

1925
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WILLIAM L. BROWN

NEOTROPICAL ANTS IN
THE COLLECTIONS OF THE ROYAL
MUSEUM OF STOCKHOLM

PART I

WILLIAM L. BROWN

BY

WILLIAM MORTON WHEELER

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STOCKHOLM

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1925 C

"Naturhistoriska
Riksmuseet"

Neotropical Ants in the Collections of the Royal Museum of Stockholm.

Part I.

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By

WILLIAM MORTON WHEELER.

Communicated May 14th 1924 by Y. SJÖSTEDT and W. LECHE.

The following paper is based on a series of *Formicidæ* taken by several collectors in South America and loaned me for study by Professor YNGVE SJÖSTEDT. The collection comprises a rather unusual number of new forms, especially among those taken by Professor NILS HOLMGREN in Peru and Bolivia. I have added descriptions of several new neotropical forms which have been accumulating in my own collection for some years and have deposited syntypes of most of them in the Stockholm Museum. I feel that I owe Professor SJÖSTEDT an apology for my delay in working up the material. I can only plead as an excuse the pressure of other work and the increasing difficulty I experience in the precise identification of neotropical and other *Formicidæ* as the collections and publications in regard to them keep increasing in number.

Subfamily **Dorylinæ.**

1. *Eciton rapax* WESTWOOD. 4 ♀ Chaquimayo, Peru (N. HOLMGREN). Collected from a procession. Dec. 20th. No soldiers.
2. *Eciton hamatum* FABR. 4 ♂ Brazil (Hj. MOSÉN).

3. *Eciton burchelli* WESTWOOD. 4 ♀ Brazil (HJ. MOSÉN); Matto Grosso, Brazil (C. LINDMAN); Rio de Janeiro, Brazil (KINBERG); Chaquimayo, Peru and Mojos, Bolivia (N. HOLMGREN). Collected from a procession April 27th.
4. *Eciton (Labidus) prædator* F. SMITH. 4 ♀ Mojos, Suriani and Charubamba, Bolivia and Chaquimayo, Peru (N. HOLMGREN); Brazil (HJ. MOSÉN). Walking few together in processions. June 4th and 7th, Dec. 21th.
5. *Eciton (Labidus) prædator* subsp. *emiliæ* MANN. ♀ Antioquia, Columbia. Processions ant walking in covered paths, except where these cross a way. Here the paths have embankments only and lack ceiling.
6. *Eciton (Labidus) cæcum* LATR. ♀ Mojos, Bolivia (N. HOLMGREN).
7. *Eciton (Labidus) cæcum* var. *grassator* FOREL. ♀ São Leopoldo, Brazil (J. W. STAHL).
8. *Eciton (Labidus) crassicorne* F. SMITH. ♀ Brazil (HJ. MOSÉN).
9. *Eciton (Acamatus) nitens* MAYR. ♀ Queara, Bolivia (N. HOLMGREN).
10. *Eciton (Acamatus) legionis* F. SMITH subsp. *crenulatum* MANN. ♀ Peru (N. HOLMGREN).
11. *Eciton (Acamatus) shuckardi* EMERY. ♂ Chaco de Santiago, Northern Argentina (WAGNER).
12. *Eciton (Acamatus) illigeri* SHUCKARD. ♂ Chaco de Santiago, Northern Argentina (WAGNER); São Paulo, Brazil.
13. *Eciton (Acamatus) swainsoni* SHUCKARD. ♂ Chaco de Santiago, Northern Argentina (WAGNER).

Subfamily Ponerinæ.

14. *Paraponera clavata* FABR. ♀ Chaquimayo, Peru (N. HOLMGREN).
15. *Typhlomymex rogenhoferi* MAYR. ♀ Chaquimayo the 14th of Dec., Peru (N. HOLMGREN).
- ✓✓ 16. *Typhlomymex robustus* EMERY subsp. *manco* subsp. nov.
Worker: Length 2.8—3 mm.

Differing from the typical *robustus* in its decidedly smaller size, in lacking the transverse striation on the mesonotum, which is merely punctate, and in having longer and more abundant golden yellow pubescence, especially on the thorax, petiole and gaster. The clypeus is less sharply longitudinally striate in most of the specimens and the anteroventral spine of the petiole is more acute.

Male. Length 3 mm.

Mandibles well-developed, with finely denticulate apical

borders. Clypeus short, its margin slightly angular in the middle. Antennal scapes as long as joints 1 to 4 of the funiculus together, the first joint more than half as long as the second. Head distinctly longer than broad, slightly narrowed behind the eyes, the posterior border somewhat concave. Ocelli rather small, eyes only moderately convex. Thorax broader than the head through the mesonotum, which is broader than long and has anteriorly developed Mayrian furrows. Epinotum in profile rather rounded, with distinct base and declivity, the former longer than the latter. Petiole similar to that of the worker, but without a ventral spine and with a more rounded node, which is broader than long and has an even shorter and less distinct peduncle than in the worker. External genital valves lobular, rounded; hypopygium very narrow, pointed; pygidium obtusely rounded. Wings with a large discoidal, a single large cubital and an open radial cell.

Sculpture resembling that of the worker, but the punctuation less distinct. Mandibles shining, sparsely punctate; clypeus somewhat shining, longitudinally rugulose; head opaque, densely and finely punctate, remainder of body, legs and antennae distinctly shining.

Pilosity and pubescence grayish, abundant; even the wings finely and abundantly pubescent.

Dark brown; head black; antennae and legs somewhat paler; mandibles, tarsi and trochanters still paler. Wings distinctly infuscated, with brown veins and pterostigma.

Described from several workers and males from Pablobamba (type-locality) and Charubamba, Bolivia, and three workers from Chaquimayo, Peru (N. HOLMGREN). The males from Charubamba are somewhat paler throughout than those from Pablobamba. The workers from Peru are somewhat larger and therefore approach the typical *robustus*. I have found in British Guiana that the species of *Typhlomyrmex* live in small colonies under the bark of rotten logs. The following table will assist in the identification of the workers of the described forms. The first (*clavicornis*) is known only from female and male specimens. SANTSCHI has recorded a *T. bruchi* from the Argentine, but seems not to have published a description of it.

- | | |
|---|--------------------------|
| (1). Last antennal joint much swollen, as long as the five preceding joints together. | 2. |
| Last antennal joint not swollen, not longer than the three preceding joints together. | 3. |
| (2). Thorax shining; striæ on head not diverging behind. | ♀ |
| (Bolivia). | <i>clavicornis</i> EMERY |

- Thorax opaque throughout, finely punctate-reticulate and coarsely punctate; striæ on head diverging behind. ♀ (Paraguay). var. *divergens* FOREL.
- (3). Small species, but little more than 2.7—3 mm. long. Head distinctly longer than broad; clypeus smooth, at least in the middle. Petiole unarmed beneath, its node distinctly transverse 4.
Larger; 3.5—5 mm. long. Head scarcely longer than broad; clypeus striated in the middle. Petiole armed beneath with a large spine; the node transverse, at least as long as broad. 5.
- (4). Pale ferruginous; head not distinctly striated; antennal scapes not reaching to the posterior border of the head. Length 2.7 mm. (Bolivia, Argentina). *pusillus* EMERY.
Somewhat darker; head distinctly striated above; antennal scapes reaching the posterior border of the head. Length 3.2 mm. (Blumenau, Brazil). subsp. *major* SANTSCHI.
- (5). Anterior border of petiolar node rounded, upper surface of the peduncle strongly concave. Length 3.5—4 mm.; ♀ 5.2 mm.; ♂ 2.3 mm. (Brazil, Guianas). *rogenhoferi* MAYR.
Anterior border of petiolar node straight and transverse; upper surface of peduncle much less concave. 6.
- (6). At least 4.5—5 mm. long. Mesonotum transversely striated (Mexico, Guatemala, Honduras, Costa Rica). *robustus* EMERY.
Smaller, about 3.5 mm. Mesonotum densely and uniformly punctate; pubescence longer and more abundant (Peru and Bolivia). subsp. *manco* subsp. nov.
17. *Ectatomma tuberculatum* OLIVIER ♀. Brazil (GYLLENKROK); Remedios, Colombia (NISSER); Tuiche, Bolivia (N. HOLMGREN).
18. *Ectatomma quadridens* FABR. ♀ Mojos, Tuiche and San Luis, Bolivia (C. HOLMGREN); Fontebôa, Brazil.
19. *Ectatomma (Holcoponera) striatulum* MAYR. ♀♂ Tuiche, Bolivia (N. HOLMGREN).
20. *Ectatomma (Gnamptogenys) annulatum* MAYR. ♀ Peru (N. HOLMGREN).
21. *Ectatomma (Gnamptogenys) continuum* MAYR. ♀ San Firmin, Bolivia (N. HOLMGREN).

A single specimen, which measures only 2 mm. and is therefore smaller than those described by MAYR. (2.7—2.8 mm.) or those in my collection (2.5 mm.). It may represent a distinct subspecies but the material is insufficient to justify a new name.

