this there are a couple of very shallow depressions, only visible at a certain angle, which are the vestiges of the posterior ocelli. The clypeus has a faint median carina (hardly more than a raised line in *punctulata*), the pronotum is wider, relative to its length, than in *punctulata*, and the posterior lateral angles less rounded at the apex, the mesonotum more clearly defined in front. The posterior half of the second joint of the petiole has a few oblique striae above. Otherwise like *punctulata*.

♀. 3.2 mm. Like *punctulata* but darker and a little larger. The sides of the head in front of the eyes are more strongly striated, and the frontal area is larger and more angular behind. The pronotum has a transverse and dark raised line in front, just above the neck;

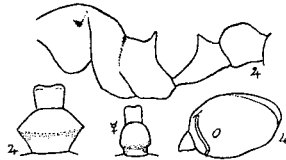


FIG 21.—*P. rotundata*, Forel.

this is hardly indicated in *punctulata*. The epinotum and sides of the mesonotum are more strongly reticulate. Otherwise like *punctulata*.

♂. 5.3 mm. Eyes a little larger and much more convex than in *punctulata*. The dorsum and declivity of the epinotum form a continuous and oblique curve; the lateral tubercles or ridges entirely absent. Otherwise not distinguishable from *punctulata*.

Chirinda Forest, S.R. (Swynnerton); Livingstone, N.R.; Durban. (S.A.M., R.M., G.A. colls.)

#### RACE IMPRESSIFRONS, Wasmann.

(Race of *megacephala*.) Notes Leyden Mus., vol. 25, p. 72, 110, 14, ♀, 1904.

Forel, Deutsch. Ent. Zeitschr. Beiheft., p. 213, 1913.

“14. 4.5–5 mm. Differs from *punctulata* in its greater size and more cordate (narrowed in front) head, which is wider and more deeply emarginate, and has a more or less distinct transverse (?)

impression on the vertex. The sculpture is like that of *punctulata*, but the head is more shining, mostly more sparsely and more finely punctured, but occasionally more coarsely and more closely, in which case the occipito-frontal sulcus is finely and longitudinally striate.

“♂, like that of *punctulata*, somewhat larger, 2.5 mm.

“♀, like that of *punctulata*, somewhat larger, 6.5 mm.

“The colour of the ♀♀ varies from reddish-yellow to brown. The darkest ♀♀ are from Port Elizabeth (host of *Paussus Elizabethae*, Per.), leg. Dr. Brauns; these also have the coarser puncturation of the head. The remaining examples come from Natal (4000 ft., leg. G. D. Haviland), and Port Elizabeth (leg. Dr. Brauns), and are of a brighter yellowish-brown or reddish-yellow, and the puncturation of the head is finer.”

Dr. Forel places this race with *rotundata*. In the paper cited specimens of *P. Foreli* taken at Knysna have been erroneously referred by him to *impressifrons*.

IMPRESSIFRONS, var. LGII, Forel.

Voeltzkow's Reise, vol. 2, p. 82, ♀, ♂, 1907.

Rev. d'Ent., p. 138, ♀, ♂, 1908.

Deutsch. Ent. Zeitschr. Beiheft., p. 213, 1913.

♀. 5 mm. Head 1.9 mm. wide × 2 mm. long. This variety differs from the type of the species in the following characters:

The head is not so much wider behind than in front, being widest at about the middle (at the posterior fourth in the type of *rotundata*), the posterior angles more prominent, less rounded, the occipital emargination wider and shallower. The sides of the head above the eyes flatter, or slightly convex. The striae between the frontal carinae less close and finer, the sides of the head in front less strongly sculptured. The anterior margin of the clypeus is more deeply emarginate, the median area not carinate. The base of the abdomen is more sharply truncate. Smaller than the type-species.

♂. 3-3.2 mm. Paler than the type, head reddish-brown, thorax brownish-yellow, petiole and abdomen fuscous brown, the abdomen somewhat yellowish at the base. Articulations of the legs, the antennae and mandibles brownish-yellow, the tarsi entirely yellow, femora and tibiae fuscous yellow. Meso-epinotal suture shallower than in the type-species, epinotal spines shorter and a little closer together. Second node less conical, more barrel-shaped, widest a little behind the middle (widest at its posterior third in the type-species). Otherwise like *rotundata*.

“ ♀. Head wider than long, wider than in the type of *rotundata*, more excavated behind, with a more distinct and smooth space for the scapes. The tibiæ have only oblique hairs. Wings very large, at least 10 mm. long (8 mm. in the type, in which the body is also large, 7.5 mm.). Of a very dark-brown colour, with the basal half of the flagellum, the mandibles, tarsi and articulations reddish. Otherwise like the type-species.

“ ♂. The eyes are smaller and the head is narrower behind than in the type. The scape is more slender and longer, twice as long as the 1st joint of the flagellum. Body 5.5 mm. long, the length of the front wing 7.2 mm. In the type-species the body is 4.8–5 mm. long, and the front wing 6 mm. Head brownish, thorax yellowish-brown, the rest of a dull, pale yellow. In *rotundata* the thorax and head are somewhat reddish-yellow.”

Bulawayo. (R.M., G.A. colls.)

P. TENUINODIS, Mayr.

Ann. K.K.N.H. Mus. Wien, vol. 16, p. 12, ♀, 1901.

♀. 4.5 mm. Head and thorax dark yellowish-red, the anterior margin of the clypeus, the epinotal spines and sides of epinotum below dark brown, abdomen brown but paler at the base, mandibles castaneous red, legs and antennae reddish-yellow, or the whole body dark reddish-brown with the legs and antennae a little paler. Body with a fairly abundant, long and semi-erect pilosity, much more plentiful and longer than in *punctulata*. Anterior three-fifths of the head strongly and longitudinally striate, the spaces between the striae reticulate and fairly dull; below the eyes the striae are stronger. Posterior two-fifths of the head, and the cheeks, from the posterior angles as far as the eyes, smooth and shining, with a few piligerous punctures. Mandibles shining, sparsely and fairly coarsely punctured. Median area of the clypeus with a few oblique striae at the sides, and a strong longitudinal carina in the middle. Dorsum of pro-mesonotum moderately shining and fairly smooth, but with a few fine and superficial rugosities near the posterior lateral angles and on the mesonotum. Epinotum and sides of thorax reticulate-punctate and dull. Petiole very minutely reticulate and almost dull. Abdomen smooth and shining, microscopically rugulose at the extreme base.

Head much flatter than in *punctulata*; excluding the mandibles a trifle longer than wide, widest in the middle, hardly wider behind

than in front, the sides not very convex. The transverse contour of the head, at the level of the eyes, forms a moderately convex and regular curve. Occipital emargination fairly deep, deeper but narrower than in *punctulata*. Occipito-frontal sulcus narrow and deep. Anterior margin of clypeus emarginate in the middle. The frontal carinae extend back as far as the level of the eyes, and are slightly prominent. Frontal area depressed, the margins bounded by a raised line. Scape of antenna extends back as far as the posterior third of the head, all the joints of the flagellum longer than wide. Eyes placed a little in front of the middle of the head. Posterior lateral angles of the pronotum very obtuse, much less prominent than in *punctulata*; the profile of the pro-mesonotum is also much less convex than in that species. The mesonotum has a shallow transverse impression in front of the slightly tumid scutellar region. Meso-epinotal suture not very deep. Dorsum of epinotum narrow, longer than wide, margined at the sides and concave transversely. Epinotal teeth directed upwards and slightly backwards, not as long as the width of the dorsum; declivity subvertical, a little shorter than the dorsum. First node with the posterior face horizontal, the anterior vertical, the dorsal edge slightly emarginate. Second joint subglobose, feebly angular at the sides, narrowed behind, three-fourths wider than the first and about as long as wide.

♂. 2.8-3 mm. Colour similar to that of *punctulata*, but the head and thorax darker and more reddish-brown, or the body entirely dark brown. Mandibles dark yellow, legs brownish-yellow.

Pilosity longer and more abundant than in *punctulata*. Head smooth and shining, the cheeks and temples sparsely striate longitudinally, the spaces between the striae reticulate. Thorax more strongly reticulate than in *punctulata*, the sculpture extending over the posterior half of the mesonotum. Mandibles very finally longitudinally striate. Anterior margin of clypeus shallowly emarginate in the middle, the median area with a raised line in the middle which does not quite reach the posterior margin of the clypeus. Scape of antenna longer than in *punctulata*, extending by one-fourth of its length beyond the posterior margin of the head (one-fifth in *punctulata*); 1st joint of flagellum as long as the 2nd and 3rd taken together. Frontal carinae slightly convergent behind, not widely divergent as in *punctulata*. Thorax narrower than in that species, the dorsum of the epinotum long. Mesonotum with a faint transverse median impression. Dorsum of epinotum margined at the sides as in the ♀, but less sharply. First joint of the petiole with the peduncle quite as long as the node, if not longer; the node is thinner above and higher than in



*punctulata*. Second node narrow, barrel-shaped, widest a little behind the middle, one-fourth longer than wide, three-fourths wider than the 1st.

♀. 8.3 mm. (hitherto undescribed). Very similar to *punctulata* but larger and darker. The head is a little wider, duller and more closely striate, the spaces between the striae closely reticulate and crossed by transverse ridges. The epinotum is longer and transversely concave almost from its base downwards, the dorsum very short and steep, margined at the sides. Epinotal teeth slightly incurved, larger than in *punctulata*. The chief distinction between this species and *punctulata* lies in the shape of the 2nd joint of the petiole, which when seen from above is biconvex, a little wider in front than behind, and not at all angularly produced at the sides. Otherwise like *punctulata*.

S. Rhodesia, fairly common; Ladismith, Cape Prov. and Bothaville, O.F.S. (Brauns). (S.A.M., R.M., G.A. colls., type of ♀ in my collection.)

PHEIDOLE TENUINODIS, Mayr, var. SIPAPOMAE, n. v.

♂. 5.3 mm. Larger than the type of the species. Sculpture of the head similar but stronger, the mandibles also much more deeply punctured. The hind margin of the head less widely but more deeply emarginate. Promesonotal suture more clearly defined. Dorsum of the epinotum wider and relatively shorter, hardly one-third longer than wide at the base of the spines. Dorsal edge of the 1st node not emarginate, the sides of the 2nd node much less angular. Legs reddish-ochreous, abdomen piceous, the apical margins of the segments testaceous. Otherwise like the type of the species.

♀. 3.6 mm. Colour a little darker, and the head more strongly sculptured than in the type of the species. Posterior fourth of the head finely reticulate. Clypeus sharply carinate. Meso-epinotal suture much deeper and wider. Otherwise like the type of the species.

Sipapoma, Umgusa River and Victoria Falls, S. Rhodesia.

The ♂♂ from Victoria Falls are a little larger than the others (5.6 mm.) and a good deal darker, but otherwise identical. The nest has several entrances, surmounted by irregular and rather high craters. (S.A.M., R.M., G.A. colls.; types in my collection.)

P. VICTORIS, Forel.

Ann. Soc. Ent. Belg., vol. 57, p. 127, ♂, ♀, 1913.

♂. 4.2-4.5 mm. Reddish-brown. Abdomen pale brown or yellowish-brown with the apical margins of the segments much paler.

Very similar in colour to *tenuinodis*. Pilosity and pubescence as in that species, but the legs with a denser pilosity. Head dull, except the posterior fourth, which is slightly shining. Thorax and abdomen dull, the pronotum nitidulous in front. Head longitudinally striate between and behind the frontal carinae, longitudinally reticulate, rugose at the sides, the spaces between the striae dull and finely reticulate. The striae extend further backwards than in *tenuinodis*. The posterior fourth of the head microscopically rugulose, with a few large and shallow punctures. Mandibles smooth and shining, finely and sparsely punctured. Pronotum with a few feeble transverse rugae, the rest of the thorax and the petiole reticulate, almost transversely striate on the declivity of the epinotum. Abdomen alutaceous.

Head resembling that of *tenuinodis*, but more convex and higher, widest behind the middle, narrower in front than behind, the occipital lobes much more rounded and obtuse, the occipital emargination much shallower and arcuate, not angular at the apex. Occipito-frontal sulcus also shallower than in *tenuinodis*. Clypeus sharply carinate in the middle. Posterior lateral angles of the pronotum very obtuse, small, and not projecting laterally. Pro-mesonotal suture more clearly defined than in *tenuinodis*. Mesonotum with a transverse impression in front of the scutellar portion, the latter fairly well defined. Dorsum of epinotum almost horizontal, as long as wide between the teeth. The latter are slightly divergent, and their front edge is continued as a raised line forwards, margining the dorsum. The declivity is very oblique and as long as the dorsum. First joint of the petiole like that of *tenuinodis*, but the dorsal edge is not emarginate. Second joint almost twice as wide as the first, nearly one-fourth wider than long, widest in the middle, the sides obtusely angulated in the middle, not convex as in *tenuinodis*.

♂. 2.3-3 mm. Reddish-yellow, the head darker behind, abdomen brown, paler at the base. Legs and antennae dark ochreous. The clypeus, middle of the head longitudinally, the disc of the mesonotum and the abdomen smooth and shining, the rest of the body dull or only nitidulous. Pubescence and pilosity as in *punctulata* ♀. Sides of the head finely reticulate-punctate and with a few longitudinal striae, which do not extend far behind the eyes. Thorax reticulate-punctate, more strongly so than in *punctulata*. Petiole slightly shining. Head oval, widest in the middle, the anterior half as wide as the posterior (in *punctulata* and *tenuinodis* wider behind than in front), the sides convex. Eyes very convex, placed at about the middle of the sides. Frontal carinae short, parallel; frontal area

large, distinct, its posterior margin round. Scape of antennae longer than in *punctulata*, extending back as far as the posterior third of the mesonotum. Pro-mesonotum less convex than in *punctulata*. Transverse impression and scutellum of the mesonotum fairly distinct. Dorsum of epinotum one and a-half times longer than wide, distinctly margined at the sides; epinotal teeth rather small, not longer than half the interval between them; declivity oblique, shorter than the dorsum. The peduncle of the 1st joint of the petiole nearly twice as long as the node, which is like that of *punctulata*; 2nd joint subpyriform, one-quarter longer than wide, widest at about its posterior third, distinctly narrower, less conical and less thick from above to below than in either *tenuinodis* or *punctulata*. Legs longer than in those two species.

Malindi, S. Rhodesia. (G.A. coll.)

P. FORELI, Mayr.

Ann. K.K.N.H. Mus. Wien, vol. 16, p. 8, ♀, ♂, 1901.

♀. 4.5-5.1 mm. Piceous, the legs and flagellum dark brown, tarsi yellowish-brown, mandibles dark reddish-brown. Pilosity longer, thinner and more abundant than in *punctulata*, especially on the head and legs.

Anterior half of the head, or a little more, dull and longitudinally rugose, the spaces between the rugae reticulate-coriaceous (the sculpture stronger than in *punctulata*). Posterior half of the head smooth and shining, very sparsely and fairly finely punctured. Pronotum smooth and shining, the rest of the thorax feebly and irregularly rugulose, mostly transversely rugulose, also partly reticulate-punctate, moderately shining. Nodes of petiole smooth above, very finely reticulate-punctate or granulate and dull at the sides and behind. Abdomen and legs smooth and shining.

Head, excluding the mandibles, as wide as long, not much narrower in front than behind, fairly deeply emarginate behind (more so than in *punctulata* or *tenuinodis*), the occipital lobes more prominent. Eyes placed well in front of the middle of the sides. Frontal carinae feebly divergent, not extending back beyond the level of the eyes. Median area of the clypeus shining, with a feeble median carina, slightly striato-rugose at the sides, shallowly emarginate in front. Frontal area well defined. Mandibles longitudinally striate, very strongly punctured between the striae, shining. Scapes extending back slightly beyond the middle of the head. Occipito-frontal sulcus shallow in the middle, deeper at its ends. Pronotum convex transversely and

lengthwise, excluding the neck about one-third wider than long, the posterior lateral angles very rounded, almost obsolete; mesonotum subcircular, a little wider than long, less than half as long as the pronotum; the scutellum distinct, the metanotum fairly clearly defined. Dorsum of epinotum a little longer than wide, as long as the declivity, moderately convex at its base, shallowly excavated at its apical half. Epinotal spines short, slightly divergent, subvertical, shorter than the interval between their bases. Pro-mesonotal suture distinct, the meso-epinotal deep, the thorax more strongly contracted at the latter point than in *punctulata*. First joint of the petiole with the anterior face as long as the ventral, the posterior-dorsal face short; 2nd node nearly twice as wide as the 1st, seen from above subquadrate, its anterior margin convex, the sides subparallel or converging a little posteriorly, without distinct angles.

♂. 2.8–3 mm. Dark brown to piceous, mandibles and flagellum brownish-red, articulations of the legs and the tarsi yellow. Shining. Cheeks very sparsely and irregularly striate, the temples finely reticulate. Mesothorax and epinotum reticulate-rugulose and a little dull, the rest of the body smooth. Pilosity scanty.

Head a little longer than wide, the sides moderately convex but less than in *punctulata*, the posterior margin narrowly emarginate. Eyes placed in front of the middle of the sides. Frontal carinae subparallel, not extending back beyond the level of the anterior end of the eyes. Mandibles feebly striate, sparsely punctured, the masticatory margin denticulate and with two larger teeth at the apex. The mandibles are rather long, quite half as long as the head. Median area of clypeus convex, the anterior margin entire and feebly convex. Scapes extending back beyond the occipital margin. Pro-mesonotal suture obsolete. Pronotum wider than long, convex in front and at the sides. Mesonotum wider than long, the scutellar region fairly clearly defined. Dorsum of epinotum convex lengthwise, horizontal and longer than wide; epinotal teeth very small, vertical, barely half as long as the interval between their bases. First segment of petiole as in *punctulata*, but longer, and the dorsal edge more rounded. Second node very little wider than the first, about as long as wide, the sides and upper surface convex.

♀. 7.8 mm. (hitherto undescribed). Dark brown. Head yellowish-red, legs brownish-red. Pilosity much longer and more abundant than in *punctulata* ♀; antennae, mandibles and tarsi densely pilose, the hairs very oblique. Head as far back as the posterior ocelli and including the whole clypeus dull, closely and coarsely reticulate-striate; behind the ocelli coarsely punctured and fairly shining. Mandibles

strongly and closely punctured. Epinotum irregularly and shallowly rugose. Anterior half of 2nd node longitudinally striolate. Base of abdomen smooth and shining, not alutaceous and subopaque as in *punctulata* ♀. Otherwise the sculpture is as in that species. Head wide, nearly as wide as the thorax across the tegulae. Clypeus with an obtusely angular emargination in front, and a fairly strong median carina. Head one-fifth wider than long, very little narrowed in front. Mesonotum one-third wider than long, the scutellum half as long as the mesonotum. Dorsum of epinotum much wider than long, epinotal teeth more acute than in *punctulata* ♀, one-third as long as the interval between their bases, directed obliquely upwards; the declivity vertical. Upper face of 1st node depressed behind its anterior margin, the anterior face of the 2nd node much less convex than in *punctulata*, the anterior angles less acute and less produced. Wings yellowish, nervures brownish-yellow. Otherwise like *punctulata* ♀.

Estcourt, Natal (R. C. Wroughton); Bothaville and Reddersburg, O.F.S. Port Elizabeth and Knysna, Cape Prov. (Dr. H. Brauns). (S.A.M., R.M., G.A. colls.; type of ♀ in my collection).

Var. PUBENS, Forel.

Schultze, Reise Süd. Afrika, vol. 4, p. 12, ♂, ♀, 1910.

Differs from the type by its paler colour, dark castaneous in the ♂, yellowish-brown in the ♀, also by the longer pilosity and longer epinotal spines.

Natal (Haviland and Wroughton). (G.A. coll.)

P. PRELLI, Forel, race REDBANKENSIS, Forel.

Bull. Soc. Vaud. Sc. Nat., vol. 47, p. 362, ♂, ♀, ♀, ♂, 1911.

(Race) Ann. Soc. Ent. Belg., vol. 57, p. 128, ♂, ♀, 1913.

♂. 4.8-5.2 mm. Bright castaneous red (burnt sienna), the anterior margin of the clypeus and the masticatory margin of the mandibles piceous; basal fourth and fifth of the abdomen yellowish-red, the rest piceous; legs reddish-yellow, the antennae dark brownish-red. Pilosity yellowish, sparse and oblique, almost absent on the thorax; legs and antennae very sparsely pubescent. Head longitudinally striate, the striae fairly parallel and widely spaced. The striae on the middle of the vertex are strongest and curve outwards over the occipital lobes. The fundamental sculpture between the striae is a fine reticulation which is fairly sharp at the sides of the head and feeble between the frontal carinae. The area between the latter fairly shining, the sides of the head duller. Thorax subopaque, finely reticulate, with a few fine

rugae superimposed; epinotum finely and transversely striate. Nodes dull, very closely reticulate, with a few thin transverse rugae on the 2nd node. Abdomen subopaque and alutaceous at the base, the rest smooth and shining. Head, excluding the mandibles, as long as wide, widest at the posterior third, narrower between the posterior angles than across the anterior margin, the sides convex, the occipital lobes prominent, the occipital emargination deep and angular at the apex. Occipito-frontal sulcus deep behind. Head highest in the middle, as high in front as behind. Sides of the head, between the eyes and the posterior ends of the frontal carinae, shallowly concave lengthwise. The frontal carinae extend back as far as the posterior fourth of the head, moderately divergent in their anterior half, subparallel in their posterior half, prominent and forming a slight demiscrobe. Eyes placed in front of the middle of the sides, convex and not small. Clypeus carinate in the middle, the anterior margin with a wide and shallow

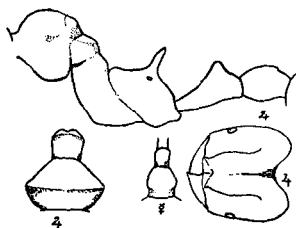


FIG. 22.—*P. Prelli*, Forel, race *redbankensis*, Forel.

emargination, the median area smooth and shining, except at the sides, which are faintly striate. Mandibles shining, strongly but sparsely punctured, armed with two large apical teeth. Antennae slender, the scapes strongly curved near the base, extending back to the posterior third of the head. Pronotum, including the neck, a little wider than long, much wider behind than in front, convex in front, the lower posterior angles very obtuse, the upper ones almost obsolete, barely tubercular. Pro-mesonotal suture indistinct. Mesonotum transversely impressed in front of the scutellar portion, the latter is vertical in the posterior half; the metanotum indistinctly defined, oblique in profile. Meso-epinotal suture wide and shining. Dorsum of epinotum longer than wide, with a deep longitudinal groove from base to apex; epinotal spines subvertical, barely divergent, fairly acute, longer than their basal width and as long as the interval between their bases; declivity subvertical, as long as the dorsum. First segment of the petiole twice as long as wide behind, longer than high, the posterior-dorsal face quadrate, the dorsal edge feebly emarginate in the middle.

Second node lozenge-shaped in outline, convex above transversely, the anterior margin more convex than the posterior, the sides angular but with the apex of the angle narrowly truncate, one-third wider than long, two and a-half times wider than the first segment. Abdomen longer than wide, the base subtruncate.

♀. 2.5-2.9 mm. Head brown, the anterior fourth paler. Thorax, petiole, antennae and mandibles dark ochreous, somewhat reddish. Legs ochreous, abdomen brown, more or less yellowish at the base. Pubescence and pilosity as in the ♂, but the clypeus has some long and outstanding hairs. Head, pronotum, petiole, legs and abdomen shining, the remainder of the thorax dull; the head duller than the pronotum. Head very faintly and closely reticulate, the middle of the vertex almost smooth, the sides in front of and above the eyes obliquely striate. Pronotum smooth, meso- and epinotum very finely reticulate. Both nodes nearly smooth, the abdomen smooth. Head longer than wide, not narrower in front than behind, the sides and posterior margin moderately convex. Eyes convex and fairly large, placed in the middle of the sides. Clypeus convex transversely and lengthwise, the anterior margin convex and entire. Frontal carinae feebly convergent behind, not extending back beyond the level of the front of the eyes. Scapes long, extending back as far as the middle of the pronotum. Mandibles very finely striate and sparsely punctured. Pronotum a little longer than wide, convex at the sides and above. Pro-mesonotal suture obsolete. Mesonotum with a feeble transverse impression, the part behind same longer than the part in front. Dorsum of epinotum twice as long as wide, one and a-half times longer than the moderately oblique declivity; spines similar to those of the ♂, but proportionately smaller and more oblique. First node as in the ♂, the dorsal edge more rounded transversely. Second node more or less bell-shaped, the sides convex, longer than wide, and twice as wide as the 1st node.

Redbank, S.R. Nesting in sandy soil. (S.A.M., R.M., G.A. colls.)

Var. *POLITOCIPUT*, Santschi.

Ann. Soc. Ent. France, vol. 84, p. 503, ♂, ♀, 1916.

♂. Colour similar to that of the type-species, but a little darker. Head a little longer than wide. The sculpture of the head differs from that in the type-species in ending rather abruptly at the posterior third, the head behind that point being smooth and shining, sparsely and fairly strongly punctured. The spaces between the striae on the middle of the head are finely and longitudinally rugulose, not shallowly

reticulate as in the type-species. The sides of the head are also more regularly striate and with fewer transverse bars, and the fundamental reticulation in that region is also much stronger. The occipito-frontal sulcus is deeper, the posterior emargination is deeper and more angular, the apex of the emargination being an acute angle. The posterior lateral angles of the pronotum are more pronounced, and the scutellar portion of the mesonotum is usually oblique and lacks the horizontal ledge present in the type. The lateral angles of the 2nd node are narrower and project further outwards owing to the greater width of the node, which is quite twice as wide as long. Otherwise like the type-species.

♂. Colour a little darker than in the type-species. The dorsum of the epinotum is very shallowly but fairly distinctly excavated longitudinally, *i. e.* concave transversely (flat or even a little convex in the type-species). The epinotal spines are less vertical. Otherwise like the type-species.

♀. 6.8 mm. Colour like that of the ♀, base of the abdomen reddish-brown. Head longitudinally striate in the middle between the frontal carinae, the sides of the head longitudinally rugose, with some transverse bars in addition. Back of the head, behind the level of the posterior ocelli, truncate and flattened, subvertical. The larger striae and rugae end at the brow of this truncation, which is only finely and obliquely striate and sparsely punctured. Mesonotum and scutellum smooth, shining, very sparsely and feebly punctured; the lateral margins in front of the tegulae, and two longitudinal bands internal to the parapsidal sutures, are rugulose or reticulate; the margins of the scutellum coriaceous. Metanotum, epinotum and petiole dull and transversely striate, closely and finely so on the nodes, the spaces between the striae coriaceous. Abdomen shining except the base, which is finely striate-reticulate and dull.

Head, excluding the mandibles, a little wider than long, wider behind than in front, the posterior margin straight, the posterior angles narrowly rounded. Mesonotum a little wider than long, rounded in front, flattened behind above; scutellum twice as wide as long. Dorsum of epinotum subvertical, concave transversely, not clearly delimited from the declivity. Epinotal teeth nearly horizontal, acute, parallel, not longer than their basal width, somewhat incurved towards their apices. Posterior-dorsal face of the 1st node wider than in the ♀, the dorsal edge shallowly emarginate in the middle. Lateral angles of the 2nd node more acute than in the ♀. Deälated.

♂. 5 mm. Mandibles, clypeus and the space between the frontal carinae and anterior ocellus brownish-yellow, the rest of the head



brownish-black. Thorax, nodes and abdomen yellowish-brown, the posterior margin of the scutellum, the sides of the mesonotum and the apical halves of the abdominal segments darker. Legs and antennae ochreous, all the femora darker in the middle. Head finely and longitudinally striate, fairly dull. Thorax sculptured as in the ♀, but the scutellum is also finely striate transversely. Nodes very finely striato-rugulose, transversely so on the upper face of the 1st, longitudinally on the 2nd. Abdomen smooth and shining, faintly aciculate and dull at the base.

Head trapezoidal, much wider in front than behind, the vertex high. The eyes occupy the anterior three-fifths of the head. Mandibles finely striate, narrow at the base, armed with three small teeth. Anterior margin of the clypeus shallowly emarginate in the middle. Frontal area dull and rugulose. Behind the frontal area there is a small elongate tubercle, and behind the latter a transverse impressed line joining the ends of the frontal carinae. Ocelli large and very prominent. Dorsum of epinotum longer than wide across its apex, feebly tuberculate on each side, one-third longer than the declivity, which is concave from above to below. Anterior face of 1st node, seen from the side, at least twice as long as the dorsal face, the dorsal edge rounded. Abdomen oblong, much longer than wide. Wings faintly tinged with brownish-yellow, the nervures bright yellow, the stigma brownish.

Bulawayo and Victoria Falls. (S.A.M., R.M., G.A. colls.)

#### *P. MAUFEI*, n. sp.

♀. 4-4.3 mm. Head, thorax and petiole varying from dark yellowish-red (burnt sienna) to brownish-red, the vertex of the head sometimes darker than the rest; abdomen varying from yellowish-red to brown, flagellum and legs dirty orange-yellow, the tarsi paler. Pilosity yellowish, oblique and fairly long, longest on the abdomen, most abundant on the sides of the head. Pubescence on the legs, antennae and mandibles long, oblique, fairly sparse; almost wanting on the body.

Head and thorax dull, with a fairly close fundamental reticulation. In addition, the head has a superimposed, coarse, rugose reticulation somewhat emphasised longitudinally, becoming fainter posteriorly, and obsolete in the middle third of the posterior half. Occipital lobes finely and transversely rugose on their inner halves. There are a few irregular rugae on the thorax, chiefly on the pronotum. Petiole and basal third of the 1st abdominal segment dull and finely reticulate,

the rest of the abdomen smooth and very shining. Clypeus almost smooth, with a strong median carina, the anterior margin distinctly excised in the middle. Mandibles striated at the base externally, the rest smooth and shining, sparsely punctured with large punctures.

Head, excluding the mandibles, about one-eighth longer than wide, very slightly narrowed in front of the eyes; behind the eyes the sides are straight and parallel as far as the posterior fifth, thence convex and convergent. Occipital lobes rounded, the posterior margin fairly deeply and arcuately emarginate, the occipito-frontal sulcus rather shallow. Head highest in the middle, not concave at the sides behind the eyes. The latter placed at about the anterior third of the sides, convex and not small. Scape of antenna long, extending back as far as the posterior fifth of the head; flagellum long and slender, all the joints much longer than wide. Pronotum short, its posterior lateral angles rounded and not prominent. Pro-mesonotal suture

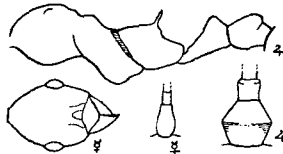


FIG. 22A.—*P. Maufei*, n.sp.

obsolete. Mesonotum submarginate at the sides, transversely impressed in the middle, without a distinct transverse torus in front of the scutellar region. Meso-epinotal suture deep. Dorsum of epinotum at least one and a-half times longer than wide, almost flat, or only very feebly excavated longitudinally towards the apex. Epinotal spines vertical, barely divergent, thin, subacute, longer than their basal width and longer than the interval between their bases. Declivity as long as the dorsum of the epinotum. The peduncle of the 1st segment of the petiole is as long as the node; the latter has a thick dorsal edge which is feebly emarginate in the middle. Second segment of the petiole hexagonal, about one-fifth longer than wide, narrower in front than behind, the sides obtusely angulated. Abdomen a little longer than wide.

♂. 2.6-3 mm. Head, thorax and petiole varying from reddish-ochreous-yellow to yellowish-red, abdomen dark ochreous, or in some specimens pale piceous. Legs and antennae ochreous yellow. Pilosity shorter and less abundant than in the ♀, the pubescence on the legs and antennae more erect than in the ♀.

Head slightly shining, finely and superficially reticulate, except in the middle of the vertex anteriorly, which, like the clypeus and frontal area, is smooth and shining. A few fine longitudinal rugae between the eyes and frontal carinae. Mandibles shining, very feebly striate. Thorax dull, closely and finely reticulate, petiole and abdomen smooth and shining. Head ovoid, excluding the mandibles at least one-third longer than wide, much narrower behind than in front, the posterior margin being formed by the articular border only. Eyes large, convex, placed a little in front of the middle of the sides. Clypeus not carinate, shallowly emarginate in the middle anteriorly. Frontal area well-defined; frontal carinae slightly convergent behind; not reaching as far as the level of the front of the eyes. Antennae thin and very long, extending back as far as the middle of the abdomen, the scape alone reaching as far as the middle of the mesonotum; 2nd-8th joints of the flagellum twice as long as wide, or even longer. Pronotum long, without tubercles; pro-mesonotal suture obsolete. Mesonotum long and narrow, clearly longer than wide, and with a transverse impression at about its anterior third. Meso-epinotal suture deep. Dorsum of epinotum twice as long as wide, the teeth erect, feebly divergent, acute, and about half as long as the interval between their bases. First segment of petiole like that of the  $\mathcal{U}$ , but with the dorsal edge convex transversely and not emarginate. Second segment of petiole pyriform, one-third longer than wide. Legs long and slender.

Belingwe, S. Rhodesia. The nest was placed in a hole in a tree-trunk, about 3 ft. from the ground, and contained decayed leaves and earth.

This species has some affinity to the *Prelli* group. It is also allied to *P. Escherichii*, Forel, by the shape of the head in the  $\sigma$ , but differs from it in that caste by the length of the antennae, by the sculpture and the pyriform 2nd node; in the  $\mathcal{U}$  it differs by the carinate clypeus, the longer scapes and also the sculpture. In the  $\varphi$  it bears a strong resemblance to *P. areniphila*, Forel, especially in the shape of the head, but differs very considerably in the much longer antennae, the different sculpture of the pronotum, and the narrower and longer 2nd node. The  $\mathcal{U}$  is quite different from that of *areniphila*, as the head is differently formed and has no trace of a scrobe.

I have much pleasure in naming this species in honour of Mr. H. B. Maufe, Director of the Geological Survey, S. Rhodesia, whose hospitality enabled me to do some collecting in the rather out-of-the-way Belingwe district.

(S.A.M., R.M., G.A. colls., types in my collection.)

*P. CAPENSIS*, Mayr.

Verh. Zool. Bot. Ges. Wien, vol. 12, p. 746, ♂, ♀, 1862.

Forel, Ann. Soc. Ent. Belg., vol. 57, p. 130, ♀, 1913.

♂. 5-5.8 mm. Head varying from dark red to piceous, thorax yellowish-red, abdomen yellowish-brown, the apical halves of the segments darker, legs brownish-yellow to brown. Pilosity and pubescence much the same as in *Prelli*, but somewhat finer and more abundant on the head and mandibles. The middle of the anterior half of the head longitudinally striate, with some finer striae between the longer ones, the sides longitudinally rugose with a few transverse anastomoses, the spaces between finely reticulate. The anterior half of the head is moderately shining, the posterior half smooth, shining and very sparsely and finely punctured (a few striae extend beyond the middle at the sides of the occipito-frontal sulcus). Mandibles smooth, shining, with some scanty and elongate punctures, the basal half faintly striate. Thorax fairly shining; pronotum transversely, irregularly and finely striate, the striae stronger at the sides. Meso-

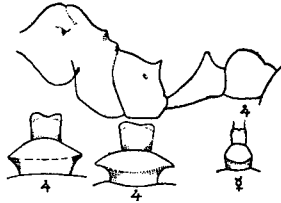


FIG. 23.—*P. capensis*, Mayr.

and epinotum, sides of the thorax, and the nodes finely reticulate-punctate, a few feeble transverse striae superimposed. Abdomen shining.

Head a little more than one-sixth longer than wide, widest at the posterior fourth, where it is about one-third wider than across the anterior margin. The posterior emargination is fairly deep and wide, but not acutely angular at the apex. Occipito-frontal sulcus well defined in its posterior half. Sides of the head between the eyes and frontal carinae not concave. The latter extend back nearly to the middle of the head. Frontal area smooth, shining and depressed. Eyes placed at the anterior third of the sides. Clypeus fairly strongly carinate in the middle, the anterior margin feebly concave. Posterior lateral angles of the pronotum subacute, projecting very slightly outwards, much more pronounced than in *Prelli-redbankensis*. The

pro-mesonotal suture is fairly clearly indicated. The transverse impression of the mesonotum is shallow and the upper face of the scutellar region has a small tubercle at each corner. Metanotum not clearly defined. Dorsum of epinotum a little wider at the apex than it is long, shallowly concave transversely; epinotal teeth small, vertical, acute, hardly as long as their basal width, considerably shorter than the interval between their bases. Dorsal edge of 1st node thinner and more deeply emarginate than in *Prelli-redbankensis*, otherwise similar; 2nd segment almost twice as wide as long, the lateral angles placed in front of the middle of the sides, acute, or sometimes produced into fairly distinct teeth.

♀. 2.5 mm. Brownish-yellow, the head and sides of thorax somewhat darker, the head more reddish than yellowish-brown. Pilosity as in *Prelli*. Head very finely and longitudinally rugulose, the vertex smooth and shining, the rest of the head only moderately shining, in front striate between the eyes and frontal carinae. Mandibles longitudinally striate and subopaque. Pronotum shining, smooth on the disc, faintly rugulose elsewhere. Meso- and epinotum reticulate-punctate and dull. Nodes and abdomen smooth and shining. Posterior margin of the head straight (convex in *Prelli*), the posterior angles widely rounded, but fairly distinct. The head is wider behind than in front and as long as wide. Meso-epinotal suture and the transverse impression of the mesonotum fairly deep. Dorsum of epinotum flat, twice as long as wide and as long as the declivity. Epinotal teeth small and acute. Posterior-dorsal face of the 1st node a trifle longer than wide; 2nd node about as long as wide, the anterior half convex, the posterior half subparallel-sided.

♀. 7 mm. Piceous, head dark reddish-brown, mandibles and antennae ferruginous, tarsi brownish-yellow, apices of the tibiae and femora pale brown. Vertex of head longitudinally striate, the sides longitudinally rugose, the spaces between the rugae reticulate. Mesonotum and scutellum shining, very sparsely and finely punctured, the mesonotum also faintly rugulose posteriorly; metanotum, sides of epinotum and the nodes coriaceous and dull, with a few rugae superimposed. Declivity of epinotum smooth and shining, the space between the teeth feebly and transversely striate. Abdomen smooth and shining, finely and sparsely punctured. Head subquadrate, slightly narrower in front than behind, the posterior margin straight, the posterior angles rounded. Mesonotum, seen from above, almost circular, slightly wider than long, rounded in front, flat behind. Dorsum of epinotum very oblique, forming a single plane with the declivity. Epinotal teeth smaller than in the ♂, their bases wide and

tumid. Nodes as in the ♀, but proportionately wider and stouter. Deälated.

Capetown, Willowmore and Kimberley. (S.A.M., R.M., G.A. colls.)

The shape of the second segment of the petiole in the ♀ is variable, even in examples taken from the same nest. In some the sides are merely acutely angular, in others the angles are produced into more or less prominent teeth or spines. For this reason it appears to me that the race *Dregei*, Emery (Ann. Soc. Ent. France, vol. 63, p. 34, 1895), which differs only in its greater size (6-6.5 mm.) and more produced sides of the 2nd node, should be regarded as no more than a slight variety. It has been recorded from Kimberley, Makapan, Bloemfontein and Delagoa Bay.

*P. xocensis*, Forel. (Plate VI, fig. 68.)

Deutsch. Ent. Zeitschr. Beiheft, p. 213, ♀, ♂, 1913.

♀. 4.9-5.4 mm. Head and thorax varying from dark castaneous red to dark reddish-brown, the anterior fourth of the head, the occipital lobes and the epinotum always paler; mandibles bright castaneous red, with the margins piceous; flagellum and legs reddish-yellow, abdomen dark brown. The pilosity is composed of much thinner hairs than in *capensis* and is more oblique, and on the abdomen more abundant. The sculpture is very similar to that of *capensis* and differs only as follows. The coarser sculpture on the head extends over the anterior two-thirds, and the posterior third is duller than in the other species, being very finely rugulose or reticulate, and as this is also the fundamental sculpture of the anterior portion, the coarse sculpture does not appear to end so abruptly as in *capensis*. The median area of the clypeus is almost smooth, not longitudinally striate as in *capensis*. The mandibles are more finely punctured. The striae on the thorax are a little coarser and the dorsum of the epinotum is very shining and almost smooth. Nodes rugulose, also finely and transversely striate. Base of abdomen distinctly and finely reticulate, with a few short striae as well (without sculpture in *capensis*). The rest of the abdomen smooth, shining and sparsely punctured.

Head, excluding the mandibles, one-fourth longer than wide, the sides parallel, the posterior emargination narrower but much less deep than in *capensis*, the occipital lobes less prominent and wider at the apex than in *capensis*. The occipito-frontal sulcus is deeper and in its posterior half margined on each side by a thin ridge. Mandibles stouter and more convex externally (I cannot see in any of the

specimens before me the longitudinal groove between the inner and outer margins which is mentioned by Forel). Median area of clypeus not carinate, the anterior margin shallowly concave. Frontal area much smaller than in *capensis*, indistinctly defined and not depressed (deeply depressed in *capensis*). The pronotum is wider in relation to its length than in *capensis*, and the posterior lateral angles are larger and more prominent. The pro-mesonotal suture is distinctly defined by a transverse ridge. The posterior margin of the scutellar region of the mesonotum is tumid and raised on each side into a small but distinct tubercle (only faintly indicated in *capensis*). The dorsum of the epinotum is more concave and the epinotal teeth are longer and more divergent; they are longer than their basal width and half as long as the space between their bases. First node wider than in *capensis*, the dorsal edge more deeply emarginate. Second node shorter, its lateral angles spinose, the apices blunted. Abdomen



FIG. 24.—*P. zocensis*, Forel.

longer and narrower, the sides only feebly convex, longer than wide.

♀. 2.3–2.6 mm. Dark brown, epinotum and petiole paler, legs, mandibles and antennae brownish-yellow. Moderately pilose, the hairs on the abdomen longer than elsewhere, the pubescence on the legs and antennae very sparse. Shining and fairly smooth. The sides of the head between the eyes and frontal carinae only very faintly striate. Epinotum and sides of mesonotum reticulate-punctate and dull. Head more or less oval, a trifle longer than wide, a little narrower behind than in front, the posterior margin very shallowly concave and narrower than in *capensis*, the posterior angles more convex. Mandibles shining, feebly striate and punctate. Eyes placed in the middle of the sides of the head. Scapes a little longer than in *capensis*, extending beyond the posterior margin of the head by twice the length of the first joint of the flagellum. Mesonotum longer and at a higher level above the epinotum than in *capensis*, its transverse impression much shallower. Dorsum of epinotum narrower, two-thirds longer than wide. The first segment of the petiole is a little shorter, the node thicker than in *capensis*. Second segment a little

longer than wide, as wide behind as in front (wider in *capensis*), the sides distinctly angular in the middle.

Xoce River, S. Rhodesia. (S.A.M., R.M., G.A. colls.)

Var. *BULAWAYENSIS*, Forel.

*Loc. cit.*, p. 215, ♂, ♀.

♂. Like the type-species but darker, brownish-black. The fundamental sculpture of the head is stronger, even on the posterior third, so that the whole head is duller than in the type.

♀. Brownish-black, including the epinotum. The reticulate-punctate sculpture of the epinotum and sides of mesonotum much sharper than in the type-species. (The dorsum of the mesonotum is smooth and shining, not reticulate-punctate as erroneously stated in Forel's description.) The posterior lateral angles of the pronotum are raised into distinct bosses and the second segment of the petiole has the sides convex. Otherwise like the type of the species.

Bulawayo. (S.A.M., R.M., G.A. colls.)

This and the type-species are at least partly graminivorous, as the nests contained accumulations of grass seeds.

*P. ARNOLDI*, Forel.

*Ann. Soc. Ent. Belg.*, vol. 57, p. 130, ♂, ♀, 1913.

♂. 4 mm. Dark brown, sometimes the posterior half of the head and the pro-mesonotum paler or castaneous brown. Antennae, excluding the basal half of the flagellum, and the femora brown, tibiae yellowish-brown, tarsi and basal half of flagellum brownish-yellow. Pilosity yellowish, short and more or less erect on the head, longer but less abundant on the thorax, much longer and fairly abundant on the abdomen. Pubescence yellowish, scanty on the body, more abundant on the legs and antennae.

Anterior half of the head moderately shining, longitudinally striate and reticulate at the sides, striate on the vertex between the frontal carinae (the striae divergent); the spaces between the striae at the sides somewhat roughened. Posterior half of the head polished and shining, sparsely and finely punctured. Pronotum and disc of mesonotum shining, nearly smooth in the middle, faintly rugulose and transversely striate in front and at the sides. Epinotum and sides of mesothorax reticulate and dull. Nodes transversely rugulose, moderately shining. Abdomen shining, feebly and longitudinally rugulose at the base.



Head, excluding the mandibles, a little longer than wide, wider and higher in front than behind, the sides straight, the posterior emargination deep and angular at its apex, the occipital lobes prominent, narrowed apically. Occipito-frontal sulcus deep in its posterior third, shallow in front. Median area of clypeus rather narrow, strongly carinate in the middle, the anterior margin nearly straight. Frontal area triangular, shining, very slightly depressed. Mandibles smooth and shining, armed with two obtuse teeth at the apex. The scapes extend back to the middle of the head. Pronotum wider than long, the posterior lateral angles fairly prominent but rounded at the apices. Pro-mesonotal suture faintly indicated. Mesonotum sloping steeply downwards in its anterior portion, the scutellar region horizontal above and vertical behind, the margin between the two planes transversely concave and slightly produced. Dorsum of epinotum horizontal, about as long as wide, armed with two sharp, slightly

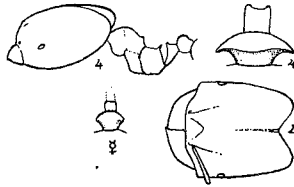


FIG. 25.—*P. Arnoldi*, Forel.

divergent and nearly vertical spines, which are longer than their basal width and as long as the interval between their bases. The declivity of the epinotum is slightly oblique and as long as the dorsum. First segment of the petiole very little longer below than high, the dorsal edge feebly concave, the posterior-dorsal face as long as wide, parallel-sided. Second segment a little more than twice as wide as long, the anterior margin convex, the sides produced into fairly acute teeth curved backwards. Abdomen longer than wide, the sides moderately convex.

♀. 1.8–2.3 mm. Dark brown, abdomen blackish-brown, legs and antennae dark yellowish-brown, the femora darker, mandibles pale reddish-brown. Pilosity and pubescence sparser than in the ♂, especially on the abdomen. Head and thorax closely reticulate-punctate and dull; nodes and base of abdomen finely reticulate and dull, the rest of the abdomen and the legs smooth and shining. Head as wide as long, widest across the eyes, narrower behind than in front, the sides feebly convex, the posterior margin nearly straight. Eyes fairly large, placed in the anterior third of the sides. Frontal carinae

subparallel, not extending beyond the anterior third of the head. Frontal area rather large. Clypeus feebly carinate in the middle. Mandibles sparsely punctured and shining, the basal half striate. The scapes extend beyond the posterior margin of the head by one and a-half times their apical width. Pro-mesonotal suture obsolete (in Forel's description erroneously stated to be distinct). The posterior lateral angles of the pronotum bear a minute tubercle, not easily seen. Meso-epinotal suture distinct. Mesonotum shallowly impressed transversely in the middle. Dorsum of epinotum flat, one and a-half times longer than wide, bearing two minute and vertical teeth, much shorter than the interval between their bases. Declivity shorter than the dorsum. Dorsal edge of the first node of petiole not emarginate, the second node one-third wider than long, convex in front, the sides obtusely angular, sometimes with the angles produced into short truncated cones. Abdomen subtruncate at the base, longer than wide.

♀. 5.7 mm. (hitherto undescribed). Brownish-black; tarsi and apices of the femora and tibiae brownish-yellow, mandibles ferruginous. Pilosity and pubescence as in the ♂. Head longitudinally and rather closely striato-rugose, the spaces between the striae rugulose and dull, except between the frontal carinae, where they are slightly shining. Mandibles more strongly punctured than in the ♂. Mesonotum very closely and finely striate and dull, the striae converging posteriorly; a median patch in front and a lateral one on each side over the parapsidal sutures are smooth and shining. Scutellum smooth, shining and very sparsely punctured. Epinotum smooth and shining in the middle, rugulose at the sides. Nodes dull and rugulose. Abdomen moderately shining, the first segment and the apical margins of the following segments finely punctured. Head as wide as long, a trifle wider behind than in front, the posterior margin straight, the sides parallel or very slightly convex in their posterior third, the posterior angles moderately acute. Clypeus and antennae as in the ♂, the frontal carinae longer. Eyes not very large, ocelli slightly depressed. Mesonotum flat, convex only in front, a little wider than long. Scutellum semicircular, less than half as long as the mesonotum. Dorsum of epinotum obsolete in the middle, forming a continuous vertical plane with the declivity. Epinotal teeth stout, triangular, shorter than their basal width. Posterior-dorsal face of the first node wider than long, 2nd node nearly three times wider than long, the lateral spines longer and thinner than in the ♂. Abdomen one and a-half to one and two-thirds longer than wide, the sides subparallel. Wings feebly fuscous, nervures pale yellow, stigma pale brownish-yellow.

♂. 4 mm. (hitherto undescribed). Black; mandibles, antennae and tarsi dirty brownish-yellow. Pilosity longer and more abundant than in the ♀. Head, thorax and nodes very closely and finely reticulate, punctate and dull, except the middle of the epinotum, which is only reticulate, and the scutellum, which is smooth and shining. There is also a fairly smooth and shining median longitudinal area on the mesonotum. Abdomen smooth and shining, the extreme base dull and very finely reticulate. Head widest in front, a trifle wider than long, the sides behind the eyes with the posterior margin forming a semicircle. Eyes placed in the anterior half of the head, occupying a little less than half of the sides. Frontal carinae obsolete. Mandibles small, quadridentate. Scapes when extended outwards not reaching the outer margin of the eyes; first joint of flagellum globose, as wide as long, the remaining joints all longer than wide. Mesonotum very convex transversely in front, one-third wider than long. Scutellum moderately convex lengthwise, half as long as the mesonotum. Dorsum of epinotum widest at the base, twice as wide as long, feebly bituberculate. First node one and a-half times wider than long, the dorsal edge convex transversely; 2nd node hardly half as wide again as the 1st, twice as wide as long, the sides produced into shorter and less acute teeth than in the ♀. Abdomen longer than wide. Wings as in the ♀.

S. Rhodesia, fairly common. It is a largely graminivorous species, and forms rather populous nests which are rarely placed more than 6 in. below the surface of the soil. (S.A.M., R.M., G.A. colls.; types of ♀ and ♂ in my collection.)

Var. *BALLAENSIS* n. v.

♂. 4.8-5 mm. Apart from its greater size, this form differs from the type in the following characters: The colour is paler, the head and pronotum bright castaneous red, the base of the abdomen yellowish-brown. The head is from one-fourth to one-third longer than wide; the occipital emargination is much deeper, and acutely angular at its apex. The pronotum is more angular and wider behind, the angles marginate. The pro-mesonotal suture is deeper, and the scutellar region is margined at the sides by a raised line. The dorsum of the epinotum is wider and less coarsely reticulate.

♀. 2.3 mm. Body dark blackish-brown. Head not wider in front than behind; an oblong area in the middle of the posterior half of the pronotum is shining and has the sculpture more or less effaced. Second node of petiole less angular at the sides. Otherwise like the type of the species.

Balla-Balla, S. Rhodesia. (R.M., G.A. colls.; types in my collection.)

Var. RUFESCENS, n. v.

♂. Differs from the type of the species in the following characters: Head, thorax, petiole and legs bright yellowish-red, abdomen dark brown or black. The sculpture of the head is much finer and closer and extends further back, only the posterior third of the head being smooth. The head is parallel-sided and longer than the type-species, and the occipito-frontal sulcus is deeper and extends forwards almost to the posterior angle of the frontal area. The sculpture of the thorax is finer than in the type. The posterior lateral angles of the pronotum are very obtuse, and the epinotal spines are shorter. Petiole similar to that of the type, but the lateral spines of the 2nd node are shorter.

♀. A little smaller than the type-species, the puncturation of the head, thorax and nodes much finer. The sides of the 2nd node are barely angular. Otherwise like the type of the species.

Sipapoma and Victoria Falls, S. Rhodesia. (S.A.M., R.M., G.A. colls.; types in my collection.)

A form of the type-species having the head brightly coloured also occurs, but it can be distinguished from *rufescens* by the sculpture and the shorter head of the ♂.

PHEIDOLE STRATOR, Forel, race FUGAX, n. r.

Forel, Zool. Jahrb., vol. 29, p. 256, 1910.

♂. 3.8-4 mm. Differs from the description of the type of the species as follows:

Colour darker, head reddish-brown, thorax and abdomen very dark-brown or piceous, legs and scapes brownish-yellow, tarsi and flagellum ochreous, mandibles pale burnt-sienna, the masticatory margins black. The vertex is only longitudinally striate, the striae fairly fine, widely spaced, and extending back to a little beyond the middle. The sides of the head as far as the base of the occipital lobes are very finely reticulate and subopaque, with a stronger sculpture of longitudinal rugae superimposed, which are strongest in front. The dorsal surface of the two nodes and the extreme base of the abdomen very superficially reticulate. The dorsum of the epinotum is as long as, or even longer than wide, and only very indistinctly marginate at the sides. The head is widest at the beginning of the posterior third, and is very nearly half as long again as wide (excluding the mandibles).

♀. 1.8-2 mm. Piceous, legs and scapes yellowish-brown, tarsi, flagellum and mandibles fuscous ochreous. Sides of petiole and mesonotum reticulate. Otherwise just like the type of the species.

Amatongas Forest, Portuguese E. A. Under the bark of a decayed tree. (R.M., G.A. colls.; types in my collection.)

*P. strator*, *termitophila* and *Schoutedeni*, Forel, are all closely allied; *P. platycephala*, Stitz, appears to be, judging from the description, only a colour variety of *P. Schoutedeni*, Forel.

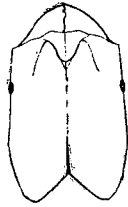


FIG. 25A.—*P. strator*, Forel, race *fugax*, n. r.

*P.* (sub-genus ALLOPHEIDOLE, Forel) *CUITENSIS*, Forel, race  
*REDDERSBURGENSIS*, Forel.

Ann. Soc. Ent. Belg., vol. 54, p. 437, ♂, ♀, 1910.

(Race) Ann. Soc. Ent. Belg., vol. 57, p. 135, ♂, ♀, ♀, ♂, 1913.

♂ major. 4.2–5.5 mm. Dark castaneous red, the occipital lobes, the pronotum, and sometimes also the basal half of the abdominal segments of a brighter tint. Pilosity moderately abundant all over,

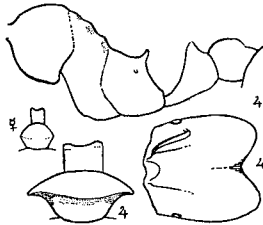


FIG. 26.—*P. cuitensis*, Forel, race *reddersburgensis*, Forel.

including the legs, antennae and mandibles, more oblique on the legs than elsewhere, and on the flagellum intermixed with a shorter pubescence. Anterior half of the head slightly shining, fairly strongly and longitudinally striate, the spaces between the striae on the cheeks reticulate-rugulose; the posterior half of the head smooth and shining, very finely and sparsely punctured. The sides of the occipito-frontal sulcus longitudinally striate. Mandibles smooth, shining, sparsely punctured. Thorax fairly shining, finely and irregularly striate transversely above, obliquely at the sides, and also more or less rugulose at

the margins of the dorsum. Both nodes transversely rugulose and dull above. Abdomen and legs smooth and shining. Head, excluding the mandibles, as long as, or a little longer than wide, widest in the posterior half, the occipital emargination wide and fairly deep, not acutely angular at its apex. Occipito-frontal sulcus shallow in front. Eyes small, placed at the anterior fourth of the head. Frontal carinae divergent, not extending back beyond the level of the hind margin of the eyes. Clypeus with a fine median carina, shallowly emarginate in front. Frontal area small and depressed. The scapes do not extend back beyond the middle of the head. Posterior lateral angles of the pronotum prominent and rounded at their apices. Pro-mesonotal suture defined as a raised line. The transverse impression of the mesonotum shallow, the scutellar portion short, not clearly defined in front, slightly tuberculate on each side. Metanotal region indistinct. Dorsum of epinotum widening towards the apex, a little wider than long, moderately excavated in the middle and more or less margined at the sides; epinotal spines a trifle longer than their basal width, acute, divergent, hardly half as long as the interval between their bases; the declivity longer than the dorsum. First joint of the petiole a little longer than deep, the posterior-dorsal face a little wider than long, the dorsal edge shallowly emarginate. Second node two and two-thirds wider than the first, twice as wide as long, convex in front, concave at the sides behind the spinose projections, the latter varying from mere cones to more or less distinct, backwardly-curved teeth. Abdomen truncate at the base.

♂ minor. 4.6 mm. or less. The head is as wide or a little wider in front than behind. Epinotal teeth shorter. The lateral projections of the 2nd node shorter and more obtuse. Otherwise like the ♀ major.

♀. 2.2-3.4 mm. Reddish-brown, the abdomen almost dark-brown, the pro-mesonotum sometimes yellowish-brown, shining. Sides of the head between the eyes and frontal carinae very shallowly reticulate, the sides of the meso- and epithorax more strongly reticulate-punctate, mesonotum shallowly rugulose, dorsum of epinotum feebly reticulate, mandibles finely striate and subopaque, the rest of the body smooth. Pilosity less abundant than in the ♀.

Head about as long as wide, the sides fairly convex. Frontal carinae parallel, extending back as far as the middle of the head. The scapes extend beyond the hind margin of the head by about the length of the eye. Posterior lateral angle of the pronotum rounded. Transverse impression of the mesonotum very shallow. Dorsum of epinotum longer than wide, faintly margined at the sides; the epinotal teeth small, acute, subvertical, half as long as the interval between their

bases. First joint of petiole long, twice as long as deep; 2nd joint a little wider than long, the sides moderately angular.

The larger ♀♀ differ in having the sculpture stronger, the pilosity longer, the scapes shorter or not extending beyond the occipital margin. The 2nd node is also wider and more acutely angular at the sides.

♀. 6.6-7.2 mm. Dark brown or piceous, the anterior half of the head, the paraptera and the median portion of the nodes above paler; the 1st segment of the abdomen also paler or reddish-brown. Antennae, mandibles and legs ferruginous. On the abdomen the pubescence is intermixed with longer pilose hairs; legs and antennae with a long and oblique pubescence. Head dull, closely and longitudinally striate, on the sides also reticulate. Mesonotum and scutellum smooth and shining, very sparsely punctured, the base of the mesonotum also superficially rugulose. Epinotum transversely striate and dull. Petiole rugulose and dull. Abdomen shining, finely and sparsely punctured. Mandibles smooth, shining and punctured. Head quadrate, a little wider than long; eyes placed in front of the middle. Clypeus with a feeble median carina. The scapes do not reach the posterior margin of the head. Mesonotum fairly flat above. Epinotal spines stout, blunt at the apex, one-third as long as the space between them. The petiole differs from that of the ♂ in having the posterior-dorsal face of the first node much wider than long, and steeper, the dorsal edge more deeply emarginate. The 2nd node has larger lateral teeth, which are strongly curved backwards. Wings brownish-yellow, the nervures pale brown.

♂. 5.5 mm. Black; antennae, legs and mandibles brownish-yellow, abdomen dark brown. Pilosity and pubescence as in the ♀, the sculpture on the head and epinotum finer than in that sex, but on the posterior half of the mesonotum somewhat stronger. Head trapezoidal, highest behind, much wider in front than behind. Eyes occupying the anterior half of the head; ocelli very prominent. Scapes not much longer than the 2nd joint of the flagellum; the 1st joint of the latter globose, the remaining joints all longer than wide. Mandibles 4-dentate, finely aciculate. Clypeus gibbous. Mesonotum similar to that of the ♀ but more convex in front; scutellum slightly gibbous, not flat as in the ♀. Epinotum with two very obtuse and flattened angles. Dorsal edge of 1st node much less deeply emarginate than in the ♀; 2nd node finely and longitudinally striate, subdentate at the sides. Wings as in the ♀.

Reddersburg,\* O.F.S. (Dr. H. Brauns).

\* The name of this race was written as *reddensbergensis* by its author, and should be amended so as to accord with the name of the locality in which it was found.

The species, which have polymorphic ♀♀, have been placed by Dr. Forel in a distinct subgenus, *Allophoidole* (Mem. Soc. Ent. Belg., vol. 19, p. 237, 1912).

*P. SPINULOSA*, Forel.

Ann. Soc. Ent. Belg., vol. 54, p. 438, ♂, ♀, ♀, ♂, 1910.

“♂. 5-5.6 mm. Mandibles smooth, abundantly punctured, the external margin feebly convex, with 3 or 4 large striae (teeth?). Clypeus carinate and emarginate. Frontal carinae divergent, rather short, as far apart from each other as they are from the sides of the head. Head of a rounded trapeze shape, a little longer than wide, narrowed in front, the sides but little convex, fairly deeply emarginate behind, the occipital groove continuous with the frontal groove. Eyes placed in the anterior third. The scape hardly extends beyond the middle of the head. No trace of a scrobe, only a slight depression present for the base of the scapes. Posterior lateral angles of the pronotum prominent. There is a wide and very superficial transverse impression in the middle of the mesonotum; behind the same there is a transverse torus which is not high. Dorsum of the epinotum not marginate, as wide as long, a little longer than the declivity. Spines shorter than half the wide space between them. First node high, the dorsal edge emarginate, the peduncle rather short. Second node a little more than twice as wide as long, bearing on each side a fairly long and pointed spine, curved backwards. Epinotum and nodes dull or subopaque, finely reticulate, punctate and transversely striate. The rest shining. Anterior half of the head coarsely and longitudinally striate or rugose. Promesonotum superficially rugose transversely; the rest more or less smooth. The occiput has some fairly large and scanty punctures, and the abdomen some piligerous punctures. Erect pilosity yellowish, very sparse, inclined slightly backwards on the body. The tibiae and scapes have only adpressed hairs, which are also scattered over the body. Yellowish-red, the abdomen light brown, the limbs yellowish, or the thorax light brown, with the antennae, tarsi and articulations yellowish. The colour varies between these two extremes.

“♀. 2-2.4 mm. Head quadrate, slightly narrowed in front, the posterior margin feebly concave. Eyes placed in the middle of the sides.

“Clypeus finely carinate. Mandibles dentate, shining, finely striate. The scape extends beyond the occiput by one-fifth to one-sixth of its length. Posterior lateral angles of the pronotum distinct.



Transverse impression of the mesonotum very weak but appreciable. Dorsum of the epinotum one and a-half times longer than wide, with two pointed teeth. First node cuneiform, 2nd node at least twice as wide as the 1st, the sides angular. Sculpture as in the ♀, but the nodes and thorax have no distinct rugae, merely reticulate (including the mesonotum in part). Pilosity as in the ♀. Head and thorax yellowish-brown, the thorax often yellowish.

“♀. 6·8 mm. Head quadrate, wider than long, a little narrowed in front, entirely rugoso-striate, as wide as the thorax. The latter flattened above. Declivity of epinotum marginate and longer than the dorsum, the latter not marginate. Spines short, triangular and pointed. Petiole as in the ♀, but the lateral spines of the 2nd node are shorter and much thicker, also slightly obtuse. Entirely brown, with the front of the head reddish, the antennae, tibiae and tarsi yellowish rusty-red. Wings tinged with rusty-yellow, the stigma brownish, the nervures brownish-yellow.

“♂. 6·6·3 mm. Mandibles yellow, with 4 or 5 teeth. Scape two and a-half times longer than wide. Head rounded, a little wider than long, half as wide as the thorax. Epinotum with two elongate and very obtuse tubercles. Petiole as in the ♀, but the lateral spines are reduced to strong pointed cones. Head rugose-reticulate, fairly dull.

“Epinotum and a part of the mesonotum finely rugoso-striate longitudinally. Nodes reticulate. Erect pilosity a little more abundant on the body. Black or very slightly brownish-black. Mandibles, legs and antennae yellowish, coxae brownish. Otherwise like the ♀.

“Basutoland (Wroughton).”

Race MESSALINA, Forel.

*Loc. cit.*, p. 440, ♀, ♂.

“♀. 5 mm. Mandibles less punctured and more striated, the external border more convex. Clypeus hardly carinate. Head more oval, the sides distinctly more convex, as much narrowed behind as in front. Posterior lateral angles of the pronotum more obtuse, wider and less prominent. Transverse impression and torus of the mesonotum barely appreciable. On the other hand, there are two fairly distinct carinae on the posterior half of the mesonotum. First node much thinner and more squamiform, emarginate at the summit. Second node as in the type of the species. Smoother than the latter; head and abdomen almost impunctate; pro-mesonotum without rugae. Epinotum and nodes reticulate and subopaque, with a few striae; anterior half of the head more closely and more finely striate, with

fine reticulations in between. Pilosity identical, of a faintly yellowish-red colour. Abdomen and limbs rusty or brownish-yellow.

“♂. 5.5 mm. Mandibles tridentate. Scape hardly longer than wide. Head short, much wider than long, two-thirds as wide as the thorax, which is much narrower than in the type. Epinotum without tubercles. Second node with two small lateral teeth. Shining; head with a few striae and reticulations. Nodes reticulate. Of a dirty-yellow colour. Posterior part of the head brown. A few brownish cloudy patches on the thorax and abdomen. Wings subhyaline, faintly tinged with yellow, the nervures and stigma yellowish.

“Basutoland (Wroughton). On account of the spines of the 2nd node in the ♀ I place this form as a subspecies of *spinulosa*. But the shape of the head and the entirely different ♂ seem to indicate that one is dealing with a distinct species. More material alone can settle this point.”

Race MESSALINA, var. NEXA, Forel. (Plate VI, fig. 70.)

Ann. Soc. Ent. Belg., vol. 57, p. 129, ♀, ♀, 1913.

♀. 5.7–6.6 mm. Head, thorax and nodes dark brownish-red, the abdomen piceous. The colour is sometimes much lighter, in which case the head, thorax and nodes are of a foxy-red, and the abdomen dark brown. In all, the clypeus and occipital lobes are darker than the rest of the head, and the basal third of the abdomen is paler. Mandibles dark castaneous red. Legs and antennae dull reddish-yellow, the tibiae and femora brownish in the middle. Pilosity short and rather sparse, except on the legs and abdomen. The sculpture of the head hardly extends beyond the anterior third, or a little behind the level of the hind margin of the eyes; the rest of the head is smooth, shining, very sparsely and very finely punctured, except the occipital lobes, which are fairly closely punctured with large, shallow and piligerous punctures. The head, excluding the mandibles, is as long as wide, widest a little behind the middle, plainly narrower in front than behind. The occipital emargination wide, not very deep, and not acutely angular at its apex. Posterior lateral angles of the pronotum prominent, their apices rounded. Pro-mesonotal suture defined by a raised line. Transverse impression of the mesonotum shallow; the scutellar region limited above by a transverse carina on each side. Meso-epinotal suture deep. Dorsum of epinotum shallowly excavated between the spines, and merging gradually into the longer declivity. First segment of the petiole differs in shape from that of

all the preceding species in having the dorsal face much wider than long (half as wide again as long), and in the sides, which are angular in the middle. The 2nd segment is a little more than twice as wide as long; the lateral spines, which vary in their degree of acuteness, are narrow and longer than their basal width.

The  $\mathcal{M}$  of *neva* differs from the species and race as follows: "Head longer than in the type of the species and also longer than in the race *messalina*, . . . The occiput has large piligerous punctures which do not occur in *messalina*, and are very feeble and scanty in the type of the species. The colour is also darker."

$\mathcal{F}$ . 1.8-2.5 mm. Dark brown, the antennae, mandibles, tarsi and articulations of the legs of a dirty ochreous colour. The thorax is usually lighter than the head and abdomen, sometimes yellowish-brown. Sides of mesonotum, mesopleura and all the epinotum evenly reticulate and slightly shining, the rest of the body smooth and shining. There are a few striae between the eyes and frontal carinae.



FIG. 27.—*P. spinulosa*, Forel, race *messalina*, var. *neva*, Forel.

The latter parallel, extending back as far as the middle of the head. Posterior lateral angles of the pronotum fairly large. Dorsum of epinotum longer than wide, the basal half convex lengthwise, the spines small and acute. The 1st segment of the petiole longer than deep; 2nd segment a little longer than wide, feebly angulated at the middle of the sides.

$\mathcal{F}$ . 9 mm. (hitherto undescribed). Black, the antennae, tarsi and joints of the brownish tibiae and femora brownish-yellow. Head rather feebly and longitudinally striato-rugose, the occipital angles shallowly punctured. The metanotum is unusually prominent, overhanging the base of the epinotum. The dorsal part of the latter is very steep and much more deeply excavated than in the  $\mathcal{M}$ ; the epinotal teeth are short, triangular, and directed outwards and backwards, not vertical as in the  $\mathcal{M}$ . The petiole is similar to that of the  $\mathcal{M}$ , but the dorsal edge of the 1st node is more deeply emarginate, and the lateral spines of the 2nd node more obtuse and shorter. Deälated.

Bulawayo, Plumtree, S. Rhodesia. Generally nesting under stones. A rather sluggish species and not common. (S.A.M., R.M., G.A. colls.)

Race MESSALINA, var. POWERI, Forel.

Bull. Soc. Vaud. Sc. Nat., vol. 50, p. 241, ♂, ♀, 1914.

♂. 6-6.5 mm. Colour lighter than in *nexa*, especially on the ead. The sides of the latter are more convex and the transverse impression of the mesonotum much shallower or almost obsolete. Otherwise like var. *nexa*.

♀. 2.5-2.6 mm. Larger than var. *nexa* and of a paler colour. The 2nd node of the petiole is wider, with the sides sometimes produced in the middle into small, subacute cones. The reticulate-punctate sculpture of the meso- and epinotum is finer than in *nexa*.

Kimberley (Brother J. H. Power). (S.A.M., R.M., G.A. colls.)

P. SCHULTZEI, Forel.

Schultze, Reise Süd. Afrika, vol. 4, p. 9, ♂, ♀, ♂, ♀, 1910.

"♂. 5-6 mm. Mandibles striate and punctate, partly smooth towards the apex. Head 2.15 mm. wide and 2.4 mm. long, excluding the mandibles, rectangular, the sides nearly straight, somewhat narrower behind than in front, deeply excised behind so as to form a hemisphere on each side. The occipital emargination is acutely angular at the apex and is continued into the occipital groove; the latter is also continuous with the frontal groove. Eyes small, almost flat, placed in the anterior fourth. The short scape extends back just to the middle of the head, and when directed outwards hardly extends beyond the lateral margin. Clypeus carinate, feebly emarginate. Frontal carinae short, straight and divergent. Pronotum strongly arched, bearing above and below very blunt and indistinct prominences. Mesonotum with a transverse impression at the posterior third and behind it a transverse torus, beyond which the surface falls steeply to the dorsum of the epinotum, which is flat lengthwise. The latter is somewhat longer than wide, channelled along its length, with two small raised margins. Epinotal teeth acute, triangular, shorter than the interval between them; the declivity transversely rugulose, as long as the dorsum. Dorsal edge of the 1st node almost trenchant and emarginate; 2nd node twice as wide as long, produced at the sides into two long and pointed teeth. Fairly abundantly punctured all over with piligerous punctures. Head dull, reticulate-punctate, and longitudinally striate in front, shining and shallowly reticulate behind. Thorax irregularly striate; the disc of the pronotum nearly smooth; 2nd node transversely rugulose. Abdomen fairly smooth. The hairs of the scapes and body short,

pointed, yellowish and exerted, on the tibiae decumbent. Yellowish-red; mandibles and clypeus brown. Abdomen and scapes brownish-yellow, legs and flagellum yellowish (the abdomen is more yellowish in front and browner behind).

“♀. 2-2.2 mm. Mandibles sculptured as in the ♂, armed with two sharp teeth in front and about six distinct but smaller ones behind. Head as wide in front as long, narrower behind, the occipital margin convex. The scape extends beyond the occipital margin by one-third of its length. Eyes convex, fairly large. Mesonotum without a transverse torus, only a very wide and shallow transverse impression present. Posterior lateral angles of the pronotum obtuse. Mesoe-pinotal suture strong. Epinotum almost unarmed, with only two very small tubercles; the dorsum convex, a little longer than the declivity. First node not emarginate above, the 2nd longer than wide, wider behind, without lateral teeth. Puncturation as in the ♂. Posterior half of the thorax dull and finely reticulate; head shallowly reticulate, reticulate-rugulose in front. Otherwise shining and fairly smooth. Pilosity as in the ♂, but more oblique on the scapes and tibiae. Head brown, except the front part, which is brownish-yellow like the rest of the body.

“♀. 7.5 mm. Head wider than long, rectangular, behind widely and shallowly emarginate and wider there than in front. The scape reaches the posterior third of the head. Otherwise like the ♂, mandibles included. Thorax somewhat narrower than the head. Epinotum with two short spines, but little longer than their basal width. Petiole, etc., as in the ♂. The whole head almost dull and longitudinally rugose as far as the occiput, marked with three brown longitudinal stripes. Sculpture, pilosity and colour otherwise like that of the ♂. Clypeus and mandibles rather yellowish-red. Wings pale yellowish, the nervures and stigma pale.

“♂. 4.8 mm. Mandibles quadridentate. Clypeus carinate, not emarginate. Head somewhat longer than wide. Epinotum unarmed. Colour, pilosity and sculpture as in the ♀, but the bands on the mesonotum and the wings as in the ♀. The yellow colour is a little brighter than in the ♀.

“Kalahari, between Kooa and Sekgoma, and between Kgokong and Kang (Schultze).”

Var. *GWAAIENSIS*, Forel.

Ann. Soc. Ent. Belg., vol. 57, p. 129, ♂, ♀, 1913.

“♂. 6-6.6 mm. Very similar to the type of the species, having almost exactly the same colour, size, and rectangular, parallel-sided

head. But the 2nd node is much narrower, only one and a-half times wider than long, having at the sides only two fairly short cones, whereas in the type of *Schultzei* it is twice as wide as long, and has spines at the sides, although these are shorter than in *spinulosa*."

♀. 2.4-2.6 mm. Almost identical with the type, slightly darker, with the mesonotal impression a little more accentuated.

This species is closely related to *spinulosa*, but differs from it in the ♂ as follows: The head is parallel-sided, not wider behind than in front, if anything a little wider in front than behind. The occipito-frontal sulcus is much deeper. The sculpture extends further back, reaching the middle of the head above, and well beyond the middle at the sides. The occipital emargination is deeper and more angular at the apex. The thorax is narrower; the posterior lateral angles of the pronotum are more prominent, since there is a fairly pronounced constriction of the sides between them and the mesonotum. The transverse torus on the mesonotum is thicker. The dorsum of the



FIG. 28.—*P. Schultzei*, Forel, var. *gwaaiensis*, Forel.

epinotum is longer and the teeth are closer together. The dorsal face of the first node is parallel-sided, not angular in the middle.

The ♀♀ of the two species are very much alike, but in *gwaaiensis* the scapes are more slender and longer, extending back as far as the middle of the pronotum, whereas in *spinulosa* they do not project beyond the occipital margin by more than one and a-half times the length of the eye. In addition, in *gwaaiensis* the frontal carinae are slightly arcuate and divergent, the head is narrower and convex behind, not straight or slightly emarginate as in *spinulosa*. The transverse impression of the mesonotum is also shallower, the first node of the petiole less high, the second node longer and distinctly longer than wide.

♀. 7.2 mm. (hitherto undescribed). Head longitudinally striate, the spaces between the striae closely and finely reticulate. A few strong rugae radiate outwards from the ocelli. There is a deep and shining occipital groove which reaches as far as the anterior ocellus. Posterior two-fifths of the mesonotum obliquely and sharply rugulose, the rest of the mesonotum and the scutellum shining and very

sparsely punctured. The epinotal spines are directed upwards and slightly backwards, acute, hardly as long as their basal width. The colour of the head is yellowish-red, without darker stripes, the anterior margin darker than the rest. Otherwise like the type of the species.

It differs from the ♀ of *spinulosa-nexa* by the much shorter thorax, and by the mesonotum, which is much more convex along the anterior margin. The metanotum does not project over the epinotum, and the dorsum of the latter is less deeply excavated. The dorsal edge of the 1st node is more feebly emarginate, and the dorsal face is as wide in front as behind, not narrower as in *spinulosa-nexa*. The 2nd node is narrower and the lateral teeth more obtuse, shorter and somewhat flattened. The colour is also quite different from that of *nexa*.

♂. 5 mm. Dirty ochreous yellow, the head black, the mesonotum yellowish-brown, with a V-shaped yellowish band in front. Legs, antennae and mandibles pale yellow. Head very closely and finely reticulate-punctate, with a few rugae superimposed and radiating from the ocelli. The latter are glassy yellow, large and very prominent. Mesonotum sculptured more finely than in the ♀. Eyes occupying the anterior half of the head, ovoid, wider in front than behind. Scutellum convex and gibbous behind. Dorsum of epinotum fairly oblique, distinctly longer than the declivity, and as long as it is wide. Second node of petiole widest behind, the sides moderately angulated at the posterior third. Flagellum densely pubescent, the scapes not extending back as far as the anterior ocellus. Seen from in front the head is trapezoidal, widest anteriorly. Other characters as in the type of the species.

S. Rhodesia, fairly plentiful on the Forest Sandstone and Kalahari Sand formations, but not occurring elsewhere as it is a distinctly areniphilous species. The nest is very distinctive and like that of the type-species; it may be seen all along the railway line from Nyamandhlovu to the Victoria Falls. The entrance, of exceptional width (from 1 to 2 in. in diameter), is surrounded by a wide but low-walled crater. The area enclosed therein is kept perfectly smooth and bare. As a rule, the entrance at about 4 or 5 in. from the surface leads into a circumconical space from the bottom of which galleries radiate outwards; the central cone itself is pierced by a vertical gallery which again leads into a second and lower circumconical chamber, similar to the upper one. (S.A.M., R.M., G.A. colls.; types of ♀ and ♂ in my collection.)

*P. SCULPTURATA*, Mayr.

Verh. Zool. Bot. Ges. Wien, vol. 16, p. 897, ♀, 1866.

“♀. 9.5 mm. Head 3.8 mm. long, 2.8 mm. wide at its widest. Shining, testaceous red, the head ferruginous, abdomen fusco-ochraceous, legs reddish testaceous, mandibles castaneous, the anterior margin of the head and the masticatory margins of the mandibles blackish; abundantly clothed with a short, yellowish pilosity, which is slightly exerted on the legs. Head elongate quadrangular, deeply excised behind, a little wider in the middle than in front or behind, indistinctly impressed behind and below the eyes; mandibles strongly convex, shining, smooth, sparsely punctured with small piligerous punctures, with some short striae at the base and near the trenchant masticatory margin, obtusely bidentate in front. Clypeus with a longitudinal median carina and some short striae behind, emarginate in front; cheeks striate, coriaceous-punctate and rugulose; the frons

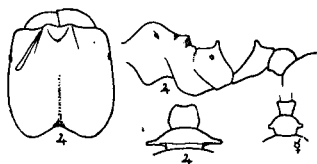


FIG. 29.—*P. sculpturata*, Mayr.

finely but closely striate, the frontal sulcus smooth; the vertex in the middle more finely and longitudinally striato-rugulose, at the sides finely coriaceous-punctate and rugulose, with large, scattered and shallow punctures; thorax finely rugulose and reticulate-punctate, strongly constricted between the scutellum and the epinotum; pronotum with a rounded tubercle on each side; scutellum distinct; epinotum with two erect spines, not long, shorter than the transversely rugose basal portion; petiole transversely rugose and coriaceous-rugulose, the peduncle of the 1st segment low, the node a little emarginate above, the 2nd segment transverse, with a subobtusely and conical spine on each side which is directed outwards but hardly curved backwards, furnished below anteriorly with a blunt denticle; abdomen finely coriaceous-rugulose and with some scanty piligerous punctures.

“Caffernland” (S. E. Africa?).

I have seen specimens of the ♀ from Pretoria and from Bothaville, O.F.S., which agree with the above description in greater part, but the colour is darker, especially of the abdomen, which is very dark brown,



with the basal third of the 1st segment reddish-brown and the apical margins of all the segments testaceous. The scutellum is more distinctly defined, and the 2nd node of the petiole is shorter and much wider than in any of the preceding species.

♀. 3-3.2 mm. Dark reddish-brown, the disc of the pronotum and the dorsum of the epinotum paler or more castaneous red, femora and tibiae reddish-yellow-brown, flagellum and tarsi yellowish-brown. A few long and exserted hairs occur on the body, shorter on the head than elsewhere; legs and antennae with a fairly abundant, long and exserted pubescence of a pale-yellowish colour. The frons and vertex are fairly smooth and shining, the rest of the head finely reticulate and longitudinally striate, the striae becoming weaker behind the eyes, hardly reaching as far as the posterior angles. Mandibles finely and longitudinally striate, with a few shallow punctures near the masticatory margin; the latter is armed with two large and acute teeth at the apex, and five or six smaller teeth behind. Pronotum sparsely and transversely striate in front, very superficially reticulate-rugulose and shining at the sides and behind, almost smooth, the rest of the thorax a little duller and closely reticulate. Nodes of petiole shallowly rugulose and slightly shining. Abdomen smooth and shining. Head, excluding the mandibles, as long as wide, widest in the middle, the sides fairly convex, the hind margin straight or only feebly concave. Eyes rather large, placed in the middle of the sides. Clypeus carinate, the anterior margin convex. Frontal area large. Frontal carinae subparallel, hardly extending back beyond the level of the anterior margin of the eyes. The scapes extend beyond the hind margin of the head by as much as the length of the 1st joint of the flagellum; the latter is twice as long as the 2nd joint. Promesonotal suture obsolete. Posterior lateral angles of pronotum prominent, slightly produced outwards, and, seen from the side, subdentiform. Mesonotum with a feeble transverse impression, the declivous face of the scutellar portion longer than the upper face. Meso-epinotal suture deep, the thorax fairly strongly constricted at this point. Dorsum of epinotum marginate at the sides, widening towards the apex, twice as long as wide. Epinotal teeth vertical, acute, a little longer than their basal width, half as long as the space between them: the declivity shorter than the dorsum. First segment of petiole two-thirds longer than high, the dorsal edge not high and barely emarginate, the dorsal face wider in front than behind; 2nd node with the sides produced into two very distinct cones, obtuse at the apex.

Bothaville, O.F.S. (Dr. H. H. Brauns); Pretoria (Lounsbury).

Var. AREOLATA, Forel.

Sitzb. k. Bayer Akad. Wissensch., p. 269, ♂, ♀, 1911.

“♂. 8 mm. Head 3 mm. long and 2·6–2·7 mm. wide. Clypeus barely emarginate, indistinctly carinate. Sides of head straighter than in the type-species. Head very little narrowed behind; a large, superficial network occurs over more than the posterior half of the head, in addition to the fine reticulate-punctate sculpture. Otherwise like the type-species.

“♀. 2·8 mm. Head somewhat narrowed posteriorly, with a more distinct posterior margin and less convex sides than in the type-species, also very distinctly longer than wide.

“Bothaville, O.F.S. (Dr. H. Brauns).”

Race BERTHOUDI, Forel.

Mitth. Schweiz. Ent. Ges., vol. 9, p. 89, ♂, ♀, 1894.

“♂. 5·3–6 mm. Head, excluding the mandibles, 2·7 mm. long and 2·1 mm. wide, a little wider in front than behind, nearly parallel-sided. Mandibles smooth, shining, very sparsely punctured, striate externally at the base. Clypeus very short, carinate, widely emarginate in the middle. Frontal carinae short, very divergent, ending in front of the anterior fourth of the head. Eyes small. Directed outwards, the very short scape hardly extends beyond the anterior corner of the head. Head deeply and narrowly excised behind, the excision being continued into the occipito-frontal sulcus. Pronotum with two blunt bosses above and below. Mesonotum with a weak transverse torus. Epinotum not marginate, armed with two long, thin, nearly vertical and strongly divergent spines, which are nearly as long as the dorsum of the epinotum. First segment of the petiole with a long peduncle, the node feebly emarginate above. Second segment wider than long, produced at the sides into two very long teeth or blunt spines. Legs fairly long. Head dull or with a slight gloss, very finely reticulate-punctate, also more coarsely striate longitudinally over the anterior two-thirds, the posterior third closely and transversely striate, underneath only reticulate and shining. Thorax slightly shining, finely reticulate and irregularly rugose, transversely so in front; epinotum reticulate-punctate only. Petiole and 1st abdominal segment reticulate, the rest of the abdomen smooth. Legs smooth and sparsely punctured. Pilosity moderately abundant except on the head and legs, very short, oblique, yellowish, and not quite decumbent. Tibiae and scapes without exerted hairs, the latter sparse on the body.

Dark reddish-brown; abdomen dark brown, legs and antennae brownish-red.

“♀. 3.2 mm. Head quadrangular, as wide as long. Eyes fairly large, placed at the anterior third. The scape extends beyond the hind margin of the head by one-fifth of its length. Pronotum with two small but quite distinct bosses above (*posterior lateral angles*). Mesonotum very distinctly impressed transversely. Dorsum of the epinotum rectangular, ending in two strong triangular spines. Second segment of petiole wider than long, produced at the sides into blunt cones. Clypeus carinate. Fairly closely reticulate punctate and almost dull. Abdomen reticulate and moderately shining. A few longitudinal striae on the cheeks and frons. Mandibles sharply striate. Pilosity as in the ♂. Dark brown, mandibles, antennae and legs yellowish-brown. Valdezia, Transvaal (Rev. P. Berthoud).”