22. *Ectatomma (Parectatomma) rastratum* MAYR. ♀ Llinquipata, Peru (N. HOLMGREN). In a stub covered with earth. Dec.
23. *Dinoponera grandis* PERTY (typical) ♀. Castro, Brazil.
24. *Neoponera commutata* ROGER. ♀ Chaquimayo, Peru (N. HOLMGREN). On the road. Dec.
25. *Neoponera unidentata* MAYR. ♀♀ Brazil (F. SAHLBERG)
26. *Neoponera unidentata* var. *rugulosa* EMERY ♀ Peru (N. HOLMGREN).
27. *Neoponera villosa* F. SMITH subsp. *inversa* F. SMITH ♀ Tuiche, Bolivia (N. HOLMGREN); Brazil (F. SAHLBERG).
28. *Pachycondyla fuscoatra* ROGER ♀ Yanalomas and Mojos, Bolivia (N. HOLMGREN).
29. *Pachycondyla fuscoatra* subsp. *inca* EMERY ♀♀ Rio Charape, Peru (C. H. T. TOWNSEND); Huadquina, 5000 ft. and San Miguel, 6000 ft., Peru (Yale Peruvian Expedition).
30. *Pachycondyla striata* F. SMITH ♀♀♂ São Leopoldo, Brazil (J. W. STAHL); Rio de Janeiro, Brazil (KINBERG).
31. *Pachycondyla harpax* FABR. var. *irina* var. nov. ✓✓

In tunnels in and under roots.

Worker. Having the sculpture and pilosity of the typical *harpax* and therefore more shining and less hairy and pubescent than the subsp. *montezumia* F. SMITH, but with the gaster, postpetiole, petiole, declivity of epinotum and more or less of the pleuræ iridescent blue.

I have seen specimens of this form from the following localities: Escuintla (type-locality), Zacapa and Quirigua, Guatemala (WHEELER), Cartago, Costa Rica (WHEELER), Santa Marta, Colombia (F. M. GAIGE), Camaria near Kartabo, British Guiana (WHEELER), El Campamiento, Perene, Peru (J. C. BRADLEY), Rio Charape, Peru (C. H. T. TOWNSEND); Llinquipata, Peru (N. HOLMGREN).

32. *Pachycondyla harpax* var. *concinna* var. nov. ✓✓

Worker and female. Like the preceding variety in the blue iridescence and sculpture, but with the mandibles, clypeus, cheeks, frontal carinae, antennæ, legs and posterior borders of the gastric segments more extensively and more vividly red. The posterior corners of the head, the crescentic anterodorsal border of the petiole and the anterior and posterior border of the postpetiole are also red. The tip of the gaster is entirely golden yellow.

Three workers from Abuna, on the Madeira River, Brazil (type-locality, W. M. MANN), two workers from San Firmin, Bolivia (N. HOLMGREN) and a worker and two rather immature females from Chaquimayo, Peru (N. HOLMGREN).

33. *Euponera* (*Mesoponera*) *marginata* ROGER. ♀ Churubamba and Mojos, Bolivia (N. HOLMGREN); Brazil (F. SAHLBERG). May.

The striæ on the meso- and metapleuræ are less pronounced than in Brazilian specimens but the differences do not seem to be sufficient to justify a varietal name.

34. *Euponera* (*Mesoponera*) *fauveli* EMEY. ♀♂♂ Lagunillas, Bolivia (N. HOLMGREN); Bolivia and Peru (STAUDINGER); Huadquina, Peru, 5000 ft. (Yale Peruvian Expedition); Santa Marta, Colombia (F. M. GAIGE).

Female (undescribed). Length 9—10.5 mm.

Very similar to the worker, except for the usual differences and the shape of the petiole, which is higher, broader and more compressed anteroposteriorly. The pilosity is longer and a little more abundant. The wings are distinctly infuscated, with brown veins and darker pterostigma.

Male (undescribed). Length 10 mm.

Slender. Head through the eyes much broader than long, the latter and the ocelli very large and convex. Cheeks very short. Mandibles very small, bluntly pointed, edentate. Clypeus with a large, blunt, projecting tubercle in the middle, so that its outline in profile is almost rectangular, its anterior border straight and transverse. Antennæ very long (nearly 8 mm.) and filiform; the scapes only about $\frac{1}{3}$ as long as the second funicular joint; first funicular joint not broader than long and not broader than the remaining joints. Mesonotum with the Mayrian furrows indistinct posteriorly. Epinotum sloping, its base somewhat shorter than its declivity. Petiole somewhat like that of the worker but lower, thicker and somewhat more conical. Gaster and legs slender.

Rather shining, especially the abdomen. Head and thorax indistinctly and unevenly punctate-rugulose; epinotal declivity more distinctly transversely rugulose, especially below. Gaster very finely and superficially shagreened.

Pilosity and pubescence less developed than in the worker, the hairs on the head and thorax darker and more flexuous.

Color as in the worker; genitalia and mouthparts, except the mandibles, brownish yellow. Wings as in the female.

Lives together with a podurid. Collected Sept. 12th.

35. *Euponera* (*Mesoponera*) *arhuaca* FOREL. ♀ San Firmin, Bolivia (N. HOLMGREN). Under a decaying stub.

36. *Euponera* (*Trachymesopus*) *stigma* FABR. ♀ Peru (N. HOLMGREN).

37. *Euponera* (*Trachymesopus*) *holmgreni* sp. nov.

Worker. Length 3.5—4 mm.

Head as broad as long, a little narrower in front than behind, with evenly convex sides and broadly excavated posterior border. Eyes absent. Mandibles rather large, deflected, with slightly concave external borders, their apical borders long, with 6 teeth, two at the base small and close together, three oblique and widely spaced in the middle and a large apical tooth. Clypeus very short, anteriorly abrupt and truncated, bluntly carinate in the middle, its anterior border straight and entire. Frontal carinae small, closely approximated. Antennal scapes rather slender, about $\frac{3}{5}$ as long as the head; first funicular joint as long as the two succeeding joints together; joints 2—10 distinctly broader than long. Thorax scarcely longer than the head *plus* the mandibles; the pro- and mesonotum seen from above together longer than broad, sub-oblong, with rounded humeri. Promesonotal suture distinct, angulate. Epinotum laterally compressed, decidedly narrower than the pro- and mesonotum. Mesoepinotal suture obsolete. In profile the dorsal outline of the pro-, meso- and epinotum is nearly straight and continuous, the base of the epinotum longer than the declivity and with it forming a rounded obtuse angle, its sides compressed. Petiolar node from above as long as broad, broader behind than in front, with straight sides and posterior border; in profile higher than long, with flat, vertical anterior and posterior and rounded superior surfaces; the ventral surface convex in the middle but without a tooth or spine. Postpetiole trapezoidal, strongly narrowed in front, its anterior border straight. Legs rather short, especially the middle tibiae and tarsi.

Mandibles and clypeus smooth and shining, the former with a few scattered, elongate punctures. Head, pro- and mesothorax opaque, very densely and finely punctate; remainder of body shining, more finely, sparsely and superficially punctate.

Hairs and pubescence bright golden yellow, the latter very dense and conspicuous, especially on the head, pro- and mesothorax, antennae and legs. Hairs very delicate, erect, uneven and rather sparse. Middle tibiae and tarsi with numerous short, stout bristles on their extensor surfaces.

Pale ferruginous; legs and posterior half of body slightly more yellowish; mandibular teeth blackish.

Described from two well preserved specimens taken by Prof. N. HOLMGREN in Peru, without further data. This species belongs to the group of species comprising *gilva* ROGER, *ochracea* MAYR and *sauteri* WHEELER, but differs from all of them in not having the base of the epinotum somewhat lower

in profile than the mesonotum and in having a much longer and thicker petiolar node. Like the other species mentioned *holmgreni* is undoubtedly a rare, hypogaëic ant.

38. *Ponera distinguenda* EMERY. ♀ San Fermin, Bolivia (N. HOLMGREN). Under a stem. Sept.
39. *Ponera opaciceps* MAYR ♂♀ (ergatomorphic). Huancabama, Northern Peru, 4200 ft. (C. H. T. TOWNSEND).
40. *Anochetus (Stenomyrme) inca* sp. nov. ✓✓

Worker. Length 9.5—10.5 mm.