Race ZAMBESIANA, Forel.

Ann. Soc. Ent. Belg., vol. 57, p. 133, ♂, ♀, 1913.

♂. 6 mm. Head dark reddish-brown, thorax and abdomen very dark brown or almost black, legs and antennae ferruginous. The whole body abundantly clothed with a long, yellowish and decumbent pubescence, shorter on the legs and antennae. Erect pilosity almost absent. Fairly dull, only the occipital lobes and the abdomen having a slight gloss. The whole head, excepting the occipital lobes, finely and longitudinally striato-rugose, the spaces between reticulate-punctate and partly rugulose. Occipital lobes fairly closely but not coarsely punctured. Mandibles very convex externally, strongly punctured, some of the punctures coalescing to form longitudinal striae. Thorax with a fine and somewhat superficial fundamental reticulation, which is strongest on the epinotum; there are a few irregular rugae in addition, more or less transverse on the promesonotum. Nodes rugulose. Abdomen very finely punctured, rugulose at the base. Head quadrate, parallel-sided as far as the occipital lobes, the outer margins of which curve slightly inwards, one-eighth longer than wide, deeply, angularly and widely excised behind. Clypeus carinate, the anterior margin straight. Frontal carinae strongly divergent, not extending beyond the anterior fourth of the head. Eyes placed at the anterior fourth. Scapes not reaching the middle of the head. Pro-mesonotal suture fairly distinct; the posterior lateral angles of the pronotum considerably rounded. Mesonotum hardly depressed in the middle, its scutellar portion vertical behind, and bearing a transverse torus above. Dorsum of

epinotum marginate at the sides, wider than long, moderately excavated, shorter than the declivity; epinotal spines divergent, subvertical, longer than their basal width, two-thirds as long as the space between them. Dorsal face of 1st node nearly one and a-half times wider than long, feebly emarginate in front. Second node twice as wide as long, longer and less wide than in the type-species, the sides produced into two fairly acute spines, strongly curved backwards.

♀. 2.4 mm. Blackish-brown or black, antennae, mandibles and tarsi ferruginous, tibiae and femora dark brown, the articulations reddish. Erect pilosity very scanty, the legs and antenna moderately pubescent. Head and thorax densely reticulate-punctate and dull. Nodes very superficially reticulate, legs and abdomen smooth and shining. A few longitudinal striae on the cheeks and vertex. Mandibles striate and sparsely punctate. Head as long as wide, the sides convex, the posterior margin straight, the posterior angles narrowly rounded. Clypeus carinate, the anterior margin straight. Eyes convex, rather large, placed in the middle of the sides. Frontal carinae slightly divergent posteriorly. Pro-mesonotum strongly convex in all directions, the mesonotum with a transverse impression and a tolerably distinct scutellum. Meso-epinotal suture deep. Dorsum of epinotum one and a-half times longer than wide, flat. Epinotal teeth subvertical, slightly divergent, acute, one-third as long as the space between them. Dorsal edge of 1st node feebly emarginate; 2nd node a little wider than long, the sides obtusely conical.

Victoria Falls and Shiloh, S. Rhodesia. (S.A.M., R.M., G.A. colls.)

P. LIENGMEL, Forel. (Plate VI, fig. 71.)

Mitth. Schweiz. Ent. Ges., vol. 9, p. 93, ♀, 1894.

Ann. Soc. Ent. Belg., vol. 57, p. 134, ♀, 1913.

♂. 7-8.5 mm. Of a very dark reddish-brown, the abdomen blackish-brown, legs and antennae ferruginous. Head, thorax and basal third of abdomen dull, the rest of the abdomen and the legs smooth and shining. Pilosity reddish-yellow, fairly sparse, the pubescence also sparse. Head strongly rugoso-striate; the striae are longitudinal on the anterior half or three-fifths but divergent posteriorly. On the posterior half or two-fifths the striae are much more oblique or almost transverse, and also closer and finer. The spaces between the striae closely and finely reticulate. Thorax and nodes reticulate-punctate, less closely on the sides and on the dorsum of the epinotum than on

the pro-mesonotum, very finely on the nodes. The latter and the pronotum are also sparsely rugose transversely; the sides of the epinotum have three or four very strong and more or less concentric striae. Basal third of abdomen microscopically alutaceous and longitudinally aciculate; the rest of the abdomen smooth, with shallow piligerous punctures. Head a little longer than wide, slightly narrowed in front, widest across the posterior fourth, the sides nearly straight. The cheeks, behind and between the eyes and vertex, feebly and obliquely depressed. The posterior margin widely and deeply excised, the apex of the excision subangular. Mandibles smooth, shining, sparsely and finely punctured. Eyes convex, placed in the anterior fourth of the sides. Clypeus carinate, shallowly emarginate in front. The scapes extend a little beyond the middle of the head. Occipito-frontal sulcus very deep and transversely striate in its posterior half. Posterior lateral angles of pronotum large and prominent. Pro-mesonotal suture more or less apparent. Mesonotum shallowly impressed transversely in

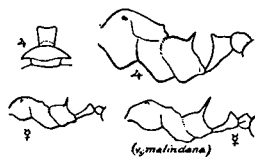


FIG. 30.—*P. Liengmei*, Forel.

front of the scutellar region, the latter surmounted by a narrow transverse torus. Meso-epinotal suture wide and deep. Dorsum of epinotum feebly margined at the sides, as long as wide. Epinotal spines distinctly long, acute, subvertical, divergent, longer than the interval between their bases and as long as, or a little longer than, the dorsum of the epinotum. Dorsal edge of the 1st node very feebly emarginate, the dorsal face a little wider in front than behind and about as long as wide. Second node twice as wide as long, the anterior margin convex, the sides produced into two cones which are curved backwards.

♂. 3.8–4 mm. Dark brown, abdomen nearly black, antennae and legs yellowish-brown, the tarsi yellower, mandibles brownish-red. Pubescence and pilosity scanty. Legs and apical two-thirds of the abdomen moderately shining, the rest of the body dull. Head and thorax closely and strongly reticulate-punctate, appearing granulate under a low magnification. Nodes finely reticulate. Base of abdomen very finely areolate or reticulate, and also longitudinally aciculate. The head has in addition a few longitudinal rugae at the sides in

front of the eyes. Mandibles moderately shining, striate, and with a row of large punctures parallel to the masticatory margin. Head, excluding the mandibles, fairly round, the posterior margin straight, the posterior angles widely rounded. Eyes large, convex and prominent, placed at the middle of the sides. Clypeus feebly carinate, the frontal area large and well defined. Frontal carinae parallel, extending back a little beyond the first third of the head. Scapes extending beyond the hind margin by a length equal to twice their apical width. Pronotum convex in front and above, the posterior lateral angles produced into two rather large cones; these are more easily seen in profile. Mesonotum with a feeble transverse impression. Meso-epinotal suture deep. Dorsum of epinotum nearly twice as long as wide, submargined at the sides. Epinotal spines very long, acute, subvertical, feebly divergent, not quite as long as the dorsum of the epinotum. First joint of petiole four-fifths longer than high, the dorsal edge obtuse. Second node not much wider than long, the sides angular. Legs long.

♀. 9.8 mm. (hitherto undescribed). Pilosity and pubescence as in the ♂. Colour darker than in the ♂. The sculpture of the head like that of the ♂, but much stronger. The vertex strongly and longitudinally striate, the spaces between the striae nearly smooth and very shining. Head obliquely truncate behind the ocelli and transversely striate. The fundamental sculpture of the mesonotum is reticulate-rugulose, with some fairly close longitudinal rugae superimposed; these converge inwards and meet in the middle; a small anterior median area smooth and shining. The anterior half of the mesonotum is also very sparsely and shallowly punctured. Scutellum smooth, shining, coarsely and sparsely punctured. Paraptera longitudinally rugose. Epinotum and nodes transversely rugose, the abdomen sculptured more strongly than in the ♂. Head, excluding the mandibles, as long as wide behind, widest behind, the posterior half of the sides convex, the anterior half concave. The eyes placed at the anterior third, very prominent. Clypeus as in the ♂. Posterior margin of the head shallowly concave, the posterior angles only narrowly rounded. Head hardly wider than the mesonotum, the metanotum slightly projecting. The dorsum and declivity of the epinotum form a single and nearly vertical plane. Epinotal spines acute, horizontal, divergent, about as long as their basal width and as long as the space between them. Petiole and abdomen as in the ♂, but larger. Wings yellowish, nervures brownish-yellow, stigma brown.

Bulawayo and Victoria Falls, not common. The nest is usually placed under stones. (S.A.M., R.M., G.A. colls.; type of ♀ in my collection.)

## Var. SHINSHENDENSIS, Forel.

Rev. Zool. Afric., vol. 2, p. 327, ♀, 1913.

“♀. 4-4.2 mm. A little larger than the type of the species. Black, legs and mandibles brown. The sculpture is coarser than in the type, even on the abdomen. Otherwise identical.

“Shinshenda, Katanga (Dr. Bequaert).”

I have some specimens from Bembesi, S. Rhodesia, which appear to agree with this variety. The superimposed rugae on the head are stronger and more abundant. The thorax is also coarsely and irregularly rugose. The epinotal spines are as long as, or a little longer than the dorsum of the epinotum.

♂. 8 mm. (hitherto undescribed). The sculpture is like that of the type of the species, but stronger everywhere. The head is more convex above transversely, the occipital sulcus is less deep, and the occipital emargination shallower, hardly more than half as deep as in the type-species. The epinotal spines are a little longer, stouter and somewhat compressed (blade-shaped). Otherwise like the type of the species.

Bembesi, S. Rhodesia. Forming populous nests in sandy soil. A very pugnacious insect. (S.A.M., R.M., G.A. colls.; type of ♂ in my collection.)

## Var. MALINDANA, Forel.

Ann. Soc. Ent. Belg., vol. 57, p. 135, ♀, 1913.

♀. 4.5-5.2 mm. Black, mandibles, scapes and legs dark-brown, tarsi and flagellum ferruginous. Sculpture like that of *shinshendensis*, but the posterior half of the head is widely reticulate-rugose. The base of the abdomen finely areolate and aciculate, but more strongly so than in the type of the species. Posterior margin of the head shallowly concave. Posterior lateral angles of pronotum strong, sub-dentiform. Epinotal spines very long and acute, longer than the dorsum of the epinotum. Second node of petiole with a conical projection on each side, a little less obtuse than in *shinshendensis*.

Malindi, S. Rhodesia. (R.M., G.A. colls.)

## Race MICRARTIFEX, Forel.

Deutsch. Ent. Zeitschr. Beiheft, p. 215, ♂, ♀, 1913.

♂. 6.5-7.2 mm. Colour similar to that of the type-species, but darker. Sculpture also similar, but stronger, especially on the head, where the transverse rugae on the posterior part are coarser and wider

apart. The occipital emargination is narrower, a little deeper, and more angular at the apex. The inner sides of the occipital lobes are distinctly convex (straight, or almost so in the type of the species). Occipito-frontal sulcus deeper and wider. The head is as wide behind as in front. The epinotal spines are less divergent than in the type of the species. The 2nd node of the petiole has a long spine on each side, longer in proportion to the rest of the node than in the type of the species. Occasionally the head is much paler than the rest of the body, being of a bright castaneous red.

♀. 3-3.4 mm. Black, tarsi and flagellum ferruginous, scapes and legs dark brown. Middle of the frons and vertex shining and almost smooth, the rest of the head more finely and superficially reticulate than in the type of the species. Thorax sharply reticulate-punctate and dull. Nodes and base of abdomen more strongly reticulate. Epinotal spines shorter than in the type, hardly two-thirds as long as the dorsum of the epinotum. Nodes as in the type of the species.

Bulawayo. (S.A.M., R.M., G.A. colls.)

*P. EXCELLENS*, Mayr, race *RHODESIANA*, Forel. (Plate VI, fig. 69.)

Verh. Zool. Bot. Ges. Wien, vol. 12, p. 744, ♀, 1862.

(Race) Ann. Soc. Ent. Belg., vol. 57, p. 131, ♀, 1913.

♀. 7 mm. Piceous, the posterior half of the head sometimes more or less dark, castaneous; flagellum and tarsi ferruginous, scapes, femora and tibiae dark brown, the latter paler at base and apex. Pubescence on the head almost decumbent, longest on the legs and abdomen, more exerted on the legs than elsewhere. Pilosity scanty, yellowish, very oblique on the head, more or less exerted on the thorax. Anterior half of the head longitudinally striate, the spaces between the striae shining and very superficially rugulose; posterior half of the head smooth, shining, shallowly and sparsely punctured, here and there also very feebly rugulose. Thorax fairly shining, the pro-mesonotum feebly and irregularly rugulose transversely, with a few stronger rugae at the sides. Epinotum more strongly sculptured, especially at the sides, transversely rugoso-striate. Sides of pro- and mesothorax irregularly rugose. Nodes transversely rugulose. Abdomen smooth and shining, the extreme base faintly aciculate. Legs smooth and shining. Head, excluding the mandibles, not quite one-fifth longer than wide, parallel-sided, deeply excised behind, the excision angular at the apex. The sides of the head, between the vertex and the eyes and behind the latter, have a slight oblique concavity. Occipito-frontal sulcus fairly deep posteriorly, the anterior half shallow.



Frontal carinae short and strongly divergent. Scapes short, extending beyond the lateral margins by about twice their apical width. Eyes small, placed a little in front of the anterior third. Mandibles stout, very convex externally, smooth and shining. Clypeus feebly carinate, shallowly emarginate in front. Posterior lateral angles of pronotum very rounded and inconspicuous. Pro-mesonotal suture indicated by a thin raised line. Scutellum fairly well defined, bituberculate. Metanotum fairly distinct but short. Meta-epinotal suture rather shallow. Dorsum of epinotum flat, submarginate at the sides, wider than long; epinotal spines subvertical, divergent, about two-thirds the length of the space between their bases. Declivity of epinotum longer than its dorsum. Dorsal face of the 1st node a little wider than long, the dorsal edge shallowly emarginate. Second node, including the lateral spines, three times wider than long; the spines are obtuse at the apex and usually longer than their basal width, more or less curved backwards.

♀. 3 mm. Piceous or black, legs and antennae as in the ♂. The pilosity and pubescence very scanty. Anterior half of the head, but excluding the frons, reticulate and longitudinally striate; the rest of the head smooth and very shining. Meso- and epithorax and sides of the 1st segment of the petiole reticulate and faintly shining, the rest of the body smooth and shining. Head as long as wide, the sides feebly convex, the hind margin straight. Clypeus carinate. Frontal carinae parallel. Eyes placed in the middle of the sides. Mandibles longitudinally striate. The scape extends back beyond the occipital margin by about twice its apical width. Posterior lateral angles of the pronotum distinct but small. Mesonotum with a moderately deep transverse impression. Meso-epinotal suture deep. Dorsum of epinotum margined at the sides, one and a-half times longer than wide. Epinotal spines short, triangular, subvertical, hardly two-thirds as long as the space between them. Dorsal edge of the 1st node rounded, not trenchant; 2nd node with the sides produced into strong conical teeth, the anterior margin strongly convex.

♂. 6.2 mm. (hitherto undescribed). Thorax, legs, antennae and mandibles pale brownish-ochreous, head yellowish-brown, apex of scutellum and greater part of the metanotum brownish, the mesonotum with a median and two smaller lateral longitudinal bands more darkly coloured than the rest of the thorax, abdomen yellowish-brown. Pilosity moderately abundant, yellowish, and not long, longest on the back of the head and on the petiole. Head dull, very finely reticulate-punctate, also finely striate between the eyes and the insertion of the scape. Epinotum and nodes subopaque and finely rugulose, metanotum transversely striate, the rest of the body smooth, shining, and nearly

impunctate. Head triangular, widest in front. The eyes occupy the anterior half of the sides. Ocelli very large, pearly white, prominent. Scapes hardly longer than the space between the posterior ocelli; 1st joint of flagellum a little longer than wide, widest apically, but not globose. Clypeus with a prominent tubercle in the middle. Mandibles triangular, shining, feebly striato-punctate, armed with 5 or 6 sharp teeth. Dorsum of epinotum twice as wide as long, feebly bituberculate, a little longer than the subvertical declivity. Peduncle of the 1st segment of the petiole as long as the node, widened on each side near the base into a small lobe; the node low. Second node with fairly sharp lateral angles, sometimes almost dentiform. Wings yellowish, nervures ochreous, the stigma brown.

Bulawayo, not common. (S.A.M., R.M., G.A. colls.; type of ♂ in my collection.)

P. AKERMANI, n. sp.

A rather small species of the *sculpturata* group, but also resembling the *capensis* group in the relatively small size of the ♀♀.

♀. 4.6-4.9 mm. Dark castaneous brown, the posterior fourth of the head, the thorax and petiole with a redder tinge, abdomen piceous, scapes, tibiae and tarsi raw-umber brown, femora brown but paler at the bases and apices. Pilosity yellowish, oblique, fairly long and moderately abundant; pubescence inconspicuous except on the tarsi. Head and thorax dull, abdomen and legs shining.

Head closely and evenly reticulate-punctate, fairly strongly and longitudinally rugose at the sides between the eyes and vertex, the latter only longitudinally striate as far as the posterior third of the head and with the fundamental reticulation absent between the striae, the occipital lobes and lower surface of the head smooth, shining and sparsely punctured. Mandibles shining, striate at the base, sparsely punctured with deep and large punctures. Clypeus strongly carinate, its anterior margin arcuately emarginate in the middle. Pronotum finely and transversely rugulose, mesonotum rugulose-reticulate in front, reticulate-punctate at the sides and behind. Epinotum and petiole reticulate-punctate, the petiole very finely so. Abdomen very finely striate longitudinally at the base medially.

Head, excluding the mandibles, nearly one-third longer than wide, barely wider behind than in front, the sides straight, the occipital emargination angular, wide and deep, the occipital lobes rounded behind. Occipital sulcus deep. Sides of the head behind the eyes with an oblique and shallow depression. The scapes extend back as far as the middle of the head.

Lateral angles of the pro-mesonotum obtuse and not prominent, pro-mesonotal suture obsolete; mesonotum with a feeble transverse torus, not depressed in front of the same, vertical behind it. Dorsum of epinotum as long as wide between the spines, the latter relatively shorter than in our other species of the *sculpturata* group, erect, triangular, as high as they are wide at the base. Declivity of epinotum subvertical, a little longer than its dorsum. Petiole shaped exactly like that of *Liengmei*, race *micrartifex*.

♀. 2.6 mm. Head piceous, excepting the anterior margin and the clypeus, which are yellowish-brown. Thorax reddish-brown (burnt umber), abdomen dark brown, antennae, femora and tibiae brown, bases and apices of the femora, tarsi and mandibles brownish-ochreous. Pilosity yellowish, oblique, fairly scanty, but more abundant than in *micrartifex* Forel. Mandibles, clypeus, legs and abdomen fairly shining, the rest dull. Head and thorax closely and evenly reticulate-punctate, the pronotum with two or three median longitudinal striae on the disc, and finely and longitudinally aciculate on the posterior half of the sides; petiole superficially reticulate, abdomen smooth.

Head oval, one-fifth longer than wide, the sides moderately convex, the posterior margin straight. Mandibles sparsely but very finely punctured and with a few longitudinal aciculations, with seven teeth. Anterior margin of the clypeus convex, finely but distinctly carinate in the middle. Frontal area triangular, large and well defined. Eyes placed in the middle of the sides of the head. The scapes extend beyond the posterior margin by one-seventh of their length. Frontal carinae nearly parallel. Pronotum strongly convex, with barely defined posterior lateral angles. Pro-mesonotal suture arcuate, indicated by a fine raised line. Mesonotum transversely and shallowly impressed in front of the middle. Dorsum of epinotum horizontal and flat, one and a-half times longer than wide, the spines acute, short, not longer than their basal width, directed vertically upwards. Node of 1st joint of the petiole obtuse above, hardly as long as wide; 2nd joint of petiole as long as wide, its anterior margin convex, obtusely angulated in the middle of the sides, but not dentiform or spinose.

Pietermaritzburg (Dr. C. Akerman), ex. Natal Museum coll. (Type in my collection.)

*P. CRASSINODA*, Emery.

Ann. Soc. Ent. France, vol. 63, p. 32, ♀, 1895.

“♀. Piceous; mouth and coxae dull ferruginous; antennae, tibiae and tarsi rufescent, sparsely pilose; legs with a long and very oblique

pubescence. Head subquadrate, hardly narrowed in front; occiput not very deeply excised, the occipito-frontal sulcus shallow; (*head*) opaque in front, punctulate and longitudinally rugose; behind very shining and with large scattered punctures; clypeus striate, nitidulous; mandibles shining, striate at the base. Thorax dull, punctulate and transversely rugose, the pronotum gibbous on each side; mesonotum with a distinct scutellum and a transverse torus; epinotal spines erect, a little shorter than the dorsum of the epinotum. First segment of petiole with a squamiform lobe (= *the nodal portion*) and emarginate above; 2nd segment more than twice as wide as the 1st, not much wider than long, the anterior margin arcuate, the sides obtusely angulate, densely punctulate, dull; the first abdominal segment punctulate at the base, 7 mm. long, the head without the mandibles 2.6 mm.  $\times$  2.4 mm.

“♂. Piceous, mouth, antennae, articulations of the legs, tibiae and tarsi rufescent, dull, very densely punctured, the abdomen shining, except at the base; head ovate, cheeks longitudinally rugose, mandibles striate, pro- and mesonotum without prominences; dorsum of epinotum sulcate in the middle, the epinotal teeth triangular and obtuse, 2nd segment of petiole three times wider than the 1st, subglobose, the sides obtusely angulated, 4.5 mm.

“Makapan; Verulam, Natal (Weitzaecker).”

PHRIDOLE CRASSINODA, Emery, var. PLUTO, n. v.

♀. Mandibles deep castaneous brown, antennae and tarsi yellowish-red, all the rest of the body black. Apart from the colour, this variety also differs from the type of the species as follows: The sculpture is much stronger everywhere. The head, excepting the median area of the clypeus and the mandibles, is dull all over, the reticulate and fundamental sculpture extending over the occipital lobes. The thorax is much more coarsely rugose and the sutures are deeper, also the transverse impression on the mesonotum. The basal third of the abdomen is dull, very sharply reticulate. The scanty punctures on the abdomen are also deeper and larger. Otherwise like the type of the species.

♂. 4.1 mm. Femora and coxae piceous; tibiae, scapes and basal half of the flagellum very dark brown; mandibles, tarsi and apical half of the flagellum ferruginous, the rest of the body black. Legs and apical half of the abdomen smooth and shining, the rest of the body dull, very strongly reticulate-punctate, and much more strongly sculptured than in the type of the species, which it otherwise resembles.

Amatongas Forest, Portuguese E.A. (S.A.M., R.M., G.A. colls. Types in my collection.)

Race *RUSPOLII*, Emery. (Plate VI, figs. 63-66.)

Ann. Mus. Civ. Gen., vol. 38, p. 597, ♂, ♀, 1897.

♂. 8 mm. Piceous or very dark reddish-brown; femora and tibiae a little paler or more reddish, tarsi and antennae ferruginous. Pubescence almost obsolete on the body, yellowish, coarse, oblique and fairly long on the legs and antennae. Pilosity short and yellowish, very scanty, especially on the thorax; some of the hairs on the head and abdomen are closely adpressed, the rest oblique. Anterior half of the head with a slight gloss, the clypeus and space between the frontal carinae smooth and more shining, closely reticulate-punctate and longitudinally rugoso-striate, the striae fairly wide apart. Posterior half of the head very smooth and shining, with a few large punctures. Thorax, upper faces of the nodes and the extreme base of the abdomen superficially and finely reticulate, and with a few feeble transverse rugae here and there; abdomen smooth and shining. Head, excluding the mandibles, as long as wide, widest in the middle, distinctly narrowed in front, not much so behind, the sides convex, the posterior margin not deeply excised, the apex of the excision and the occipital lobes rounded. Occipito-frontal sulcus shallow. The head is highest in the middle, and has a very shallow depression on each side above and behind the eyes. Clypeus feebly carinate, widely and fairly deeply emarginate in front. Mandibles smooth, shining, very finely and sparsely punctured; a row of larger punctures borders the masticatory margin. Scapes extend a little beyond the middle of the head. Eyes small, placed at the anterior third of the sides. Posterior lateral angles of the pronotum moderately acute and prominent. Promesonotal suture distinctly defined. Mesonotum with a transverse median impression, and a transverse torus above the scutellum. Dorsum of epinotum horizontal and flat, one and three-quarter times longer than wide, as long as the declivity; epinotal spines acute, subvertical, divergent, very little longer than their basal width. Posterior dorsal face of the 1st node as wide as long, the dorsal edge barely emarginate; 2nd node two and a-third times wider than long, the anterior margin semicircular, the sides moderately angular, but not spinose or dentiform. Abdomen subcircular, the base transverse.

♀. 4.4-4.7 mm. Piceous; mandibles, flagellum, tarsi and articulations of the legs ferruginous. Pilosity and pubescence as in the ♂.

Head, thorax and nodes dull, closely and finely reticulate-punctate (granulate), the nodes more shallowly so than the rest of the body. Abdomen and legs smooth and shining. Mandibles nitidulous, feebly striate. Head, excluding the mandibles, one-sixth longer than wide, oval. Eyes convex, fairly large, placed in the middle of the sides. Frontal carinae parallel; frontal area depressed and shining. Clypeus with a feeble median carina, the anterior margin entire and convex. The pronotum is rather long, very little shorter than wide, the posterior angles feeble. Mesonotum with a wide transverse impression; in most specimens the anterior margin of the mesonotum is slightly raised in the middle. Meso-epinotal suture deep. Dorsum of epinotum much longer than wide, a little longer than the oblique declivity, longitudinally sulcate in the middle. Epinotal teeth acute, vertical, very small, and hardly longer than their basal width. Dorsal edge of 1st node rounded and thick; 2nd node subconical or hemispherical, widest at the posterior fourth, behind which point it is rather abruptly contracted, but without forming sharp lateral angles. Abdomen oblong. Legs long, the femora a little swollen.

♀. 10.5 mm. (hitherto undescribed). Black, the head sometimes paler or piceous, the mandibles dark castaneous brown, the flagellum and tarsi ferruginous. Pilosity and pubescence as in the ♂. Head dull, the sides closely reticulate-punctate and with large longitudinal rugae superimposed, the vertex longitudinally striato-rugose, the spaces between the striae rugulose. The occipital groove is distinctly defined and transversely ribbed, or clathrate, ending at the anterior ocellus. Mesonotum rugulose, with a shallow and longitudinal rugosity superimposed; a small anterior median area and the borders of the parapsidal sutures smooth and shining. Paraptera longitudinally rugose. Scutellum and meta-notum finely and transversely rugulose, the former slightly shining in the middle. Epinotum shining, the sides sparsely and coarsely rugose, the declivity finely and superficially reticulate. Nodes dull, reticulate-punctate and rugose; the rugae on the 2nd node transverse. Basal fourth of 1st abdominal segment dull and reticulate, the extreme base with a few short rugae, the rest of the abdomen smooth and shining. Head, excluding the mandibles, about one-seventh wider than long, widest behind, the sides convergent anteriorly, the posterior margin concave. Eyes placed in front of the middle of the sides. Clypeus as in the ♂. Mandibles feebly striate but more strongly punctured than in the ♂. The scapes extend back as far as the posterior ocelli. Head barely wider than the mesonotum. The latter almost one-third wider than long. Dorsum of epinotum obsolete between the teeth, the declivity

subvertical; epinotal teeth horizontal, wide at the base, triangular and as long as wide at the base. Second node two and a-quarter times wider than long, widest in the middle, the sides bluntly angular, the anterior margin convex, but not semicircular as in the ♀. Abdomen half as long again as wide. Wings yellowish, nervures ochreous, stigma yellowish-brown.

♂. 7.3 mm. (hitherto undescribed). Reddish-brown yellow (raw umber), tarsi dark ochreous, the middle of the femora brown, antennae pale ochreous, head brown, clypeus and mandibles brownish-yellow. The mesonotum has three longitudinal and sharply-defined dark-brown bands, the median one ending before the middle. Pilosity yellowish, fine, oblique, fairly abundant on the thorax and nodes, sparse elsewhere. Legs and antennae pubescent. Head dull, very finely reticulate, with a fine rugosity superimposed, the rugae radiating outwards from the ocellar region. Mesonotum longitudinally strigose, also sparsely and very shallowly punctured. Scutellum transversely rugulose. Epinotum shallowly reticulate, the sides striate above, the striae becoming stronger and more or less concentric below. Nodes microscopically reticulate and sparsely striate. Thorax slightly shining, more especially the mesonotum and base of the scutellum. Nodes dull. Abdomen smooth and shining.

Head triangular-trapezoidal, widest in front, the posterior margin feebly convex and somewhat produced at the lateral angles. The eyes occupy a little less than the anterior half of the sides. Clypeus subtuberculate or gibbous in the middle. Mandibles with one large apical tooth and three smaller teeth behind. Scapes shorter than the space between the posterior ocelli; 1st joint of the flagellum subglobose, very little longer than wide. Thorax much wider than the head; scutellum convex above, higher than the mesonotum. Dorsum of epinotum with a feeble elongate ridge on each side. First node of petiole as long as wide, the anterior face convex from side to side, the anterior margin rounded; 2nd node campaniform, widest behind, a trifle wider than long. Abdomen large, ovate, narrowed towards the apex, the 1st segment nearly as long as the remaining segments taken together. Wings as in the ♀.

This is a common species near Bulawayo, and is fond of making its nest near houses and in gardens. There are several entrances to the nest, surrounded by large heaps of excavated soil. It is partly graminivorous and collects the seeds of a variety of grasses. (S.A.M., R.M., G.A. colls.)

The following species, being unknown to me in nature, have not been included in the analytical key:

P. ASPERA, Mayr.

Verh. Zool. Bot. Ges. Wien, vol. 12, p. 746, ♀, 1862.

Reise der Novara, Zool. II, Formicid., p. 97, ♀, ♂, 1865.

“♀. 5 mm. Yellowish-brown, the head brown and darkest, the thorax red or yellowish-brown, the flagellum brownish-yellow. The outstanding pilosity is yellow and fairly abundant, that of the legs dense and nearly decumbent. Mandibles longitudinally striate, the apical half sparsely and coarsely punctured, smooth and shining between the punctures. Head dull, the anterior half longitudinally striate, the cheeks rather rugose. The posterior half of the head, as far as the posterior angles, is obliquely and finely rugose and also superficially reticulate-punctate. Clypeus smooth in the middle, shining, fairly sharply carinate, the anterior margin entire. Pronotum more or less transversely rugose, widened on each side behind into a hump. Mesonotum with a transverse torus in the middle, which is angular on both sides. The epinotum is transversely rugose; the epinotal teeth divergent, directed upwards, not acute and not long. The sides of the thorax are sharply reticulate-punctate and somewhat striate. Petiole finely rugose. The 1st node, seen from behind, quadrate, its dorsal edge emarginate; the 2nd node with dentiform dilated sides. Abdomen smooth and shining.

“♂. 3 mm. Head blackish-brown, thorax reddish-brown, petiole and abdomen yellowish-brown, mandibles and flagellum brown-yellow, the legs brownish-yellow or yellowish-brown. Brighter specimens have the head and thorax reddish-brown, and the rest more or less yellowish-brown. The pilosity is fairly abundant. Mandibles longitudinally striate at the base, smooth at the apex and sparsely punctured. Clypeus feebly and longitudinally striate, smooth in the middle, carinate, its anterior margin entire. Vertex, between the frontal area and the frontal carinae, longitudinally rugose, the middle of the head more finely rugose or almost smooth and shining; sides of the head finely rugose. Pronotum shining and almost smooth, its posterior lateral angles feeble. The mesonotum has a feeble transverse torus, and like the epinotum, is reticulate-punctate; epinotal teeth acute, erect and fairly short. First node of petiole not emarginate above, reticulate-punctate and also sparsely rugose lengthwise; 2nd node shining, nearly smooth, not dilated at the sides. Abdomen smooth and shining. Cape of Good Hope.”

I am unable to place this species in any of my groups, as the shape of the head is not stated.



P. CAFFRA, Emery.

Ann. Soc. Ent. France, vol. 63, p. 33, 2, 1895.

"2. 4.5 mm.; head, 1.7 mm. × 1.6 mm. Ferruginous, dull, abdomen piceous and shining. Head depressed behind, narrowly and deeply excised, very closely punctate above, dull, the occipital margin shining, the anterior two-thirds evenly and longitudinally rugose; the frontal carinae prolonged backwards, antennal scrobes as long as the scapes; clypeus with a short carina, barely striate, excised in the middle; mandibles sparsely punctured, striate at the base externally. Thorax transversely rugulose, the pronotum indistinctly bigibbose, the mesonotum with a transverse torus, the epinotum longitudinally grooved above, the spines fairly long, not very acute at the apex. First node of petiole emarginate above, the 2nd node wider, transverse, the sides obtusely conical. Legs shining, with oblique pubescence.

"Hamman's Kraal (Simon)."

"— On a number of points this form agrees fairly well with the description of *P. aspera* (Mayr), which I have not seen. It differs markedly from it by the emarginate clypeus. Mayr does not state that in his species the head is depressed behind, nor that the frontal carinae are prolonged backwards—characters which separate *caffra* from most of the African species of *Pheidole* and unite it with certain Indian forms such as *latinoda*, *rhombinoda*, *Feai*, etc. The head of *caffra* is barely longer than wide, its sides fairly parallel over the anterior two-thirds; further back the sides converge a little; the large occipital lobes are separated by a deep emargination. Seen from the side, the head appears distinctly depressed in its posterior third, the profile of which is oblique. On the median line, which is marked by a distinct groove, there is a wide impression, recognisable only in a certain light. The sculpture of the head consists of a fundamental reticulate puncturation, over which are imposed some trenchant rugae, very regular and longitudinal on the frons, less regular, thicker and anastomosed on the sides; these rugae extend as far as the frontal carinae, *i. e.* as far as the posterior fourth of the head. The scrobes are as long as the scape and are formed by a space between two rugae, wider than the others, one of which is the prolongation of the frontal carinae. On the occiput the punctures are intermixed with rugae and large piligerous foveae. The whole thorax is finely punctured and transversely rugulose. Petiole with piligerous foveae only; abdomen shining, very finely punctulate, more strongly so at the base, which is dull; in addition, it has some elongate piligerous punctures. The legs

have a long, oblique and decumbent pubescence, but no erect pilosity."

As far as one can judge from the above description, this species should be placed in the Punctulata group, and appears to stand nearest to *rotundata*, in which the head is also distinctly depressed behind and shows faint traces of scrobes.

P. KITSCHNERI, Forel.

Ann. Soc. Ent. Belg., vol. 54, p. 436, ♀, ♂ (?), 1910.

"♀ 3.2 mm. Resembling *P. minima*, Mayr, but the frontal carinae are not prolonged backwards, and do not form scrobes. Mandibles smooth, feebly punctured. Clypeus shallowly emarginate in the middle, also feebly carinate in the middle, and having a longitudinal carinula on each side extending from the articulation of the antennae to the anterior margin. Head fairly depressed, obtusely rectangular, the sides convex, slightly longer than wide, feebly concave behind, as wide in front as behind, with a deep occipital sulcus joining the frontal sulcus. Eyes fairly small, placed at the anterior third. The scape does not reach the posterior third of the head. The pro-mesonotum forms a single convexity, without a transverse impression or torus; it is, however, truncate behind and margined above on each side with a little ridge. Epinotal spines acute, shorter than half the space between them. Petiole as in *P. punctulata*, Mayr, but the 2nd node a little narrower. Pronotum without prominent posterior lateral angles. Anterior half of the head longitudinally rugose; a few rugae and reticulations on the sides of the epinotum. The rest of the body smooth. Erect pilosity yellowish, sparse on the body, absent from the tibiae and scapes, which have only sparse, oblique, or nearly decumbent hairs. Brownish-yellow; legs and antennae dirty yellow.

"♂ (?). 2.5 mm. Head oval-rectangular. Mandibles dentate, striate near the base. Clypeus without carinae, feebly emarginate. The mesonotum with two small ridges behind, as in the ♀. Epinotum subdentate. Head fairly smooth in front, excepting a few rugae in the antennal hollows; epinotum reticulate. Otherwise in sculpture, pilosity and colour like the ♀.

"Mountains of Natal (Wroughton). A species distinctly characterised in the ♀ by the shape of the head, clypeus and mesonotum."

P. ARENIPHILA, Forel.

Schultze, Reise Süd-Afrika, vol. 4, p. 11, ♀, ♂, ♀, ♂, 1910.

"♀. 4.2-4.7 mm. Mandibles smooth, shining, sparsely punctured, with two teeth in front and two behind, flattened externally at the

base. Lower margin of the head in front bidentate. Clypeus with a low swelling in the middle, but not carinate, emarginate in the middle in front. Head as wide as long, wider behind, the sides convex posteriorly (widest behind the eyes), deeply excised behind, the occipital groove strong and merging into the frontal sulcus, not depressed behind. The scrobe, which receives the whole of the scape, is reticulate-punctate, not deep, margined above by the frontal carina and below by a strong longitudinal ruga; there is also a shallow impression to receive the end of the flagellum. Frontal carinae prolonged as far as the end of the scapes. Eyes convex, placed at the anterior third. The scape extends back as far as the posterior third of the head. All the joints of the flagellum longer than wide. Head 1.7 mm. long and equally wide. Pronotum rounded above, with two very obtuse and indistinct tubercles. Mesonotum with a very deep transverse impression, and a strong, thick and transverse torus. Dorsum of epinotum horizontal, somewhat longer than the declivity, excavated in the middle posteriorly. Epinotal spines long, thin, as long as the interval between them, directed more upwards than backwards. First node of petiole almost cuneiform, with a fairly long peduncle in front, narrow, very feebly emarginate above. Second node almost three times wider than the 1st, wider than long, very angularly dilated at each side (rhomboid). Fairly shining. Head coarsely and regularly rugose longitudinally, lightly reticulate in between, the posterior part of the head merely reticulate. Thorax coarsely and irregularly rugose transversely, reticulate between the rugae. Petiole more closely reticulate, nearly dull, with a few transverse rugae. First segment of abdomen finely and lightly reticulate, the rest nearly smooth. A fairly short, sparse and yellowish pilosity on the body, the legs and antennae with decumbent hairs only. Brownish yellow-red; the legs paler. Abdomen in front of a bright brownish-yellow, entirely or partly brown behind.

“♂. 2.3-2.5 mm. The whole of the masticatory margin of the mandibles dentate. Clypeus without emargination. Head longer than wide, convex behind the eyes, but the sides converge gradually up to the articulation, without a distinct hind margin and without a neck. Eyes strongly convex, placed in the middle of the sides. The scape extends beyond the articulation of the head by quite one-third of its length. No trace of a scrobe. Mesonotum transversely impressed. Dorsum of epinotum much longer than wide and longer than the declivity, with two fairly long spines which are almost as long as the interval between them. First node low, cuneiform, with a long peduncle. Second node quite three times wider than the first, very

wide and as long as wide. Fairly shining, lightly and finely reticulate all over; posterior half of abdomen smooth. Pilosity as in the ♀. Reddish-yellow, head brownish-yellow. Abdomen yellowish, with brown apex and often with brown sides.

“♀. 6.5 mm. Mandibles, clypeus and scrobe as in the ♀. Head trapezoidal, wider than long, narrower in front, the posterior margin straight. Eyes in the anterior third. The scape does not quite reach as far as the posterior margin of the head. Mesonotum somewhat wider than the head, flat above, with two lateral longitudinal lines. Spines nearly as long as the dorsum of the epinotum, blunt at the apex. Petiole as in the ♀, but the even wider 2nd node has the sides acutely conical. Head coarsely, mesonotum finely and evenly rugose lengthwise. Epinotum smooth above; sides of thorax coarsely rugose. Petiole and abdomen as in the ♀, but the first abdominal segment is nearly dull and closely reticulate-punctate over its basal half. Pilosity as in the ♀. The exerted hairs on the body very short. Yellowish-red; legs and base of the abdomen dirty yellow, the rest of the abdomen dark brown. Deälated.

“♂. 5-5.2 mm. Mandibles bidentate. Head, excluding the eyes, as wide as long, narrowed like a trapezoid towards the articulation behind. Dorsum of epinotum much longer than the declivity, ending in two blunt tubercles. Scape as long as the second joint of the flagellum. Fairly shining, finely and irregularly reticulate or rugulose. Pilosity as in the ♀ and ♀. Brownish-yellow. The vertex and abdomen in part brownish. Wings tinged with brownish-yellow, nervures brownish-yellow, stigma brown.

“Khakhea, Kalahari (Schultze), in sand. Perhaps allied to *caffra*, Em., but the latter has the head strongly depressed behind in the ♀.”

P. VANDERVELDI, Forel.

Rev. Zool. Afric., vol. 2, p. 326, ♀, ♂, 1913.

“♀. 7 mm. Closely allied to *speculifera-crassinoda*, Em., and particularly to its var. *cubangensis*, Forel. It differs particularly in its much longer scape, which almost extends back to the posterior third of the head (to the posterior half in *speculifera*), also in its head, which is much longer than wide, the sides but slightly convex (very convex in *speculifera* and only little less so in *cubangensis*) and in the mesonotum, which has a stronger torus behind, and the pro-mesonotal suture, which is deeper. The eyes are also more convex. The head is in great part dull, with a strong and sparse puncturation on the occiput and vertex. The sides of the occiput alone are slightly shining.

The rugae on the front of the head are coarser and wider apart than in *cubangensis*. The thorax is dull, and so also are the petiole and the base of the abdomen, which are simple reticulate-punctate, whereas the thorax is indistinctly rugose as well. Dark brown, the legs paler, the tarsi and flagellum rusty red. Otherwise identical with var. *cubangensis* of *speculifera*, with the same large node.

“♂. 3.9–4 mm. Larger than *speculifera-crassinoda*, the hind margin of the head rather indistinct but nevertheless defined, wanting in *speculifera*. The antennae are a little longer, and also the joints of the flagellum. The same differences present in the ♀ also occur in the mesonotum of the ♀, which has a distinct tubercle in front, which is absent in *speculifera*. Entirely dull except the posterior half of the abdomen and the legs, which are shining. The front of the head has some fairly coarse and longitudinal rugae. The pilosity is oblique and more abundant than in *speculifera*. Entirely black, the legs, scapes and mandibles brown. Tarsi and club of the antennae rusty red.

“Sankisia, Katanga (Dr. Bequaert); perhaps simply a race of *speculifera*.” Durban (Traegaordh), *teste* Santschi.

### TRIBE CREMASTOGASTRINI, Forel.

Including only the following genus.

#### GENUS CREMASTOGASTER, Lund.

Ann. Sc. Nat., vol. 23, p. 132, 1831.

#### *Characters.*

♂. Antennae 10- or 11-jointed (rarely 9-jointed, *C. edentula* Santschi), the club formed of two or three joints; maxillary palpi 5-jointed; labial palpi 3-jointed. Thorax usually widest in front, constricted at the meso-epinotal suture. The latter deep and well defined, the pro-mesonotal suture usually more or less obliterated at least in the middle. Epinotum armed with two teeth or spines, rarely unarmed. First segment of petiole squamose or cuneiform and decumbent, articulating with the epinotum by a very short and narrow piece, or almost sessile in front; 2nd segment thick, with a short peduncle in front, nodose behind, the node frequently grooved in the middle lengthwise so that the node appears to be made up of two hemispherical lobes or discs. Petiole articulating with the dorsal surface of the abdomen. The latter subcordate, the basal margin straight or subtruncate.

♀. Antennae 10- or 11-jointed. Thorax elongate, pronotum not exposed dorsally. Epinotum with the spines or teeth usually much shorter than in the ♂, or reduced to mere angles. Abdomen oblong-ovate, narrowed apically. Wings with 1 cubital and 1 discoidal cell; the radial cell usually closed. Petiole as in the ♂, but the first segment thicker.

♂. Considerably smaller than the ♀. Antennae 12-jointed, the scape short, rarely longer than the 1st and 2nd joints of the flagellum taken together; usually all the joints of the flagellum except the 1st longer than wide. Pronotum not exposed above; mesonotum and scutellum high; Mayrian furrows obsolete or indistinct. Epinotum unarmed. Segments of the petiole shorter and flatter above than in the ♀. Abdomen subcordate or ovate. Legs thin.

Distribution both hemispheres.

This very large genus contains very many closely allied forms, and to judge by its tendency to form minute variations, appears still to be in a very plastic condition. Owing perhaps to this condition, which does not appear to have been sufficiently realised by some myrmecologists, and also to the lack of abundant material, the taxonomy of the genus is hopelessly confused, and its study presents us with greater difficulties than that of any other genus represented in our region. Many species have a very extended distribution, and exhibit numerous geographical subspecies and varieties. The variation may apply to one or several anatomical features, in such a way that a species may possess several extreme forms, at least some of which are connected with the central type-form by a series of more or less gradual and transitional links. Where such links are numerous, no doubt is left as to the relationship of the terminal forms to the central type. But on the other hand, such links are frequently missing, and where the gaps appear to be rather wide, the tendency has been to accord specific rank to each form. If at a later period the annectant forms are discovered, the natural result is to render the boundaries between the so-called species exceedingly vague, in which case it becomes very difficult to place the latter in any analytical key unless their status is revised and altered. With the yearly growth of our knowledge of the genus and the increase of material brought about by labours of collectors over the whole continent, the time will come when we shall be able to unite many so-called species as forms of one type, and thereby reduce the number of apparently distinct species which are recognised at the present day.

Apart from the differences manifested in geographical varieties, minor distinctions may be shown to occur in the members of the different nests of one species, and it is therefore desirable that large

series derived from many nests and localities should be studied before attempting to make innovations in the classification. It is frequently the case that the ♀ ♀ of the first brood differ not only in size but also in minor details of structure from those of later broods, and I am inclined to believe that not a few new races and varieties have been erected on such slender foundations.

In the separation of the species the following points should be noted:

The pro-mesonotal suture, although usually more or less effaced in the middle, can generally be traced by a depression which becomes deeper at the sides and is often angular in form. At the apex, or a little behind the apex of the mesonotum, there is in many species a longitudinal median tubercle or carinula. It is of some diagnostic value, but as it is liable to variation in the degree of prominence and length, even within the species, too much reliance should not be placed on it. The epinotal spines are similarly variable within the limits of a species, and a great deal too much importance has been attached to the comparative length of those structures in the separation of the species. The mesonotum has a declivous face behind, just above the meso-epinotal suture. This face is usually much shorter than the anterior and more or less horizontal face; it is sometimes concave transversely, and its lateral margins are sometimes defined by sharp raised edges or carinulae. The length of the declivity and its degree of obliquity are characters of diagnostic value and fairly reliable. The 1st joint of the petiole is nearly always thicker (from above to below) behind than in front, and seen from above is generally of a trapezoidal or triangular form, the apex of the triangle truncate and invaginating the short and globose peduncle of the 2nd joint. In measurements of these two joints the length of the 1st should be taken from the level of its anterior angles to the level of the point behind where it touches the anterior margin of the node of the 2nd joint; the length of the 2nd joint should be taken over the node only, since the short peduncle in front is telescoped into the 1st joint to a variable depth and can rarely be seen in its entirety (see Text-fig. 31). Owing to the peculiar mode of attachment of the petiole, which is articulated to the base of the dorsal plate of the abdomen, the latter can be carried reflected over the thorax, and this attitude is assumed when the insect is alarmed, but in some species that position of the abdomen is adopted without any apparent provocation, more especially when the insect is moving head downwards on a vertical or steep plane.

From the anal glands a sticky whitish fluid of an unpleasant odour is secreted, which is freely exuded when the ants are disturbed.

All the members of the genus are very fond of sugary substances, and for this reason most of them are aphidicolous and coccidicolous, and also cultivate the society of Membracid, Fulgorid and Lycaenid larvae for the sake of their secretions. In some Indian species (sub-genus *Physocrema*) the ants appear to be able to draw on a supply of fluid furnished by their own bodies and secreted by the epinotal glands. These glands, which are probably to be found in most ants, are greatly developed in this sub-genus, so that the epinotum becomes greatly inflated. The gland communicates with the exterior by a

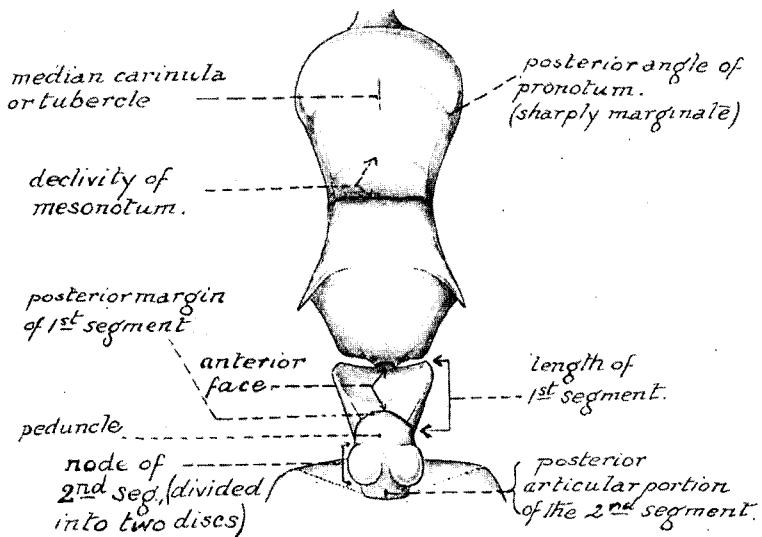


FIG. 31.—Thorax and petiole (semi-diagrammatic), *Cremastogaster*, ♀.

small aperture on each side situated below or behind the stigmatic orifice. Bingham remarks that “in live specimens there seems to be a continual flow from this aperture of a sweet fluid, and I have watched the ♀♀ of *C. physothorax* licking one another’s thoraces vigorously.”

With the exception of an undetermined sp. of *Microdon*, which was bred from the nest of *C. castanea* var. *medio-rufa* (collected at Aberdeen, C.P., by Dr. Brauns), no records of parasitic or myrmecophilous insects attached to this genus are known to me from our South African species. Nevertheless, in other parts of the world various insects of different orders have been found in the nests of *Cremasto-*



gaster, such as the coleopterous *Myrmedonia*, *Conurus*, *Xenalluaudia*. and a few Paussidae and the orthopterous *Myrmecophila*.

Most of the species of the genus are tree-ants, making their nests under the bark, in hollow branches or forming carton nests, which may be either sheltered in cavities in the trees or attached to branches, reeds and bushes. The character of the nest built by any one species is not invariable. Thus *rufo-nigra*, which in Natal usually builds large carton nests attached to the branches of a tree or shrub, is, according to my experience, always found in S. Rhodesia to make its nest in hollow branches, empty galls or under stones without the elaboration of any carton-like substance. Very few of our Rhodesian species nest as a rule in the ground, although young incipient nests may occasionally be found in that situation.

Key to the ♂♂ of *Cremastogaster*.

- (46) 1. Antennae 11-jointed.  
 (3) 2. Antennae exceptionally long, extending back as far as the petiole, and one-third of the scape extending beyond the hind margin of the head  
*Schultzei*, Forel.  
 (2) 3. Antennae of usual length.  
 (7) 4. Head distinctly longer than wide, parallel-sided or nearly so.  
 (6) 5. First joint of petiole trapezoidal; scapes short, reaching the posterior third of the head. . . . . *nigronitens*, Santschi.  
 (5) 6. First joint of petiole oblong, one-third longer than wide; scapes longer, reaching the posterior fourth of the head  
*Welmani*, Forel, race *retusa*.  
 (4) 7. Head as wide as, or wider than long, very rarely a trifle longer than wide, the sides more or less convex.  
 (17) 8. First joint of petiole not trapezoidal.  
 (10) 9. Head and thorax strongly striate; 1st joint of petiole subpyriform, longer than wide, not much wider in front than behind  
*arborea*, Mayr, race *melanogaster*, Em.  
 (9) 10. Head and thorax not strongly sculptured; 1st joint of petiole not subpyriform.  
 (12) 11. First joint of petiole quadrate, wider than long  
*sordidula*, Nyl., var. *rectinota*, Forel.  
 (11) 12. First joint of petiole longer than wide.  
 (16) 13. First joint of petiole minutely bidentate near the posterior margin; the 2nd node globose and without even a trace of a median groove.  
 (15) 14. Epinotum sharply and widely reticulate, its dorsal lateral margins strongly convex; abdomen elongate, not cordate  
*transvaalensis*, Forel.  
 (14) 15. Epinotum not sharply reticulate, the lateral dorsal margins straight and divergent; abdomen cordate  
*Muralti*, Forel, race *livingstonei*, Santschi.

- (13) 16. First joint of petiole not bidentate behind; 2nd node with a feeble median groove; epinotum with very small teeth  
*constructor*, Emery.
- (8) 17. First joint of petiole more or less trapezoidal, widest in front.
- (19) 18. Second node of petiole much wider than long and clearly wider than the 1st; whole body very polished and shining *Santschii*, Forel.
- (18) 19. Second node of petiole not wider, or very little wider than long.
- (29) 20. Second node of petiole without a median longitudinal groove, entire or only slightly emarginate behind; pronotum sharply marginate at the sides, at least on the posterior half.
- (28) 21. Dorsum of epinotum not deeply impressed longitudinally in the middle; mesonotum without a wide transverse impression on each side behind the median tubercle; seen in profile, the mesonotum is not raised above the level of the pronotum.
- (23) 22. Pro-mesonotal suture very shallow, obsolete or nearly so over the middle third . . . *Kneri*, Mayr, race *hottentota*, Emery.
- (22) 23. Pro-mesonotal suture deep and wide, at least at the sides, and fairly clearly defined in the middle.
- (25) 24. Head in greater part smooth and shining; colour more or less bright ochreous . . . *gambiensis*, Andre, var. *krantziana*, Forel.
- (24) 25. Head distinctly sculptured; colour more or less dark brown or reddish-ochreous.
- (27) 26. Median carinula of mesonotum prominent and long; colour dark brown; dorsum of epinotum rather deeply impressed in the middle  
*Kneri*, Mayr, var. *amita*, Forel.
- (26) 27. Median carinula less prominent; colour reddish-ochreous; dorsum of epinotum very shallowly impressed . . . *Kneri*, Mayr.
- (21) 28. Dorsum of epinotum very deeply impressed in the middle; mesonotum with a transverse and wide impression on each side behind the median tubercle; seen in profile, the mesonotum is raised above the level of the pronotum . . . *Kneri*, Mayr, var. *matabela*, Arnold.
- (20) 29. Second node of petiole more or less clearly grooved longitudinally in the middle.
- (31) 30. Epinotum unarmed, or with very minute dentiform tubercles  
*inermis*, Mayr, and races.
- (30) 31. Epinotum with distinct spines or teeth.
- (33) 32. Epinotal spines curved downwards . . . *Buchneri*, Forel.
- (32) 33. Epinotal spines horizontal or directed more or less upwards.
- (45) 34. Sides of pro-mesonotum not marginate, or (rarely) the sides of the mesonotal declivity feebly marginate.
- (36) 35. All the joints of the flagellum as long as, or longer than wide  
*Group A, q. v. infra.*
- (35) 36. At least some joints of the flagellum wider than long.
- (38) 37. Head, excepting a narrow longitudinal streak on middle of the vertex, dull and closely sculptured . . . *Group B, q. v. infra.*
- (37) 38. Head very superficially sculptured and fairly shining, at least over the posterior two-thirds.
- (40) 39. Small species, 3 mm. or less; head not reddish. . . *gallicola*, Forel.
- (39) 40. Larger species 3-5 mm.

- (42) 41. Head distinctly reddish . *acaciae*, Forel, race *victoriosa*, Santschi.  
 (41) 42. Head yellowish or more or less brown.  
 (44) 43. Lateral margins of the disc of the mesonotum bevelled  
*brunneipennis* Andre, var. *omniparens*, Forel.  
 (43) 44. Lateral margins of mesonotum not bevelled  
*Newillei*, Forel, race *Cooperi*, Forel.  
 (34) 45. Sides of mesonotum distinctly marginate over the greater part of their  
 length; the sides of the pronotum also sharply marginate, at least  
 over their posterior half. *Group C*, q.v. *infra*.  
 (1) 46. Antennæ 10-jointed . *Group D*, subgenus *Decracrema*, Forel.

The four groups mentioned in the key are composed of the following species.

*Group A*.—*Peringueyi*, Em.; *monticola*, Arnold; *opaciceps*, Mayr; *solers*, Forel; with their varieties and races.

*Group B*.—*Godefreyi*, Forel; *bulawayensis*, Forel; *misella*, Arnold; with their varieties and races.

*Group C*.—*Castanea*, Smith; *scrutans*, Forel; *excisa*, Mayr; *impressa*, Emery; with their varieties and races (var. *medio-rufa* hardly fits in with their group, but it cannot be placed elsewhere).

*Group D*.—*Liengmei*, Forel; *Arthur-Muelleri*, Forel; with their varieties and races.

Three sub-genera are represented in our region, viz. *Atopogyne*, Forel; *Oxygyne*, Forel; and *Decracrema*, Forel. These will be dealt with in their place further on.

#### C. CASTANEA, Smith.

Cat. Hymen. B.M., vol. 6, p. 136, ♂, ♀, 1858.

“♂. Length 2 lines (4.1 mm.). Head and thorax rufo-ferruginous, abdomen brownish-black, with the base obscure rufo-fuscous. The head, seen from above, rotundate, scarcely shining; the thorax deeply constricted at the base of the metathorax (*epinotum*), which is armed with two diverging acute spines; the legs ferruginous, the tibiae and tarsi darkest. Abdomen: the 1st node of the petiole, viewed in front, heart-shaped, the pointed end upwards; the 2nd node globose, with a deep longitudinal incision above.

“♀. Length 4 lines. Rufo-ferruginous, smooth and shining; the thorax with a central and two lateral longitudinal rufo-fuscous stripes, the metathorax not spined; wings hyaline, the nervures testaceous. Abdomen oblong, the apical margins of the segments fuscous, slightly depressed and thinly sprinkled with short cinereous pubescence.”

It has been shown by Emery that *tricolor*, Gerst., as a specific name

must sink as a synonym of *castanea*, Smith, which antedates it; it is retained, however, as the sub-specific name of the form which occurs in Madagascar and Natal. As far as I am aware the type-species is not African.

Race TRICOLOR, Gerst. (Plate VI, figs. 72, 72 a).

Monatsb. Akad. Wiss. Berlin, p. 263, ♀, 1858.

Forel, Mitth. Schweiz. Ent. Ges., vol. 7, p. 388, ♀, ♂, 1887.

♀. 4.2-4.8 mm. Head, thorax and petiole varying from bright yellowish-red to chestnut-red (burnt sienna), the 1st segment of the abdomen varying from ochreous yellow to reddish ochreous over its basal two-thirds, the whole of the remaining segments dark brown with yellowish and somewhat translucent apical margins. Tibiae and tarsi more or less brownish-red. Antennae coloured like the head but somewhat fuscous on the club and on the basal half or two-thirds of the scape. Pilosity almost entirely absent excepting a few short and thin hairs on the pronotum and apical margins of the abdominal segments. Pubescence very fine, microscopical, not very abundant, decumbent all over except on the flagellum, where it is oblique and longer than elsewhere. Head dull, very finely and closely rugulose longitudinally, sometimes almost striato-rugulose; the anterior corners, between the antennal sockets and the eyes, distinctly striated obliquely. The space between the frontal carinae is slightly shining, with the sculpture somewhat effaced. Mandibles longitudinally striate, dull, the masticatory margin black, armed with 4 or 5 sharp teeth. Thorax dull, reticulate-rugulose, the sculpture on the epinotum becoming progressively weaker, so that at least the lower half of the declivity is smooth and shining. Occasionally there is a feeble longitudinal rugosity superimposed on the pronotum and extreme base of the epinotum. Petiole microscopically reticulate or alutaceous, dull except the upper face of the 1st node, which has a slight gloss. Abdomen and legs feebly shining, the former very finely alutaceous.

Head rotund, a trifle longer than wide, the sides convex, the hind angles widely rounded, the posterior margin very feebly concave in the middle, or nearly straight. Anterior margin of the clypeus feebly convex in the middle; the median area fairly convex transversely and lengthwise, its posterior margin arcuate and not clearly defined. Frontal area triangular and indistinct. Behind it is a median impressed line ending at the posterior third of the head. Scape as long as the head, 1st joint of flagellum twice as long as wide, 3rd and

4th joints as long as wide, all the remaining joints longer than wide, the club 3-jointed. Thorax at its widest point hardly half the width of the head. Pronotum much wider than long, the posterior half of the sides sometimes fairly sharply margined. Pro-mesonotal suture indicated by a wide and shallow depression. Mesonotum longer than its basal width, the sides marginate, the median tubercle elongate and well defined. Meso-epinotal suture very deep. The dorsum of the epinotum widens gradually backwards, and merges gradually into the oblique declivity, which is longer than the dorsum. Epinotal spines acute, strongly divergent, directed obliquely upwards, nearly two and a half times longer than their basal width, as long as, or a little longer than the dorsum of the epinotum. First node of petiole more or less subcordate or trapezoidal, the anterior angles rounded, the dorsal face shallowly concave transversely, wider than long. Peduncle of 2nd joint as long as its node, the latter twice as wide as long, and divided by a strong longitudinal groove into two more or less spherical and convex discs. Abdomen cordate-triangular, longer than wide, the basal margin straight, with moderately sharp angles.

♀. 8.6 mm. Pilosity and pubescence as in the ♂, the colour similar but darker. Head dull, finely, closely and longitudinally striate, the striae curving outwards behind the ocelli, the spaces between the striae very finely and sparsely punctured and somewhat rugulose. The clypeus and anterior third of the head more strongly striate than the rest. Mandibles strongly striate and punctured between the striae. Pronotum dull and finely reticulate-punctate and rugulose. Mesonotum and scutellum smooth and shining, sparsely and finely punctured. Dorsum of epinotum feebly rugose and dull, the sides sharply striate and reticulate-punctate between the striae; declivity smooth and shining. Sides of thorax reticulate-punctate and longitudinally striate, more finely so than on the sides of the epinotum. Nodes coriaceous and dull, the 2nd also shallowly punctured. Abdomen smooth and moderately shining. Head widest in the middle, the sides converging in front of the eyes, parallel and straight behind the same, the posterior margin straight, strongly convex above. Head nearly one-third wider than the thorax. Mesonotum moderately convex from side to side, a little longer than wide. Paraptera and scutellum together a little more than half as long as the mesonotum. Dorsum of epinotum nearly four times wider than long, merging by a very short curve into the vertical declivity. First node of petiole similar to that of the ♂ but shorter, more deeply excavated in front, with the anterior angles more rounded. Second node convex at the sides, one and a-half times wider than

long, the median groove almost obsolete. Abdomen one and a-half times longer than wide. Deälated.

“♂. 3·7 mm. Head and abdomen brown, the rest of a very pale brown. Wings hyaline. A moderate and oblique pilosity present on the body. First joint of petiole wider in front than behind.”

Durban, Grahamstown and Port Alfred. Common in Natal. (S.A.M., R.M., G.A. colls.)

Var. *SIMIA*, Forel.

Schultze, *Reise Süd-Afrika*, vol. 4, p. 6, ♀, ♀, ♂, 1910.

“♀. 4–6 mm. Larger than the type-species, from which it differs by the coarsely and longitudinally rugose dorsum of the thorax, the declivity of the epinotum excluded. The mesonotum is also less sharply marginate. Otherwise like the type in all particulars, including colour and the dull reticulate-punctate sculpture of the thorax.

“♀. 9·5 mm. Head large, much wider than the thorax. Mesonotum smooth. Sides and dorsum of epinotum longitudinally rugose. Otherwise like the type of the species.

“♂. 4·3 mm. Mesonotum partly longitudinally rugose (*rugulose?*) and shining. Otherwise like the type-species.

“Chakamakue, between Lehututu and Letlake, Kalahari. In acacia wood.”

Var. *DURBANENSIS*, Forel.

(As var. of *ferruginea*) Bull. Soc. Vaud. Sc. Nat., vol. 50, p. 234, ♀, 1916.

♀. 4–5 mm. Head, thorax and petiole brownish-red (burnt umber), the thorax sometimes paler than the head. Abdomen dirty ochreous-yellow, the apical fourth of all the segments brownish. The meso-epinotal suture is deeper than in *tricolor* or *rufonigra*, and the base of the epinotum a trifle more convex lengthwise than in *tricolor*. The dorsum of the epinotum widens rapidly backwards (*i. e.* the sides are strongly divergent posteriorly) and the spines are about twice as long as their basal width. The 2nd node of the petiole has a deeper and narrower median groove than *tricolor*. Otherwise like that race.

♀. 9 mm. Abdomen dark reddish-ochreous, the apical margins brownish, the apical segment yellowish-brown except at the base. The upper face of the 1st node is more concave, and the excavation extends further back than in *tricolor*. Otherwise like that race.

Durban. (S.A.M., R.M., G.A. colls.)

This variety should be attached to race *tricolor* rather than to race *ferruginea*. The dorsum of the metanotum is like that of *tricolor*, and moreover, except in colour and the shape of the 1st node, the ♀♀ of the two are indistinguishable.



FIG. 32.—Race *tricolor*, var. *durbanensis*.

Race RUFONIGRA, Emery.

Ann. Soc. Ent. France, vol. 63, p. 27, ♀, 1895.

♀. 4.2–5 mm. Head and thorax varying from pale reddish-brown to dark chestnut (a reddish burnt umber). Petiole darker than the thorax, abdomen dark brown or brownish-black, a trifle paler at the base but not yellow as in race *tricolor*. Legs dark brown, tarsi more ferruginous, antennae reddish-brown, the club and scape usually darker. The fundamental sculpture of the thorax is a little stronger, and the reticulations wider apart than in *tricolor*. The sides of the mesonotum are not so sharply margined as in that race, and the epinotal spines are considerably stouter, especially at the base, and also a little shorter or not more than twice as long as their basal width. The median groove on the second node is shallower than in *tricolor*, and the posterior margin of the discs of the node less sharp. Otherwise like race *tricolor*.

♀. 8–9.6 mm. (hitherto undescribed?). Head dark chestnut red, usually paler in front. Thorax dark brown, the epinotum and petiole less dark. Abdomen black, legs and antennae dark brown. The apex of the scutellum is narrower and more angular than in *tricolor*, and the brow of the declivity of the epinotum is less abrupt. The 2nd node is more distinctly divided into two discs, the median groove being fairly deep behind. Otherwise like *tricolor*. Wings hyaline, nervures and stigma pale yellow.

♂. 4 mm. Dark brown; the head black, the paraptera, metanotum, dorsum and declivity of epinotum brownish-yellow or yellowish-brown. Flagellum pale dirty ochreous; tarsi pale brown; wings hyaline, nervures and stigma brownish-yellow. Pilosity pale yellow, short and scanty, exerted on the scutellum and petiole, more or less decumbent elsewhere. Flagellum with abundant and exerted pubescence. Head

very finely striate longitudinally, and in part reticulate punctate, dull, except a shining groove between the clypeus and the indistinct frontal area. Anterior half and sides of mesonotum shining, the median portion behind very finely striate and duller, with large and shallow punctures all over. Scutellum and epinotum smooth and shining, the latter very shallowly rugulose near the base. Petiole moderately shining, the 1st node faintly reticulate-punctate. Abdomen shining, the first segment with a few large and shallow punctures. Head one-third wider than long, widest in front, the sides subparallel for a short distance behind the eyes, thence converging posteriorly. The eyes occupy a little more than the anterior half of the head. Scapes very short, hardly twice as long as wide, or about as long as the 2nd joint of the flagellum; the 1st joint of the latter subglobose, as long as wide. Mandibles small, with 2 or 3 teeth. Anterior half of mesonotum very convex transversely and lengthwise. Mesonotum a little longer than wide, sides of scutellum vertical, very finely striate longitudinally. Dorsum of epinotum very short, the declivity steep. First joint of the petiole as long as wide, the anterior half of the upper face excavated; 2nd joint nearly twice as wide as long, oblong.

S. Rhodesia, common.; Natal (H. W. B. Marley and C. B. Cooper). This is a pugnacious species, which in S. Rhodesia makes its nests in hollows in trees, or in hollow branches, and more rarely in galls; elsewhere it has been recorded as making large carton nests, attached to the branches of trees and shrubs. (S.A.M., R.M., G.A. colls.)

Var. *MEDIO-RUFA*, Forel. (Plate VI, figs. 77, 77a and b.)

Voeltzkow, *Reise Ost Afrika*, vol. 2, p. 81, ♀, ♂, 1907.

♀. 4 mm. Head, thorax and petiole reddish-brown, the median posterior fourth of the head and the sides of the thorax generally darker. Abdomen brownish black, antennae and legs dark brown. The sculpture is similar to that of race *rufonigra*, but stronger and more distinctly reticulate punctate (granulate). The dorsum of the epinotum also has a fine longitudinal striation superimposed, absent in the race. It differs from the latter in the following features: The sides of the pronotum are barely marginate, of the mesonotum not at all; the median tubercle of the latter is feebler, the declivity of the mesonotum is more oblique and shorter, and the suture shallower; the dorsum of the epinotum is narrower between the spines and more parallel-sided (in the race the dorsum is more or less trapezoidal).

♀. 8 mm. Pilosity and pubescence as in *rufonigra*, colour similar but a shade darker, particularly the head, which is castaneous red.



The head is duller than in the race, and the sculpture stronger, the spaces between the striae roughened. The scutellum is wider and less convex posteriorly, and the dorsum of the epinotum is strongly striate transversely and furnished with a fairly acute triangular tooth on each side (these are absent in the race). In addition, the declivity is vertical, its brow rectangular, the two faces not merging by a gradual curve as in the race. Wings hyaline, nervures and stigma dark brown (yellow in the race).

♂. 4.1 mm. Dark brownish-black. The sculpture is stronger than in the race, and the mesonotum has a very fine reticulate puncturation in addition to the rugulosity, and is in consequence duller. The posterior half of the 1st node is reticulate-punctate, and in front is vertically truncate. The exerted hairs on the epinotum, petiole and abdomen are longer and a little more plentiful than in the race. Otherwise like *rufonigra*.

Aberdeen, Cape Prov. (Dr. H. Brauns). (S.A.M., R.M., G.A. colls.; type of ♀ in my collection.)

Var. *CACODAEMON*, Forel.

(As race of *C. Peringueyi*, Em.) Bull. Soc. Vaud. Sc. Nat., vol. 50, p. 234, ♂, ♀, ♂, 1914.

The insects described under this name by Dr. Forel include two distinct forms, one of which is a variety of *Peringueyi*, and the other variety described hereunder, which must be attached to *castanea*, race *rufonigra*, and is closely allied to var. *mediorufa*. For the other variety a new name is required, and will be treated further on as var. *angustior* of *Peringueyi*.

♂. 3.7-4.1 mm. Reddish piceous, the petiole and thorax in parts sometimes a little paler, abdomen piceous or black, legs and antennae dark brown. Sides of pronotum more convex than in *mediorufa*, the mesonotum more convex lengthwise, the declivity merging gradually into the anterior part of the mesonotum. Epinotal spines less divergent than in *mediorufa*. First segment of the petiole distinctly narrower than in *mediorufa*, much less widened in front than in that variety, and with less rounded anterior angles. Otherwise like *mediorufa*.

♀. 9.5 mm. Black, flagellum, mandibles and tarsi dark reddish-brown. The sculpture of the head a little finer and much closer than in *mediorufa*. Mesonotum, excepting a narrower anterior and median area which is shining, dull and coarsely rugulose-punctate. Dorsal face of the 1st segment of the petiole a little shorter, the anterior angles less rounded than in *mediorufa*. Otherwise like that variety.

♂. 3.8 mm. Thorax narrower than in *mediorufa*, the median shining area on the mesonotum narrower and more sharply defined. Second segment of the petiole wider and shorter, twice as wide behind as long (one and a-third times wider than long in *mediorufa*). Otherwise like that variety.

Willowmore, C.P. (Arnold). The nest is a small and irregularly-shaped carton nest attached to the branches of median-sized shrubs or small trees.

Var. *QUISQUILIA*, Santschi.

Ann. Soc. Ent. France, vol. 84, p. 502, ♀, 1916.

♀. 5 mm. Of a brighter red than in the type, the base of the abdomen diffusely reddish-brown in some specimens. The fundamental sculpture is stronger than in the race, and the thorax has also some longitudinal rugae which are strongest on the base of the epinotum. The epinotal spines are a little longer than in the type of the race, and are also slightly sinuate in their apical half. The anterior angles of the 1st node are more pronounced, and the upper face of the node is distinctly margined at the sides. Otherwise like the race.

Victoria Falls, S.R. (G.A. coll.)

Var. *BRUTA*, Santschi.

(As race of *ferruginea*, Forel.) Bull. Soc. Ent. France, p. 412, ♀, 1913.

♀. 4.3–4.5 mm. Head and thorax reddish-brown or sordid yellowish-brown; 1st, 2nd and 3rd segments of abdomen more or less dark, brownish-yellow in the middle, shading off to dark brown at the sides and at the extreme apical margins, the paler areas most distinct on the 1st segment, the apical segments dark brown. The median tubercle of the mesonotum is stronger than in *quisquilia*. The petiole is narrower than in that variety, and the 1st joint less distinctly margined at the sides. The 2nd joint is longer than it is wide across the middle. Apart from these slight differences this form hardly differs from var. *quisquilia*, and I think it should therefore be placed with *rufonigra* rather than with *ferruginea*.

Springvale, S. Rhodesia. (G.A. coll.)

Race *FERRUGINEA*, Forel.

(As species) Mitth. Schweiz. Ent. Ges., vol. 8, p. 353, ♀, 1892.

“♀. 4.8–6 mm. Mandibles longitudinally striate, with 4 or 5 teeth. Head, excluding the mandibles, rectangular and rounded at

the angles, somewhat wider than long, fairly straight in front and behind, much the same as in *tricolor*, but with the sides less convex. Club of antenna distinctly 3-jointed. Pronotum and mesonotum about the same as in *tricolor*, but the pronotum is nevertheless narrower and less sharply and less projectingly marginate at the sides. The lateral marginal carinae of the mesonotum are more obtuse and less distinct behind. Meso-epinotal suture as in *tricolor*. The epinotum is much narrower than in *tricolor*, especially in the middle at the level of the spines, and hardly wider there than in front or behind (rhomboidal in *tricolor* and strongly dilated in the middle). Moreover, the sides of the dorsum of the epinotum diverge but feebly, so that the thorax, seen from above, appears less constricted than in *tricolor*. The spines are fairly long, thin, and widely divergent. The declivity of the epinotum is lower and more oblique than in *tricolor*. First segment of the petiole trapezoidal, with rounded anterior angles and straight anterior margin, wider in front than long, and wider there than behind, with a blunt tooth in front below. Second segment of petiole divided by a median groove into two hemispheres. Abdomen fairly flat, long and relatively narrow. Head closely and finely punctate-rugulose, with a somewhat silky gloss. Thorax coarsely and sparsely longitudinally rugose, closely reticulate-punctate between the rugae and fairly dull, excepting the smooth and shining declivity of the epinotum. Petiole closely reticulate-punctate. Abdomen feebly reticulate, evenly and sparsely punctured, very shining. Outstanding pilosity almost obsolete. Femora and scapes with a decumbent pubescence. The pubescence is very short and scattered. Rusty yellowish-red. The abdomen brighter, of a reddish brown-yellow. Legs and club of antennae brownish. Mandibles brownish-red. Closely allied to *tricolor*, but clearly distinct on account of the shape of the epinotum and the 1st segment of the petiole, by the longer, narrower, and flatter form, and by the colour and sculpture."

Somaliland; and East Coast of Africa, including Natal.

Having only a single specimen (a co-type) of this species, I have preferred to copy the original description. In the specimen referred to the dorsum of the epinotum is shorter and much more convex lengthwise than in *tricolor*; the spines are shorter than in that race, or not quite twice as long as their basal width, and a little shorter than the dorsum of the epinotum. The posterior margins of the hemispherical discs of the 2nd node are more elevated and prominent than in *tricolor*, and the pro-mesonotal suture is also deeper.

*C. NEUVILLEI*, Forel.

Rev. Ent. (Caen), vol. 26, p. 140, ♀, 1908.

“ ♀. 3.9–5 mm. Mandibles strongly striated, the masticatory margin moderately oblique, short. Anterior margin of clypeus straight and entire. Frontal area distinct. Head more or less quadrate, slightly wider than long, distinctly wider behind than in front, feebly emarginate behind, rounded behind the eyes. The latter fairly large, placed in the middle of the sides, of which they occupy nearly one-quarter. The scapes extend back as far as the occipital margin. Antennae 11-jointed, all the joints of the flagellum longer than wide, but the 3rd–5th joints are almost as wide as long. Club 3-jointed. Dorsum of pronotum convex and marginate. Pro-mesonotal suture distinct. Dorsum of mesonotum longer than wide, wider in front than behind, slightly convex, marginate at the sides, without a median carina or tubercle. Meso-epinotal suture fairly strong. Dorsum of epinotum fairly convex, widened posteriorly, wider than long, ending in two robust spines, short, feebly pointed, subhorizontal, feebly divergent and slightly curved inwards; their external margins continuous with those of the dorsum; they are a little longer than their basal width. Declivity oblique, as long as the dorsum of the epinotum. First node as in *C. scutellaris*, Ol., widened in front, the anterior margin straight, the anterior angles rounded, without a tooth below. Second node divided into two subcircular halves by a deep groove; it is a little less wide than the 1st node. Abdomen fairly elongate. Finely but quite distinctly reticulate, not very shining. Thorax and petiole subopaque. Clypeus and cheeks finely and closely striated longitudinally. Pronotum finely rugose transversely. Legs and scapes reticulate; declivity of the epinotum smooth. There is a sparse and much obliterated puncturation, somewhat more distinct on the abdomen. Pilosity absent, except a few hairs on the front of the head and the under-side of the abdomen. There is a yellowish, adjacent, short and evenly spaced pubescence on the whole body and on the limbs. Castaneous brown, including the legs. Thorax and petiole of a rather paler brown. Abdomen yellowish rusty-red, mandibles and front of the head of a more reddish-brown.

“ Uomber, S. Africa.”

Race *COOPERI*, Forel. (Plate VI, figs. 76, 76 a.)

Bull. Soc. Vaud. Sc. Nat., vol. 50, p. 233, ♀, 1914.

“ ♀. 3.3–5 mm. Differing from the type-species by the 2nd node being much less deeply grooved. The groove is very superficial in

front of the constriction (*i. e.* the posterior articulation of the node). There is a very distinct transverse impression in the middle of the mesonotum which does not occur in the type. In addition, the abdomen has a fairly long pubescence, whereas it is very short and more scattered in the type. The colour is yellower and duller, but similarly distributed. Otherwise identical."

The transverse impression on the mesonotum is absent in the smaller ♀♀, and even in some of the larger ones. The epinotum is armed with very short, triangular teeth, somewhat variable in length, but not longer than their basal width. The scapes do not reach the occipital margin, falling short of the same by as much as the apical width of the scape. The dorsal face of the 1st node is distinctly concave from side to side, more so than in *castanea*, *tricolor* and *ferruginea*. The median tubercle of the mesonotum is very prominent, especially when seen from the side, and the dorsum of the epinotum is convex, short, hardly more than half the length of the declivity.

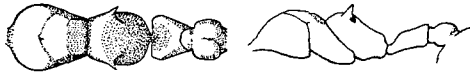


FIG. 33.—*C. Neuvillei*, race *Cooperi*.

♀. 9 mm. (hitherto undescribed). Castaneous brown, the petiole a little brighter, the apical margins of the abdominal segments dirty ochreous and translucent. Sculpture, pilosity and pubescence as in *tricolor*, but the epinotum above and at the sides is duller and more densely rugulose. The epinotal teeth as in *tricolor*, the declivity of the epinotum shorter. The scapes are shorter and thicker, not extending back beyond the posterior ocelli, also more strongly curved near the base. The 1st node is twice as wide as long, more deeply excavated in front than in *tricolor*; 2nd node feebly grooved posteriorly.

Durban. (S.A.M., R.M., G.A. colls.; type of ♀ in my collection.)

Race *COOPERI*, var. *INGRAVIS*, Forel.

*Loc. cit.*, p. 341, ♀.

♂. 3.1–4.8 mm. Much darker than the race, of a warm reddish-brown. The sides of the head are a little less convex. This form hardly merits separation as a variety; I am unable to confirm the other differences noticed by Forel.

Durban (L. Bevis and C. B. Cooper). (S.A.M., R.M., G.A. colls.)

C. NEUVILLEI, Forel, race CARININOTUM, Santschi.

Ann. Soc. Ent. France, vol. 85, p. 279, ♂, 1916.

“♂. 3.8–4 mm. Reddish-brown. Legs more or less pale castaneous brown, abdomen black, its base sometimes more or less reddish-brown. Occiput and 2nd joint of the petiole brownish. Reticulate, the thorax distinctly reticulate-punctate. Head finely and longitudinally striate; the frons more or less smooth. Abdomen very finely reticulate, almost smooth. Declivity of the epinotum smooth. Nearly dull, only the frons and abdomen fairly shining. Pilosity sparse, pubescence as in the type. Margin of pronotum rounded. The mesonotum has a median carina in front, absent from the type of the species and its races. Meso-epinotal constriction fairly deep; epinotal teeth as long as their basal width, but also somewhat variable. Second node of petiole as strongly grooved as in the type of the species, which it otherwise resembles.”

Bulawayo (Arnold).

C. BRUNEIPENNIS, Andre, race OMNIPARENS, Forel.

Rev. d'Ent., vol. 9, p. 323, ♂, ♀, 1890.

(Race) Bull. Soc. Vaud. Sc. Nat., vol. 50, p. 237, ♂, ♀, 1914.

♀. 2.6–3.9 mm. Varying from a brownish ochreous yellow to a clear reddish-brown, the abdomen usually darker and the head paler



FIG. 34.—*C. bruneipennis*, race *omniparens*.

and more clearly reddish-brown or burnt sienna. Sides of head in front of the eyes finely longitudinally striate, the rest of the head very smooth and shining (more polished than in race *Cooperi*), sparsely, finely and sharply punctured. Thorax and petiole moderately shining, very superficially, irregularly and sparsely striato-rugulose. Abdomen smooth and shining. The anterior face of the pronotum is less oblique than in *Newvillei*, race *Cooperi*, joining the dorsum by a shorter and more abrupt curve. The disc of the mesonotum is obliquely bevelled at the sides (in *Cooperi* it forms a continuous convexity transversely). In most specimens the epinotal spines are a little longer than in that race, and the median longitudinal impression on the dorsum of the epinotum is a trifle deeper. The petiole is shaped like that of *Cooperi*, but the 1st node is usually a little wider

(varying from one-fourth to nearly one-third wider than long), and the anterior angles are more widely rounded; the 2nd node has a shallow median groove, somewhat deeper than in *Cooperi*.

Durban (Arnold).

This form appears to me to be very closely allied to *Neuvillei*, and I would attach it to that species as a variety but for the fact that *bruneipennis*, Andre, is known to me only from the description. Indeed, some of the specimens determined by Forel as *omniparens* (No. 330, leg. C. B. Cooper) cannot be distinguished from *Neuvillei*, race *Cooperi*.

(S.A.M., R.M., G.A. colls.)

C. ACACIAE, Forel, race VICTORIOSA, Santschi.

Zool. Anzeiger, vol. 15, p. 142, ♀, 1892.

(Race) Ann. Soc. Ent. France, vol. 84, p. 497, ♀, 1916.

♀. 3-5 mm. Head, thorax and petiole varying from a clear yellowish-red to dark reddish-brown, the head usually paler and more yellowish. Abdomen dark brown or piceous, the apical margins of the segments testaceous, the 1st segment in greater part dull brownish ochreous, becoming lighter towards the base. Legs dull, ochreous, the antennae somewhat redder. Pilosity and pubescence sparse. Head very shining, the rest of the body moderately shining. Cheeks, clypeus and mandibles finely and longitudinally striate, the rest of the head smooth, shallowly and sparsely punctured, the occipital face microscopically rugulose. Pro- and mesonotum very finely rugulose, the mesonotum also finely striolate longitudinally; dorsum of epinotum rugulose, the rest smooth and shining. Head, excluding the mandibles, as wide as, or a little wider than long, the sides fairly convex, slightly narrowed in front (less so in the smaller ♀♀ than in the larger), the posterior margin almost straight. Eyes not small, placed in the middle of the sides of the head. Frontal area triangular and clearly defined; frontal sulcus distinct and extending to the middle of the vertex. The scape extends back as far as the occipital margin; 3rd-6th joints of the flagellum wider than long. Pronotum not marginate. Pro-mesonotal suture fairly well defined in the larger ♀♀. In the latter the mesonotum is fairly convex from side to side in front, and slightly constricted on each side in front of the declivous face, the latter short, oblique and feebly marginate at the sides. In the smallest ♀♀ the declivity of the mesonotum is almost obsolete, the profile of the pro- and mesonotum forming a single convexity as far as the meso-epinotal suture. The latter is fairly deep. Dorsum of

epinotum very convex lengthwise in the ♀ major, barely convex in the ♀ minor, about twice as wide as long, not much wider behind than in front, ending in two very divergent spines, directed obliquely upwards, distinctly curved inwards towards their extremity, and about one-fourth as long as the space between their bases. First joint of petiole trapezoidal, as wide as, or a little wider than long, the angles widely rounded. Second node very shallowly grooved in the middle, the groove becoming a little deeper behind, the hind margin emarginate in the middle and very prominent when seen in profile.