Slender and very much like *A. (S.) emarginatus* FABR. in the shape of the head, mandibles and antennæ, but the apical mandibular teeth are stouter and the antennæ are somewhat longer. The epinotum, petiole and postpetiole are very different. The dorsal surface of the epinotum in profile is undulating, with two convexities and two depressions, the first depression being at the middle, the second just in front of the declivity. The posterior angles are rectangular, but not armed with distinct teeth as in *emarginatus*. Seen from above there is a median longitudinal groove on the posterior half of the base of the epinotum. The petiolar node is narrow, smaller and inclined much more backward than in *emarginatus*, so that its posterior surface, which is straight and longitudinally grooved in the middle, forms an obtuse angle with the ventral surface instead of a right angle as in *emarginatus*. The teeth at the summit of the node are blunt, short and closely approximated. The postpetiole is very strongly constricted off from the gaster and is not convex and rounded as in *emarginatus* and *haitianus* WHEELER and MANN, but with straight dorsal outline and subtruncated anterior and posterior surfaces. Seen from above it is elongate triangular, about 1½ times as long as broad, with straight sides and fully four or five times as broad behind as in front. Legs even longer than in *emarginatus*.

Mandibles, head, petiole, postpetiole and gaster shining. Front subopaque, very finely, evenly and divergently striate, the striæ becoming transverse and rather indistinct on the more dorsal portions of the postocular foveæ. Mandibles very finely punctate along their external borders. Thorax finely and evenly transversely striate throughout. Anterior surface of petiole transversely rugulose but rather superficially, so that the surface is shining. Gaster with very minute, indistinct, scattered punctures; legs distinctly, densely and very finely punctate, even less shining than in *emarginatus*.

Pilosity absent, except a few hairs on the gaster and the usual sense-hairs on the mandibles. Pubescence pale, very short, indistinct on the body, more apparent on the funiculi and tibiæ.

Pale ferruginous; mandibles, gula and femora more yellow; mandibular teeth and the borders of the blades brown; posterior portion of head, petiole and postpetiole somewhat paler than the thorax and gaster.

Described from nine specimens taken by Mr. C. H. T. TOWNSEND on the Rio Charape, in Northern Peru (5000 ft.) in September 1911. They were nesting in the dead branch of a small tree.

This is a very distinct species and a true *Stenomyrmex*, the third to come to light. The workers of the known forms of the subgenus may be readily separated by means of the following key:

✓ ✓

- (1). Mandibles scarcely longer than the width of the head through its posterior corners. Base and declivity of epinotum not forming an angle but rounded and quite unarmed. Antennal scapes reaching only a short distance beyond the posterior corners of the head. Length 6—7 mm. (Haiti). *haytianus* WHEELER and MANN.

Mandibles at least $1\frac{1}{2}$ times as long as the width of the head through its posterior corners. Base and declivity of epinotum forming a distinct angle in profile, dentate or subdentate. Antennal scapes extending at least $\frac{1}{4}$ their length beyond the posterior corners of the head. 2.

- (2). Epinotum not distinctly dentate; petiolar node strongly inclined backward, its posterior surface forming an obtuse angle with the ventral surface, its teeth blunt; postpetiole with straight sides and dorsal surface, strongly separated off from the first gastric segment. Length 9.5—10.5 mm. (Peru). *inca* sp. nov.

Epinotum with distinct teeth; petiolar teeth acute; posterior surface of node forming a right angle with the ventral surface; postpetiole with rounded dorsal and lateral surfaces; not deeply constricted off from the first gastric segment. Length 6—9 mm. (*emarginatus* FABR.). 3.

- (3). Anterior surface of petiolar node more or less transversely rugulose; color brown or ferruginous or only partly testaceous. 5.

Anterior surface of petiolar node largely smooth and shining; color testaceous throughout. 4.

- (4). Head and pronotum distinctly shining. (West Indies).

emarginatus subsp. *testaceus* FOREL.

Most of head and whole of pronotum subopaque and more sculptured; color a little deeper. (Costa Rica).

var. *micans* FOREL.

- (5). Head very finely striated; body brown throughout, with the mandibles, antennæ and legs testaceous (Costa Rica).
subsp. *striatulus* EMERY.
- Head more coarsely striated. 6.
- (6). Posterior surface of petiolar node convex; pronotum more or less smooth in the middle (Northern South America and Brazil).
subsp. *emarginatus* FABR. (typical).
Posterior surface of petiolar node flat; pronotum more regularly striated over its whole surface (Brazil).
subsp. *rugosus* EMERY.
41. *Odontomachus chelifer* LATREILLE. ♀♀ São Leopoldo, Brazil (J. W. STAHL); Remedios, Colombia (NISSER); Mojos, Bolivia (N. HOLMGREN). In the earth of an old »Tucho» heap. June 8th.
42. *Odontomachus hastatus* FABR. ♂. Brazil (HJ. MOSÉN).
43. *Odontomachus hæmatoda* L. ♀. Rio Janeiro, Brazil (KINBERG).
44. *Odontomachus hæmatoda* L. var. *rugisquama* FOREL ♀. Chaquimayo, Peru (N. HOLMGREN).
45. *Odontomachus hæmatoda* subsp. *pubescens* ROGER. ♂. Llinquipata and Chaquimayo, Peru, and Pablobamba, Bolivia (N. HOLMGREN). Lives partly in mouldering wood, partly in tunnels under mouldering wood or stubs. In one of the stubs there also were white ants. June 2nd, Dec. 9th and 12th.
46. *Odontomachus hæmatoda* subsp. *laticeps* ROGER. ♂. San Firmin, Bolivia (N. HOLMGREN).

Subfamily Pseudomyrminae.

47. *Pseudomyrma gracilis* FABR. ♂. São Paulo, Brazil (A. HEINE); Rio Janeiro, Brazil (KINBERG).
48. *Pseudomyrma gracilis* subsp. *mexicana* EMERY var. *guayaquilensis* FOREL. ♀. Mojos, Bolivia (N. HOLMGREN).

Numerous workers agreeing very closely with FOREL's description of the types from Guayaquil, Ecuador, though the petiolar peduncle is nearly as long as the node. The body in this variety is somewhat smaller and more slender than in the typical *mexicana*, the head and thorax are dark brown, the abdomen and legs paler brown, the clypeus and cheeks brownish yellow, the mandibles pale yellow. The head is rather smooth and shining, less deeply punctate than in the typical *mexicana*, the pubescence is somewhat longer.

Lives in the stems of tall grasses. June 29th.

49. *Pseudomyrma gracilis* subsp. *carapuna* MANN. ♀. Brazil (F. SAHLBERG).
50. *Pseudomyrma elegans* F. SMITH ♀♀. Mojos, Bolivia (N. HOLMGREN); Rio Janeiro, Brazil (KINBERG); São Leopoldo, Brazil (J. W. STAHL).
51. *Pseudomyrma mutica* MAYR. ♀. Buenos Aires, Argentina (KINBERS).
52. *Pseudomyrma acanthobia* EMERY. ♀. San Fermin, Bolivia (N. HOLMGREN).
53. *Pseudomyrma ejecta* F. SMITH var. *peruviana* var. nov.

Worker. Length 2.8—3 mm.

Differing in color from the typical form as described by SMITH and EMERY. Head, prothorax, mesonotum, fore legs and antennæ testaceous; mesopleuræ, epinotum, petiole, post-petiole and gaster rich castaneous; middle and hind legs testaceous but with the femora and tibiæ largely infuscated; occipital portion of head slightly darkened in some specimens. Mandibles, clypeus and cheeks pale yellow: mandibular teeth dark brown. Epinotum more sharply shagreened and somewhat less shining than the remainder of the body.

Female. Length 3.5 mm.

Colored like the worker; wings almost colorless, with colorless veins and pale brown pterostigma.

Described from a number of specimens taken by Prof. N. HOLMGREN at Chaquimayo, Peru, from the cavities of small twigs.

54. *Pseudomyrma holmgreni* sp. nov.

Worker. Length about 4.3 mm.

Head about $\frac{1}{6}$ longer than broad, slightly broader in front than behind, the eyes moderately convex, taking up about half of its sides; its lateral borders behind the eyes and the posterior border straight. Mandibles somewhat flattened, with two larger, acute, apical and a few small basal teeth. Clypeus bluntly carinate in the middle, its anterior border with a short but distinct and entire lobe and a notch on each side. Frontal carinæ very short and close together. There is a rather deep, short, linear impression representing a piece of the frontal groove on the middle of the head. Antennal scapes reaching to the middle of the head; funicular joints 2—4 broader than long, remaining joints, except the last, as long as broad; terminal joint scarcely longer than the two preceding joints together. Thorax rather stout; pronotum not convex above, bluntly submarginate on the sides, a little longer than broad, with rounded humeri; mesonotum convex, nearly circular, sharply marked off, especially behind, where is a pronounced

and rather long depression in front of the epinotum. The latter is longer than broad, oval; in profile its base rises abruptly from the mesoëpinotal depression and is flat, horizontal and fully $1\frac{1}{2}$ times as long as the sloping declivity. Petiole about three times as long as broad, broadest somewhat behind the middle, the peduncle very short and passing very gradually into the node, which is rather low and evenly rounded above, not truncated but a little more strongly curved behind, its sides above distinctly marginate, but the dorsal surface straight from side to side, not concave, and evenly convex anteroposteriorly. The ventral tooth is short and blunt, but with a long compressed base. Postpetiole from above almost circular, twice as broad as the petiole, its anterior portion strongly constricted at the articulation.