Victoria Falls. (S.A.M., R.M., G.A. colls.)

Not unlike *Neuvillei*, race *Cooperi*, from which it may be distinguished by the shape of the mesonotum, the more prominent hind margin of the 2nd node, and the 3rd-6th joints of the flagellum, which in *Cooperi* are longer than wide.



FIG. 35.—*C. acaciae*, race *victoriosa*.

*C. EXCISA*, Mayr.

Ann. K.K.N.H. Mus. Wien, vol. 10, p. 139, ♀, 1895.

“♀. 3.5-3.8 mm. Bright rusty red, antennae and legs brown, abdomen usually dark brown, the 1st segment either of a brownish-red more or less all over, or only at the extreme base. Pilosity altogether wanting; the short decumbent pubescence is very sparse on the head, thorax and petiole, less so on the abdomen and legs, more abundant on the antennae. Mandibles quadridentate, sharply striate longitudinally. The head is about as long as wide, or wider, the cheeks close and finely longitudinally striate, the clypeus more or less finely rugulose longitudinally, the anterior margin fairly straight, the frontal area indistinctly defined, the frons between the frontal carinae, and particularly in their immediate vicinity, finely and longitudinally rugulose, in the middle shining and often smooth, the back of the head shining and smooth, with very scattered piligerous punctures; laterally and near inner margin of the eyes finely rugulose, behind the eyes finely coriaceous-rugulose, or almost smooth. The scape of the 11-jointed antenna almost reaches the posterior margin of the head, the 3rd-5th joints of the flagellum wider than long, the two following joints about as long as wide, the club distinctly 3-jointed. The eyes are placed a little behind the



middle of the sides of the head. The moderately finely and longitudinally rugulose thorax is fairly short and quadrate, gradually narrowed from the rounded shoulders of the pronotum as far as the meso-epinotal suture. The pronotum, neglecting the neck-like prolongation in front, is wider than it is long in the middle, very distinctly marginate at the posterior angles and somewhat prominent; the pro-mesonotal suture somewhat impressed. The mesonotum is very feebly arched, the anterior part quite flat, the median carinula weak, distinctly marginate at the sides; the declivous face slopes downwards to the meso-epinotal suture fairly steeply and is feebly concave, and when seen obliquely from in front appears arcuately emarginate above, margined on each side by a sharp edge, which ends above in a very blunt tooth or projection. The meso-epinotal suture is narrow but deep. The dorsum of the epinotum is about twice as wide at the base as it is long in the middle. It has in addition to the longitudinal rugae a fine reticulate rugulosity, which is also apparent to some extent on the lateral margins of the dorsum of the pro-mesonotum. The epinotal spines are straight, directed outwards, backwards and upwards, fairly far apart, hardly longer than one-third of the space between them; the declivity of the epinotum is fairly large, feebly concave, smooth and shining. The 1st segment of the finely coriaceous-rugulose and shining petiole is trapezoidal, somewhat wider than long, or perhaps as long as wide, with strongly rounded anterior angles; the 2nd segment deeply and sharply grooved above. The shining abdomen is exceedingly finely coriaceous and almost smooth.

“Loango, West Africa; Sierra Leone.”

The type-species has not been recorded from our region, but is possibly represented by the following variety:

VAR. MALEDICTA, Forel.

Bull. Soc. Vaud. Sc. Nat., vol. 50, p. 236, ♂, ♀, 1914.

“♂. 3.3–4 mm. Differs from the type of Mayr by its deeper reddish colour, by the subopaque head, finely but not deeply striate longitudinally. It is smaller and darker than the race *lacustris*, Santschi, which, besides, has not a striated head. The eyes are fairly convex.”

Assuming that the “base” of the dorsum of the epinotum in Mayr’s description is equivalent to the term “apex” (*i.e.* the brow of the declivity) which has been used throughout this work, this form would appear to differ considerably from the type-species in the structure

of the epinotum. In all my specimens the dorsum of the latter is decidedly long (much longer than in *tricolor*, etc.), being as long as wide at the base and two-thirds as long as the width of the apex at the base of the spines. It is fairly flat above. The spines are quite twice as long as their basal width, and not one-third, but at least half as long as the interval between them. The declivity of the epinotum is very slightly inclined and not at all concave. The head is subcircular.

♀. 9.8 mm. Dark castaneous red, the head and petiole a little paler and redder than the thorax; abdomen black. Head longitudinally and closely striate, sparsely but clearly punctured, the space between the frontal area and the anterior ocellus slightly shining, with the sculpture effaced. The thorax in shape, sculpture and gloss closely resembles that of *rufonigra*, but the sides of the dorsum of the epinotum are more parallel. The 1st segment of the petiole has more



FIG. 36.—*C. excisa* var. *maledicta*.

acute anterior angles than that species. Otherwise like the ♀ of *rufonigra*.

C. GODFREYI, Forel.

(As race of *foraminiceps*, Santschi) Bull. Soc. Vaud. Sc. Nat., vol. 50, p. 237, ♀, 1914.

(Race of *vulcania*, Santschi; Forel emend.) Rev. Suisse Zool., vol. 24, p. 406, 1916.

♂. 3 mm. Dark brownish-red, with a tinge of yellow, the back of the head more brown, the legs less reddish than the thorax, the abdomen dark brown, becoming somewhat paler towards the base. Pilosity absent except on the clypeus. Pubescence pale, fairly long, not very abundant except on the abdomen, where it is adjacent (oblique on the head). Head dull, very delicately and longitudinally striate or aciculate, sparsely and finely punctured, the striation more or less effaced in the middle of the vertex. Thorax very finely and superficially reticulate-punctate above, fairly dull, the dorsum of the epinotum with a few transverse rugae. Sides of thorax longitudinally rugulose and partly reticulate-punctate. Abdomen and petiole very slightly shining, the former microscopically alutaceous. Head, excluding the mandibles, quadrate, about as long as wide, the sides

feebly convex, the posterior margin shallowly concave, the posterior angles very little rounded. The scape almost reaches the posterior margin of the head; 3rd-5th joints of the flagellum wider than long, 2nd and 6th as wide as long, club 3-jointed. Eyes placed in the middle of the sides. Mandibles finely striate. Head very little more than one and a-half times wider than the thorax at its widest point. The frontal sulcus is fairly well defined as a narrow and shining impression, reaching the middle of the vertex. Pronotum not marginate behind at the sides, the posterior corners convex. Mesonotum two-thirds longer than its basal width, flat and horizontal or even slightly inclined upwards posteriorly, the median tubercle round and very prominent. The declivity of the mesonotum short, barely marginate at the sides. Meso-epinotal suture narrow and deep. Dorsum of epinotum flat, merging very gradually into the oblique declivity, about twice as wide at its base as it is long in the middle, considerably widened towards the teeth. The latter are very short, hardly as long



FIG. 37.—*C. Godfreyi*.

as their basal width, triangular. The 1st joint of the petiole is a trifle wider than long, the anterior margin straight, the anterior angles widely rounded, the dorsal face almost flat. The 2nd joint is not deeply grooved in the middle, but the posterior margins of the nodal discs are prominent, the sides of the discs not very convex.

King William's Town (Rev. R. Godfrey). (S.A.M., G.A. colls.)

Unwilling as I am to add to the number of species in this confused genus, it nevertheless appears necessary to me to separate this form from *vulcania*, Santschi. I have not seen specimens of the latter, but from Santschi's description and illustrations it is clear that *Godfreyi* is tolerably distinct. In *vulcania* the dorsum of the epinotum is convex, the pro- and mesonotum form a single convexity, the pronotum is marginate at the sides, the mesonotal tubercle is feeble, and lastly, the petiole is differently formed.

Var. **ARNOLDI**, Forel.

(As species) Bull. Soc. Vaud. Sc. Nat., vol. 50, p. 238, ♀, 1914.

♀. 3-3.5 mm. Dark brown, the anterior half of the head sometimes paler or brownish-yellow, mandibles ferruginous. The thorax

is less reddish than in the type-species. The head is more strongly striate and more sharply and less sparsely punctured. The striae are effaced along the middle of the head, which is distinctly shining, the rest of the head being dull. The posterior margin of the head is very slightly concave or almost straight. The thorax appears a little narrower, owing to the mesonotum being less dilated in front and the sides of the dorsum of the epinotum less divergent. The declivity of the mesonotum is shorter than in the type of the species and subvertical, so that the meso-epinotal suture appears much narrower. Epinotal spines variable, like those of the type, or sometimes a little longer, but not more than one-third the length of the space between their bases. The anterior half of the sides of the 1st joint of the petiole, seen from above, are sometimes almost straight, but this character is also variable, as half the specimens before me have the petiole formed exactly as in the type of the species. The sculpture of the thorax is perhaps a shade coarser than in the type.



FIG. 38.—*C. Godfreyi* var. *Arnoldi*.

Durban (H. B. Marley and C. B. Cooper). (S.A.M., R.M., G.A. colls.)

This form, described by Forel as a distinct species, differs very little from *Godfreyi*, i. sp., and merits at the most only varietal rank. The specimens collected by Mr. Cooper are more strongly punctured on the head than the others and are of a slightly darker colour.

Var. FORAMINICIPIDES, Forel.

Rev. Suisse Zool., vol. 24, p. 406, ♂, 1916.

♂. 3·8-4·6 mm. Black, flagellum and tarsi ferruginous. Mandibles castaneous brown. Pubescence on the abdomen shorter than in the type. Sculpture similar, but stronger everywhere, the head fairly abundantly punctured with small, sharply defined and piligerous punctures. The pro-mesonotal suture is wider and deeper, and the median tubercle of the mesonotum longer and distinctly carinate, shining and more prominent than in the type of the species. The declivity of the mesonotum is vertical, more abruptly delimited from the anterior plane than in the type. The 1st joint of the petiole is more trapezoidal, the sides converging more inwards posteriorly; there is a small and acute tooth on the ventral surface,

quite absent in the type. The 2nd joint has a deeper groove on the node and the abdomen is more shining than in the type.

Bulawayo. (R.M., G.A. colls.)

C. ARBOREA, Smith (*nec* Mayr).

Cat. Hymen. B.M., vol. 6, p. 138, ♀, 1858.

The validity of this species (in regard to which there is considerable confusion) cannot, in my opinion, be maintained. Mayr (Ann. K.K.N.H. Mus., vol. 10, p. 136, footnote) definitely synonymises Smith's species with *tricolor*, Gerst. (= *castanea*, Smith, race *tricolor*, Gerst.). I am in agreement with this view on the evidence of a specimen received in exchange from the British Museum, which had been compared and found to agree with Smith's type by Mr. Meade-Waldo. The specimen in question is a little larger than the average *tricolor*, the spines are somewhat thinner, and the 1st segment of the petiole is a fraction narrower, but otherwise not distinguishable from *tricolor*. On the other hand, Dr. Forel *in litt.* supports the validity of Smith's species, and points out that it differs from *tricolor* in its larger size, the longer epinotal spines, the coarser sculpture, especially on the head, the shape of the petiole, which is less wide in front, and the lateral discs of the 2nd node less separated. These characters certainly hold good in the race *melanogaster*, Emery, but Mayr refers this variety to his own *arborea* and not to Smith's (Ent. Tidsk., p. 251, 1896, footnote).

Smith's description suffers from the vagueness which is characteristic of that author's diagnoses of Formicidae, but serves at least to show not only that the specimen received from the British Museum agrees in the characters tabulated and was therefore correctly identified with Smith's species, but also that Dr. Forel is in error in ascribing a coarse sculpture to *arborea*, Smith. I reproduce Smith's description and the greater part of Mayr's remarks on his own species, from the study of which, together with the characters presented by the race *melanogaster*, Em., one must conclude that Smith's species ought to sink as a synonym of *castanea*, race *tricolor*, Gerst.

(Smith.) " ♀. Length 2 lines (4.1 mm.). Pale ferruginous, with very thinly scattered, short, glittering hairs; the head subovate, slightly emarginate behind, *delicately* striated longitudinally, the mandibles with 4 strong acute teeth; the antennae, tarsi and apex of abdomen more or less fuscous. Thorax flattened on the disc, deeply strangulated between the meso- and metathorax, with the latter armed with 2 acute spines. Abdomen: the 1st node of

the peduncle, viewed in front, pear-shaped, with the broad end downwards; the 2nd node ovate, with a deeply impressed line above. Hab., Port Natal."

(Mayr.) *loc. cit.* "Mr. W. F. Kirby sent me for examination a typical example of *C. arborea*, Smith, from the British Museum. This ♂ agrees with *C. tricolor*, Gerst., only the pronotum has more and stronger longitudinal rugae than is the case in the examples in my collection, in regard to which I should say that in many specimens of the latter the longitudinal rugosity is quite obsolete, in some only feebly indicated, and in others quite distinct, so that I do not consider it justifiable to base a variety on the specimen referred to."

C. ARBOREA, Mayr.

Ent. Tidsk., pp. 250-251, 1896.

"Abdomen dark brown, the 1st segment above brighter, especially in front and in the middle. The exerted pilosity is almost entirely wanting, on the ventral surface of the abdomen very sparse, the external margins of the tibiae without exerted hairs; the decumbent pubescence is sparse on the upper surface of the head and abdomen. The head is almost a little wider than long, nearly quadrate, the posterior corners more rounded off than the anterior; it is longitudinally striate near the inner margin of the eyes. Mandibles quadridentate. Clypeus moderately arched . . . its anterior margin fairly straight, without a depression behind. . . . The scape of the 11-jointed antenna extends beyond the posterior margin of the head, all the joints of the flagellum longer than wide. The indistinctly defined frontal area is closely and longitudinally striate like the frons. The eyes are placed distinctly behind the middle of the sides. The pronotum above is somewhat smooth near the suture and has a broad obtuse hump on each side. The mesonotum is feebly arched from side to side and obtusely marginate on both sides. The dorsum of the epinotum has a transverse impression in front of the base of the spines, less distinct in the middle. . . . The 1st segment of the petiole is widest between the anterior and middle third, but yet very little wider there than behind; there is a small and not very evident tubercle on the sides in front of the posterior corners. The abdomen is almost smooth or very delicately rugulose only on the 1st segment, but all the segments are finely coriaceous-rugulose near the posterior margins. The upper surface of the abdomen has piligerous punctures and the 1st segment is broadly truncate at the base."

ARBOREA, Mayr, race MELANOGASTER, Emery.

Ann. Soc. Ent. France, vol. 63, p. 29, ♂, ♀, 1895.

♂. 4.6–5.5 mm. Head, thorax and petiole bright red, abdomen black, antennae and legs dark reddish-brown, the tarsi and articulations of the legs paler. Exserted pilosity sparse, fairly long, present only on the clypeus, pronotum, petiole and margins of the abdominal segments. Decumbent pubescence long and sparse all over except on the flagellum and abdomen. Head dull, strongly, closely and longitudinally rugoso-striate, the striations strongest near the anterior margin. Mandibles longitudinally striate, 4-dentate. Thorax dull, coarsely and irregularly rugose above, the rugae chiefly longitudinal on the mesonotum and dorsum of the epinotum, the spaces between the rugae roughened; the rugae are coarsest on the epinotum. The sides of the thorax longitudinally rugose, the rugae fairly regular and close together. Declivity of epinotum shining and fairly smooth, or with only one or two feeble rugae. Nodes of petiole closely and

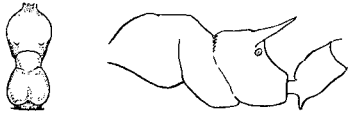


FIG. 39.—*arborea*, Mayr, race *melanogaster*, Emery.

longitudinally rugoso-striate, except the dorsal face of the 1st node, which is smooth and slightly shining. Abdomen smooth and moderately shining, the basal half of the 1st segment duller and very finely rugulose in the middle. Head, excluding the mandibles, about one-seventh wider than long, widest behind the eyes, but not much wider behind than in front. The eyes are large, convex and placed behind the middle of the sides. The scape extends well beyond the occipital margin; club 3-jointed, all the joints of the flagellum longer than wide. The pronotum has a distinct subangular and marginate boss on each side behind. The pro-mesonotal suture is wide, much wider than in *tricolor* and other races of *castanea*. Median tubercle of the mesonotum feeble. The mesonotum is one-third longer than wide at the base, feebly marginate at the sides posteriorly, and seen from the side clearly convex, the posterior half or thereabouts sloping downwards to the deep meso-epinotal suture. The dorsum of the mesonotum is plainly higher than that of the epinotum. The latter is fairly flat and not much wider at the apex than at the base, much less rhomboidal than in *castanea* and races. Epinotal spines thin, acute, not very divergent (much less than in *castanea*), nearly three times as long as

their basal width. The 1st segment of the petiole viewed from in front subovate, the anterior margin convex, widest a little in front of the middle, and wider in front than behind. The upper face is as long as wide, feebly tuberculate on each side behind; the ventral surface bears a sharp, vertical tooth. The node of the 2nd segment is one-quarter wider than long, feebly grooved in the middle, the sides only slightly convex. Abdomen truncate at the base, the corners subacute.

“♀. . . . Entirely dark castaneous brown, smooth and shining, the cheeks and clypeus striate; the frons also has some longitudinal rugae; the epinotum is finely striate at the base and on the sides, Head wider than long. Epinotum armed with 2 strong teeth. First node of petiole parallel-sided, bearing a transverse crest behind, ending on each side in a small angular projection; the crest separates a wide anterior plane from a very short posterior one. Second segment convex, without a longitudinal groove. The antennae are much shorter than in the ♂.”

De Aar (Simon); Namaqualand (Peringuey); Willowmore (Brauns); Conway, C.P. (Hewitt). (S.A.M., R.M., G.A. colls.)

Mayr (Ent. Tidskr., p. 251, 1896) remarks that a ♀ of this race, received by him from Prof. Emery, agrees so closely with the type-species that he is unable to discover any substantial difference which would justify the separation of the form even as a variety. Only the transverse impression at the base of the epinotal spines is wanting in that specimen. But even this slight distinction is lacking in some of the specimens which I have seen.

C. PERINGUEY, Emery. (Plate VI, fig. 83.)

Ann. Soc. Ent. France, vol. 63, p. 27, ♂, ♀, ♂, 1895.

♂. 3.5–5.2 mm. Black, dull, very closely and fairly finely striate longitudinally on the head, more coarsely on the thorax, especially the epinotum. Abdomen shining, smooth, sparsely sprinkled with small, shallow and piligerous punctures. The pilosity is scanty, fairly long and yellowish; pubescence moderately abundant, decumbent and pale yellowish. Head about one-seventh wider than long, decidedly convex above, the sides moderately convex and gradually convergent in front of the eyes, the posterior margin straight. The scape hardly reaches the posterior margin of the head; 2nd–5th joints of the flagellum as long as wide, or a little longer; the club 3-jointed with the joints sharply differentiated. Mandibles strongly and longitudinally striate. Frontal area small but well defined; a shallowly impressed shining line extends from the frontal area to the posterior fifth of the head.



Eyes rather large, placed in the middle of the sides. Width of pronotum a little more than half that of the head. Pronotum rounded at the sides and hind angles, not marginate. Pro-mesonotal suture distinct, fairly deep at the sides. Mesonotum about one-fifth longer than wide at the base, the median carinula not high, extending over the anterior third of the mesonotum. The latter is not marginate at the sides, moderately convex in profile. Dorsum of epinotum twice as wide as long, widening moderately towards the apex, slightly convex lengthwise. The spines are thin, acute, moderately divergent, oblique, and usually half as long as the interval between them; the declivity very smooth and shining. First joint of petiole trapezoidal, about as long as wide in front and not much wider in front than behind, the dorsal face smooth and shining, concave. There is a very small tubercle on each side terminating the upper margin of the sides. Node of 2nd joint grooved longitudinally in the middle, the groove not deep, the discs a little longer than wide.

“♀. 8-9 mm. Very similar to the ♀ in colour, the head is also dull, more sharply striate, thorax shining above, finely striate at the sides, epinotum obtusely bidentate, the 1st segment of the petiole wider, the sides straight, obliquely concave in front, without posterior tubercles, the 2nd segment less deeply grooved. Wings hyaline, the costa pale fuscous.

“♂. 4 mm. Black, head dull, thorax nitidulous, delicately striate, abdomen shining, punctures piligerous and foveiform, antennae 12-jointed, moniliform, the mandibles narrow, acutely tridentate; the 1st segment of the rather short petiole is obliquely truncate in front, the 2nd evenly convex.”

Capetown (Peringuey); Port Elizabeth (Brauns). (S.A.M., R.M., G.A. colls.)

A nest of this species sent to me by Dr. H. Brauns is very much like the one which has been figured and described by Mayr in the *Ann. K.K.N.H. Mus. Wien*, vol. 16, p. 14, 1901. It consists of an ovoid carton mass, attached to the stems of a reed or grass, of a dark brown colour and pierced by numerous galleries and chambers, and looking, when cut across, very much like a coarse toilet-sponge. The outer surface is composed of less compact material than the inner substance, being in fact a close felt-like layer formed of short pieces of grass. The reed stems pass through the nest near its major axis.

Var. *ANGUSTIOR*, n. v. (= race *cacodaemon*, Forel, pars).

♀. 3.6-4.3 mm. Smaller and narrower than the type-species. The head, excluding the mandibles, is a little longer than wide, the

pronotum is less convex at the sides and longer; it is only twice as wide as long in the middle, excluding the neck (at least two and a-half times in the type of the species). The median carinula of the mesonotum is much more distinct. The dorsum of the epinotum is longer, narrower apically, or about two-thirds wider than long (twice as wide as long in the type-species). The spines are slightly but quite clearly curved inwards.

♀. 9.6 mm. Black, mandibles, flagellum and legs dark reddish-brown. Pubescence fairly long, scanty everywhere. Exerted pilosity pale yellowish, fairly long and sparse. Head closely and longitudinally striate, the striae on the median area of the clypeus converging inwards. Mesonotum and scutellum smooth, shining, very sparsely and shallowly punctured. Dorsum of epinotum strongly rugose transversely. Abdomen and petiole smooth and shining. Head, excluding the mandibles, nearly one-fifth wider than long, the posterior margin straight, the posterior three-fourths of the sides subparallel, the anterior fourth moderately convergent. Thorax

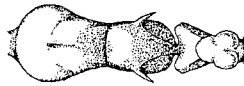


FIG. 40.—*C. Peringueyi*, Forel, var. *angustior*, n.v.

twice as long as wide across the tegulae. Epinotum unarmed, the dorsum four times wider at the base than long; the declivity vertical. First node of petiole trapezoidal, two and a-quarter times wider in front than long in the middle, the anterior angles narrowly rounded. The 2nd node feebly grooved posteriorly, not so wide as the anterior margin of the 1st node. Dealcated.

♂. 3.7 mm. Black. Pilosity and pubescence sparser than in the ♀. Head very finely striate, chiefly lengthwise, but behind the ocelli radiating outwards, dull. Mesonotum very finely and closely striate or rugulose longitudinally, the scutellum smooth and shining. The whole epinotum rugulose and only slightly shining. Nodes nitidulous and reticulate. Abdomen smooth and shining. Head a little wider than long, subovate, the outline of the posterior half forming a single convexity. Scape nearly as long as the 1st and 2nd joints of the flagellum taken together; these two are a little wider than long, the 3rd as wide as long, the rest longer than wide. In the single specimen before me, the mesonotum has a median impression in front of the hind margin with a semilunar and raised area on each side of it, but this may be only a teratological feature.

Dorsum of epinotum convex, short, not distinctly delimited from the vertical declivity. First segment of petiole as long as wide, the sides feebly convex and parallel. Second segment transversely ovate, hardly wider than the 1st. Wings hyaline, nervures pale brown.

Durban (C. B. Cooper). (S.A.M., R.M., G.A. colls.; types in my collection.)

As I have remarked on a previous page, *cacodaemon*, Forel, includes two quite distinct forms, those from Willowmore being no more than a slight variety of *castanea*, race *rufonigra*.

Var. GEDEON, Forel.

Bull. Soc. Vaud. Sc. Nat., vol. 50, p. 341, ♂, 1914.

♂. 4.1-5 mm. Very dark reddish-brown. Sculpture stronger than in the type of the species of var. *angustior*. Thorax longitudinally rugose (in one specimen belonging to the same nest the thorax is very distinctly transversely rugose). Median tubercle of mesonotum larger and more prominent than in the type of the species. The sides of the head are less convex, and the 2nd node of the petiole is more deeply grooved in the middle. Otherwise like the type-species.

Pietermaritzburg (R. D. Boyce); New Hanover Rail, Natal (C. B. Hardenburg). (S.A.M., R.M., G.A. colls.)

Var. CACOCYMA, Forel.

(As race) *loc. cit.*, p. 235, ♀, ♀.

♂. 4.5-5.2 mm. Light reddish-brown, the back of the head and the apical half of the abdomen darker than the rest, mandibles yellowish-red. Pro-mesonotal suture less deeply impressed than in the type-species, sculpture of the thorax a shade stronger, particularly on the epinotum. In all my specimens the mesonotal carinula is as strong as, or even stronger than in the type-species, and the petiole, contrary to Forel's description, is not wider than in the type-species.

“♀. More robust than the type. The mesonotum entirely smooth (partly striate in the type of *Peringueyi*).”

Hab. ? ex. S.A.M. coll. (S.A.M., G.A. colls.)

C. CAPENSIS, Mayr.

Verh. Zool. Bot. Ges. Wien, vol. 12, p. 764, ♂, ♀, 1862.

Ann. K.K.N.H. Mus. Wien, vol. 10, pp. 135-7, 1895.

“♂. 4-4.5 mm. Dirty reddish-brown, antennae and abdomen chiefly dark brown; pilosity sparse. Mandibles sharply striate longitudinally; head finely and longitudinally striate above, rugose at the

sides. Thorax finely and longitudinally rugose, constricted between the meso- and epinotum, the latter with two acute spines, directed backwards, upwards and outwards. Petiole shaped as in *C. scutellaris*. Abdomen shining, exceedingly finely rugulose.

“♀. 7–8 mm. Dark reddish-brown, partly brownish-black, particularly the mesonotum; pilosity sparse. Head and petiole as in the ♀. Thorax finely longitudinally rugose; epinotum with two small teeth, wide at their bases. Sculpture of abdomen as in the ♂.

“Cape of Good Hope (Novara).”

The above description is insufficient, but from Mayr's table of South African species in the Ann. K.K.N.H. Mus. the following additional characters may be extracted:

The second segment of the petiole has a deep median groove, and all the joints of the flagellum are as long as, or longer than wide, excepting the third, which is a little wider than long.

Var. CALENS, Forel.

Ann. Soc. Ent. Belg., vol. 54, p. 435, ♀, 1910.

“♀. Differs from the type of the species by its spines, which are longer than half the interval between them, and by its entirely brown colour. 3–3.6 mm. (a little smaller than the typical *capensis*).

“Delagoa (Dr. Liengme).”

A co-type of this variety, in my collection, has the head very superficially sculptured or almost smooth, excepting the area between the eyes and the front of the head, which is finely and longitudinally rugulose-striate. In addition, contrary to Forel's statement, the epinotal spines are barely half as long as the interval between their bases.

C. MISELLA, n. sp.

♀. 3.4–3.9 mm. Head, thorax, petiole and antennae reddish-brown, abdomen piceous brown, legs brown with the tarsi a little paler. Pilosity short and scanty, absent except on the clypeus and apical margins of the abdominal segments. Pubescence very sparse, short and decumbent, almost entirely absent on the head and thorax. Head dull, closely and fairly finely reticulate, here and there somewhat reticulate rugulose, the reticulations near the inner margins of the eyes emphasised longitudinally; a longitudinal area on the vertex with the sculpture somewhat effaced and moderately shining. Mandibles dull, strongly striate. Thorax fairly dull, very regularly reticulate, the strands of the reticulation sharply defined and narrower than the spaces which they

enclose, the spaces slightly shining; on the epinotum the reticulation is less sharp, the declivity smooth and shining. Petiole and abdomen shining, microscopically reticulate or alutaceous. Legs fairly shining. Head globose, as wide as long, the sides very convex, the posterior margin straight. Scapes not reaching the posterior margin of the head, falling short of the same by as much as their apical width; 3rd joint of flagellum a trifle wider than long, 4th and 5th at least one-third longer than wide, the club 3-jointed. Anterior margin of clypeus straight. Posterior angles of pronotum submarginate; promesonotal suture obsolete. Mesonotum marginate at the sides, strongly so on the declivous posterior part, which is oblique and about as long as the rest of the mesonotum. The median tubercle fairly prominent and subcarinate. Meso-epinotal suture deep. Dorsum of epinotum convex lengthwise, widened apically. The spines acute, divergent, oblique, half as long as the interval between their bases. The declivity of the epinotum longer than its dorsum. First segment of petiole trapezoidal, the anterior corners widely rounded, the upper



FIG. 40A.—*C. misella*, n. sp.

face concave transversely, as long as wide; 2nd node divided into two discs by a complete median groove. The 1st segment of the petiole bears at its base below a sharp, triangular tooth pointing downwards.

Bulawayo. In hollow stems of *Acacia horrida*. (S.A.M., R.M., G.A. colls.; type in my collection.)

This species is allied to *capensis* in the structure of the antennae, but differs from it and all our other species by the sculpture of the thorax, which consists of a remarkably sharply defined and raised reticulation, the spaces between being smooth and flat. These specimens had previously been named by Dr. Forel as *gallicola*, race *Sjoestedti*, Mayr—quite a different insect, having the 3rd–5th joints of the flagellum wider than long, the sides of the mesonotum not marginate, and a different sculpture.

#### *C. OPACICEPS*, Mayr.

Ann. K.K.N.H. Mus. Wien, vol. 16, p. 12, ♀, 1901.

“♀. 3.6–4.2 mm. Dull, clypeus and legs more or less shining, abdomen nitidulous; dark rusty red, the abdomen brown. The

exserted pilosity sparse, the decumbent pubescence more abundant, the scapes and tibiae with short and almost adjacent hairs. Mandibles shining, longitudinally striate and very sparsely and coarsely punctured, with several teeth. Clypeus and cheeks longitudinally rugose, the rest of the head, the thorax and petiole sharply, closely and fairly finely reticulate-punctate, the disc of the pronotum and the dorsum of the epinotum with not coarse longitudinal rugae superimposed, the declivity of the epinotum shining and very superficially reticulate. The abdomen finely rugulose, and also with a few shallow punctures. The head is rectangular, the corners rounded, very little wider than long, anterior margin of clypeus fairly straight, not emarginate. Frontal carinae well developed and of the usual length. The scape of the 11-jointed antenna extends back almost as far as the posterior margin of the head; the 2nd joint of the flagellum is somewhat longer than wide, the 3rd-5th as long as wide, or barely longer, the 6th and following joints all longer than wide, the club distinctly 3-jointed. The shining frontal sulcus is distinct. Eyes placed a little behind the middle of the sides of the head. Posterior margin of the head moderately arcuate. The pro- and mesonotum together, seen from above, reversed trapezoidal, with strongly rounded shoulders, the upper surface of both parts feebly convex; pro-mesonotal suture distinct; mesonotum about as long as wide, not marginate at the sides. The meso-epinotal suture deep; the dorsum of the epinotum horizontal and trapezoidal, shorter than wide behind, the spines moderately long, straight, divergent and oblique. The 1st segment of the petiole trapezoidal, shorter than wide in front, the anterior margin moderately arcuate, the convexity directed forwards, the widely rounded anterior corners ending before the middle of the segment, the upper surface concave in front. The 2nd segment with a sharp and fairly deep longitudinal groove.

“Port Elizabeth” (Brauns).

“The nests are made of carton, of a brownish colour, and attached to the branches of *Erica* and other low shrubs. The surface of the nests (which measure about 10-13 cm. in diameter and 18 cm. long) is rougher and more uneven than those of *Peringueyi*.”

Race *DEFLETA*, Forel.

Ann. Soc. Ent. Belg., vol. 54, p. 434, ♀, 1910.

“♀. 3.1-3.4 mm. A little smaller than the type of the species. The epinotal spines much shorter, hardly half as long, barely longer than a fourth of the interval between them. Pro-mesonotum narrower,

but much more convex, forming an even and strong convexity raised much above the level of the dorsum of the epinotum. The head is a little narrower, more rounded, and the eyes are a little smaller. The abdomen is entirely shining and nearly smooth (densely reticulate and more or less subopaque on the 1st segment in the type of the species). Rusty red; posterior half of abdomen, and sometimes also the head and antennae brown. Otherwise quite like the type, particularly in the sculpture, the petiole and mesonotal carina. *C. opaciceps* is closely allied to *capensis*, Mayr, from which it hardly differs except in the sculpture, which is clearly reticulate-punctate (in *capensis* more striato-rugose).

“Transvaal, in *Acacia horrida* (Dr. C. Keller).”

C. SOLERS, Forel.

Schultze, Reise Süd-Afrika, vol. 4, p. 7, ♂, 1910.

“♂. 4 mm. Mandibles striate. Anterior margin of clypeus straight. Head quadrate, as long as wide, feebly concave behind, the sides convex. Eyes flat, placed barely behind the middle. The scape hardly reaches the posterior margin of the head; club 3-jointed; the middle joints of the flagellum as wide as long. Pro-mesonotum much longer than wide, evenly arched or convex on all sides, not wide in front. When viewed from in front there can be seen a fairly sharply defined, arcuate marginal line on the sides and the front of the pronotum. Disc of mesonotum rounded, as long as wide, without a median carinula, not marginate at the sides. Thoracic emargination (= *meso-epinotal suture*?) sharp, steep, fairly deep, not wide. Epinotum with 2 broad triangular teeth, which are hardly longer than their basal width. First segment of petiole trapezoidal, shorter than wide in front, the anterior margin straight, with rounded anterior angles. Its sides are deeply arcuate-emarginate, so that it presents wide anterior and narrow posterior halves. Second segment much wider than long, divided by a deep median groove into 2 discs. Abdomen of the usual form. The 1st segment of the petiole bears a tooth below. Head very nearly smooth, very finely and sparsely punctured. Clypeus, cheeks and thorax, excepting the smooth declivity of the epinotum and the sides of the pronotum, finely and irregularly rugose lengthwise. Abdomen very finely and superficially coriaceous-rugulose, the petiole somewhat more sharply so. Sparsely pubescent all over, the hairs yellowish and decumbent. Pilose hairs absent except on the clypeus, the apex and ventral surface of the

abdomen. Scapes, tibiae, tarsi and abdomen brown. Head reddish-brown, the rest brownish red-yellow.

“Great Namaland, Arasab River, near Kubub (Schultze); on the bark and in the heart of an *Acacia horrida*.”

*C. MONTICOLA*, n. sp.

♂. 3.8–4 mm. Ferruginous or reddish raw-umber, the posterior half of the head above, the dorsum of the thorax partially and the apical half of the abdomen darker, or more mahogany brown. Fairly smooth and shining all over, the head sparsely and finely punctured, longitudinally and fairly closely striate at the sides, in front of the eyes. The meso- and epipleura longitudinally rugoso-striate, and

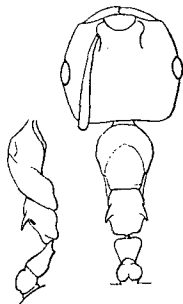


FIG. 40B.—*C. monticola*, n. sp.

partially reticulate-punctate between the striae, the dorsum of the epinotum with a few longitudinal striae at the base. Clothed all over with a fairly abundant, long, silky and whitish pubescence, obliquely exerted; on the head this pubescence is shorter, decumbent and less plentiful. This pubescence, which is only too easily rubbed off, is very striking, and renders this insect tolerably distinct from all our other species of the genus.

Head quadrate, between one-sixth and one-seventh wider than long, the sides distinctly convex, the posterior margin straight. The median area of the clypeus feebly convex, a little longer than wide. The scapes extend beyond the hind margin of the head by about as much as their apical width. Mandibles longitudinally striate and shining. Eyes placed at about the middle of the sides. Posterior half of the lateral margins of the pronotal disc submarginate. Mesonotum feebly convex, as long as wide, without a clearly defined posterior declivity. Meso-epinotal suture shallow. Dorsum of epinotum feebly



convex lengthwise, widened towards the spines, which are divergent, acute, and hardly longer than their basal width. First node of the petiole trapezoidal, about as long as wide in front, the anterior angles rounded. Second node wider than long, with a fairly well-defined median longitudinal groove.

Mountains of Natal, 11,000 ft. (Haviland), *ex* Natal Museum coll. (R.M., G.A. colls.; type in my collection.)

C. SCRUTANS, Forel.

Zool. Jahrb., vol. 29, p. 258, ♂, 1910.

“♂. 2·7–3·3 mm. Mandibles closely striate and sparsely punctured. Head somewhat wider than long, the sides convex, feebly concave behind. Eyes moderately convex, placed in the middle of the sides of the head. The scape extends beyond the occipital margin by a trifle (not as much as one-third of its width); 3rd–5th joints of the flagellum somewhat wider than long. Frontal area and sulcus feebly defined, the latter almost obsolete. Pronotum and mesonotum together form a moderate and elongate convexity lengthwise and transversely; both are only indistinctly and obtusely marginate, without a trace of a median carinula or prominence, the pro-mesonotal suture visible. The meso-epinotal suture forms only a slight, sometimes very feeble constriction of the dorsum of the thorax. The dorsum of the epinotum, distinctly convex lengthwise, is not lower than the mesonotum; it is somewhat wider than long and ends in two short, narrow, divergent and nearly horizontal little spines, which are about one-third the length of the interval between them. Declivity oblique, as long as the dorsum of the epinotum. First segment of the petiole not toothed below, wider than long, trapezoidal, the anterior margin somewhat arcuate (or with bluntly truncated anterior angles). Second node as wide as the 1st, with a complete median longitudinal groove. Abdomen more oval than cordate. Head smooth; only the cheeks in front and the antennal pits rugose. Thorax finely reticulatè, with a few weak rugae, less shining than the head. Abdomen and petiole very lightly reticulate, shining. Abdomen with a sparse puncturation. Some isolated yellowish hairs on the body, none on the tibiae and scapes, which have only a decumbent pubescence. The latter is very sparsely distributed on the body. Dull reddish-brown head and abdomen dark brown.

“Nefassit, Abyssinia.

“Near *solers*, Forel, which, however, has almost straight sides to the head, with the latter wider in front, a median prominence on the

mesonotum, a deeper meso-epinotal suture and a longer and narrower 1st segment of the petiole, toothed below, and of a somewhat different shape. Also allied to *Neuvillei*, Forel."

This species has not been recorded from our region, but is represented by the following variety.

Var. ILGH, Forel.

*Loc. cit.*, p. 259, ♂.

"Differs from the type-species in the pronotum and mesonotum, which are flatter above and sharply marginate. The epinotal spines are also stouter and the meso-epinotal suture deeper.

"Zoutpansberg."

C. SCHULTZEI, Forel.

Schultze, *Reise Süd-Afrika*, vol. 4, p. 6, ♂, ♀, 1910.

♂. 3.3-3.7 mm. Brownish-reddish-yellow, the front of the head and the petiole paler, the antennae more yellowish-red, abdomen dark brown to blackish-brown. Head and thorax slightly shining, very sharply and longitudinally striate, more closely on the head than on the thorax, the striation of the pronotum somewhat irregular, 2nd node of petiole longitudinally striato-rugulose. Abdomen smooth and shining, finely and very sparsely punctured. Pubescence and pilosity yellowish, sparse, the legs and scapes with only a fine decumbent pubescence. Head quadrate, slightly wider than long, the sides subparallel in front of the eyes and convex behind them, the hind margin feebly concave. Eyes large, convex, and placed at the posterior third of the head. Clypeus slightly impressed in the middle just behind the anterior margin, the latter almost straight. Mandibles striate. Frontal area indistinct, frontal carinae well developed. Antennae unusually long, reaching back as far as the petiole or beyond, the scape extending beyond the occipital margin by quite one-third of its length; all the joints of the flagellum much longer than wide. Posterior lateral angles of the pronotum very prominent, raised above the level of the rest of the pronotum and of the mesonotum. Pro-mesonotal suture ill-defined in the middle, wide and deep at the sides. Mesonotum convex lengthwise, without a distinct declivous face behind, obtusely marginate at the sides. Dorsum of epinotum convex, marginate at the sides, about one-third wider at the base than long. Epinotal spines long, thin, acute, oblique, and about as long as the interval between their bases, with a transverse impres-

sion in front of the latter. First segment of the petiole toothed below, subpyriform (the apex truncate, the broad end anterior), not much wider in front than behind, the sides not very convex, as wide as long; 2nd segment with a shallow median groove, the discs well defined behind, each disc at least half as long again as wide. Abdomen cordate, the apex acute. Legs decidedly long.

"♀. 10.5–11 mm. Near *arborea-melanogaster*, but the back of the head is shining, almost smooth and smaller (narrower than the thorax). Clypeus impressed in front. Dark brown. Head, petiole and patches on the middle of the abdominal segments brownish-red, like the legs and antennae."

Steinkopf, Little Namaland; in nest of *Hamitermes runconifer*, Silv. The subterranean nest was hidden under a stone; also at Kammagas, Little Namaland, one ♀; Prince of Wales's Island (Schultze). (G.A. coll.)

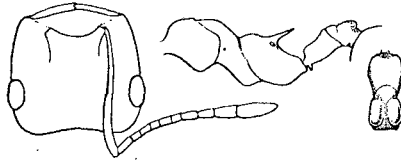


FIG. 41.—*C. Schultzei*, Forel.

C. BUCHNERI, Forel.

Mitt. Schweiz. Ent. Ges., vol. 9, p. 94, ♀, 1894.

"♀. 4–6.5 mm. Mandibles coarsely striate and sparsely punctured. Head noticeably large, somewhat flattened, wider than long, deeply emarginate behind, narrower in front than behind. Anterior margin of clypeus widely and deeply excised in the middle and at the sides. Clypeus fairly flat, not carinate. Frontal area and sulcus deep. Eyes flat, placed at or a little behind the middle of the sides. The scape does not reach quite as far as the hind margin of the head; club 3-jointed, all the joints of the flagellum at least a little longer than wide. Pronotum fairly narrow, and fairly distinctly marginate at the sides. Mesonotum convex, with a high and elongate median carina, obliquely declivous at its posterior extremity, barely marginate laterally. Meso-epinotal suture deep. Epinotal spines broad, moderately long, only slightly divergent, feebly curved downwards, two-thirds the length of the interval between them. First segment of petiole considerably flattened; in the small ♀♀ rectangular, rounded at the corners and longer than wide; in the large ♀♀ as long as wide,

nearly round. Second segment wider than long, widely impressed above posteriorly. Abdomen distinctly flattened, truncate at the base. With a silky gloss, shallowly and sparsely punctured all over; abdomen and legs somewhat more shining. Head and thorax very closely and fairly finely striate longitudinally, with a finer sculpture between the striae; pronotum transversely striate above. The striae on the head diverge posteriorly. Petiole and abdomen finely reticulate-punctate. Legs reticulate, the scape longitudinally striate. Somewhat sparsely clothed all over with yellowish decumbent hairs, the outstanding pilosity very scanty. Scapes with short oblique hairs, the tibiae with decumbent hairs only. Reddish-brown. Scapes, tibiae, tarsi and vertex darker brown; abdomen more dirty yellow-brown, with darker transverse bands.