Shining; mandibles, clypeus and anterior half of head subopaque; the mandibles with small, sparse punctures, the anterior half of the head with denser, sharper punctures, the posterior half very smooth and shining, with very sparse and indistinct punctures, the remainder of the body less shining and very indistinctly punctate.

Hairs and pubescence whitish, the former very sparse, slightly more abundant on the clypeus, mandibles and tip of the gaster; the pubescence distinct only on the postpetiole and gaster, sufficiently dense on the latter to give it a pruinose appearance.

Testaceous or brownish yellow; mandibles, clypeus and cheeks pale yellow. The color of the abdomen seems to be variable. In one specimen there is a brown spot on the middle of the postpetiole, the first gastric segment is dark brown, except its apical border, and each of the remaining segments has a broad, dark brown band across the middle. In the other specimen the first gastric segment has a narrow brown band at the base and the bands on the more posterior segments are still narrower. In both cases the bands are notched in the middle behind.

Described from two specimens taken at Chaquimayo, Peru by Prof. NILS HOLMGREN.

I describe this species with some misgiving. It is obviously related to *Ps. filiformis* FABR. (= *biconvexa* FOREL), but the head is much shorter and broader and the thorax and petiole are of a different shape. Judging from materials in my collection, *filiformis* is only one of a number of closely allied forms which remain in great part undescribed.

55. *Pseudomyrma pallens* MAYR. ♀. Llinquipata, Peru (N. HOLMGREN).

In a dry branch. Dec. 1st.

56. *Pseudomyrma decipiens* FOREL var.

A dealated female from São Leopoldo (J. W. STAHL) and two small workers from Mojos, Bolivia and Llinquipata, Peru (N. HOLMGREN) probably represent a distinct, small southern variety of this ant. I have similar undescribed varieties from Brazil and British Guiana.

Subfamily Myrmicinae.

57. *Pogonomyrmex bruchi* FOREL subsp. *micans* FOREL. ♀. São Leopoldo, Brazil (J. W. STAHL).58. *Pogonomyrmex coarctatus* MAYR. ♀. Buenos Aires, Argentina (KINBERG).59. *Pogonomyrmex rastratus* MAYR. ♀. Patagonia (O. NORDENSKJÖLD).60. *Pogonomyrmex* (*Ephobomyrmex*) *nægeli* FOREL. ♀. Charubamba, Bolivia (N. HOLMGREN).

Collects pieces of vegetables and carries these to its nest. June 2nd.

61. *Pheidole pubiventris* MAYR. 4 Brazil (F. STAHL).62. *Pheidole quiaccana* sp. nov.

Soldier. Length about 3.5 mm.

Resembling *Ph. pubiventris* MAYR and especially its subsp. *nevadensis* FOREL of Colombia, but with distinctly larger head. This is as broad as long, narrower in front than behind, with rather straight sides and posterior border, the latter narrowly and deeply excised in the middle, the excision continued into the occipital groove. Gular teeth pronounced. Eyes small but rather convex, at the anterior $\frac{2}{3}$ of the head. Clypeus concave in front, ecarinate; its anterior border deeply and acutely notched in the middle. Frontal area semicircular, deeply impressed, without median carinula. Frontal carinae very short, not reaching to the middle of the head; scrobes or impressions for the antennal scapes absent, the latter rather strongly curved and distinctly flattened but not dilated at the base, their tips reaching fully $\frac{2}{3}$ the distance between the eyes and the posterior corners of the head. Club distinctly shorter than the remainder of the funiculus; joints 2—8 distinctly longer than broad. Thorax shaped much as *pubiventris* but the mesonotal torus is much less pronounced, the epinotal spines are much shorter, though acute, and the base of the epinotum on each side in front of the spine has a blunt projection or tubercle, best seen when the thorax is viewed obliquely. Petiole much like that of *pubiventris*, the postpetiole

transversely elliptical, with indistinct anterior corners, about twice as broad as long and about $1\frac{1}{2}$ times as broad as the petiole. Gaster and legs as in *pubiventris*.

Shining; mandibles sparsely and coarsely punctate and distinctly striate (smooth in *pubiventris*); clypeus smooth in the middle, longitudinally rugulose on the sides. Cheeks and sides of front longitudinally rugose, the rugæ feeble and their flat interspaces vaguely reticulate. Posterior portion of head and pronotum uneven, but not distinctly foveolate or rugose. Mesopleuræ, epinotum and petiole densely reticulate-punctate and somewhat less shining than the remainder of the body. Gaster and postpetiole above smooth and shining, with minute, scattered piligerous punctures.

Pilosity yellow; somewhat longer, more bristly and more abundant than in *pubiventris* on both body and legs; pubescence scarcely developed.

Rich castaneous brown; mandibles, posterior corners of head, sides of pronotum, gaster and appendages somewhat paler and more reddish; borders of mandibles black.

Worker. Length 2.3—2.5 mm.

Head larger, more rectangular and less rounded behind than in *pubiventris*, with straight sides and posterior border, a little narrower in front than behind. Clypeus similar to that of the soldier; antennal scapes extending only about $\frac{1}{3}$ their length beyond the posterior corners of the head. Spines of the epinotum reduced to minute teeth; base horizontal and nearly twice as long as the declivity, with a feeble trace of the lateral projection of the soldier in front of each tooth. Postpetiole subglobular, a little broader than long.

In sculpture, pilosity and color very similar to the soldier. Most of the specimens are, however, distinctly paler and more reddish, with the head darker.

Male. Length 4.5—4.7 mm.

Mandibles small, acutely bidentate. Head small, subtriangular, as long as broad through the eyes. Clypeus convex in the middle, with straight, entire anterior border. Antennal scapes nearly three times as long as broad, first funicular joint slightly longer than broad. Thorax robust, broadly elliptical; epinotum unarmed, with long sloping base and short, abrupt declivity.

Shining; pilosity abundant but shorter than in the soldier and worker, fine and appressed on the legs.

Yellowish brown; head somewhat darker; mandibles, antennæ and legs more yellowish. Mesonotum yellow, with three reddish longitudinal bands. Wings dull yellowish, with pale brown veins and pterostigma.

Described from three soldiers, seven workers and six males taken by Prof. N. HOLMGREN at Quiacca, Bolivia (type locality) and one soldier and three workers taken by him at Queara, Bolivia.

This species obviously belongs to the *fabricator* group and is closely allied to *pubiventris*, but the larger head of the soldier, more rectangular head of the worker and the differences in the structure of the thorax of both phases separate it from all the forms of *pubiventris* known to me (*pubiventris* in sp., subsp. *cearensis* FOREL, var. *nevadensis* FOREL, subsp. *timmii* FOREL and *variegata* EMERY and the recently described subsp. *impia* SANTSCHI).

In dry shrubground under stone, where the ants make wide, plastered (?) tunnels. Oct. 3rd.

63. *Pheidole vafella* sp. nov.

Soldier. Length 3—3.6 mm.

Related to *Ph. angusta* FOREL, *vafra* SANTSCHI and *peregrina* WHEELER. Head subrectangular, rather small, nearly as broad as long, scarcely narrower in front than behind, with nearly straight sides and angularly excised posterior border, the excision continuous with the occipital groove. Eyes moderately convex, at the anterior third of the head. Gular teeth slender, acute, curved and spine-like. Mandibles convex, with two large apical and two small basal teeth. Clypeus flat, ecarinate, its anterior border feebly and sinuately emarginate in the middle. Frontal area triangular, deeply impressed, slightly longer than broad, without a median carinula. Frontal carinae short; scrobes absent. Antennal scapes slender, curved but scarcely flattened at the base, their tips reaching about $\frac{3}{4}$ the distance between the eyes and posterior corners of the head; club distinctly shorter than the remainder of the funiculus; joints 2—8 very distinctly longer than broad. Pronotum somewhat more than half as broad as the head, rounded above and on the sides, without prominent humeri. Mesonotum with well-developed rounded torus, the impression in front of it about half as deep as the mesoepinotal impression. Epinotum unarmed, merely obtusely angulate at the corners between the base and declivity, both of which are nearly straight in profile, the base being horizontal and somewhat longer than the sloping declivity. Their median longitudinal impression feebly developed. Petiole with a well-developed peduncle and rather low node, the latter with a somewhat transverse, entire, apical border. Postpetiole subglobose, rounded on the sides, about $1\frac{1}{2}$ times as broad as long and about $1\frac{1}{2}$ times as broad as the petiolar node. Gaster elliptical, with subtruncated anterior

border. Legs rather long, femora slightly incrassated in the middle.

Shining; mandibles coarsely punctate and with a few coarse striæ near the dental border. Clypeus smooth; head with very shallow, indistinct, piligerous punctures so that the surface is uneven; cheeks and sides of front rather feebly longitudinally rugulose and punctate. Pro- and mesonotum smooth and shining; mesopleuræ, epinotum, peduncle and ventral portion of petiolar node less shining, very finely and densely punctate or reticulate. Nodes of petiole and post-petiole, gaster, legs and scapes smooth and shining, with scattered piligerous punctures.

Hairs pale yellow, rather coarse and abundant, suberect on the body, more oblique on the scapes and legs, but decidedly shorter than in *pubiventris*.

Yellowish ferruginous; head slightly darker and more reddish; appendages a little paler and more yellowish; borders of mandibles black.

Worker. Length 2—2.2 mm.

Head broadly elliptical, a little longer than broad, rounded behind, without distinct posterior corners. Eyes just in front of the middle of the sides. Mandibles with two large, acute, curved apical and several minute basal teeth, the external borders rather straight. Clypeus with a distinct emargination in the middle of its anterior border. Antennal scapes slender, extending nearly $\frac{2}{3}$ their length beyond the posterior border of the head. Structure of the thorax and abdomen much as in the soldier, but the mesonotal torus is less pronounced and the angles of the epinotum are minutely dentate.

The sculpture and color are much as in the soldier but the pilosity is distinctly shorter and less abundant.

Described from 13 soldiers and three workers taken by Prof. N. HOLMGREN at Yanalomas (type-locality), Mojos and San Fermin, Bolivia.

This species appears to be very closely related to *Ph. vafra*, recently described by SANTSCHI from Santa Catharina, Brazil. That species, however, is much darker and differs in several details of structure, such as the absence of the clypeal notch in the worker, the longer scapes in the soldier, etc. Perhaps *vafella* may prove to be only a subspecies of SANTSCHI's species.

Built their nests under stones April 25th June 9th.

64. *Pheidole accinota* sp. nov.

Soldier. Length 3 mm.

Related to the preceding species and also to *Ph. cameroni*

MAYE of Ecuador, but smaller. Head very small, subrectangular, not longer than broad, slightly narrower in front than behind, with somewhat rounded sides and nearly straight posterior border, only feebly notched in the middle, the occipital furrow deep behind but becoming obsolete on the middle of the front. Eyes rather flat, in front of the middle of the head. Gular teeth very small and acute. Mandibles convex, with two large apical and apparently two small basal teeth. Clypeus flat, ecarinate, its anterior border with a broad, deep notch in the middle. Frontal area broadly elliptical, deeply impressed, without a median carinula. Frontal groove obsolete, at least anteriorly. Frontal carinæ short, not reaching the middle of the head. There are no scrobes or similar impressions for the antennæ. Scapes reaching a little more than half the distance between the eyes and posterior corners of the head, slender, terete and curved at the base, somewhat thickened towards their tips; club shorter than the remainder of the funiculus; joints 2—8 slightly longer than broad. Pronotum half as broad as the head, rounded, subhemispherical, without prominent humeri; mesonotum sloping, with a feeble torus, which descends abruptly behind to the pronounced mesoëpinal constriction. Epinotum armed with small, acute, suberect teeth, the base and declivity subequal in profile, the median surface of both with a well-developed groove. Petiolar node moderately high, somewhat compressed anteroposteriorly, its superior border straight and entire. Postpetiole transversely elliptical, nearly twice as broad as long and about $1\frac{1}{2}$ times as broad as the petiolar node. Gaster broadly elliptical, somewhat smaller than the head, with straight anterior border. Femora scarcely thickened.

Shining; mandibles smooth in the middle, obscurely punctate-striate near the dental border. Surface of clypeus uneven, subrugulose. Cheeks and sides of front longitudinally rugose, with feebly reticulate interrugal spaces. Pronotum very smooth and shining; mesopleuræ and epinotum more opaque, finely and densely punctate. The ventral portions of the petiole and postpetiole have a similar sculpture. Nodes, gaster and appendages shining.

Hairs yellow, bristly, rather short, not abundant, especially on the head; shorter and more appressed on the appendages. Pubescence undeveloped.

Head and thorax brown; cheeks and posterior corners of the head paler; clypeus, mandibles, antennæ, petiole, postpetiole, gaster, legs, including the coxæ, yellow. Mandibular teeth and anterior border of clypeus blackish.

Worker. Length 1.8—2 mm.

Very similar to the soldier, except that the head is smaller, slightly longer than broad, with straight sides and posterior border and rounded posterior corners. The anterior clypeal border is feebly though distinctly notched. The scapes extend about $\frac{1}{4}$ their length beyond the posterior corners of the head; the eyes are rather convex and near the middle of its sides. The mesonotal torus and the epinotal teeth are more feebly developed than in the soldier; the color, sculpture and pilosity are very similar.

Described from a single soldier and 8 workers taken by Prof. C. T. BRUES at Matucana, Peru, 7300 ft., during the summer of 1913.

I have described this species from specimens in my collection because it is closely allied to the preceding species. It is much smaller and paler than *Ph. cameroni* MAYR and seems to be quite distinct from any of the other described members of the *fabricator* group.

65. *Pheidole holmgreni* sp. nov.

Soldier. Length 4.2 mm.

Belonging to the *præusta* group and related to *stulta* FOREL. Head large, distinctly longer than broad and distinctly broader behind than in front, with straight cheeks and the sides very feebly convex behind the eyes, the posterior border deeply and angularly excised, the occipital furrow distinct, the frontal furrow shallow, the eyes small but moderately convex, just in front of the second fourth of the head; gula anteriorly with large, blunt teeth. Mandibles large and convex, with two large apical teeth. Clypeus flattened, its anterior border entire, its disc with a distinct tubercle in the middle behind instead of a carina. Frontal area triangular, deeply impressed, without median carinula. Frontal carinæ short; scrobes absent but represented by a slightly flattened area on each side. Antennæ slender; scapes curved at the base, their tips reaching to the middle of the sides of the head; club distinctly shorter than the remainder of the funiculus; joints 2—8 distinctly longer than broad. Pronotum less than half as broad as the head; broader below, where the sides are swollen, than above, where the humeri are rounded and not projecting. Mesonotum with a distinct transverse torus in the middle, sloping to the pronounced mesoëpinotal constriction. Epinotum with subequal base and declivity, the former horizontal, the latter sloping, the dorsal surface with a broad, shallow groove in the middle, the spines erect, very slender, much longer than broad at their bases, nearly as long as half their distance apart. Petiole small, the node sharp and strongly compressed at the summit,

its superior border seen from behind straight and entire. Postpetiole fully twice as broad as the petiole, broader than long, with the sides distinctly but not acutely angular in the middle. Gaster elliptical, flattened, somewhat smaller than the head. Legs rather slender, femora not incrassated.

Shining; mandibles sparsely punctate, striate at the base and more finely near the apical border. Sides of clypeus and anterior $\frac{4}{5}$ of head longitudinally rugose, the rugæ on the head fine and sharp, not anastomosing and the spaces between them indistinctly and superficially reticulate; the posterior fifth of the head with shallow, scattered piligerous foveolæ, or coarse punctures. Pro- and mesonotum smooth and shining, epinotum and posterior portions of mesopleuræ, petiole and postpetiole more opaque, very finely and densely punctate. Gaster and legs shining, with fine, sparse, piligerous punctures.

Hairs yellow, moderately abundant, erect or suberect on the body and rather short; somewhat shorter on the legs and scapes; pubescence undeveloped.

Brownish yellow; antennæ, mesopleuræ, petiole and postpetiole brown; mandibles and head rich reddish brown, the posterior corners of the head paler, the borders of the mandibles and anterior border of clypeus black.

Worker. Length 2 mm.

Head broadly elliptical, a little longer than broad, evenly rounded behind, without posterior corners. Eyes a little in front of the middle of the sides of the head. Mandibles rather long, with straight external borders, their apical borders with several minute basal and two large terminal teeth. Clypeal border rounded and entire. Antennal scapes extending about $\frac{1}{3}$ their length beyond the occipital border of the head. Thorax differing from that of the soldier in having a longer, more sloping mesonotum, with much less prominent torus, or swelling. The epinotal spines are represented by minute teeth. The petiolar node is small and conical, the postpetiole somewhat campanulate, about twice as broad as the petiole, rounded above and on the sides. Gaster elongate-elliptical, smaller than the head.

Shining; mandibles finely striate and coarsely and sparsely punctate; cheeks and sides of front with feeble longitudinal rugules. Mesopleuræ, epinotum, petiole and postpetiole slightly opaque, very finely and densely punctate.

Pilosity very similar to that of the soldier but somewhat shorter and sparser.

Yellow; borders of mandibles and anterior border of clypeus brown.

Described from a single soldier and four workers taken by Prof. N. HOLMGREN at Mojos, Bolivia, »nesting under a log».

This species is related to *Ph. stulta* FOREL, but is smaller and paler, the soldier has a shorter and posteriorly much less deeply excised head, the clypeal border is entire, there is no clypeal carina, etc.

Lives under stone. Very active. April 25th.

66. *Pheidole holmgreni* subsp. *festata* subsp. nov.