“Benguella (Buchner).”

The type-species has not been recorded from our region, but in view of Forel's latest pronouncement in regard to it and several allied forms, I have reproduced the original description.

Dr. Forel (*Rev. Suisse Zool.*, vol. 24, p. 411, 1916) is now of the opinion that the evidence presented by the numerous annectant varieties necessitates the inclusion of the following species as mere races of *Buchneri*: *kasaiensis*, Forel; *vulcania*, Santschi; *impressiceps*, Mayr; *excisa*, Mayr; *impressa*, Emery; *Kohli*, Forel; *Alulai*, Emery; and *Meneliki*, Forel. On the other hand, Santschi has recently raised *africana*, Mayr, var. *bulawayensis*, Forel, to the rank of species; I adopt this arrangement for the present, although it is likely that the discovery of new forms later on may require its being linked again to the race *africana* of *Buchneri* or to the type of the species.

Race *africana*, Mayr, described originally from the Cameroons, has not been recorded within the limits of our region.

C. BULAWAYENSIS, Forel. (Plate VI, figs. 74, 74 a.)

(As var. of race *africana*) *Ann. Soc. Ent. Belg.*, vol. 57, p. 125, ♀, 1913.

(Synonym, *gallicola*, var. *oraclum*) *Rev. Zool. Afr.*, vol. 2, p. 323, ♂, 1913.

♂. 3-4.1 mm. Piceous brown, the anterior half of the head and sometimes the thorax with a reddish tinge; legs brown, flagellum brownish-red, the club (excepting apical half of last joint) paler or yellowish red. Pilosity absent, excepting a few hairs on the clypeus and pronotum. Pubescence very fine and decumbent, almost absent on the thorax and very sparse elsewhere. Head, thorax and petiole

with a slight gloss. Head very finely and closely rugulose, and behind the vertex also microscopically reticulate; the sculpture is more or less effaced on each side of the frontal sulcus, leaving a more shining area which is sparsely and finely punctured. The sculpture around the antennal pits a little stronger. Mandibles dark ferruginous, finely striate and sparsely punctured. Thorax and petiole regularly and finely reticulate, the upper face of the 1st node very superficially sculptured. Abdomen smooth and shining, microscopically alutaceous. Legs smooth and shining. Head a trifle wider than long, the sides feebly convex, the posterior margin very shallowly concave in the middle. Frontal area distinct, the frontal sulcus more or less clearly defined and ending beyond the middle of the head. The scape falls short of the occipital margin by about the length of the eye. Second joint of the flagellum as wide as long, 3rd-5th wider than long. Posterior corners of pronotum slightly tumid, not marginate. Promesonotal suture fairly deep and wide at the sides,



FIG. 42.—*C. bulawayensis*, Forel.

very shallow across the middle third. Median tubercle of mesonotum very prominent, elongate but hardly carinate. Declivity of mesonotum oblique, obtusely marginate at the sides, forming one-third or less of the mesonotum; the latter is about one and a-half times longer than wide at the base. Meso-epinotal suture deep. Dorsum of epinotum much wider than long, widening towards the apex, distinctly convex at the base when seen in profile, its sides external to and not continuous with the outer margins of the epinotal teeth. The latter divergent, short, very little longer than their basal width, subtriangular. First segment of petiole trapezoidal, as long as wide in front, or a little longer, the anterior corners fairly angular, the anterior margin straight, the ventral lamella ending in front in a small tooth. Node of 2nd segment wider than long, divided by a shallow longitudinal groove which is deeper behind, the posterior margins of the discs prominent.

Bulawayo. (S.A.M., R.M., G.A. colls.)

I am obliged to unite to this species the var. *oraclum*, Forel, of *C. gallicola*, Forel. Apart from the smaller size and paler colour, there are no differences of any value. It is true that in some of the specimens (no. 30) determined by Dr. Forel as *oraclum* the mesonotal

declivity is more oblique and less abrupt above, but in looking through a large series a complete gradation will be found between one extreme and the other.

Var. RHODESIANA, Forel. (Plate VI, figs. 82, 82 a.)

(*C. inermis*, Mayr, race *delagoensis*, var.) Ann. Soc. Ent. Belg., vol. 57, p. 126, ♀, 1913.

This variety must be removed from the *inermis* group, to which it bears a superficial resemblance in the sculpture and shape of the petiole. It differs from it quite clearly by the presence of distinct epinotal teeth and by the shape of the mesonotum. It is exceedingly closely allied to *bulawayensis*, i. sp. From the latter it differs as follows:

The size is greater, 3.2-4.4 mm. The head is duller and more densely rugulose. The thorax is also duller and has a very close and



FIG. 43.—*C. bulawayensis*, Forel, var. *rhodesiana*, Forel.

somewhat coriaceous reticulate sculpture, over which is superimposed a sparse and longitudinal rugosity; the epinotal teeth are more robust.

Bulawayo; Victoria Falls. (S.A.M., R.M., G.A. colls).

The specimens from the Victoria Falls have the middle of the head a little more shining, and the meso-epinotal suture deeper and narrower.\*

Var. DESPERANS, Forel.

(*C. gabonensis*, Em., var.) Bull. Soc. Vaud. Sc. Nat., vol. 50, p. 233, ♀, 1914.

♂. 3.2-4 mm. Reddish-brown, the thorax and petiole paler, the basal third of the abdomen paler than the apex, the anterior third of the head more yellowish-red; flagellum ferruginous, tarsi brownish-ochreous. Pubescence long, decumbent, pale whitish-yellow, fairly abundant all over, on the abdomen very abundant and sparse on the legs. Sculpture of head and thorax like that of the type of the species but a little stronger, the surface duller. Petiole closely reticulate-punctate and

\* The profile figure in Plate VI is inaccurate, the convexity of the mesonotum having been somewhat exaggerated. For this reason I add a corrected drawing in Text-fig. 43.

dull. Abdomen microscopically rugulose and dull, fairly closely and finely punctured. Head more deeply marginate behind than in the type-species, the scapes as long as in the type-species or very little shorter. Thorax resembling that of the type-species, but the pronotum is subvertical in front, the junction of the vertical and horizontal faces rounded; the declivity of the mesonotum is shorter, less oblique, fairly distinctly marginate at the sides, the margins ending in front in a subdentate prominence. The dorsum of the epinotum is relatively longer and flatter than in the type, and also less widened towards the apex; it is as long in the middle as it is wide at the base. First segment of petiole as wide as long. Node of 2nd segment a little narrower in front than behind, one-third wider than long. Otherwise like the type-species.

Durban. (S.A.M., R.M., G.A. colls.)

Apart from the shape of the dorsum of the epinotum and the deeper occipital emargination, this form differs but little except in size from the type of the species. It has no relationship whatever to *gabonensis*,



FIG. 44.—*C. bulawayensis*, Forel, var. *desperans*, Forel.

Emery, in which species the 2nd node is entire, without a median groove or even a posterior emargination. Moreover, in *gabonensis* the spines are nearly as long as the dorsum of the epinotum, and the sculpture is of a different character.

Race INFACETA, Santschi.

Ann. Soc. Ent. France, vol. 84, p. 498, ♀, 1916.

♀. 3.6–5 mm. Black, tarsi brown, mandibles dull ferruginous, antennae reddish-brown, the scapes and flagellum darker towards the apex. Sculpture similar to that of the type-species but stronger. The striae on the head become increasingly oblique posteriorly and near the posterior angles are directed outwards, or almost transverse. The smooth median area is wider (covering about one-third of the diameter of the vertex) and more strongly punctured. The dorsum of the epinotum is very sharply reticulate, with a few oblique and fine rugae near the base. The sides of the pro- and epithorax more coarsely sculptured than in the type of the species. First abdominal segment very finely punctured. The frontal area and sulcus more clearly defined than in the type of the species. The scape extends back

as far as the posterior margin of the head. The posterior corners of the pronotum more tumid than in the type-species, the pro-mesonotal suture deeper and wider, especially at the sides.

This race differs from the type-species chiefly in the structure of the mesonotum and epinotum. The declivity of the former is vertical, forming an abrupt angle with the upper plane, sharply marginate at the sides, the margins extending forwards almost as far as the pro-mesonotal suture and produced at the junction of the two planes into a small dentiform projection. The meso-epinotal suture is much deeper than in the type. The dorsum of the epinotum is strongly convex at the base, the convexity starting at the suture; the teeth are longer, and directed more upwards. The 1st segment of the petiole is a little longer, and the median groove of the second is deeper. Otherwise similar to the type of the species.

Victoria Falls. Nesting in a hollow branch of a *Combretum*. (R.M., G.A. colls.)

Race *INFACETA*, var. *PUDICA*, Santschi.

*Loc. cit.*, p. 499.

♀. 3.1-4.8 mm. Differs from the race in the following characters: The colour of the head, thorax and petiole is paler, of a dark reddish-brown. The sides of the head are less convex. The anterior plane of the mesonotum is merely obtusely marginate at the sides, and the pro-mesonotal suture is shallower and narrower at the sides. In the larger specimens the dorsum of the epinotum is transversely rugose. The epinotal spines are somewhat shorter than in the race, except in the larger ♀♀.

Victoria Falls. (S.A.M., R.M., G.A. colls.)

*C. KNERI*, Mayr.

Verh. Zool. Bot. Ges. Wien, vol. 12, p. 762, ♀, 1862.

♀. 4-5 mm. Head and abdomen ochreous-red, the abdomen darker and more brownish. Thorax and petiole reddish-yellow. Mandibles, anterior margin of the head, flagellum and tarsi fuscous-ochreous, scapes, tibiae and femora brownish-ochreous. Pubescence pale, whitish-yellow, short, decumbent, scanty on the head and almost wanting on the thorax. Erect pilosity sparse, occurring only on the clypeus, pronotum, petiole and ventral surface of abdomen. The fundamental sculpture of the head and thorax is a fine, dense and rather superficial reticulation. On this is superimposed a coarser sculpture as follows: Anterior half of head from the cheeks to the



frontal carinae and including the clypeus longitudinally striate, the rest longitudinally rugulose, a narrow area on each side of the frontal sulcus nearly smooth and shining, with a row of 6 or 7 piligerous punctures. Thorax longitudinally rugulose, with a few stronger rugae on the pronotum and dorsum of epinotum. Sides of prothorax and epithorax moderately shining and reticulate-rugulose, sides of mesothorax strongly reticulate-punctate and dull. Petiole very lightly reticulate above. Abdomen smooth and shining. Head a little wider than long, not much wider behind than in front, the sides moderately convex, the posterior margin widely but not deeply concave. The scape reaches the hind margin of the head; all the joints of the flagellum longer than wide, the 1st joint shorter than the 2nd and 3rd together, the club 3-jointed. Anterior margin of clypeus almost straight in the middle. Frontal area and sulcus well defined. Eyes placed a little behind the middle of the sides. Pronotum and mesonotum marginate all round, the margin continued on to the epinotum and joining the lower margin of the spines. Pronotum with a wide and shallow median longitudinal impression, the posterior corners



FIG. 45.—*C. Kneri*, Mayr.

fairly prominent. Pro-mesonotal impression wide, fairly deep at the sides. Mesonotum three-fourths longer than its basal width, furnished with an elongate tubercle or carinula in front, the posterior declivous face forming a little more than one-fourth of its whole length, oblique and merging gradually into the anterior plane. Seen from the side, the profile of the mesonotum forms a continuous convexity, and is distinctly higher than the dorsum of the epinotum. Meso-epinotal suture deep. Dorsum of epinotum very slightly convex lengthwise, trapezoidal, widened towards the apex, its lateral margins continuous with the upper margins of the spines. The latter are long, thin, acute, widely divergent and oblique, longer than the dorsum of the epinotum and as long as the interval between their bases. Declivity of epinotum smooth and shining. First segment of petiole subcordate, wider than long, the anterior angles widely rounded and somewhat raised, the upper face shallowly concave transversely. The sides of the segment are much less sharply bevelled than in the preceding species. Node of 2nd segment oblongo-ovate, one and two-thirds as wide as long, without a median groove. Abdomen one-fourth longer than wide, rather convex above transversely.

♀. 10.1 mm. Reddish-brown, the anterior half of the head, the paraptera, the base of epinotum and 1st segment of petiole paler or yellowish red-brown; abdomen dark brownish-red, antennae, mandibles and tarsi dull ochreous, femora and tibiae brownish-ochreous. Pilosity and pubescence as in the ♀. Head longitudinally striate, the striae more or less effaced between the frontal area and the ocelli, that area being more or less shining, sparsely and strongly punctured. Mandibles striate, sparsely punctured between the striae. Anterior margin of clypeus with a row of large punctures. Mesonotum and scutellum smooth and shining, with some sparse, evenly distributed and fairly large punctures. Dorsum of epinotum dull, transversely striato-rugulose. Petiole: 1st segment very finely rugulose and dull, 2nd segment slightly shining, feebly rugulose and sparsely punctured. Abdomen smooth and shining, sparsely punctured, the punctures small and piligerous. Head widest behind, one-fifth wider than long, the posterior margin straight, the angles narrowly rounded. Frontal area scutiform and well defined, the frontal sulcus deep and ending at the anterior ocellus. Eyes convex, placed at the middle of the sides. Scapes not quite reaching the posterior margin of the head. Mesonotum not so narrow as in *tricolor* and allied forms, as wide as long, scutellum (excluding the paraptera) half as long as the mesonotum, its hind margin semi-circular. Dorsum of epinotum four times wider at the base than long, ending on each side in a stout, horizontal, and triangular tooth; the declivity vertical, shining and smooth. First segment of petiole more or less trapezoidal, one-third wider in front than long, the anterior angles subacute; node of 2nd segment one and a-half times wider than long, widest in front, with pronounced anterior angles, the posterior margin slightly concave in the middle. Wings hyaline, nervures and stigma dark yellow.

Bothaville, O.F.S. (Brauns). (G.A. coll.)

Var. *AMITA*, Forel. (Plate VI, fig. 75.)

Ann. Soc. Ent. Belg., vol. 57, p. 125, ♀, 1913.

♀. 3.5-4.3 mm. Dark-brown, the base of the abdomen paler. Legs pale-brown, tarsi and flagellum reddish-ochreous. Pro-mesonotal suture much deeper than in the type-species, the mesonotal median carinula much more prominent and longer, extending back as a raised line as far as the brow of the declivous face; the latter less oblique than in the type. The dorsum of the epinotum has a deep, median and longitudinal impression, which is barely indicated in the type. The posterior margin of the head is less emarginate. I am unable to

recognise the other differences indicated by Forel. The petiole is precisely similar to that of the type, and the sculpture is quite as strong. Bulawayo. (S.A.M., R.M., G.A. colls.)

Var. *MATABELE*, n. v.

♂. 4.1–5.2 mm. Head and thorax of a warm reddish-brown, abdomen piceous, legs dark brown, the articulations, tarsi, flagellum and mandibles reddish-ochreous. Very similar to var. *amita*, but differing from it in colour, size, and also in the following characters. The fundamental reticulate sculpture of the thorax is much sharper and more coarse. The superimposed rugae on the pronotum finer and less regular than in *amita*. The pro-mesonotal suture is considerably wider and deeper, and joins in the middle a longitudinal impression which divides the pronotum into two (visible also in *amita*, but much less distinct). The anterior plane of the mesonotum, seen from above, is almost pentagonal in outline, the posterior half of the sides sharply marginate, the declivous plane also marginate,



FIG. 46.—*C. Kneri*, Mayr, var. *matabele*, n. v.

longer and steeper than in *amita* (in some specimens almost vertical). The median tubercle is also more sharply carinate and longer than in *amita*. The epinotal spines are as long as in the type-species, less divergent and directed more upwards than in *amita*. The median longitudinal impression on the dorsum of the epinotum is even stronger than in that variety.

Hillside, Bulawayo. Nesting under a stone. (S.A.M., R.M., G.A. colls.; type in my collection.)

Not unlike *C. Bequaerti*, Forel, from which it appears to differ by the weaker sculpture, the much smaller eyes and the pro-mesonotal suture, which is very wide and deep at the sides.

Race *HOTTENTOTA*, Emery.

Ann. Soc. Ent. Belg., vol. 43, p. 482, ♀, 1899.

♀. 3–3.9 mm. Head and thorax varying from a dull ochreous yellow to dark yellowish or reddish-brown, the anterior third of the head usually paler. Abdomen dark brown, becoming paler or more reddish-yellow towards the base. Antennae, legs and mandibles dark ochreous, the tibiae and femora more or less brownish-yellow. Pubescence

much shorter and a little less abundant than in the type-species. Head smooth and shining, very finely and sparsely punctured, the anterior third, including the clypeus, duller, finely, and very superficially striate longitudinally. Mandibles dull, densely striate. Thorax with a weak fundamental reticulation, with a few longitudinal rugae superimposed; these are strongest on the dorsum of the epinotum. Thorax moderately shining. Petiole very superficially coriaceous and rugulose, the upper face of the 1st node shining, the 2nd slightly so. Abdomen smooth and shining. Head a trifle wider than long, the posterior margin almost straight, the posterior angles much more widely rounded than in the type-species. Frontal area and sulcus shallow and indistinct. Head twice as wide as the pronotum. The latter is much less clearly marginate at the shoulders than in the type-species, and is not marginate at all in the middle in front, the upper surface merging into the neck by a gradual curve (in the type-species almost vertically truncate in front). The posterior angles of the pronotum not tumid as in the type-species. The promesonotal suture very shallow, nearly obsolete in the middle. Seen in profile, the pro- and mesonotum form an almost continuous convexity, the mesonotum hardly higher than the pronotum, its declivity much more oblique and gradual than in the type-species. The median carinula weaker, the sides of the declivity less strongly marginate. The epinotum similar to that of the type-species, but the spines are more horizontal and shorter, barely longer than the dorsum of the epinotum, about twice as long as they are wide at the base. First segment of the petiole a little wider than long, trapezoidal, the anterior angles somewhat raised, slightly concave transversely. Node of 2nd segment transversely oblong, not grooved in the middle, the sides much less convex than in the type-species, the posterior margin feebly indented in the middle. Abdomen narrower than in the type-species, one and a-half times longer than wide.

Bedza and Springvale, S. Rhodesia; Sipapoma, S. Rhodesia.

The latter are somewhat intermediate in structure, the 1st segment to the petiole being nearly half as wide again as long, and the pronotum less obliquely curved in front.

(S.A.M., R.M., G.A. colls.)

C. GAMBIENSIS, Andre.

Rev. d'Ent., vol. 8, p. 228, ♀, 1889.

“♀. 3.5–4.5 mm. Head wider than long. Antennae 11-jointed, club 3-jointed; scape short, not reaching the posterior margin of the

head. Eyes placed in the middle of the sides of the head. Mandibles sharply striate longitudinally. Clypeus and front of the head longitudinally striate, very superficially so on the former; the rest of the head smooth and very shining. Pronotum and mesonotum very feebly marginate at the sides; pronotum only slightly depressed, very rounded at the shoulders; mesonotum without a median carina, separated from the pronotum by a feebly marked depression; mesoepinotal suture deep; epinotum armed with 2 short, stout spines, not very acute, feebly divergent and shorter than the interval between their bases. The thorax is smooth and very shining, except the sides of the meso- and epinotum and the dorsum of the latter, which are longitudinally rugose. First segment of the petiole longer than wide, trapezoidal, a little wider in front than behind, the anterior angles rounded; 2nd segment transversely oval, neither grooved nor emarginate above. The 2 nodes are superficially rugose and shining. Abdomen smooth and very shining. Pubescence fine, short and very scanty, almost absent on the head, a little more abundant on the abdomen. Scapes and tibiae without erect hairs. Varying from ferruginous to reddish-brown; the legs often paler; abdomen blackish-brown, often reddish at the base.

“Gambia.”

Var. *KRANTZIANA*, Forel.

Bull. Soc. Vaud. Sc. Nat., vol. 50, p. 234, ♀, ♂, 1914.

“♀. 3.6–4.5 mm. The spines are slender and much longer than in the type-species, three-fourths as long as the interval between them. The petiole is also wider in front and the anterior angles more rounded. The colour is paler and duller, and the 1st abdominal segment is entirely yellowish. Otherwise like the type of Andre, which is in my possession.”

♀. 9.2 mm. (hitherto undescribed). Dark reddish-ochreous, the ocellar area, two longitudinal bands on the parapsidal sutures, the middle third of the abdominal segments and the apex of the abdomen more or less reddish-brown. Head dull, very finely striate longitudinally, the striae almost effaced behind the ocelli. Mesonotum and scutellum nitidulous, smooth, sparsely and feebly punctured. Dorsum of epinotum transversely rugose and dull. Petiole dull and very finely coriaceous. Abdomen smooth, not very shining. Head quadrate, parallel-sided, or very little narrower in front than behind, the posterior margin straight, the posterior angles narrowly rounded. Mesonotum one-fourth longer than wide, two and a-half times longer

than the scutellum; the posterior margin of the latter semicircular. Dorsum of epinotum convex lengthwise, three times wider than long in the middle, armed with 2 acute and small triangular teeth; the declivity subvertical. Petiole as in the ♀, but the anterior angles of the 1st segment less rounded. Abdomen with subacute lateral angles at the base. Wings hyaline, slightly tinged with yellow, nervures and stigma dark ochreous.

♂. 4 mm. Dark brown, petiole and abdomen paler than the thorax; legs, mandibles and antennae dark ochreous-yellow, the legs also somewhat brownish. Shining. Head finely striate longitudinally. Mesonotum very finely striate in the middle, the striae on each side converging posteriorly. Scutellum very finely striate at the sides and in the middle, with a broad and shallow transverse impression at the base. The scape as long as, or a little longer than the 1st joint of the flagellum; the latter as long as wide, the 2nd-5th joints wider than long, the remaining joints very little longer than wide. First segment of petiole a little longer than wide, the sides subparallel, the anterior face oblique and hardly longer than the upper face; 2nd segment subcircular, not very convex above, barely wider than the 1st. Wings with pale yellow nervures.

Krantz Kloof, Natal (H. W. B. Marley). (S.A.M., R.M., G.A. colls.)

The ♀ has a sharp tooth below the 1st segment of the petiole as in race *hottentota* of *C. Kneri*, to which this variety appears to be closely allied. Apart from the greater size, the only appreciable differences lie in the wider head, shallowly but distinctly emarginate behind, the more clearly marginate thorax, the longer spines and the wider 1st segment of the petiole. The sculpture of the thorax is also a little finer than in *hottentota*, and the surface duller.

C. GALLICOLA, Forel.

Mitth. Schweiz. Ent. Ges., vol. 9, p. 95, ♀, 1894.

“♀. 2.2-3 mm. Mandibles striate. Clypeus without a carina; the anterior margin not emarginate in the middle. Head rectangular, the angles rounded, somewhat longer than wide, with convex sides. Eyes placed a little behind the middle of the sides. The frontal sulcus is continued very shallowly as far as the posterior margin of the head, the latter slightly emarginate. The scape does not reach quite as far as the posterior margin. Club of antenna almost 2-jointed in the ♀ major, 2-jointed only in the ♀ minor; 2nd-5th joints of the flagellum wider than long. Pronotum barely marginate at the

sides, the mesonotum not at all. The latter has an elongate median tubercle. Meso-epinotal suture narrow and deep. Epinotal teeth short, as long as two-fifths of the interval between them. First segment of petiole with a very short and blunt tooth below in front, much the same as in *C. scutellaris*; somewhat wider than long. Second segment with a complete median groove and 2 not very projecting discs. Abdomen cordate. ♀ minor shining, lightly reticulate, distinctly but sparsely and finely punctate, the abdomen and back of the head nearly smooth, the cheeks sparsely striate. ♀ major less shining, more sharply reticulate all over, the head in greater part very finely and closely striato-rugulose and reticulate, with shallow and widely spaced punctures which are distinct and abundant. Pubescence very fine, scattered. Pilosity almost entirely wanting, except on the ventral surface. ♀ major, brownish-black, mandibles, cheeks, club of antenna and articulations of the legs dark yellowish-red. ♀ minor, yellowish or dark yellowish-brown, posterior half of the abdomen blackish-brown.

“Delagoa, in a gall (Dr. Liengme).”



FIG. 47.—*C. gallicola*, Forel.

The ♀♀ before me are all small examples, 2.4 mm. or less, derived from an incipient nest. In these the head is as wide as long, excluding the mandibles. Frontal area feebly defined. The 2nd-7th joints of the flagellum wider than long. The pro-mesonotal suture is very shallow but fairly visible. The declivity of the mesonotum is quite two-thirds as long as the anterior plane, and the latter has a rounded tubercle in front. The 1st segment of the petiole is as long as wide, with the anterior angles somewhat obtusely truncate.

Apart from these slight differences these specimens agree fairly well with Forel's description; they have also been determined as *gallicola* by Dr. Santschi.

♀. 8 mm. (hitherto undescribed). Blackish-brown, tarsi and flagellum ferruginous, mandibles castaneous red. Erect pilose hairs very sparse on the abdomen, and almost entirely wanting elsewhere. Pubescence moderately plentiful, decumbent; fairly long on the legs and antennae. Sides of the head, in front of the eyes, finely and longitudinally striate, behind the eyes very superficially rugulose and feebly punctured, moderately shining. Clypeus nearly smooth in the middle. Mandibles coarsely striato-punctate. Mesonotum and scutellum

very smooth, shining, finely and sparsely punctured. Epinotum faintly rugulose above and at the sides, the declivity smooth and shining. Petiole and abdomen smooth, shining, very minutely and sparsely punctured. Head subquadrate, as long as wide behind, slightly narrowed in front, the posterior angles narrowly rounded, the hind margin straight. Frontal area well defined, longitudinally striate. Head very little wider than the thorax across the tegulae. Scutellum half as long as the mesonotum. The dorsum of the epinotum very short, joining the vertical declivity in a very short curve. First segment of petiole subquadrate, a little wider in front than behind, nearly one-third wider than long, the anterior two-thirds semicircularly bevelled. Second segment subglobose, a little wider than long, the posterior margin feebly emarginate in the middle. Dealcated.

Somabula, S. Rhodesia; in a gall, 1 ♀, 14 ♂♂. (R.M., G.A. colls.; type of ♀ in my collection.)

Race LATRO, Forel.

Schultze, *Reise Süd-Afrika*, vol. 4, p. 6, ♂, 1910.

“♂. 3.3–3.7 mm. Like the type of the species, but larger. Entirely yellowish-brown. The 1st segment of the petiole wider than long, feebly arcuate in front (in the type of the species as long as wide, the anterior margin straight).”

“Between Kgokong and Kang, Kalahari (Schultze); in gall-like swelling on the branches of an *Acacia*, in company with Aphides.”

C. TRANSVAALENSIS, Forel.

Mith. Schweiz. Ent. Ges., vol. 9, p. 96, ♀, 1894.

“♀. 2.7–2.8 mm. Mandibles smooth, shining, quadridentate. Clypeus fairly flattened, impressed in the middle anteriorly. Head rectangular, with the angles rounded, somewhat wider behind. Eyes large, placed at the posterior third. Club of the antenna 2-jointed; the scape reaches the posterior margin of the head. Pronotum fairly distinctly marginate at the sides, with a little longitudinal carina in the middle. Pro-mesonotal suture barely visible. Mesonotum without a median carina, marginate at the sides behind, the declivity short and oblique. Meso-epinotal suture not deep. Dorsum of epinotum marginate, wider behind than in front. Epinotal spines short. First segment of petiole, seen from above, almost quadrate, higher behind than in front, with 2 quite small and blunt denticles or corners behind, below toothed in front, the tooth short, thick, obtuse



and continuous with its lower surface. Second segment of petiole somewhat wider than long, as wide as the 1st, quite round, without a trace of a median groove or impression. Cheeks, sides of the clypeus, a part of the sides of the frons finely and longitudinally striate, reticulate between the striae. The rest of the head, the abdomen, 2nd segment of petiole, a part of the mesonotum and sides of the pronotum smooth, shining, sparsely and finely punctured, with a mere trace of a reticulate sculpture here and there. The rest of the thorax closely and not very finely punctate-reticulate and fairly dull; 2 or 3 longitudinal rugae on the pronotum. First segment of petiole reticulate. Erect pilosity sparse and fairly coarse. The hairs are somewhat truncate and clavate as in *Leptothorax*. Pubescence decumbent and very scanty. The tibiae and femora with only decumbent hairs. Dark castaneous brown. Mandibles, antennae and tarsi reddish-yellow. Legs and club of antennae more brownish.

“Transvaal (Rev. P. Berthoud); Capetown and Vrijburg (Simon).”

Var. HAMMI, n. v.

♀. 2.4 mm. Pitch black, legs and antennae brownish. The whole thorax, including the declivity of the epinotum, and the sides

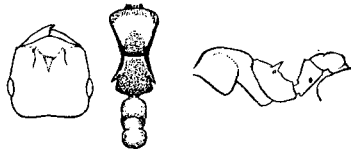


FIG. 48.—*C. transvaalensis*, Forel, var. *Hammi*, n. v.

of both segments of the petiole, very sharply reticulate, the meshes wide and shining, the strands thin and trenchant. The reticulation is strongest on the epinotum, more superficial and closer on the mesonotum. The pro- and mesonotum are also finely rugoso-striate longitudinally. The declivity of the mesonotum distinctly marginate at the sides, the margins being continued over the dorsum of the epinotum and along the inner side of the spines. The latter are not very short, quite half as long as the interval between their bases. The 1st joint of the flagellum is as long as the 2nd-4th taken together, the 3rd, 4th and 5th a little wider than long, the 2nd and 6th a trifle longer than wide. Erect pilosity whitish, fairly long.

(S.A.M., R.M., G.A. colls.; type in my collection.)

I have much pleasure in naming this variety in honour of my friend, Mr. A. H. Hamm, of the Hope Museum, Oxford.

*C. constructor*, Emery.

Ann. Soc. Ent. France, vol. 63, p. 29, ♀, 1895.

“♀. 3-3.5 mm. Piceous, nitidulous, sparsely pilose, erect hairs absent, head subglobose, finely striate in front; the scape of the 11-jointed antenna reaches back beyond the occipital margin, the club indistinctly 3-jointed; thorax short and thick, not marginate, pronotum obtusely bigibbose, mesonotum moderately convex, declivity of the epinotum large, very smooth, forming an obtuse angle with the dorsum, the latter fairly round, with a short tooth on each side; sides of the first segment of petiole bisinuate, slightly narrower behind, impressed in the middle above, the 2nd segment very shallowly impressed. Hammans Kraal (Simon). Makes carton nest in trees.”

“ . . . In the shape of the epinotum, which is almost devoid of spines, this ant recalls *C. inermis* and allied forms, from which it is quite distinct in not having the 1st segment of the petiole trapezoidal.

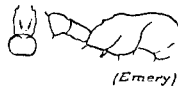


FIG. 49.—*C. constructor*, Emery.

The sculpture is feeble, so that the greater part of the head is shining, not showing puncturation or longitudinal striation except under a very high magnification. The thorax is a little duller, except the declivity of the epinotum, which is smooth above, faintly punctured and slightly concave below, longer than the dorsum, from which it is separated by a much-rounded angle. The mesonotum is uniformly convex, separated from the pronotum by a shallow suture, which emphasises 2 not very prominent bosses formed by the lateral portions of the pronotum. The 1st segment of the petiole is hardly wider in the middle than in front or behind, the anterior angles well defined; it is longer than wide, and shallowly excavated in the middle above, . . .”

Var. *KIRBYI*, Mayr.

Ann. K.K.N.H. Mus. Wien, vol. 10, p. 137, ♀, 1895.

“This variety differs from the type of the species by the presence of epinotal spines, which are directed somewhat outwards and upwards, and are about half as long as the width of the epinotum at the mesoepinotal suture.

“S. Africa.”

*C. MURALTI*, Forel, race *LIVINGSTONEI*, Santschi.

Ann. Soc. Ent. Belg., vol. 54, p. 432, ♀, 1910.

(Race) Bull. Soc. Vaud., vol. 52, p. 344, ♀, 1919.

♀. 2.2-2.4 mm. Piceous, legs, antennae and mandibles brownish-yellow. Shining, the pronotum, sides of mesonotum and mesopleurae less shining than the rest of the body. Pubescence very scanty on the thorax, and fairly so elsewhere, composed of thin, decumbent and yellowish hairs. Erect pilosity yellowish, absent from the head except on the clypeus, very sparse on the thorax and petiole, a little more abundant on the abdomen, where they are slightly clavate and truncate. Head smooth, finely and very sparsely punctured, microscopically aciculate at the sides in front of the eyes. Pronotum and sides of the mesonotum sharply and finely striate longitudinally, the striae very regular, the middle of the mesonotum smooth. Dorsum of epinotum



FIG. 50.—*C. muralti*, Forel, race *livingstonei*, Santschi.

with a few short striae on each side and a fairly discrete reticulate patch in the middle, the declivity almost smooth, at the most only very superficially reticulate. Nodes and abdomen smooth and shining, the dorsal surface of the 1st node slightly duller and very superficially coriaceous. Head as wide as long, narrowed a little in front, the sides moderately convex, the posterior margin shallowly concave. Eyes small, flat, placed just behind the middle of the sides. The scapes do not extend beyond the posterior sixth of the head; 2nd-7th joints of the flagellum at least twice as wide as long, club 2-jointed or indistinctly 3-jointed. Mandibles smooth, shining, 4-dentate. Clypeus transversely impressed behind the anterior margin of the median area. Pro-mesonotum, seen from above, reversed pyriform, the apex (*i. e.* meso-epinotal suture) broadly truncate. Pro-mesonotal suture obsolete, meso-epinotal fairly deep and narrow. Declivity of the mesonotum marginate at the sides and merging into the anterior plane by a low curve. Dorsum of epinotum submarginate at the sides, very short, much wider than long, delimited from the declivity only by the difference of the sculpture. Epinotal teeth triangular, short, erect,

acute and compressed; the declivity concave lengthwise, at least three times longer than the dorsum. First segment of petiole with the sides parallel or only feebly convex, almost one and a-half times longer than wide, the dorsal face not excavated, if anything a little convex transversely, with a minute tooth on each side in front of the posterior margin; node of 2nd segment subglobose, without a trace of a median groove or posterior emargination.

Livingstone, N. Rhodesia. On the trunks of a tree. This locality is just outside the limits of our region, but it is most probable that the species will be found to occur also on the south side of the Zambesi. (S.A.M., R.M., G.A. colls.)

C. SORDIDULA, Nylander.

Act. Soc. Fenn., vol. 3, p. 44, ♀, 1849.

Mayr, Verh. Zool. Bot. Ges. Wien, vol. 5, p. 472, ♀, 1855.

Forel, Mitth. Schweiz. Ent. Ges., vol. 3, p. 308, ♂, 1870.

The type-form of this species is distributed, together with numerous varieties, over the southern Palaearctic region; it is represented in our region by the following forms:

Var. RECTINOTA, Forel. (Plate VI, fig. 73.)

Ann. Soc. Ent. Belg., vol. 57, p. 126, ♀, 1913.

♀. 1.8-2.1 mm. Pale ochreous-yellow, the head reddish to brownish-ochreous, the 1st segment of the abdomen entirely pale ochreous or sometimes yellowish-brown, the rest of the abdomen pale piceous brown, the extreme apex brownish-yellow. Pilosity yellowish, fine and pointed, oblique and fairly abundant on the abdomen, sparse elsewhere. Pubescence inconspicuous. Shining and nearly entirely smooth. Head quadrate, the sides moderately convex, the posterior margin straight, the posterior angles widely rounded. Mandibles smooth, shining, finely and sparsely punctured. The scapes fall short of the occipital margin by the length of the eye; 2nd joint of flagellum as long as wide, 3rd-7th joints much wider than long, club 2- or almost 3-jointed. Frontal area indistinct. Head a little less than one and a-half times wider than the thorax. The latter very short, not quite as long as the head including the closed mandibles. Promesonotum marginate in front and at the sides, the shoulders sharply angular. Promesonotal suture indicated only by the slightly raised anterior margin of the mesonotum; the latter has no distinctly

delimited declivity. Epinotum marginate at the sides, the margins being continued along the inner side of the spines; the latter one-third as long as the interval between their bases, divergent, oblique and slightly compressed. Excepting a very small and transversely concave face at the extreme base, the whole of the upper surface of the epinotum forms one continuous plane. First segment of petiole subquadrate, the slanting dorsal face one-third wider than long, the anterior angles very slightly rounded; node of 2nd segment subglobose, as long as wide, without a median groove or posterior emargination.

♀. 7.9 mm. (hitherto undescribed). Length of front wing 7.8 mm. Head pale yellowish-brown, thorax, petiole, legs, antennae and mandibles dull ochreous, the scutellum, base of mesonotum and declivity of epinotum more or less brownish-yellow, abdomen brown, paler near the base. Legs, antennae and abdomen with thin, oblique and pale yellow hairs; head, thorax and petiole with fairly abundant erect hairs, which are long and coarse. Head nitidulous, longitudinally striate and rugulose between the striae, with a few large and shallow punctures. Mandibles shining, feebly striate, sparsely and coarsely punctured. Mesonotum and scutellum smooth and shining, very sparsely but strongly punctured. Dorsum and sides of epinotum dull and longitudinally rugose, the declivity and the petiole dull and rugulose. Abdomen smooth and shining, finely punctured. Head nearly as long as wide behind the eyes, the posterior margin convex. Eyes large, convex and prominent, occupying a third of the sides. Median area of clypeus smooth and excavated lengthwise in the middle. Frontal area and sulcus distinct. Head, excluding the eyes, very little wider than the thorax across the tegulae. Thorax fairly convex from side to side and in front, a trifle wider than long. Scutellum a little wider than longer, not much narrowed behind. Dorsum of epinotum very short, armed with a blunt, horizontal and triangular tooth on each side. Declivity vertical, not marginate. The vertical anterior face of the 1st segment of the petiole is a little longer than wide, parallel-sided, the anterior angles rounded, the posterior angles surmounted by a small vertical tooth. Second node wider than the 1st, semicircular when seen from above (the convexity posterior), the anterior angles subacute, without a median groove or posterior emargination. Wings deeply tinged with yellow, the nervures and stigma brownish-ochreous.

(S.A.M., R.M., G.A. colls.; type of ♀ in my collection.)

This species is fairly common, always nesting in Rhodesia under stones, very often in close proximity to the nests of termites.

Race NATALENSIS, Forel.

Ann. Soc. Ent. Belg., vol. 54, p. 431, ♀, ♀, ♂, 1910.

♀. 2-2.5 mm. Pilosity longer than in var. *rectinota*. It differs from that variety as follows: The pronotum is not marginate in front, where it is gradually curved into the neck, not almost vertically truncate as in *rectinota*. The pro-mesonotum is narrower and longer, as long as wide in front (in *rectinota* wider in front than long). The anterior face of the 1st segment of the petiole is as long as wide. Otherwise like the type of the species.

“♀. 6-6.7 mm. Scape as in the ♀, not reaching the occipital margin. Spines longer than in the type of the species. First node quadrate, possibly wider than long. Body more elongate and less squat than in the type of the species. Pilosity shorter. Reddish or slightly brownish-yellow, abdomen more or less brown. Front wing 6.3 mm. long, subhyaline, nervures pale.

“♂. 2.3 mm. Yellowish-brown. Joints of the flagellum a little longer than wide (a little wider than long in the type-species). Wings and pilosity as in the ♀. Otherwise like the type of the species.”

Estcourt, Natal (Wroughton); Krantz Kloof, Natal (H. W. B. Marley). (S.A.M., R.M., G.A. colls.)

Race NATALENSIS, var. BRAUNSI, Forel.

Rev. Zool. Afric., vol. 1, p. 277, ♀, 1911.

♀. 2.6-3.5 mm. Head yellowish-brown, thorax and nodes varying from ochreous to reddish-brown-ochreous, abdomen reddish-brown. The puncturation is stronger than in the race, and in the larger ♀♀ the pro-mesonotal suture is clearly indicated by the raised margin of the mesonotum. The epinotal spines are a little longer, the declivity marginate at the sides. First node of petiole a little longer than in the race, distinctly longer than wide. Otherwise like the type of the race.

Estcourt, Natal (Wroughton). (S.A.M., R.M., G.A. colls.)

C. INERMIS, Mayr, race DELAGOENSIS, Forel.

Verh. Zool. Bot. Ges. Wien, vol. 12, p. 766, ♀, 1862.

(Race) Mith. Schweiz. Ent. Ges., vol. 9, p. 99, ♀, 1894.

“♀. 3.4-4.1 mm. Mandibles closely and fairly coarsely striate. Head at least as long as wide (wider in the type of the species). Thorax wider, more robust and more deeply constricted than in the

type-species. Tubercle of the mesonotum very distinct. Epinotum with two distinct, broad and blunt teeth. Abdomen distinctly cordate. Glossy and in part somewhat shining, the abdomen even more so. Irregularly, finely reticulate-rugulose and very sparsely punctured (the head strongly, closely and regularly punctured). Epinotum reticulate-punctate; pronotum and back of the head transversely rugulose, the rest of the head longitudinally striato-rugulose. The ventral surface of the 1st node has a small tooth in front. Brownish-black; mandibles, cheeks, flagellum and articulations dark reddish. Erect pilosity almost entirely wanting.

“Delagoa (Dr. Liengme).”

The type-species has a North African distribution. It has the head smooth and shining, sparsely and finely punctured. The epinotum is entirely devoid of teeth or even tubercles. The race *delagoensis*, of which I possess a co-type, differs very considerably from the type-species. The head, thorax and petiole are dull or very nearly so. The scapes are much shorter, falling short of the occipital margin by



FIG. 51.—*C. inermis*, Mayr, race *delagoensis*, Forel.

about the length of the eye. The head is also wider, the posterior margin shallowly concave (straight in the type of the species). The eyes are placed a little behind the middle of the sides of the head. The pro-mesonotal suture is more deeply impressed, and the dorsum of the epinotum widens towards the apex (hardly wider there than at the base in the type of the species) and bears on each side a broad tubercle ending in a minute dentiform point. The 1st segment of the petiole is trapezoidal, a trifle longer than wide. The node of the 2nd segment has a median groove (not so deep as in the type-species), and the discs have rather prominent posterior margins.