Soldier. Differing from the preceding form in having the clypeus clearly carinate and longitudinally rugose throughout. The frontal area has a median carinula. The head is decidedly narrower in proportion to its width and parallel-sided, not narrower in front than behind. The superior border of the petiolar node is more compressed and distinctly notched in the middle. Head and mandibles rich castaneous red; middle portions of the latter almost black; posterior corners of head, middle of the clypeus and front paler. Petiole and postpetiole, inferior border of thorax and posterior borders of gastric segments dark brown; extensor surfaces of tibiae brown, darker than the remainder of the legs. Pilosity and sculpture much as in the typical *holmgreni*.

Worker. Head decidedly narrower and proportionally longer than in the worker of the typical *holmgreni*. Base of epinotum more distinctly convex in profile, the color much darker, being brown, the head dark brown; tips of antennal clubs, middle portions of femora and tibiae almost as dark; mandibles yellow, with brown teeth. Punctuation of mesopleuræ and epinotum a little coarser.

Described from a soldier and worker from Mojos, Bolivia and a soldier from Peru (HOLMGREN).

67. *Pheidole carapuna* MANN var. *chaquimayensis* var. nov.

Soldier. Differing from the typical form from Brazil in having the epinotal spines fully twice as long, and in color, the head, thorax, petiole and postpetiole being of a paler, more yellowish or ferruginous brown, the gaster and legs yellow, the segments of the former with brown borders.

Male. Length 3—3.2 mm.

Mandibles very small, indistinctly bidentate. Antennal scapes only about twice as long as broad. Head, thorax and abdomen of the usual shape. Smooth and shining; head opaque behind, obscurely and very finely punctate.

Pilosity whitish, very fine, reclinate, rather abundant.

Pale yellow; posterior portion of head, mesonotum, meso-

pleuræ and scutellum more or less brownish; the mesonotum with three darker brown streaks. Wings colorless, with very pale brown veins and pterostigma.

Described from six soldiers and three males taken by Prof. N. HOLMGREN at Chaquimayo, Peru.

Under the bark of a mouldering stem. Dec. 20th.

68. *Pheidole radoszkowskii* MAYR subsp. *acuta* EMERY. ♀ Mojos, Bolivia (N. HOLMGREN).

Robs white ants from a combined white ants nest. Lives under stone. April 18th. June 8th.

69. *Pheidole biconstricta* MAYR subsp. *simplex* subsp. nov.

Soldier. Length about 3.2 mm.

Differing from the other subspecies in its smaller size, proportionally smaller head and somewhat simpler thorax. It is most closely related to the subsp. *rubicunda* EMERY and resembles it in its rufescent color and in sculpture, but the head is smaller and narrower, with less convex sides. The mesonotal torus is much less pronounced than in the other subspecies, blunter and more rounded in profile, the epinotal teeth are shorter. The piligerous foveolæ on the posterior portion of the head and first gastric segment are quite pronounced.

Three soldiers from Llinquipata, Peru (HOLMGREN).

70. *Pheidole dimidiata* EMERY. 4 Peru (HOLMGREN).

71. *Pheidole dimidiata* var. *schmalzi* EMERY. 4 San Fermin, Bolivia (HOLMGREN).

Under decaying bark. August 1st.

72. *Pheidole moséni* sp. nov.

Soldier. Length 1.8—2 mm.

Related to *Ph. floridana* EMERY and *anastasii* EMERY. Head large, subrectangular, about $\frac{1}{5}$ longer than broad, as broad in front as behind, with straight, subparallel sides and deeply and angularly excised posterior border. Occipital groove rather deep and narrow. Teeth on the gula small and widely separated. Eyes very small and poorly developed, just behind the anterior fourth of the head. Mandibles thick and convex, flattened along their apical borders, with the basal borders concave. Clypeus short, ecarinate, its anterior border sinuate in the middle. Frontal area subtriangular, rather shallow, without a median carinula. Frontal carinæ with unusually high and erect anterior lobes, short and diverging behind, bordering flattened scrobe-like areas for the antennæ. These

are very short, the scapes when turned backward scarcely reaching beyond the middle of the head, slender, terete and curved at the base, somewhat thickened apically. Club about as long as the remainder of the funiculus, the terminal joint thicker and somewhat longer than the two preceding joints together; joints 2—8 distinctly broader than long. Thorax, especially the pronotum, robust, the latter transverse, with prominent humeri, the dorsal surface strongly convex antero-posteriorly, more nearly straight from side to side. Mesonotum descending almost vertically to the mesoëpinal constriction, on each side with a distinct, compressed and moderately acute tooth. Epinotum small and low, the base very short, shorter than the declivity, the spines acute, longer than broad at their bases and nearly as long as the space between their bases, directed upward and somewhat outward and backward. Petiolar node compressed anteroposteriorly, seen from behind rectangular above, with straight, entire superior border. Postpetiole more than twice as broad as the petiole and much broader than long, its sides produced as rather long, acute spines. Gaster very broadly elliptical, flattened, very much smaller than the head. Legs stout, the femora and tibiae somewhat thickened.

Shining; mandibles smooth, sparsely punctate, striated at the base. Clypeus smooth in the middle, obscurely rugulose on the sides. Head with the anterior $\frac{3}{4}$ longitudinally rugose, the rugæ being rather feeble, especially on the flat, scrobe-like areas, the posterior half of the head with coarse piligerous punctures, or foveolæ. Pro- and mesonotum smooth and shining, pleuræ and epinotum feebly rugulose-punctate. Petiole and base of postpetiole subopaque, finely and densely punctate. Gaster and legs shining, very finely shagreened, with sparse, piligerous punctures.

Hairs yellow, rather abundant but not very long, uniformly clothing the body and appendages. Pubescence not apparent.

Brownish ferruginous; head darker; mandibles still darker; gaster, legs and antennæ paler and more yellowish; scapes infuscated at the base; anterior border of clypeus black.

Worker. Length 1.2—1.3 mm.

Head subrectangular, very slightly longer than broad, slightly narrowed in front and behind, the posterior border feebly but distinctly emarginate in the middle. Eyes small, in front of the median transverse diameter of the head; antennal scapes reaching to its posterior corners. Mandibles and clypeus of the usual shape, the latter rather flat. Pronotum narrower and more hemispherical than in the soldier, without

prominent humeri; the abrupt mesonotum with only faint indications of the lateral teeth. Epinotum similar to that of the soldier, but with smaller teeth. Petiolar node more rounded and conical.

Mandibles finely striated, subopaque. Head more opaque, longitudinally rugulose, with reticulations between the rugules. Remainder of body sculptured more as in the soldier.

Pilosity like that of the soldier but shorter.

Head, thorax, petiole and postpetiole reddish ferruginous; gaster, antennæ, legs and mandibles yellow; mandibular teeth brownish.

Female (déalated). Length 2.8 mm.

Head nearly square, its posterior border less deeply excised than in the soldier; eyes larger, though small for a female; ocelli small and widely separated. Mandibles and frontal carinæ as in the soldier. Antennal scapes reaching nearly halfway between the eyes and the posterior corners of the head. Thorax very broad and short, broadly elliptical, not more than $1\frac{1}{2}$ times as long as broad, not broader than the head, flattened above. Mesonotum with a narrow median groove on its posterior half. Epinotum very small and narrow, its base only about half as long as the abrupt declivity, the spines stout and tooth-like, directed backward. Petiole and postpetiole like those of the soldier. Gaster rather small.

Sculpture and pilosity much as in the soldier; the rugæ on the head extending further back; the whole mesonotum and scutellum smooth and shining. First gastric segment with large piligerous punctures, most numerous near the anterior border.

Deep castaneous brown; legs and antennæ brownish yellow; scapes infuscated at the base.

Described from four soldiers, five workers and a single female taken by HJ. Mosén in Brazil.

This species is peculiar in the structure of the frontal carinæ and mesonotum when compared with the other members of the *flavens* group.

73. *Pheidole flavens* ROGER subsp. *tuberculata* MAYR var. *iheringi* EMERY. 4 Peru (HOLMGREN).

74. *Pheidole flavens* subsp. *rudigenis* EMERY. 4♂♂. Brazil (HJ. MOSÉN).

The soldier agrees well with EMERY's description, but I am not certain of the identification.

75. *Pheidole* (*Elasmopheidole*) *aberrans* MAYR. 4♂. Buenos Aires, Argentina (KINBERG).

76. *Crematogaster* (*Orthocrema*) *victima* F. SMITH subsp. *nitidiceps* EMERY var. *pergens* FOREL. ♀♀ Chaquimayo, Peru (HOLMGREN).

Collected from a dry, dead branch of an else living tree.
Dec. 15th.

77. *Crematogaster* (*Orthocrema*) *brevispinosa* MAYR subsp. *rusata* subsp. nov.

Worker. Length 2.5—3 mm.