C. SANTSCHII, Forel, var. CLYMENE, Forel.

Rev. Zool. Afric., vol. 2, p. 322, ♀, 1913.

(Var.) Bull. Soc. Vaud. Sc. Nat., vol. 50, p. 337, ♀, 1914.

♀. 3.3–3.5 mm. Black, the club of the flagellum yellowish-red, the tarsi brown. Pilosity absent, the decumbent pubescence very short and sparse, a little less sparse on the abdomen. The whole body very smooth and very shining, only the sides of the mesopleura,

epinotum and the 2nd node of the petiole very superficially rugulose. Abdomen microscopically alutaceous. Head subglobose, as long as wide, a little wider in front than behind, the posterior margin shallowly concave in the middle. Eyes placed a little behind the middle of the sides. The scapes almost reach the posterior margin; 3rd-6th joints of the flagellum very little wider than long, the club 3-jointed. The profile of the pro-mesonotum forms a continuous curve, the pro-mesonotal suture obsolete in the middle, at the sides very shallow, or sometimes entirely obsolete. Pro-mesonotum not marginate, the mesonotum without a distinct declivity. Dorsum of epinotum twice as wide at the apex as long, fairly convex lengthwise, armed with two acute, fairly slender and moderately divergent spines, about one-third as long as the interval between their bases. First segment of petiole as long as wide, at least one and two-thirds wider in front than behind, slightly excavated longitudinally in the middle, the anterior angles widely rounded. Node of 2nd segment very wide, almost twice as wide as long, with a very shallow median groove and the posterior



FIG. 52.—*C. Santschii*, Forel, var. *clymene*, Forel.

margin widely emarginate in the middle, distinctly wider than the 1st segment.

Durban (C. B. Cooper). (G.A. coll.)

#### *C. NIGRONITENS*, Santschi.

♂. 2.8-3.8 mm. Black; tarsi brown, mandibles and flagellum ferruginous, the club brown. Very sparsely pubescent; pilosity absent except on the clypeus. Very smooth and shining, the head finely and very sparsely punctured, the clypeus and area around the antennal pits superficially rugulose longitudinally. Head, excluding the mandibles, distinctly longer than wide, varying from one-seventh to one-fifth longer, the sides barely convex, nearly as wide in front as behind (in the larger ♀♀ wider behind than in front), the hind margin almost straight, the posterior angles rounded. Mandibles narrow, longitudinally striate, obtusely 4-dentate. Anterior margin of clypeus feebly convex in the middle. Scapes very short, hardly extending beyond the posterior third of the head; 2nd to 7th joints of the flagellum wider than long, the club 3-jointed. Eyes almost flat,



placed at the middle of the sides. Thorax long and narrow. The sides and front of the pronotum subvertical. Pro-mesonotal suture feeble in the smaller ♀♀, more distinct in the larger ♀♀, in which the mesonotum is somewhat tumid in front and clearly higher than the level of the pronotum. Declivity of the mesonotum short and oblique in the small ♀♀, longer and steeper in the larger ♀♀. Mesoepinotal suture not deep; mesopleura feebly reticulate. Median tubercle of the mesonotum obsolete or nearly so. Dorsum of epinotum merging into the declivity by a very gradual curve, armed with two very short, suberect teeth, which are shorter than their basal width. First segment of petiole trapezoidal, a little longer than wide in front, the anterior angles widely rounded. Node of 2nd segment feebly emarginate behind and shallowly grooved longitudinally above, not so wide as the 1st segment. Abdomen elongate, two-thirds longer than wide.

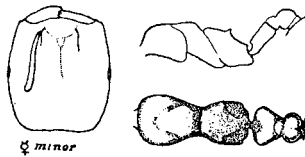


FIG. 53.—*C. nigronitens*, Santschi.

Matoppo Hills, S. Rhodesia; nesting in the hollow and dead branches of a small shrub.

A very distinct species, easily recognised by its polished integument, elongate head, short scapes and minute epinotal teeth.

#### SUB-GENUS OXYGYNE, Forel.

Ann. Soc. Ent. Belg., vol. 45, p. 376, 1901.

“Distinguished in the ♀ by the more or less completely edentate mandibles which lack a masticatory margin; by the rudimentary frontal carinae and by the aberrant and characteristic structure, whereas in the ♀♀ of *Cremastogaster*, s. str., the structure varies but little and is not very characteristic of the species.” Type of sub-genus, *C. Emmae*, Forel. In *C. Daisyi*, Forel, the ♀♀ also have no frontal carinae, and the mandibles are 4-dentate and very narrow, the epinotum with long spines, antennae 11-jointed.

In some species the ♀♀ have the epinotum unarmed, and the frontal carinae are sometimes fairly developed, so that the characters diagnostic for the sub-genus appear as yet to be insufficiently determined for the ♀ caste.

It is generally assumed on the evidence of the structure of the ♀ (although I believe no proof has yet been furnished) that the queens of this sub-genus and of the sub-genus *Atopogyne* exhibit a method of nest-formation, based on a temporary social parasitism on other species of *Cremastogaster*, similar to that shown in the case of the dolichoderine *Bothriomyrmex meridionalis*, var. *atlantis*. In this species the queen enters the nest of a *Tapinoma erraticum* and takes refuge from the attacks of the *Tapinoma* workers by climbing to the back of their queen. While in this position she applies her energies to the task of sawing off the head of the unfortunate victim below her, and by the time this has been accomplished has acquired the nest odour of the *Tapinoma* and is then adopted by the workers in place of their dead and mutilated queen. The workers bring up the progeny of the *Bothriomyrmex* queen, and as the former eventually die of old age the nest becomes a pure colony of *Bothriomyrmex*.\* In one species of *Oxygyne*, *C. Ranavalonae*, the aged queen has the abdomen enormously enlarged, like the queens of the permanently parasitic genus *Anergates*.

C. (sub-gen. OXYGYNE) OSCARIS, Forel.

Schultze, *Reise Süd-Africa*, vol. 4, p. 7, ♀, ♀, ♂, 1910.

“ ♀. 3.5-4 mm. Mandibles 4-dentate, narrow, closely striate, punctured, nitidulous and pilose. Clypeus widely impressed in the middle in front and shallowly emarginate. Frontal carinae very short, almost obsolete. Frontal area indistinct. Eyes moderately flat, placed somewhat behind the middle of the sides. Head wider than long, feebly concave behind, the sides very convex. The scape extends beyond the back of the head by a good third of its length; club 3-jointed with distinct constrictions between the 3 joints; 2nd-7th joints of the flagellum only a little, but nevertheless distinctly longer than wide. Pronotum rounded, feebly impressed in the middle. Mesonotum without a median carina, barely convex, with an arcuate transverse torus at about the posterior third (the convexity of the torus in front); behind the torus a transverse impression. Thoracic constriction fairly strong. Dorsum of epinotum convex, wider than long, with a very shallow longitudinal groove, the epinotal spines very acute, nearly as long as the dorsum or as the interval between them, distinctly curved a little inwards and downwards. Declivity concave, shorter than the dorsum. First segment of the petiole a little longer than wide, trapezoidal, with laterally trun-

\* See Santschi, 'Ann. Soc. Ent. France,' vol. 75, pp. 362-92, 1906.

cate anterior angles. From these truncate angles to the posterior margin the sides are concave. Second segment nearly twice as wide as long, very shallowly impressed above. Abdomen almost truncate in front, acute apically. Legs fairly long. Moderately shining. Head quite finely, the thorax more coarsely longitudinally rugose (the striae on the epinotum divergent), and reticulate between the striae. Clypeus very superficially rugulose like the abdomen. Petiole almost reticulate only. Body and limbs with a sparse, fine and yellowish pubescence, pilosity absent. Black; mandibles, antennae and legs blackish-brown.

“ ♀. 4.5 mm. Mandibles narrow, sickle-shaped as in *Polyergus*, with the apex acute, shining, striate, punctate. Head short, widely truncate in front up to the level of the frontal area, somewhat as in *Colobopsis*, but the truncated face is only obtusely and indistinctly marginate. Clypeus almost flat, without a carina, feebly emarginate in the middle in front. Behind the eyes the head is abruptly narrowed and almost trapeziform, but not narrowed in a neck-like manner, the posterior margin consisting of the articular border only. The scape extends beyond the posterior margin by two-fifths of its length; the joints of the flagellum are longer than in the ♀. Frontal carinae as in the ♀. Thorax narrower than the head; the mesonotum overhangs the pronotum to a certain extent in front. Metanotum pointed, projecting in an almost dentiform shape over the epinotum. Scutellum large. Epinotum quite unarmed, declivous, with a very short dorsum. First segment of petiole wider than long, concave in front, otherwise as in the ♀. Second segment more than twice as wide as long, in front wider and produced laterally. Abdomen, frontal area and clypeus smooth; only a few transverse rugae in front on the clypeus. Legs and antennae shining, with numerous piligerous punctures. Otherwise the head, thorax and petiole are nearly dull, closely and rather coarsely longitudinally rugose, and coarsely reticulate-punctate or reticulate in between the rugae. The scutellum and declivity of the epinotum like the rest. Legs and antennae with abundant decumbent hairs, head, thorax and petiole with dark yellowish exerted hairs. Abdomen almost glabrous. Brownish-black, abdomen, the front of the head, antennae and legs brown. Mandibles brownish-red. Wings hyaline, with pale nervures and stigma.

“ ♂. 3 mm. Mandibles narrow, with only an apical tooth. Head rather wider than long, with a distant hind margin. The mesonotum overhangs the pronotum. Thorax somewhat wider than the head. Epinotum unarmed, but with 2 well-defined faces, the dorsal one short and nearly horizontal. Nitidulous. Head and thorax finely

rugose; abdomen finely reticulate; petiole reticulate-rugose. Wings long. Nearly black, antennae and legs brown. Pilosity, etc., as in the ♀.

“Kammagas, Little Namaland, in a large nest on an orange-bush. (Schultze). The carton nest is 36 cm. long by 26 cm. wide. . . .”

SUB-GENUS ATOPOGYNE, Forel.

Bull. Soc. Vaud. Sc. Nat., vol. 47, p. 343, 1911.

“Characterised by the depressed head, rectangular or trapezoidal, by the straight mandibles with a long masticatory margin, and by the elongate and anteriorly narrowed thorax, all these characters applying only to the ♀.”

C. (sub-gen. ATOPOGYNE) WELMANI, Forel, race RETUSA, Santschi.

Ann. Soc. Ent. Belg., vol. 53, p. 64, ♀, 1909.

(Race) Ann. Soc. Ent. France, vol. 84, p. 500, ♀, ♀, ♂, 1916.

♀. 3.2–4 mm. Head bright red (burnt sienna or brick-red), thorax red or brownish-red, becoming progressively darker towards the petiole, abdomen black, legs brownish-red, the first 4 tarsal joints paler, antennae brownish-red, the club paler. Pilosity absent, except a few hairs on the clypeus and abdomen. Pubescence exceedingly fine and sparse, more abundant on the abdomen than elsewhere. Mesopleura reticulate-punctate and dull, sides of the epinotum finely and longitudinally rugulose and moderately shining, the rest of the thorax, the head and the petiole very smooth and shining, finely and sparsely punctured. Abdomen smooth, shining, impunctate. Clypeus, frontal area and the anterior third of the sides of the head longitudinally striate or aciculate. Mandibles longitudinally striate, 4-dentate. Head, excluding the mandibles, one-sixth longer than wide, rectangular, the sides subparallel, the posterior margin widely and shallowly concave, the posterior angles feebly rounded. The scape does not extend beyond the posterior fourth of the head, 3rd–7th joints of the flagellum wider than long, the club 3-jointed. Eyes flattened, placed at the middle of the sides. Median area of clypeus fairly convex lengthwise, the anterior margin straight. Pronotum rounded at the sides, the anterior face rather steep. Pro-mesonotal suture faintly defined in the middle, more strongly defined at the sides. Mesonotum at least one-third longer than wide at the base, with a trace of a very obtuse median carina in front; the declivity fairly steep, and rounded above. Meso-epinotal suture deep. Dorsum

of epinotum convex at the base lengthwise, its lateral margins also convex, armed with two feebly-pointed tubercles (hardly dentate). First segment of petiole oblong, very little wider in front than behind, nearly one-third longer than wide, slightly concave in front. Node of 2nd segment distinctly narrowed in front, hardly wider than the 1st, barely emarginate behind, with a trace of a median longitudinal groove (quite obsolete in some specimens). Abdomen a little longer than wide.

♀. 8.2 mm. Mandibles and anterior margin of the head dark reddish-brown; a longitudinal band on each side of the mesonotum brownish, legs reddish-yellow, abdomen dark brown, becoming gradually paler or more reddish towards the base; otherwise the colour is like that of the ♂. Sculpture of the head as in the ♂, but stronger and more abundantly punctured. Mandibles strongly striate, sparsely punctured in the striae, 5-dentate. Mesonotum and scutellum very smooth and shining, sparsely and sharply punctured. Epinotum dull, transversely rugulose. Petiole and abdomen moderately shining.



FIG. 54.—*C. Welmani*, Forel, race *retusa*, Santschi. Head less enlarged than the other two.

Head, excluding the mandibles, nearly one-third longer than wide, like that of the ♀ in general, but with the posterior angles much more pronounced, and the sides near the eyes very distinctly concave (in the ♀ there is only a slight trace of this concavity). Eyes placed a little in front of the middle of the sides, feebly convex. Ocelli depressed. The scape hardly reaches the posterior third of the head; 3rd joint of the flagellum wider than long, 4th as wide as long, all the rest longer than wide. The mesonotum slopes downwards from back to front, and is considerably narrowed apically; it is one-fourth longer than wide across the tegulae. Metanotum produced in the middle, subdentiform. Epinotum unarmed, the dorsum at least four times wider than long, the declivity subvertical. First segment of petiole subtrapezoidal, the sides convex, widest a little in front of the middle. Second node oblongo-ovate, not wider than the 1st, without a median groove or posterior emargination. Wings hyaline, nervures and stigma ochreous.

♂. 3.5 mm. Head black, the anterior third reddish-brown, thorax and abdomen brown, the paraptera and metathorax paler than the rest,

legs pale-brown, tarsi, mandibles and antennae fuscous ochreous. Antennae densely pubescent; the brow of the declivity of the epinotum has a tuft of thin, long hairs on each side; elsewhere the pubescence is very sparse. Smooth and very shining, except the head, which is very superficially reticulate-rugulose. Head trapezoidal, as long as wide across the eyes. The latter large, occupying the anterior half of the sides. Mandibles shining and bidentate. Clypeus with a transverse groove across the median area. Scapes two and a-half times longer than wide; 1st joint of flagellum shining, the remaining joints dull, 3rd joint wider than long, the remaining joints as long as, or longer than wide. Scutellum conical in outline, much higher than the epinotum. First segment of petiole wider than long, declivous, a little narrowed in front; 2nd segment subglobose, a little wider than the 1st.

Victoria Falls. A populous nest under the bark of a leguminous tree (*Baikalea* or allied genus), containing several dozens of ♀♀ and ♂♂, and about three or four hundred ♀♀.

SUB-GENUS DECRACREMA, Forel.

Ann. Soc. Ent. Belg., vol. 54, p. 18, 1910.

*Characters.*

♀ and ♀ with 10-jointed antennae. Otherwise like *Cremastogaster*, s. str.

C. (sub-gen. DECRACREMA) ARTHUR-MÜLLERI, Forel.

(As race of *gallicola*, Forel) Mitth. Schweiz. Ent. Ges., vol. 9, p. 96, ♀, 1894.

Mayr, Ann. K.K.N.H. Mus. Wien, vol. 10, p. 144, 1895.

“♀. 3.8 mm. Club of antenna more or less 3-jointed. First segment of petiole with a long thin tooth below in front. Dorsum of thorax less uniformly flattened than in *gallicola*. The scattered puncturation somewhat stronger. Epinotal spines even shorter than in that species. Otherwise like the ♀ major of the type-species.”

Delagoa (Dr. Arthur Müller).

This species and *C. Liengmei* were wrongly described by Forel as forms of *gallicola*. Mayr, in correcting the error, remarks that “*C. gallicola* has a short mesonotum strongly rounded from side to side in front, and the 1st segment of the petiole has only a very small tooth below, or none at all. *C. Arthur-Mülleri* has a much larger mesonotum, and the meso-epinotal suture is much deeper; the 1st segment of the petiole has a thin spine below in front, which is directed steeply forwards and downwards. Larger than *C. gallicola*.”

## C. LIENGMEL, Forel.

(As race of *gallicola*) Mitth. Schweiz. Ent. Ges., vol. 9, p. 96, 1894.  
 Mayr, Ann. K.K.N.H. Mus. Wien, vol. 10, p. 144, 1895.

“♂. Like *gallicola* in size, and with the same brighter colour in the ♀ minor and with more equal sized ♂♂. Posterior half of the head very shining and fairly smooth. Mesonotum without a median tubercle in front. Epinotal spines longer than in *gallicola*. First segment of the petiole with a quite obtuse protuberance below in front, directed entirely forwards (not projecting out underneath). Thorax somewhat more coarsely rugulose and more feebly constricted. Otherwise similar.

“Delagoa (Dr. Liengme).”

## Race WEITZAECKERI, Emery.

Ann. Soc. Ent. France, vol. 63, p. 28, ♀, 1895.

♂. 3-3.7 mm. Black; abdomen, antennae, legs and mandibles dark brown or blackish-brown. Finely and very sparsely pubescent; pilosity absent except on the clypeus. Head smooth and shining, sparsely and finely punctured, the clypeus, mandibles and sides in front of the eyes finely striate longitudinally. Thorax longitudinally rugulose above and dull (sometimes more strongly sculptured, almost rugose), the sides of the pronotum shining, the mesopleura reticulate. First segment of petiole fairly dull, very finely reticulate or coriaceous, the 2nd segment and the abdomen smooth and shining. Head as wide as long, very little narrower in front than behind, the posterior margin straight, the sides very convex. Eyes placed in the middle of the sides. Frontal area indistinct. The scape nearly reaches as far as the occipital margin; all the joints of the flagellum longer than wide, except the 3rd and 4th, which are about as wide as long. Seen in profile, the anterior face of the pronotum is subvertical, its brow rounded, the rest of the pronotum and the mesonotum flat. The promesonotal suture is very shallow, the meso-epinotal deep. Dorsum of epinotum oblique, forming a continuous plane with the declivity. Epinotal spines thin and acute, divergent, directed obliquely upwards, a little more than one-third the length of the interval between their bases. The mesonotal declivity is short and slightly concave transversely. First segment of petiole trapezoidal, wider than long, the anterior angles obliquely truncate, with a minute denticle on each side in front of the posterior margin; node of 2nd segment with a

wide median longitudinal groove, the posterior margin of the lateral discs well defined. The 1st node is unarmed below.

Pietermaritzburg (Simon); Estcourt, Natal (R. C. Wroughton). Durban. (S.A.M., R.M., G.A. colls.)

I have attached to this race a large number of specimens from Durban and neighbourhood, which have been wrongly recorded by Dr. Forel as *C. excisa*, Mayr, race *Andrei*, Forel (Bull. Soc. Vaud. Sc. Nat., vol. 50, p. 236, 1914), and also his *C. coelestis*, Santschi, var. *kloofensis* (*loc. cit.*, p. 237). These specimens have 10-jointed antennae, whereas the true *Andrei* (from the Congo) has 11 joints. In the same place Forel describes several other varieties, also erroneously placed with species of *Cremastogaster* s. str. These are dealt with below.



FIG. 55.—*C. Liengmei*, Forel, race *Weitzaeckeri*, Emery.

RACE WEITZAECKERI, var. THAIS, Forel.

(As var. of race *Andrei*) Ann. Soc. Ent. Belg., vol. 57, p. 126, ♀, 1913.

♀. 2.5–3.5 mm. Differs from *Weitzaeckeri* by its more brownish and paler colour. The head is much more convex above, especially in its posterior half. The 2nd joint of the flagellum is clearly wider than long, and the whole flagellum is a little shorter and thicker than in the race. Otherwise similar.

Port Elizabeth (Brauns); Grahamstown (Sherry). (S.A.M., R.M., G.A. colls.)

RACE WEITZAECKERI, var. GORDONENSIS, Forel.

Bull. Soc. Vaud. Sc. Nat., vol. 50, p. 236, ♀, 1914.

♀. 2.8–3.2 mm. This form is intermediate between *Weitzaeckeri* and var. *acanthobia*, Forel. Like the former the 1st segment of the petiole is wider than long, and the epinotal spines are fairly long and thin; it resembles *acanthobia* in having the steep declivity of the mesonotum strongly concave transversely, even more so than in that variety, the sides of the declivity standing out as distinct ridges.

Gordon's Bay, Cape. Prov. (S.A.M., G.A. colls.)



## Race WEITZAECKERI, var. ACANTHOBIA, Forel.

*Loc. cit.*, ♀.

♀. 2.8-3.3 mm. Head longer than in the race, as long as wide (not longer than wide as stated by Forel), barely narrower in front than behind. In the race the head is clearly narrower in front, and is also one-sixth wider than long. The sculpture of the head is stronger in front, even the clypeus showing a fairly clear longitudinal rugulosity. The thorax is quite dull (slightly shining in *Weitzaeckeri*), more strongly sculptured than in the race, almost longitudinally rugose. The declivity of the mesonotum is steeper and longer, nearly as long as the anterior plane, more deeply concave transversely. Seen in profile, the dorsum of the thorax rises from front to back as far as the mesonotal declivity. The dorsum of the epinotum is less widened towards the apex, and the spines are broader at the base and shorter, or barely half as long as the interval between their bases. The first segment of the petiole is as long as wide in front, the anterior angles less abruptly rounded. It bears below in front a short obtuse tooth, directed downwards.

Willowmore, Cape Prov. (S.A.M., R.M., G.A. colls.)

The specimens from Durban which were also assigned to this variety by Dr. Forel are quite different, having the broad head and other characters distinctive of typical *Weitzaeckeri*, with which they should be placed. They are duller and more strongly sculptured on the thorax than *Weitzaeckeri*, but this character is too variable within the group to justify the separation of the Durban specimens as a variety.

The var. *pensitata*, Forel (*loc. cit.* p. 341) should be sunk as a synonym of *acanthobia*. It is merely a little smaller and has the angles of the 1st segment of the petiole more rounded.

## C. LIENGMEL, race CACULATA, Forel.

(As race of *C. Peringueyi*) *loc. cit.* p. 341, ♀.

♀. 3.5-4 mm. Colour as in var. *acanthobia*. Sculpture of the thorax more reticulate and rugulose and a little stronger than in that variety, especially the dorsum of the epinotum, which is almost rugose; sides of the meso- and epithorax and of the segments of the petiole sharply reticulate. Head globose, a little wider than long. Thorax similar to that of *acanthobia* but more robust, the declivity of the mesonotum as large and as sharply margined laterally as in that variety, but meeting the anterior plane in a less acute angle. Mesoepinotal suture deeper than in *acanthobia*. Dorsum of epinotum

wider at the apex, two and a-half times wider than long, hardly twice as wide as long in *acanthobia*. First segment of petiole wider than long, bearing below a fairly acute triangular tooth pointing downwards.

Durban (C. B. Cooper). (G.A. coll.)

All these races and varieties of *C. Liengmei* are, in my opinion, closely related, and it is most probable that when we have much more extensive material than is now at our disposal, it will be found that they will all be connected together by minute gradations whereby the limits of the present known forms will be entirely obscured.

## SUB-FAMILY CAMPONOTINAE.

### *Characters.*

Gizzard with a 4-sepaled calyx separated from the cavity of the crop by circular muscles. (In the Dolichoderinae there is either no calyx or it is enclosed within the cavity of the crop.)

Petiole 1-jointed, variously shaped.

The poison gland forms a flat or oval cushion; the poison vesicle large and elliptical; no true sting present; only a vestige of it is present, acting as a support for the orifice of the poison vesicle.

Pupae usually enclosed in cocoons.

The following subdivisions of the sub-family have been instituted by Dr. Forel (Mem. Soc. Ent. Belg., vol. 20, p. 87 *et seq.*, 1912):

### SECTION I. PROCAMPONOTINAE.

Calyx of gizzard greatly shortened. The 4 sepals strongly divergent and chitinised from their base upwards. They are very short and strongly recurved at their ends. Mandibles inserted very close together, linear, correct, longer than the head. No frontal carinae present. Antennae inserted far behind the posterior margin of the clypeus, in an isolated antennal socket . . . . . Genus *Myrmoteras*, Forel (not African).

### SECTION II. MESOCAMPONOTINAE.

Calyx of gizzard reflected. Including the following S. African genera: *Aphomomyrmex*, *Plagiolepis* and *Acantholepis*.

### SECTION III. EUCAMPONOTINAE.

Calyx of gizzard straight or slightly curved, but never reflected. Including the following S. African genera: *Oecophylla*, *Prenolepis*, *Camponotus* and *Polyrachis*.

The Mesocamponotinae contains three tribes, of which two are represented in our region, distinguished as follows:

- A. Antennae 11-jointed in the ♀, 12-jointed in the ♂. Gizzard longer  
Tribe *Plagiolepidini*, Forel.
- B. Antennae 9- or 10-jointed in the ♀, 10- or 11-jointed in the ♂. Gizzard shorter . . . . . Tribe *Myrmelachistini*, Forel.

The Eucamponotinae contains five tribes, three of which are represented in our region, and distinguished as follows:

- A. Antennae 12-jointed in the ♀, 13-jointed in the ♂. Calyx of gizzard slightly curved or recurved. Antennae inserted at the sides of the frontal area . . . . . Tribe *Prenolepidini*, Forel.
- B. Gizzard long and narrow, the calyx straight. Antennae inserted somewhat behind the frontal area, but near the ends of the frontal carina  
Tribe *Oecophyllini*, Forel.
- C. Gizzard as in B. Antennae inserted at the sides of the frontal carinae, far from the clypeus and the frontal area . . . . . Tribe *Camponotini*, Forel.

*Key to the Genera of Camponotinae, ♀ ♀.*

- (2) 1. Antennae 9-jointed . . . . . *Aphomomyrmex*, Emery.
- (1) 2. Antennae with 11 or 12 joints. . . . .
- (6) 3. Antennae 11-jointed.
- (5) 4. Epinotum and petiole more or less bidentate or bispinose  
*Acantholepis*, Mayr.
- (4) 5. Epinotum unarmed . . . . . *Plagiolepis*, Mayr.
- (3) 6. Antennae 12-jointed
- (8) 7. Maxillary palpi 5-jointed. Antennae inserted behind the frontal area but near the anterior ends of the frontal carinae *Oecophylla*, Smith.
- (7) 8. Maxillary palpi 6-jointed.
- (10) 9. Antennae inserted at the sides of the frontal area, close to the posterior margin of the clypeus . . . . . *Prenolepis*, Mayr.
- (9) 10. Antennae inserted at the sides of the frontal carinae, some distance from the frontal area and clypeus.
- (12) 11. ♀ ♀ polymorphic. Petiole not spinose or dentate. Shoulders of the pronotum very rarely dentate or sharply angular, never spinose in S. African species . . . . . *Camponotus*, Mayr.
- (11) 12. ♀ ♀ monomorphic. Petiole nearly always spinose or dentate. Shoulders of pronotum often spinose, at least dentate. . . . . *Polyrachis*, Smith.

SECTION MESOCAMPONOTINAE, Forel.

TRIBE MYRMELACHISTINI, Forel.

GENUS APHOMOMYRMEX, Emery.

Ann. Soc. Ent. Belg., vol. 43, p. 493, 1899.

*Characters.*

“♀. Head short. Antennae 9-jointed (or less?), the 1st joint of the flagellum longer than the 2nd, the following joints gradually

incrassate, without a distinct club. Clypeus slightly prolonged arcuately between the frontal carinae, short, feebly projecting in front; no distinct frontal area. Eyes oval, placed noticeably distant from the frontal carinae, the latter far apart; ocelli distinct. Mandibles of the usual shape. Thorax of the *Plagiolepis* type, the postscutellum (metathorax) forming a transverse torus.

"Scale of petiole thin. Pilose hairs thin and aculeate, not branched at the apex.

"♀. Head longer, otherwise formed as in the ♂. Antennae 8- or 10-jointed. Thorax narrow, elongate. Scale of petiole thick and low. Neuration of the wings as in *Plagiolepis*.

"♂. Much smaller than the ♀. Antennae 10-jointed as in the ♀ (in the only species in which the ♂ is known), the scape longer than half the flagellum. Mandibles dentate. Frontal carinae nearer together. Scale of petiole about the same as in the ♀. Genital armature well developed, stipes forming a falciform plate, the volsella slender and longer than the lacinia, which is distinct."

*Distribution*.—Cameroons and Natal. Also Borneo if *A. Andrei* Em., is correctly ascribed to this genus.

A. MURALTI, Forel.

Ann. Soc. Ent. Belg., vol. 54, p. 499, ♀, 1910.

"♀. 2.4 mm. Closely allied to *A. afer* but smaller. Head more convex in front, the sides also more convex. Pro-mesonotal suture deeper; dorsum of epinotum more convex. Entirely smooth and shining, without pubescence and impunctate. Pilosity and colour as in *afer*.

"Natal (Dr. L. v. Muralt). It is perhaps only a race of *afer*, from which it differs chiefly by the absence of puncturation and pubescence and also by its smaller size."

The above diagnosis needs amplification by reference to *A. afer*, the description of which is as follows:

"♀. Black; antennae, trochanters, base of tibiae, and tarsi rusty red, the scape paler; very shining and smooth on the sides of the head, thorax and abdomen, less shining and finely punctulate on the vertex and also on the dorsum of thorax and abdomen; the latter are covered with a fine greyish pubescence, arising from the punctures. There are also some pilose hairs on the whole body, including the scapes and legs. Head subquadrate, a little narrower in front, the posterior angles rounded, the eyes placed in the middle of the sides, the ocelli forming a large triangle. Clypeus convex, its anterior

margin arcuate in the middle, feebly sinuate on each side; the suture between the clypeus and the frons very weak; the clypeus and cheeks are finely striolate and have some large punctures. Mandibles strongly striate, 3-dentate. The distance between the insertion of the antennae is a little less than their distance from the sides of the head. Antennae 9-jointed; the scape does not reach the posterior margin of the head; the flagellum gradually incrassate towards its apex, the last joint almost as long as the three preceding joints taken together. The thorax is squat, the pronotum and mesonotum together forming a globose mass, behind which the metanotum (at the bottom of the depression separating the mesonotum from the epinotum) forms a transverse torus bearing the stigmatic orifices. The epinotum in profile forms a continuous curve, its declivity is concave in the middle, very polished and shining. The scale is high and thin, narrower towards the summit, which is excised. Length 3-3.5 mm."

*A. murali* is apparently a very rare species, as it has not been recorded again since it was first discovered by Dr. Muralt.

### TRIBE PLAGIOLEPIDINI, Forel.

Including the genera *Acantholepis*, Mayr, and *Plagiolepis*, Mayr.

#### GENUS ACANTHOLEPIS, Mayr.

Europ. Formicid., p. 42, 1861.

#### *Characters.*

♂. Antennae 11-jointed, the scape long and usually extending beyond the back of the head, the flagellum filiform, incrassate apically but without a club. Antennae inserted close to the posterior margin of the clypeus, that is at the anterior end of the frontal carinae and at the sides of the frontal area. Frontal carinae short and fairly far apart. Ocelli or traces of the same sometimes present. Mandibles dentate, the masticatory margin oblique and usually long. Maxillary palpi decidedly long. Median area of clypeus gibbose, carinate or subcarinate in the middle. Pronotum long, the thorax always considerably narrowed in its meso- and metanotal portion, widening again at the epinotum. Both thoracic sutures well defined. Mesonotum small, oval or subcircular or quadrate, divided by a transverse impression or suture from a well-defined metanotum. This segment bears two stigmata which occupy a dorsal position and are often raised, so that this part of the thorax has a bituberculate appearance.

Epinotum always rather large and somewhat inflated, armed with a tooth or spine on each side or simply bituberculate, often excavated longitudinally above, and sometimes more or less emarginate between the teeth or tubercles. The dorsum of the epinotum higher than the meso- and metanotum. Petiole with a more or less scale-like node anteriorly and a peduncle behind, the scale emarginate, or bidentate or bispinose above. Abdomen oval, acute apically. Legs long and slender.

♀. Not considerably larger than the ♂. Ocelli not large. Pronotum not visible from above. Mesonotum broad, the scutellum much wider than long, its posterior margin wide and not angular. Metathorax fairly evident. Epinotum lower than the anterior part of the thorax, unarmed. Scale of petiole round or pentagonal, unarmed or merely emarginate above. Abdomen massive. Wings long, extending beyond the apex of the abdomen; anterior wing with 1 cubital cell, the radial cell closed.

♂. Much smaller than the ♀. Antennae 12-jointed; the scape long, at least half as long as the flagellum. Head more or less triangular, eyes large, ocelli small. Pronotum not visible from above. Scutellum narrower behind than in the ♀, the posterior outline more or less conical, much higher than the epinotum. The latter unarmed. Scale of petiole thicker than in the ♀. Wings long, but yet shorter and wider than in the ♀.

*Distribution.*—Palaeartic, Ethiopian and Indo-Malayan regions.

The members of this genus are very active insects. All our species form their nests in the ground, usually under stones. The colonies are of moderate size, nests containing more than about 200 ♂♂ being rare. I have no records of myrmecophilous insects having been found in the nests of any of our South African species. Most of them are omnivorous, with a partiality for sweet substances, and therefore aphidicolous.

*Key to the Species of Acantholepis* ♂♂.

- (10) 1. Node of petiole bispinose above, the spines as long as or longer than the node is wide.
- (5) 2. Petiole very long, two and a-half times as long as the node is high (excluding the spines); the spines long, thin and straight.
- (4) 3. Head and thorax reddish-brown, dull and reticulate-punctate  
*longinoda*, Arnold.
- (3) 4. Head and thorax ochreous, smooth and shining . . . *arenaria*, Arnold.
- (2) 5. Petiole shorter, as long as, or very little longer than the node is high.
- (9) 6. Spines of node round in cross-section, thicker at the base than at the apex.

- (8) 7. Head and thorax more or less yellowish-red, abdomen pale, at least at the base . . . . . *spinosior*, Forel.
- (7) 8. Head and thorax piceous, abdomen wholly black  
*spinosior* var. *natalensis*, Arnold.
- (6) 9. Spines of node flattened from front to back, as thick at the apex as at the base . . . . . *spinosior*, var. *ballaensis*, Arnold.
- (1) 10. Node of petiole only bidentate or emarginate above; if bidentate, then the teeth are much shorter than the width of the node.
- (24) 11. Small species, 2·2 mm. or less; body not entirely black or dark brown.
- (19) 12. Whole body very smooth and shining.
- (18) 13. Thorax more or less ferruginous, head and abdomen dark brown.
- (15) 14. Scapes and tibiae pubescent only . . . . . *rubrovaria*, Forel.
- (14) 15. Scapes and tibiae with exserted pilose hairs in addition to the pubescence.
- (17) 16. Head dark brown . . . . . *rubrovaria*, race *pilosa*, Forel.
- (16) 17. Head ferruginous . . . *rubrovaria*, race *pilosa*, var. *avunculus*, Arnold.
- (13) 18. Dark reddish-ochreous, apical third of abdomen blackish  
*Arnoldi*, Forel.
- (12) 19. Whole body dull.
- (21) 20. Epinotum straight between the tubercles, which are almost obsolete  
*Foreli*, Arnold, var. *convexa*, Arnold.
- (20) 21. Epinotum concave between the tubercles, which are well developed.
- (23) 22. Mesonotum feebly convex transversely, the meta-epinotal suture shallow . . . . . *Foreli*, Arnold.
- (22) 23. Mesonotum strongly convex transversely, the meta-epinotal suture deep . . . . . *Foreli*, var. *impressa*, Arnold.
- (11) 24. Larger species, more than 2·2 mm. long; body entirely or in greater part black or dark brown.
- (28) 25. Head and thorax with a greenish abdomen with a violaceous metallic lustre; dorsum of epinotum with a deep median longitudinal groove.
- (27) 26. Head and pro-mesonotum shining . . . . . *submetallica*, Arnold.
- (26) 27. Head and pro-mesonotum dull . . . . . *submetallica*, var. *aspera*, Arnold.
- (25) 28. Body without any metallic lustre.
- (32) 29. Epinotum very coarsely and irregularly rugose; pilosity long and white.
- (31) 30. Smaller species, 2·4 mm.; scape extending beyond the back of the head by one-fourth of its length . . . . . *crinita*, Mayr.
- (30) 31. Larger species, 2·6–3·3 mm.; scape extending beyond the back of the head by nearly one-third of its length  
*hirsuta*, Santschi, var. *elevata*, Forel.
- (29) 32. Epinotum finely sculptured; pilosity not white.
- (34) 33. Large stout species; head and thorax closely and finely sculptured and dull . . . . . *silvicola*, Arnold.
- (33) 34. More slender species; head and thorax more or less smooth and shining.
- (40) 35. The scape extends beyond the back of the head by nearly half its length, or more.
- (37) 36. Head not narrower in front than behind; the scape extends by more than half its length beyond the back of the head  
*egregia*, Forel, race *Santschii*, Arnold.

- (36) 37. Head narrower in front than behind ; a little less than half the scape extends beyond the back of the head.
- (39) 38. Lateral profile of the dorsum of the epinotum very convex, scale of petiole thick . . . . . *egregia*, Forel.
- (38) 39. Lateral profile of dorsum of epinotum straight and inclined upwards posteriorly ; scale thinner . *capensis*, Mayr, var. *validiuscula*, Emery.
- (35) 40. The scape extends beyond the back of the head by very little more than one-third of its length.
- (42) 41. Metathorax and epinotum fairly dull, rugulose or reticulate ; scale bidentate . . . . . *capensis*, Mayr.
- (41) 42. Metathorax and epinotum shining.
- (44) 43. Length 2.4-2.8 mm. ; scale emarginate above  
*capensis*, Mayr, race *simplex*, Forel.
- (43) 44. Length 2 mm. ; scale more deeply emarginate, or almost bidentate  
*capensis*, race *laevis*, Santschi, var. *Alexis*, Arnold.

The above key does not include *capensis*, race *Junodi*, and var. *simplicoides*, Forel, and *simplex*, var. *minuta*, Forel, which are not known to me in nature.

#### A. SPINOSIOR, Forel.

Ann. Soc. Ent. Belg., vol. 57, p. 144, ♀, 1913.

♀. 2.7-3 mm. Head, thorax and petiole dark rusty red (dark burnt sienna), the head somewhat darker than the thorax, abdomen dark brown, becoming paler or rusty red towards the base ; the basal segment sometimes pale all over except the sides. Legs yellowish-red, flagellum brown and darker at the apex, scapes dark ochreous, becoming gradually darker towards the apex. Pubescence very fine on the legs and scapes, very sparse on the thorax and abdomen, absent from the head. Abdomen with suberect, thick and bristly brownish-black hairs, elsewhere the pilosity is wanting. Head, thorax and petiole dull, very closely finely and evenly reticulate-punctate. Abdomen moderately shining. Mandibles very finely striate, feebly shining, with three or four acute teeth. Head, excluding the mandibles, nearly one-fourth longer than wide, ovoid, considerably narrowed in front, the posterior margin straight. Eyes large, placed in the middle of the sides. Ocelli much reduced, just visible under a high magnification. Clypeus very convex transversely, subcarinate in the middle. Scapes extending beyond the back of the head by two-fifths of their length ; second joint of flagellum one and a-half times longer than wide, all the other joints much longer. Pronotum somewhat flattened above, the sides fairly convex, two-fifths wider than long in the middle. Mesonotum subcircular, a little wider than long, half as wide as the



pronotum; meso-metanotal suture feeble. Metanotum a little wider than long, the stigmatic tubercles fairly prominent. Meta-epinotal suture not very deep. Dorsum of epinotum as long as the declivity, fairly convex and rising posteriorly when seen in profile; seen from above subrectangular, not much widened posteriorly, the lateral margins convex, armed with two fairly acute, triangular teeth, distinctly excavated lengthwise in the middle of the apical half. Declivity oblique, the stigma below prominent. Petiole as long as high in front, ending in front in a wedge-shaped scale which is inclined forwards, and armed above with 2 long, divergent spines directed upwards. The spines are thick at the base, as long as the scale is wide above, and seen from the side are distinctly curved backwards. Abdomen large, longer than wide.

♀. 5 mm. (hitherto undescribed). Black; legs reddish-brown, tarsi, mandibles and antennae reddish-ochreous, the apical third of the scape brownish. Pubescence decumbent, exceedingly fine, abundant all over. Apical margins of the abdominal segments with a few short, obtuse, yellowish erect hairs. Head and thorax dull, closely and fairly finely punctate-coriaceous. Abdomen dull, rugulose. Head subquadrate, wider than long. Ocelli placed close to the hind margin of the head. Eyes large, occupying the middle third of the sides. Mesonotum convex in front, flat above behind, a trifle wider than long, with a depressed median line over its anterior fourth. Scutellum broad, not much wider in front than behind, sloping gradually downwards to the metanotum. Dorsum and declivity of epinotum forming a continuous and steep curve. Petiole short, without a long peduncle behind the scale, the latter thin, unarmed, its upper edge convex from side to side. Abdomen one and a-half times longer than wide, the apex broad and obtuse. Wings fusco-hyaline, nervures and stigma brownish.

Bulawayo. Not common. The entrance to the nest is a very small hole, rarely surrounded with excavated material. A very agile species, and not easily seen, since its colour matches that of the soil. (S.A.M., R.M., G.A. colls.; type of ♀ in my collection).

Var. *BALLAENSIS*, n. v.

♀. 3 mm. Head brownish-black, thorax dark red, petiole and abdomen black; legs and flagellum brown, tarsi and greater part of the scapes dull ochreous. Pilosity on the abdomen black, longer than in the type of the species. Thorax more robust than in the type-species, pronotum one and a-half times wider than long in the middle; mesonotum circular, as long as wide, the metanotum one-third wider than long. The petiole is a little longer than high in front and the

spines of the node are flattened from front to back, directed obliquely backwards; their anterior edge when seen in profile is straight, not convex as in the type-species. Otherwise like the type-species, but a much more robust and darker insect.

Balla-Balla, S. Rhodesia. (R.M., G.A. colls.; type in my collection.)

Var. NATALENSIS, n. v.

♂. 2.4 mm. Very similar to var. *ballaensis* but smaller. Sculpture and pilosity as in that variety. The head is narrower, being one-fifth to one-fourth longer than wide. The scapes extend beyond the hind margin of the head by one-third of their length. Epinotal teeth smaller than in the type of the species, and considerably smaller and more obtuse than in var. *ballaensis*. The petiole resembles that of the type of the species, the teeth being curved backwards, but they are shorter, being barely longer than their basal width. Colour like that of var. *ballaensis*.