Head scarcely broader than long, a little narrower in front than behind, its posterior border very distinctly emarginate in the middle. Clypeus moderately convex; frontal groove reduced to a short but pronounced impression at the middle of the head. Eyes small, flat, elongate, very near the middle of the sides of the head. Antennal scapes scarcely reaching its posterior corners; club strongly 2-jointed, funicular joints 2—8 distinctly broader than long. Promesonotum convex and hemispherical; promesonotal suture indistinct dorsally; mesoëpinal constriction very pronounced; base of epinotum somewhat convex in the middle anteriorly but less so than in the subsp. *tumulifera* FOREL; the spines well-developed, nearly twice as long as broad at their bases, about half as long as their distance apart, acute, directed backward and very slightly outward, in some specimens distinctly recurved at the tip. Petiole longer than broad, with straight, subparallel sides, decidedly rounded and not angulate anteriorly, its posterior border rather broadly and deeply excised, its posterior corners acutely dentate; the anteroventral tooth very small and indistinct. Postpetiole subglobular, without any trace of a median longitudinal groove or impression behind.

Shining throughout, posterior half of head more strongly than the remainder of the body. Mandibles finely striatopunctate. Clypeus and anterior half of head very finely, longitudinally striate and glossy; posterior half finely, sharply and sparsely punctate. Pronotum transversely, mesonotum and base of epinotum longitudinally rugulose; mesopleuræ and parts of metapleuræ densely punctate; epinotal declivity smooth and shining; abdomen very finely reticulate and shagreened.

Pilosity very feebly developed, restricted to a few hairs on the clypeus, pronotum, pedicel and gaster; pilosity very short and appressed, but distinct on all parts of the body.

Rich castaneous red throughout, the appendages concolorous with the body.

Described from nine specimens taken by Prof. N. HOLMGREN at San Fermin (type-locality) and Mojos, Bolivia.

This form is distinct from any of the 23 subspecies and varieties of *brevispinosa* enumerated by FOREL and EMERY. It seems to approach the subsp. *sampaioi* FOREL of Brazil most closely, but this has small epinotal spines, a strong ventral petiolar tooth and the antennal clubs are indistinctly 2-jointed.

Taken from a procession in July.

78. *Crematogaster* (*Orthocrema*) *brevispinosa* subsp. *townsendi* subsp. nov.

Worker. Length 2—3 mm.

Head, eyes and antennæ as in the preceding subspecies, but the promesonotum is much less convex and more depressed above, so that the mesonotum is only a little higher than the epinotum and much less abruptly sloping behind. The base of the epinotum is rather convex in the middle when seen in profile, but the acute spines are decidedly shorter, more erect, a little longer than the width of their bases. The postpetiole is as broad as long and nearly circular, with broadly concave posterior border and distinct posterior teeth. The anteroventral tooth is well-developed. There is a feeble but distinct median longitudinal impression at the posterior border of the postpetiole.

Sculpture like that of the preceding subspecies but the thorax is more subopaque and its rugules more numerous.

Hairs more abundant on the dorsal surface of the body, distinctly obtuse. Pubescence, especially on the gaster longer than in the subsp. *russata*.

Castaneous brown; gaster more blackish; mandibles red, with black teeth; tarsi brownish yellow.

Described from a number of workers taken at Piura, Peru by Mr. C. H. TYLER TOWNSEND.

This form seems to approach the subsp. *moelleri* FOREL of Southern Brazil most closely but the petiole of the latter is square, the antennal scapes are shorter and the color is much paler.

79. *Crematogaster* (*Orthocrema*) *longispina* EMERY var. *boliviana* var. nov.

Worker. Length 2.6—3 mm.

Differing from the typical form and the var. *tenuicula* FOREL in color, the body being rather vivid yellowish red, the mandibles, clypeus, antennæ and legs brownish yellow.

Female (déalated). Length 5.5 mm.

Head distinctly broader than long, broader behind than in front, with straight, subparallel cheeks and broadly convex

posterior border. Eyes and especially the ocelli, large. Antennal scapes extending about $\frac{1}{4}$ their length beyond the posterior corners of the head. Thorax elongate-elliptical, narrower than the head through the eyes. Mesonotum convex, longer than broad; epinotum short, abruptly descending between the spines, which are stout and acute, with slender tips, not longer than broad at the base. Petiole strongly constricted anteriorly into a short peduncle, then suddenly widened, with rounded sides and rather abruptly narrowed again behind but not as much as in front, the posterior corners prominent but blunt. Postpetiole evenly convex, transversely elliptical. Gaster elliptical, with pointed tip, straight anterior border and convex ventral surface.

Smooth and shining; mandibles with a few indistinct striæ and punctures; cheeks and sides of front longitudinally rugulose but not very sharply. Base of epinotum with rugæ that diverge fanwise posteriorly; sides of epinotum more indistinctly rugulose.

Pilosity yellow, abundant, bristly, erect or suberect on the body, shorter and more reclinate on the legs.

Castaneous brown; mandibles, antennæ and legs brownish yellow.

Six workers and two females taken by Prof. N. HOLMGREN at Mojos, Bolivia.

I have not seen the typical *tenuispina* of Costa Rica, but EMERY describes it as fuscous. Compared with cotypes of the var. *tenuicula* FOREL and many specimens of the same form from British Guiana in my collection, the var. *boliviana* is more robust, with even longer and more diverging epinotal spines, coarser and more abundant pilosity and much deeper coloration. The subsp. *egregior* FOREL from Pará is larger (3.5—4.5 mm), with more heavily sculptured head, etc.

The nest under stone. Lives together with a little podurid. When escaping from the disturbed nest each of the females carries two soldiers on her back.

80. *Crematogaster* (*Orthocrema*) *nigropilosa* MAYR. ♀ Mojos, Bolivia (HOLMGREN).
81. *Crematogaster* (*Orthocrema*) *limata* F. SMITH var. *palans* FOREL ♀ Pachitea, Peru (STAUDINGER).
82. *Crematogaster* (*Orthocrema*) *quadriformis* ROGER. ♀ Vilcanota, Peru (STAUDINGER).
83. *Crematogaster* (*Orthocrema*) *brasiliensis* MAYR. ♀ Fontebôa, Brazil.
84. *Crematogaster* (*Orthocrema*) *stolli* FOREL. ♀ Remedios, Colombia (NISSER).

85. *Crematogaster* (*Eucrema*) *inca* sp. nov.

Worker. Length 4—4.5 mm.

Head subrectangular, distinctly broader than long, very slightly narrower in front than behind, with nearly straight sides and scarcely concave posterior border. Eyes moderately convex, their anterior orbits at the median transverse diameter of the head. Mandibles narrow, with very oblique 4-toothed apical borders. Clypeus moderately convex, its anterior border straight in the middle, somewhat projecting at the sides. Frontal area distinct, triangular; frontal groove developed as far as the middle of the head. Antennal scapes extending about $\frac{1}{4}$ their length beyond the posterior corners; club 3-jointed, almost 4-jointed; the two basal joints subequal, together as long as the thicker terminal joint; joints 2—8 fully $1\frac{1}{2}$ times as long as broad. Thorax shaped much as in *C. longispina* and allied species but somewhat stouter; the promesonotum longer than broad, rounded on the sides; the mesonotum on each side with a strong carina, which in profile is distinctly angulate in the middle and descends to the strong and acute mesoëpinotal constriction. At this point each carina bears a very minute tooth. Epinotum about the same size as the promesonotum, as broad as long, with very long spines, whose bases join the mesonotal carinae at the constriction. These spines are fully as long as their distance apart at the base and as the declivity, tapering, acute, directed upward, backward and outward. They are straight or in some specimens with slightly deflected tips. Petiole about $1\frac{3}{4}$ times as long as broad, rather gradually narrowed anteriorly to a slender peduncle which bears no tooth but only a slight convexity anteriorly on the ventral side. The posterior border is broadly excised, the posterior corners bluntly subdentate. Postpetiole very convex, hemispherical, entire. Gaster triangular, with rather long, pointed tip, very convex below. Legs long and slender.

Shining; mandibles and clypeus smooth, the former with a few punctures. Sides of front finely and densely punctate-rugulose, the rugules concentric around the antennal foveæ; cheeks and sides of vertex with several coarse punctures, or foveolæ. Promesonotum and base of epinotum finely and sharply longitudinally rugulose; mesopleuræ densely punctate; the large, diamond-shaped, concave sloping space between the spines shining and very finely, indistinctly and transversely shagreened or striolate. Petiole smooth and shining; postpetiole and first gastric segment subopaque, finely, densely and sharply punctulate, the latter segment with raised, piligerous points.

Hairs yellowish, moderately abundant, bristly, of uneven length, erect or suberect on the body, oblique on the antennal scapes, short and appressed on the legs.

Head, thorax and petiole yellowish brown; the head somewhat mottled with darker brown; postpetiole, gaster, femora and tibiae dark brown; the antennal scapes, mandibular teeth and posterior borders of gastric segments blackish; mandibles, tarsi and four terminal joints of antennae yellow; remainder of funiculi brown.