Pietermaritzburg (Dr. C. Akerman), ex. Natal Museum coll. Type in my collection.

A. LONGINODA, n. sp. (Plate VIII, figs. 120, 120 a.)

♂. 3-3.8 mm. Head, thorax and petiole dark castaneous red or reddish-brown, abdomen black, legs brownish, the tarsi paler, flagellum dark brown, mandibles and scapes reddish-ochreous, the scapes becoming brownish towards their apices. Dull, very closely and finely reticulate-punctate, or apparently granulate; the thorax with a fine, widely-spaced reticulation superimposed, more apparent and closer on the epinotum than elsewhere. Abdomen almost smooth, shining. Femora reticulate-punctate and dull. Mandibles slightly shining, finely striate and sparsely punctured, 5-dentate. Pubescence very fine and sparse, almost absent on the thorax. Abdomen with a sparse, erect, black, short and obtuse pilosity. Clypeus with about 6 long dark and exserted hairs.

Head, excluding the mandibles, about one-sixth longer than wide, oval, the posterior margin straight. Eyes large, occupying nearly the middle third of the sides. Ocelli barely distinguishable. Scapes very long, quite half their length extending beyond the back of the head, reaching as far as the pro-mesonotal suture; 2nd joint of flagellum twice as long as wide, the other joints much longer. Pronotum long, nearly as long as the meso-metanotum, not more than one-fourth wider than long in the middle, fairly convex above from side to side.

Mesonotum longer than wide behind, widest in front, feebly convex transversely, straight longitudinally; meso-metanotal impression feeble. Stigmatic tubercles of metanotum prominent, subconical in profile. Meta-epinotal suture fairly deep. Dorsum of epinotum convex lengthwise, a little wider than long, not much narrowed at the base, seen from above broadly campaniform, armed with two fairly long oblique and feebly divergent teeth, longer than their basal width; declivity as long as the dorsum, steeply inclined, the stigmata at the base not very prominent. Petiole two and a-half times longer than its node is high, the latter with a fairly large dorsal face, which is as long as wide and bears posteriorly two long, subvertical and thin spines. The spines are longer than the node is wide and at least three times longer than their basal width. Abdomen very convex transversely, longer than wide, pointed towards the apex.

♀. 5.7 mm. Black, legs brownish, tarsi ochreous, mandibles ferruginous, antennae brown, the basal half of the scape more or less ochreous. Anterior third of the head with a fine, decumbent and whitish pubescence. Abdomen, legs and antennae densely pubescent, the pubescence closely adjacent on the abdomen and of a golden ochreous colour, somewhat pruinose; the apical margins with a few erect, short and blunt hairs. Whole body, including the legs and antennae, dull. Head and thorax very regularly coriaceous, the abdomen rugulose. Mandibles slightly shining, finely striate, sparsely and coarsely punctured. The shape of the head and thorax resembles that of *spiniosior* ♀. The petiole without a long peduncle behind the scale, seen from the side cuneiform, higher than long, the upper edge convex transversely, unarmed. Deälated.

Hillside, Bulawayo. A very distinct and handsome species, easily recognised by the exceptionally long petiole in the ♂, and the pruinose-golden sheen on the abdomen of the ♀. (S.A.M., R.M., G.A. colls.; types in my collection.)

A. ARENARIA, n. sp.

♂. 2.8-3.1 mm. Ochreous to dark amber-yellow, the head usually darker, at least in front, and of a more reddish-yellow colour. Apical halves of the 3rd and 4th and the whole of the 5th abdominal segments more or less black or brown, the apical third of the posterior femora and more or less the apical half of the posterior tibiae, and the last two tarsal joints of all the legs brown. Scapes and flagella infusate near their apices, the last joint of the flagellum nearly black. Pubescence yellowish, very short, fine and sparse all over,

more abundant on the legs and antennae. Abdomen and anterior margin of the clypeus with erect whitish-yellow and fairly long pilose hairs, scanty.

Legs and antennae microscopically coriaceous and dull, mandibles very finely aciculate and dull, thorax dull and reticulate-granulate, excepting the pronotum and disc of mesonotum, which, like the head, are smooth and shining, with traces of an almost effaced reticulation; abdomen smooth and shining.

Head a little less than one-quarter longer than wide, hardly narrower in front than behind, the sides moderately convex, the hind margin straight. Clypeus distinctly convex transversely, obtusely

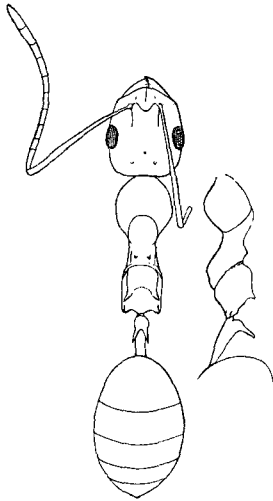


FIG. 56.—*A. arenaria*, n. sp.

subcarinate in the middle, the anterior margin convex. Mandibles 5-dentate and very finely striate. Frontal area triangular, wider than long. Scapes long, extending back as far as the middle of the mesonotum, 2nd joint of the flagellum twice as long as wide, all the other joints longer. Eyes large and convex; traces of 3 ocelli present. Pronotum one-third wider than long, convex transversely above. Mesonotum oval, a trifle longer than wide, nearly one-third longer than the metanotum, from which it is indistinctly defined; metanotal stigmata placed in the middle, prominent in profile. Metaepinotal suture wide and deeply impressed. Dorsum of epinotum rising gradually towards the apex, a little wider there than at the base, wider than long, ending at each side in an acute tooth which is

as long as it is wide at its base; declivity oblique, about as long as the dorsum, produced at each angle below into a blunt tubercle, directed outwards, clearly visible when looked at obliquely from the side. Petiole like that of *A. longinoda*, but the node is narrower, less convex vertically in profile, and armed with longer and thinner spines, which are as long or nearly as long as the node is deep.

Sawmills, Ungusa River, S.R.

A very distinct species, most nearly allied to *A. longinoda*, but with a very different sculpture and colour. The nest was situated in loose yellowish sand, the colour of which so closely matched that of these insects as to render them almost invisible. A very agile and swift species.

(S.A.M., R.M., G.A. colls.; type in my collection.)

#### A. RUBROVARIA, Forel.

(As var. of *simplex*) Ann. Soc. Ent. Belg., vol. 54, p. 449, ♀, ♂, 1910.

This species differs from its race *pilosa* in being a little larger, in having a wider head, and in the absence of exerted pilosity on the scapes and tibiae.

In the ♂, which is 2 mm. long, the scape does not extend beyond the posterior margin of the head by more than one-third of its length. Basutoland (Wroughton). I have not seen the type-species, and the above characters are extracted from Forel's description of the race *pilosa*.

#### Race PILOSA, Forel.

Ann. Soc. Ent. Belg., vol. 57, p. 141, ♀, 1913.

♀. 1.7-1.9 mm. Head dark brown, thorax varying from yellowish-red to brownish brick-red, abdomen and petiole black. Scapes and first two joints of the flagellum dirty ochreous, the rest of the flagellum brown; legs brown, the articulations and the tarsi ochreous. Without sculpture, entirely smooth and shining. A whitish, short and fairly sparse pilosity on the body, scapes and legs. Head subquadrate, as long as wide, hardly narrowed in front, the sides moderately convex, the posterior margin shallowly emarginate in the middle. Eyes placed a little in front of the middle of the side. Scapes short, only just extending beyond the back of the head; 2nd and 3rd joints of the flagellum wider than long, 4th and 5th as wide as long, the remaining joints very little longer than wide. Mandibles tridentate, sparsely punctured and shining. Clypeus very convex in the middle, but not

carinate. Pronotum fairly flat above, about two-thirds wider than long in the middle. Meso-metanotum hardly longer than the pronotum; meso-metanotal suture feeble, the meta-epinotal stronger. Dorsum of epinotum rising from base to apex, the latter distinctly concave transversely between the teeth; the teeth small, divergent, merely prominent angles, the declivity as long as the dorsum, the stigmata below raised and subangular in profile. Petiole one-fourth longer than the scale is high, the peduncle as long as the scale, the latter inclined forwards, its posterior face convex transversely, the dorsal edge straight. Abdomen not very convex above, about one-third longer than wide, broadly ovate. Legs rather short.

Redbank, S. Rhodesia. On sandy soil; a few specimens taken on one occasion only, apparently a rare species. (R.M., G.A. colls.)

Race *PILOSA*, var. *AVUNCULUS*, n. v.

♂. 2.3-2.5 mm. Head and thorax ferruginous, petiole and abdomen piceous, the bases of all the segments more or less paler or reddish-brown. First 3 or 4 joints of the flagellum, the scapes, articulations of the legs, anterior tibiae and all the tarsi reddish-ochreous, the rest of the legs and flagellum reddish-brown. Erect pilosity longer and more abundant than in the type of the race. Smooth and very shining. Second and 3rd joints of the flagellum as long as wide, 4th and 5th a little longer than wide. Pronotum more convex transversely than in the type of the race, also narrower or not more than one-third wider than long in the middle. Mesonotum one-fourth wider than long and nearly twice as long as the metanotum (three-fifths wider than long and very little longer than the metanotum in the type of the race). Dorsal edge of scale thinner than in the type of the race, straight or slightly concave. Otherwise like the type of the race.

Sawmills, Ungusa River, S.R. (R.M., G.A. colls.; type in my collection.)

A. ARNOLDI, Forel.

Ann. Soc. Ent. Belg., vol. 57, p. 142, ♂, 1913.

♂. 1.7-2 mm. Dark reddish-ochreous (deep orange-yellow), the 3rd to 5th abdominal segments and the sides of the apical margins of 1st and 2nd brownish-black; the flagellum, excepting the 1st joint, yellowish-brown, becoming darker apically. Apical halves of the

middle and hind tibiae and femora brownish. Without sculpture entirely smooth and shining. Pilosity and pubescence similar to that of *rubrovaria-pilosa*. Very similar to that species, from which it differs by the colour and the following characters.

The head is narrower, about one-sixth longer than wide, narrower in front. The 2nd joint of the flagellum is as long as wide, the 3rd a trifle longer. The meso-metanotum is narrower, two-thirds longer than wide, and the dorsum of the epinotum is longer and flatter, the teeth blunter and smaller, merely tubercles. The scale of the petiole is feebly but distinctly emarginate above.

Redbank and Bulawayo, S. Rhodesia.

The nest is placed in loose sandy soil in the hottest situations. A very agile species. In one nest several ♀♀ were found which had the abdomen considerably swollen (as long as the head and thorax together), but not so rotund as in the *repletes* of *Myrmecocystus* or of *Plagiolepis Trimeni*. Probably the habit of using some of the members of the colony as storage-vessels for honey is only in the incipient stage in this genus.

A. FORELI, n. sp. (Plate VIII, fig. 121.)

♀. 1.6-1.9 mm. Head and thorax bright red (burnt sienna), abdomen dark brown, with the middle of the upper surface of the 1st and 2nd segments ochreous. Front pair of legs and the scapes ochreous, flagellum, middle and hind legs brownish, the tarsi ochreous. Entirely dull, the head and thorax microscopically rugulose or coriaceous. Pubescence whitish, decumbent and very sparse, more plentiful on the legs, head and antennae than elsewhere. Apical margins of the abdominal segments with a sparse, white, fairly short and obtuse pilosity. Head subquadrate, a little longer than wide, hardly narrowed in front, feebly emarginate behind, the sides feebly convex. Clypeus produced more forwards than in the two preceding species, hiding the closed mandibles, subcarinate. Eyes placed in the middle of the sides; the ocelli vestigial as in the two preceding species. The scapes just reach the posterior margin of the head; 2nd joint of flagellum wider than long, the 3rd as long as wide, all the remaining joints longer than wide. Pronotum like that of *pilosa*, but the meso- and metanotum are wider than in that race or in *Arnoldi*, the mesonotum being almost twice as wide as long. The stigmata of the metanotum only slightly prominent. Epinotum as in *Arnoldi*, but more concave between the tubercles, not inclined upwards posteriorly but horizontal or even slightly inclined downwards. The petiole is as long as the

scale is high; the latter thin, inclined forwards, distinctly emarginate above. Abdomen longer than wide.

Sipapòma, S. Rhodesia. Running about on very hot sandy soil. (S.A.M., R.M., G.A. colls.; type in my collection.)

Var. IMPRESSA, n. v.

♂. 1.7-2.2 mm. Apart from its more robust form and larger size, this differs from the type of the species as follows:

The colour is similar but darker in all parts. The thorax is wider, the mesonotum more convex transversely and the meta-epinotal suture deeper. The metanotum is not more than two-thirds the length of the mesonotum (quite as long in the type-species) and its stigmata are more prominent.

Hillside, Bulawayo; in similar situations as the type-species. (S.A.M., R.M., G.A. colls.; type in my collection.)

Var. CONVEXA, n. v.

♂. 1.8 mm. Colour and sculpture as in *impressa*. The pubescence is longer and much more apparent than in that variety or in the type of the species. It differs from both by the narrower thorax, the pronotum more convex transversely; the dorsum of the epinotum is straight between the tubercles, not concave as in the type and var. *impressa*, and the tubercles are even smaller than in the type. The chief distinction lies in the shape of the scale of the petiole, which is thinner, much narrower and more convex above.

Hillside, Bulawayo. Type in my collection.

A. CRINITA, Mayr.

Ann. K.K.N.H. Mus. Wien, vol. 10, p. 149, ♂, 1895.

“♂. 2.4 mm. Black, the apical half of the mandibles, the antennae (excepting the apical fourth of the scape and the apical half of the flagellum), and the tarsi more or less bright reddish-brown or brownish-yellow. The whole body is abundantly clothed with long, whitish, exserted and not very thick, bristly hairs, the femora and tibiae with similar hairs, but only moderately long. A decumbent pubescence is not recognisable. Head, pronotum and mesonotum shining and nearly smooth, or partly and very superficially coriaceous and rugulose, the metanotum and sides of the mesonotum coarsely and longitudinally striate; the whole epinotum coarsely rugose and fairly dull; petiole and abdomen smooth and shining. The body is



thicker than in *capensis*, Mayr. The oval head, moderately emarginate behind, has the same shape as in *capensis*. The scape extends beyond the back of the head by about one-fourth of its length, the 2nd joint of flagellum is hardly half as long again as wide, the other joints longer. The pronotum, as in *capensis*, is not strongly arched. The constriction of the thorax is distinct, stronger than in *capensis*. The epinotum has two cones rounded at the apices and directed steeply outwards, upwards and backwards. The scale of the petiole has two pointed teeth above and is arcuately emarginate between them.

“Durban (Brauns).”

A. SUBMETALLICA, n. sp.

♀. 3.2-3.8 mm. Black, femora blackish-brown, tibiae brown, tarsi brownish-yellow, flagellum brown, scape dirty ochreous, becoming brown towards the apex. Head and thorax with a greenish metallic lustre, not very pronounced, abdomen with a very evident violaceous or steely blue lustre. Pubescence present on the clypeus, lower surface of the head, legs and antennae only, fine and decumbent. The pilosity consists of long, thin, erect and white hairs, most abundant on the abdomen, absent from the legs and antennae. Legs dull, the whole body shining, especially the abdomen. Head almost smooth, at the most only microscopically reticulate. Pro-mesonotum very finely reticulate above or sometimes smooth, also with a few small piligerous punctures. Metanotum with 3 or 4 strong longitudinal rugae between the stigmatic tubercles; epinotum striated on the inner half of the lateral cones, the striae curving outwards posteriorly. Sides of meta- and epithorax longitudinally striate. Petiole and abdomen smooth. Head a little longer than wide, subovate, considerably narrowed in front, the posterior margin feebly concave, the posterior angles widely rounded. Clypeus carinate in the middle. Mandibles almost smooth, 5-dentate. Eyes large, placed at about the middle of the sides; ocelli vestigial. Antennae long; the scape extends beyond the back of the head by one-third of its length. 1st joint of flagellum as long as the 2nd and 3rd together, all the joints longer than wide. Pronotum distinctly flattened above and sloping forwards, two-thirds wider than long in the middle (excluding the neck). Pro-mesonotal suture deep. Mesonotum convex, large, as wide as long, at least twice as long as the metanotum. Meso-metanotal suture feeble. Dorsum of epinotum convex longitudinally, divided by a deep median groove into two lateral cones, divergent and ending in subdentiform points; declivity oblique, longer than the

dorsum, the stigmata below prominent. Petiole a little longer than its scale is high, the latter convex behind, flat in front, the dorsal edge emarginate and subdentate on each side of the emargination. Abdomen longer than wide, acute at the apex, rather large, very convex above. Legs long and slender.

♀. 5.8 mm. Black; femora and tibiae brown, mandibles, anterior margin of the clypeus, antennae and tarsi bright ferruginous. A metallic lustre is just visible in some lights, more or less bronzy on the head and mesonotum, faintly greenish on the epinotum and abdomen. Pilosity less abundant than in the ♂, almost entirely absent from the thorax; the pubescence is very abundant all over, longest on the scutellum, epinotum and abdomen, decumbent except on the scutellum and epinotum, where it is oblique. Whole body nitidulous, the abdomen somewhat duller than the rest, very closely and regularly punctured. The punctures are piligerous, finest and most abundant on the abdomen, fairly fine on the scutellum, large and deep on the mesonotum and back of the head; the epinotum is obliquely striate, punctured between the striae. Mandibles shining, sparsely and coarsely punctured. Head subtriangular, as long as wide behind. Clypeus carinate on the anterior half of the median area. Scapes very long, extending beyond the back of the head by half their length. Mesonotum with a shallow transverse impression a little in front of its basal margin, and a median longitudinal and impunctate line extending from front to back; parapsidal sutures clearly defined. The dorsum and declivity of the epinotum form a single oblique plane, bearing a small tubercle on each side above; the extreme apex of the epinotum, facing the petiole, is shining and impunctate. Petiole longer than wide, convex from side to side above. Abdomen elongate, twice as long as wide. Wings tinged with brown, the nervures and stigma dark brown.

♂. 2.8 mm. Dark brown, the thorax paler than the head and abdomen and with yellowish-brown sides, antennae, legs and mandibles pale ochreous. Very shining. Pilosity and pubescence sparse, the former much shorter than in the ♂ or ♀. Exceedingly finely and sparsely punctured. Abdomen impunctate. Head subcircular, a little wider than long, nearly as wide as the thorax. The eyes occupy the anterior two-thirds of the sides; the distance between the posterior ocelli is twice as great as the distance between them and the anterior ocellus. The scape is two-thirds as long as the flagellum, and extends by a good deal more than half its length beyond the back of the head. Epinotum with a small tubercle on each side above, as in the ♀. Scale of petiole thick, almost half as thick as wide across the top, the

dorsal edge straight and furnished at each corner with a minute sub-acute tubercle. Wings as in the ♀, but paler.

Bulawayo.

Forming fairly populous nests in the ground, the entrances surrounded by a large amount of excavated material, more or less crateriform.

A very distinct species, easily recognised by the metallic lustre and by the deeply-divided epinotum in the ♀, and by the long scapes in the ♀ and ♂. Excluding some species of *Monomorium* (in which, however, there is a slight suggestion of a metallic sheen on the abdomen only) this is the only South African ant which has a metallic lustre. In the Australian fauna, on the other hand, this feature is quite common in many genera of Formicidae and of other Hymenoptera.

(S.A.M., R.M., G.A. colls.; types in my collection.)

Var. ASPERA, n. v.

♀. This differs from the type of the species only in having the head and pro-mesonotum very finely rugulose and dull, and in the less pronounced greenish tinge. The abdomen, however, has the same violaceous lustre as the type.

Amatongas Forest, Portuguese E.A. (S.A.M., R.M., G.A. colls.; type in my collection.)

A. CAPENSIS, Mayr.

Verh. Zool. Bot. Ges. Wien, vol. 12, p. 699, ♀, 1862.

Reise der Novara, Zool. 2, Formicid., p. 56, ♂, 1865.

Emery, Ann. Mus. Civ. Genoa, vol. 9, p. 366, ♀, 1877.

“♀. 2·8–3·3 mm. Shining, sparsely hirsute, black, the mandibles, legs and antennae brown, the mandibles sparsely striate longitudinally. Head and thorax very finely, superficially and coriaceously rugulose, almost smooth. The 1st joint of the flagellum twice as long as the 2nd. Epinotum with 2 blunt teeth. Scale of petiole bidentate above, strongly emarginate between the teeth. Abdomen almost smooth. The body much more compressed or narrower than in *A. Frauenfeldi*, Mayr.

“Cape of Good Hope.”

The only examples of the type-species which I have seen are a few (ex S.A.M. coll.) which have been determined as such by Dr. Forel. They agree with Mayr's description in all but colour, which is dark

brown, the abdomen reddish-brown. This may be due to exposure and consequent bleaching, since the specimens were collected in 1899. Mayr's diagnosis of the species being so short, I append a fuller one, based on these specimens.

♀. Pilosity brown, very short and sparse. Head, pro-mesonotum, petiole and abdomen shining and smooth (at the most only with a microscopical sculpture); meta- and epinotum finely rugulose and dull. Head subovate, widest behind, as wide as long, the posterior margin straight, the posterior angles widely rounded. Eyes barely convex, rather large, placed a little behind the middle of the sides. Scapes extending beyond the posterior margin by very little more than one-third of their length; 1st joint of flagellum twice or a little more than twice as long as the 2nd, the latter as long as wide, all the remaining joints longer than wide. Clypeus obtusely carinate, the anterior margin convex. Pronotum one and a-half times wider than long in the middle, its anterior half somewhat flattened. Mesonotum a trifle wider than long, one-third longer than the metanotum. Mesometanotal suture not deep. Metanotum widening posteriorly, twice as wide behind as in front. Meta-epinotal suture fairly deep. Dorsum of epinotum ending in a blunt cone on each side, between the cones feebly concave transversely, hardly convex lengthwise; the declivity as long as the dorsum. The posterior face of the scale of the petiole a little convex transversely, the anterior face flat, bidentate above (the teeth small, shorter than the interval between them), emarginate between the teeth. The whole petiole is about as long as the scale is high.

“ ♂. 3 mm. Brownish-black, fairly shining, clypeus, scape, tibiae, femora and abdomen brown; flagellum, tarsi and mandibles more or less brownish-yellow, the genital armature partly brown, partly brownish-yellow. The pilosity is sparse; on the head, thorax and base of abdomen there are only a few isolated hairs, the end of the abdomen more abundantly pilose, the legs without pilosity. Pubescence yellow, fairly fine and not abundant, most plentiful on the legs. Head triangular, with strongly-rounded corners, fairly smooth, very slightly rugulose or rugulose-punctate. Mandibles flattened, very shining, feebly rugulose, 4-dentate. . . . The clypeus like that of the ♀. Frontal area large, triangular, not clearly defined behind. Antennae 12-jointed, . . . scape long and thin, the flagellum thicker, the 1st joint nearly twice as long as the 2nd, which is the shortest, the remaining joints becoming gradually longer in succession towards the apex. Frontal carinae fairly short, straight and parallel. The frontal sulcus not distinct. Eyes large, hemispherical, placed at

about the middle of the sides. The thorax is more closely rugulose-punctate and less shining than the head and abdomen, and is about as high as wide; the pronotum is very narrow, and the mesonotum projects over it a little. The epinotum is steep, feebly convex, the dorsum and declivity not clearly delimited. The scale is small and strongly inclined forwards. The abdomen is sparsely rugulose-punctate and about as large as the thorax, . . . The wings are large, almost hyaline, nervures brown, the anterior wing with 1 cubital cell, but without a closed discoidal-cell. . . ."

♀. I omit Emery's description of this sex, as it is too short to be of any value for purposes of identification.

Var. *VALIDIUSCULA*, Emery.

Ann. Mus. Civ. Genoa, vol. 18, p. 602, ♀, 1897.

♂. 2·8-3·3 mm. Jet black, the tarsi and flagellum brown, the tibiae and femora brownish-black, the scape ochreous-yellow with the apical 3rd or 4th brownish. Sometimes the legs and flagellum are paler, and the head more or less brownish-black. The chief distinction between this variety and the type of the species lies in the greater length of the scape, which extends beyond the back of the head by almost half its length, and by the pilosity, which is much longer, coarser (more bristly) and more abundant, particularly on the pronotum and back of the head. The epinotum is as a rule less flat above, being very shallowly excavated in the middle almost to its base, and the lateral cones more divergent and larger. Mesonotum as long as wide, rarely so short as in the type-species.

I refer to this variety a large number of specimens derived from different parts of South Africa. Some of these exhibit a slight amount of variation in minor details, such as the sculpture and degree of opacity of the meta- and epinotum, and the pilosity.

♀. 4·6-5 mm. Dark brown, the head and thorax almost black, legs, basal half of the scapes and flagellum paler brown, the tarsi and mandibles ochreous. Pubescence dense, very fine, adpressed and of a pale greyish-yellow; the pilosity composed of short, yellowish hairs, present only on the abdomen and clypeus. Head and mesonotum very finely and fairly closely punctured, the scutellum rather sparsely punctured. Epinotum closely striato-rugulose, transversely so on the declivity. Head and thorax with a very slight gloss, almost dull. Abdomen dull, microscopically punctate-rugulose. Head subtriangular, as long as wide, the posterior angles widely

rounded. Clypeus very convex and raised in the middle, but not distinctly carinate. Mandibles smooth and shining, sparsely and very finely punctured. Eyes not very convex, placed a little behind the middle, occupying about a third of the sides. Ocelli placed far back, close to the occipital margin. The scape extends beyond the back of the head by about one-fourth of its length, all the joints of the flagellum longer than wide. Thorax about one-third wider than the head. The pronotum is slightly exposed in the middle above. Mesonotum one-third wider than long, the scutellum half as long as the mesonotum and sloping downwards gradually behind. Dorsum and declivity of epinotum not distinctly delimited, forming a single vertical plane which is feebly convex above. Scale of petiole as wide as high, its dorsal edge almost linear. Abdomen one-third longer than wide, oval, all the segments much wider than long. Wings dirty ochreous, the nervures brown, the stigma pale yellowish-brown.

♂. 2.7 mm. Black, femora, tibiae and scapes brown, tarsi and flagellum pale ochreous. Smooth and shining. Pubescence very fine, fairly abundant, longer and less decumbent than in the ♀, intermixed on the mesonotum with a short, dense and bristly pile of a blackish colour. Apex of abdomen, the epinotum and back of the head with some longer and brownish pilose hairs. Head, including the mandibles, having the shape of an isosceles triangle, much narrower in front of the eyes than behind them. Clypeus with an elongate median tubercle. Eyes convex, occupying about one-third of the sides of the head. Scapes extending beyond the posterior margin by about one-third of their length; 2nd-7th joints of the flagellum less than half as long again as wide. Mesonotum very convex in front, one-fourth wider than long. Scutellum longer and narrower posteriorly than in the ♀, three-fifths the length of the mesonotum. Scale of petiole widest above, wider than high, the dorsal edge fairly thick, not linear as in the ♀. Abdomen ovate, the genital armature large and exerted. Wings brownish, the nervures and stigma dark brown.

The ♀♀ taken with the ♂♂ from which the above description is derived differ slightly from those taken with the ♀, the dorsum of the epinotum being more convex, but I do not consider that difference sufficient to enable me to regard these ♂♂ as belonging to anything but the var. *validiuscula*.

S. Rhodesia and Cape Province. Generally distributed and very common. Nesting usually under stones; an industrious attendant on Aphididae and Coccidae. (S.A.M., R.M., G.A. colls.)

## Var. SIMPLICOIDES, Forel.

Voeltzkow's Reise Ost Afrika, vol. 2, p. 86, ♀, 1907.

"A form transitional to *simplex*, Forel, with blunt and wide epinota. teeth, and with the scale only emarginate, barely dentate. Basutoland (Wroughton). This form proves that *simplex* is only a race of *capensis*."

## Var. MINUTA, Forel.

Rev. Suisse Zool. vol. 24, p. 438, ♀, 1916.

"♀. 1.5 mm. Differs from the type, apart from its very small size, by its more robust build and by the short scapes, which extend beyond the hind margin of the head by barely as much as their apical width. It differs from var. *laevis*, Santschi, by its jet-black colour and wider head.

"Shiluvane, Transvaal (Junod)."

## Race JUNODI, Forel.

*Loc. cit.*, ♀, p. 438.

"♀. 2.5-2.8 mm. Differs from the race *incisa*, Forel, like which it has a bispinose scale, by the legs and scapes covered with white subdecumbent hairs, by the yellowish and fairly pointed hairs on the body, by its much wider head, by the shorter scapes which extend beyond the head by barely one-fourth of their length, and by the less deep incision of the thorax. It differs from *curta*, Emery, by the spines on the scale and by its narrower head.

"Shiluvane, Transvaal (Junod)."

## Race SIMPLEX, Forel.

Ann. Soc. Ent. Belg., vol. 36, p. 43, ♀, 1892.

Mitth. Schweiz. Ent. Ges., vol. 8, p. 350, ♀, ♂, 1892.

♀. 2.4-2.8 mm. This race differs from the type of the species as follows:

The pilosity on the abdomen is much longer, finer and more abundant. The meso-metanotum is slightly narrower and longer. The meta- and epinotum are nitidulous and very feebly sculptured. The scale of the petiole is shallowly emarginate above and without teeth at each corner of the emargination. Forel says that an additional distinction exists in the shape of the epinotum, in which

the brow of the declivity is straight transversely, not concave as in the type-species. This difference is not recognisable in the specimens determined for me as *simplex* by Dr. Forel.

“♂. 2 mm. Smooth, shining (in *capensis* there is some sculpture on the thorax, especially on the epinotum). Sparsely hirsute. Scale low. Brownish, the legs paler. Wings fairly clear, with pale nervures and stigma. The mandibles have 4 or 5 minute teeth and are fairly long.”

Bulawayo; Grahamstown (Baines and Cherry). (S.A.M., R.M., G.A. colls.)

Race *LAEVIS*, Santschi, var. *ALEXIS*, n. v.

(Race) Ann. Soc. Ent. Belg., vol. 57, p. 312, ♀, 1913.

Bull. Lab. Zool. Sc. Agr. Portici, vol. 8, p. 378, 1914.

♀. 2 mm. This differs from race *simplex* as follows:

Entirely smooth and shining, except a slight roughening of the dorsum of the epinotum and the lateral margins of the disc of the mesonotum. Pubescence adjacent, short and very sparse. Pilosity scanty, almost absent from the head and thorax, composed of whitish short and blunt hairs. The scape extends beyond the posterior margin of the head by one-third of its length; 1st joint of the flagellum as long as the 2nd and 3rd together (shorter in *simplex*), 2nd joint a trifle longer than wide, the 3rd one-fourth longer than wide. Pronotum convex transversely (a little flattened in *simplex*), as long as wide, the pro-mesonotal suture distinct. Mesonotum more convex than in *simplex*, the lateral cones of the epinotum less prominent and a little more acute. The scale of the petiole is more deeply emarginate, almost bidentate at the corners.

It differs from *laevis* by the dull and striated mandibles, by the pronotum, which is quite one and a-half times wider than long, by the subdentate scale, and its slightly larger size. From var. *minuta*, Forel, it differs by the much longer scapes. Colour as in *simplex*.

Hillside, Bulawayo. Nesting in the ground. (R.M., G.A. colls.; type in my collection.)

Race *HIRSUTA*, Santschi, var. *ELEVATA*, Forel.

(Race) Voyage d'Alluaud et Jeannel, Formicid., p. 124, ♀, 1914.

(Var.) Bull. Soc. Vaud. Sc. Nat., vol. 50, p. 249, ♀, 1914.

♀. 2.8–3.3 mm. Jet black, tibiae brown, tarsi yellowish-brown, basal half of the scape ochreous. Pilosity long, thin and whitish on



the thorax and abdomen, shorter and brownish-white on the head, most abundant on the abdomen and epinotum, oblique and fairly long on the legs and scapes. Smooth and shining, except the meta- and epinotum, which are a little less shining and also coarsely and irregularly rugose, the rugae extending over the declivity. The sides of the epinotum are finely and longitudinally striate and somewhat dull. On the sides of the meso- and metathorax there are 2 or 3 very strong longitudinal rugae. The mesonotum, seen from above, is subquadrate, parallel-sided, the anterior margin nearly straight in the middle, not convex as in *capensis*, i. sp., *simplex* and *convexiuscula*, a trifle wider than long. The meso-metanotal and meta-epinotal sutures strongly clathrate. The metanotum is about half as long as the mesonotum and twice as wide as long. The epinotal teeth are raised towards their apices, more divergent than in *capensis*, directed more outwardly, and projecting over the sides of the epinotum when looked at direct from above. The declivity is longer than the dorsum; the latter seen from the side is straight. The petiole is as long as its scale is high, both the scale and its posterior peduncle fairly thick. The scale is bidentate above (the teeth narrow and acute), emarginate between the teeth. Abdomen rather large, high and very convex at the base.

Nesting under a stone. Hillside, Bulawayo. (S.A.M., R.M., G.A. colls.)

A. EGREGIA, Forel.

Ann. Soc. Ent. Belg., vol. 57, p. 143, ♀, 1913.

♀. 3-3.4 mm. Closely allied to *capensis-validiuscula* and possibly only an extreme form of *capensis*. Black, tibiae and antennae brown, tarsi pale brown, basal three-fourths of the scape ochreous, mandibles reddish-yellow. Pilosity scanty, composed of thin, long and dark brown hairs on the abdomen, somewhat thicker and shorter on the head and thorax. Posterior half of the head with a very sparse, pale and decumbent pubescence. Very shining. The sculpture similar to that of *validiuscula* but a little stronger, composed of a very fine and altogether superficial reticulation; a little coarser on the dorsum of the epinotum, which is also duller than the rest of the thorax. The sides of the meso- and metathorax longitudinally striate, the sides of the epinotum rugulose. Head like that of *validiuscula*. Mesonotum as long as wide, the anterior margin semi-circular; metanotum as long as wide, quadrate, very little shorter than the mesonotum, with prominent stigmatic tubercles (in *validiuscula* and

*capensis*, i. sp., the metanotum is much wider than long, and widened considerably towards the base). Meso-metanotal impression wider and shallower than in *validiuscula*. The meta-epinotal suture deep, much deeper than in *validiuscula*. The dorsum of the epinotum is moderately concave transversely and convex lengthwise. It rises more steeply from its base than in *capensis* and its varieties. The teeth are more angular than in that species and directed more distinctly upwards. The brow of the declivity is strongly concave transversely; the upper two-thirds of the declivity vertical or nearly so, the lower third oblique or subhorizontal, with a very prominent and dentiform stigma on each side. Petiole about as long as its scale is high, the peduncle behind shorter than its scale and shorter than in *capensis*. The scale is much thicker, especially at its base; above it is bidentate and deeply emarginate between the teeth, the latter short and fairly acute (in some specimens the teeth are very short and almost blunt).

Redbank, S. Rhodesia. (S.A.M., R.M., G.A. colls.)

Race SANTSCHII, subsp. n.

♀. 4 mm. Head subcircular, excluding the mandibles only a very little longer than wide, not narrower in front than behind (distinctly narrowed in front in the type). Pilosity much coarser, thicker and longer, more abundant on the back of the head and on the thorax than in the type. The femora have some exerted pilose hairs, which are absent in the type. The scape is longer, distinctly more than half its length extending beyond the hind margin of the head (hardly half in the type); 1st joint of the flagellum one-third longer than the 2nd (nearly twice as long as the 2nd in the type). The meso-metanotum is narrower and there is no distinct suture between the two segments as in the type-species, only a long and fairly deep concavity. Epinotum like that of the type-species. Peduncle of petiole as long as the base of the scale. The latter is thicker above than in the type and its posterior face is strongly convex transversely (almost flat in *egregia*, i. sp.). The eyes are relatively larger and more convex.

Cawston Farm, Umgusa, S. Rhodesia.

Easily distinguished from *egregia* type by its larger size, coarser and more abundant pilosity, which is present also on the femora, by the shape of the head and by the longer antennae. Possibly this form should rank as a distinct species.

Type in my collection.

## A. SILVICOLA, n. sp.

♀. 3.4-3.8 mm. Head dark reddish-brown, thorax and petiole piceous, abdomen black, tarsi brownish-yellow, flagellum and scapes brown, the basal two-thirds of the latter dark ochreous. Legs, petiole and abdomen shining, the rest of the body dull. Pilosity yellowish, long, exserted, fairly abundant all over including the legs and scapes, present also on the edge of the scale, longest and most plentiful on the head and abdomen. A scanty and decumbent pubescence on the mandibles, flagellum and legs. Head, pronotum, epinotum and dorsum of the meso-metanotum very finely and densely granulate, the sides of the meso-metanotum sharply and longitudinally striate, the lower angles and margin of the epinotum smooth and shining. Scale smooth. Abdomen microscopically reticulate, finely punctured. Head, including the closed mandibles, subcircular, a trifle longer than wide. Eyes very

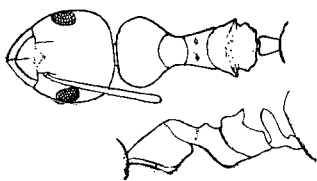


FIG. 57.—*Acantholepis silvicola*, n. sp.

large, placed just in front of the middle of the sides. Clypeus convex, its anterior margin arcuate, sharply carinate in the middle over the anterior two-thirds of its length. Mandibles 6-dentate, finely and closely striate. The scapes extend beyond the hind margin of the head by a little less than half their length. Head one-third wider than the pronotum. The latter is two-thirds wider than long, distinctly flattened above, its sides very convex. The thorax is strongly constricted at the mesonotum, which is barely half as wide as the pronotum and about as wide as long. Metanotum widened posteriorly, two-thirds as long in the middle as the mesonotum, separated from the latter by a wide and deep depression. Metanotal stigmata very prominent, subconical when seen in profile. Meta-epinotal suture deep. The dorsum of the epinotum rises abruptly and vertically from the suture, and is thence continued backwards and inclined upwards towards the posterior margin, which bears on each side a large and broad tubercle. Seen from the side these tubercles appear as wide and upturned teeth. Across the apices of the tubercles the dorsum of the epinotum is three times as wide as it is long in the middle. The declivity is wide and oblique, longer than the dorsum. In front of the tubercles the dorsum

is slightly concave transversely. Petiole higher than long below, its scale inclined forwards. The dorsal edge of the scale is fairly thick and slightly emarginate in the middle; the anterior face of the scale is convex from above to below, the posterior face concave. Abdomen massive, subovate, very little longer than wide.

♀. 6 mm. Anterior wing 6.5 mm. long. Colour as in the ♂, but the anterior angles of the head and the greater part of the clypeus castaneous. An abundant, very fine, long and yellowish pubescence present all over, oblique on the cheeks behind the eyes, decumbent elsewhere. Pilosity yellowish, fairly abundant, outstanding, very short on the mesonotum. Head dull, thorax and abdomen moderately shining.

Head and upper two-thirds of the epinotum finely and densely punctate and aciculate. Mesonotum and scutellum densely and fairly coarsely punctured, the abdomen and legs very finely and densely punctured. Scale smooth and shining.

Head quadrate, as wide as long, slightly narrowed in front, the posterior margin straight, the posterior angles rounded. The eyes occupy the middle third of the sides. Mandibles and clypeus as in the ♂. The scapes extend beyond the hind margin of the head by one-third of their length. Mesonotum one-third wider than long. Scutellum semi-circular, half as long as the mesonotum. Dorsum of the epinotum obsolete, the declivity subvertical. Scale much wider and thinner above than in the ♂, its dorsal edge trenchant and feebly excised in the middle. Abdomen oblong, half as long again as wide. Wings brownish-yellow, nervures brown.

♂. 3.3 mm. Dark brown, scutellum, epinotum and petiole reddish-brown, tarsi ochreous, femora ochreous at the base and apex and brown in the middle, mandibles and antennae smoky yellow. Shining. Mesonotum and abdomen very finely punctured, clypeus and sides of the head, between the eyes and frontal carinae, finely reticulate-punctate, the rest of the body smooth. Mandibles dull, 3-dentate and aciculate.

Head as long as wide across the eyes, the sides behind the eyes and also the posterior margin straight, narrower behind than in front. The eyes occupy the middle third of the sides. Clypeus two and a quarter times wider than long in the middle, carinate. The scapes extend beyond the hind margin of the head by one-third of their length. Thorax like that of the ♀, but the upper face of the epinotum is oblique. Scale, seen from behind, trapezoidal, as long as wide above, where it is widest, the dorsal edge thin, the posterior face twice as long as the anterior and feebly convex from above to below. Base of abdomen concave transversely. Wings as in the ♀.

Amatongas Forest, Portuguese E. A. (S.A.M., R.M., G.A. colls.; types in my collection.)

Nesting in a decayed tree-stump in the shadiest part of the forest. This species is unlike any other of the genus known to me. The remarkably deep impressions in front and behind the metanotum and the peculiar shape of the epinotum are very distinctive.

#### GENUS PLAGIOLEPIS, Mayr.

Europ. Formicid., p. 42, 1861.

##### Characters.

♀. Sometimes polymorphic, the forms differing chiefly in size, very little in structure. Antennae 11\*-jointed, without a club. Scape as long as the head or longer. Clypeus large. Frontal carinae short; frontal area not well defined. Traces of the ocelli are present. Pronotum and epinotum large, usually much wider than the rest of the thorax. Pro-mesonotal suture distinct; meso-metanotal and meta-epinotal sutures more or less distinct. Epinotum unarmed. Scale of petiole usually inclined forwards, without a peduncle or with only a very short one.

♀. Antennae 11\*-jointed. Thorax similar to that of *Acantholepis* ♀, but broader and shorter. Petiole as in the ♀. Abdomen usually very massive. Wings with a closed radial and one cubital cell; discoidal cell absent.

♂. Antennae 12-jointed, the scape at least half as long as the flagellum. Genital armature large and exerted.

*Distribution.*—Both hemispheres.

The genus may be divided into the following sub-genera:

- (4) 1. Metanotum distinctly defined in front and behind.
- (3) 2. ♀. Metanotum very prominent, separated from the short and convex epinotum by a deep suture; the epinotum higher than the metanotum. Rarely polymorphic (a sub-genus transitional to the genus *Acantholepis*) . . . Sub-genus *Anacantholepis*, Santschi.
- (2) 3. ♀. Metanotum not prominent; meta-epinotal suture usually feeble; epinotum oblique, not higher or not much higher than the metanotum. Small species, not polymorphic.
  - ♀. Not much larger than the ♀, but considerably larger than the ♂.
  - ♂. Scapes not much longer than the head, the latter wider than long.
    - Sub-genus *Plagiolepis*, Mayr, s. str.
- (1) 4. Metanotum indistinctly defined or almost obsolete.
- (6) 5. ♀. Metanotum small, much smaller than the mesonotum, from which it is feebly delimited; epinotum convex and higher than the metanotum. Large species, often polymorphic.
  - ♀. Not very much larger than the ♀ major or the ♂.