Described from 20 specimens taken by Prof. NILS HOLMGREN at Chaquimayo, Peru.

This species is very puzzling. The structure of the thorax and abdomen is that of the species of the *limata* group of the subgenus *Orthocrema*, but the antennal clubs are 3-jointed, or rather indistinctly 4-jointed, instead of 2-jointed. I have therefore placed the species in the subgenus *Eucrema*, although it differs in the antennal clubs and perfectly undivided postpetiole from the species assigned by EMERY to that group (his *Crematogaster sens. str.*). I find in my collection the following subspecies:

86. *Crematogaster* (*Eucrema*) *inca* subsp. *ascendens* subsp. nov.

Worker. Length 2.5—2.8 mm.

Smaller than the typical form of the species, with somewhat longer antennal scapes and the spines of the epinotum more slender, less diverging and directed more backward in line with the base of the epinotum which they equal in length. The sides of the petiole are straight, almost subparallel, the segment being narrower, clearly twice as long as broad.

Surface of body smoother and more shining; the rugules on the sides of the front less distinct, the foveolae on the sides of the vertex obsolete, the rugules on the thorax sharper but less numerous, the basal segment of the gaster shining, feebly reticulate and without the raised piligerous points.

Pilosity like that of the typical form but the hairs on the tibiae are longer, oblique and less appressed.

Color less diversified; yellowish brown; head and gaster darker posteriorly; mandibles and three terminal antennal joints brownish yellow, remainder of antennae and legs of the same brown tint as the thorax.

Described from six specimens taken by the Yale Peruvian Expedition at Santa Ana, Peru, 3000 ft., Aug. 3, 1911.

Were it not for its three-jointed antennal club this subspecies would be readily mistaken for *C. longispina* EMERY.

87. *Monomorium pharaonis* LINN. ♀♀. Lower Amazon; Fontebôa, Brazil (HAHNEL); São Paulo, Brazil (A. HEINE); São Leopoldo, (J. W. STAHL).
88. *Megalomyrmex balzani* EMERY. ♀ San Fermin, Bolivia (N. HOLMGREN); ♀♂ Songo and Mapiri, Bolivia; Pozuzu, Peru (STAUDINGER).

Male (undescribed). Length 8 mm.

Head through the eyes as broad as long, rounded behind, without distinct posterior corners, the occipital border raised, or marginate. Eyes large, cheeks very short. Mandibles well-developed, with oblique, coarsely 4-toothed apical borders. Clypeus convex and bluntly subcarinate in the middle. Antennæ very long and filiform; scapes nearly four times as long as broad and distinctly longer than the second funicular joint; first funicular joint as long as broad, succeeding joints long and cylindrical, increasing in length and decreasing in thickness towards the tip. Thorax large, through the eyes; mesonotum very convex and evenly rounded, hemispherical, without Mayrian furrows. Epinotum long and sloping, feebly convex in profile, without distinct base and declivity and without a median dorsal groove. Petiole about twice as long as high, the node almost obsolete; the node of the postpetiole also very low, longer than high and longer than broad, inverted heart-shaped when seen from above, the posterior border somewhat impressed in the middle. Gaster elongate-elliptical, convex above. External genital valves roundly triangular; cerci apparently absent. Legs rather long and slender. Wings with sharply defined veins, with a large discoidal, a single cubital and an open radial cell and with both branches of the cubitus well-developed.

Sculpture and color much as in the worker, but the pilosity is very feebly developed, almost lacking on the body, very short and appressed on the appendages. Wings hairy, distinctly infuscated, with dark brown veins and pterostigma.

89. *Megalomyrmex goeldii* FOREL. ♀♂ Nogueira, Brazil (T. BORGMEIER).

Male (undescribed). Length nearly 4 mm.

Head including the eyes, a little longer than broad, broad and rounded behind, with straight, marginate occipital border. Eyes rather small. Cheeks well-developed. Mandibles 5-toothed. Clypeus convex in the middle. Antennal scapes long, as long as joints 2—4 of the funiculus, the first joint about $1\frac{1}{2}$ times as long as broad; joints 2—12 cylindrical, increasing in length towards the tip. Thorax shaped much as in *balzani*,

but the nodes of the petiole and postpetiole are much more developed and resemble those of the worker though lower. Wings very narrow, with small discoidal, one cubital and an open radial cell, both branches of the cubitus being well-developed.

Sculpture and pilosity as in the worker.

Uniformly yellow, the mandibular teeth brown; the wings somewhat smoky, with brown veins and pterostigma.

I have described the males of this and the preceding species because the male of only one species of *Megalomyrmex* (*foreli* EMERY) has been previously described.

90. *Megalomyrmex* (*Wheelerimyrmex*) *sjöstedti* sp. nov.

Worker. Length 3.5—4 mm.

Allied to *M. silvestrii* WHEELER of Mexico. Head about $\frac{1}{3}$ longer than broad, rounded behind, without distinct posterior corners, with the occipital border distinctly raised, or marginate. Eyes rather large and convex, in front of the middle of the head, longer than their distance from the clypeus. Clypeus short, abrupt, somewhat produced in the middle, where it is subtruncate and slightly sinuous. Frontal area circular, deeply impressed. Mandibles rather narrow, with nearly straight external borders, their blades with two apical teeth and a number of very minute and indistinct basal teeth. Antennæ long and stout; the scapes extending nearly $\frac{1}{3}$ their length beyond the occipital border of the head; the funiculus with a 3-jointed club, distinctly longer than the remaining joints; joints 2—6 as long as broad; 7 and 8 a little broader than long. Promesonotum forming an even, rounded convexity, regularly oval from above, about $1\frac{1}{3}$ times as long as broad, the promesonotal suture distinct but not impressed. In profile the mesonotum falls abruptly only at its posterior end to the deep and rather long mesoëpinotal constriction. Epinotum small, lower than the promesonotum, about $1\frac{1}{3}$ times as long as broad, the base in profile rising abruptly from the constriction in front and then sloping to the declivity, with which it forms an obtuse angle and which is of the same length and somewhat more abruptly sloping. The metasternal angles are small and undeveloped, much smaller than in *silvestrii*. The base is broadly grooved dorsally but the declivity is merely flattened. Petiole large, the node high, rounded, slightly compressed anteroposteriorly, its anterior slope in profile distinctly concave; the ventral surface of the peduncle straight, with a minute tooth at its anterior end. Postpetiolar node high and convex, but lower than the petiolar node, seen from above transversely elliptical, $1\frac{1}{3}$ times as broad as long,

constricted posteriorly. Gaster broadly elliptical, evenly convex above and below. Legs rather long.

Very smooth and shining throughout; mandibles with small, scattered punctures. There are a few concentric rugæ around the antennal foveæ.

Hairs white, rather soft, erect and moderately abundant on the body, much oblique and decidedly shorter on the scapes and legs.

Rather vivid reddish yellow; mandibles, clypeus, legs and tip of gaster clear yellow; antennæ brownish yellow; posterior portion of head and first gastric segment, except its base, sutures of the thorax and articulations of petiole and postpetiole, pale castaneous brown.

Female (déalated). Length 4 mm.

Scarcely larger than the largest workers and very similar, except in the structure of the thorax. Head somewhat broader, with larger eyes and rather large ocelli. Mesonotum about as broad as long. The mesoëpinotal constriction of the worker is represented by a distinct but not very deep groove, the epinotum is somewhat similar to that of the worker in profile, but more sloping, and the longitudinal impression of the base is less distinct. Petiole, postpetiole and gaster very much as in the worker.

Sculpture, pilosity and color also very similar, but the darker portions of the head and gaster of a deeper tint; wing-insertions black; scutellum and a V-shaped spot on the posterior portion of the mesonotum brown.

Described from fifteen workers and a single female taken at Llinquipata, Peru (type-locality) and two workers taken at San Fermin, Bolivia (N. HOLMGREN).

Closely related to *M. silvestrii*, but this form is much darker, has much more slender antennæ, much larger and more conspicuous episternal lobes to the epinotum and the base of the latter is horizontal, not sloping, and is more deeply grooved above. Dr. MANN has recently created the subgenus *Wheelerimyrme* for this species on account of its peculiar dentition and the feeble development of the promesonotal suture. *M. sjöstedti* is obviously to be assigned to the same group.

Collected under stone. Nov.

91. *Megalomyrmex* (*Wheelerimyrme*) *sjöstedti* var. *langi* var. nov.

Worker. Length 3.5—4 mm.

Differing from the preceding form in having the epinotum somewhat more distinctly angular in profile, with more nearly horizontal base; the petiolar node higher, narrower and in

profile slightly more pointed at the summit. The color is decidedly darker, the head, pronotum and first gastric segment, except its base, being deep castaneous brown, the remainder of the body paler but a shade darker than in the typical form of the species. The pilosity is somewhat longer and coarser.

Male. Length somewhat less than 3 mm.

Head as broad as long, broadest through the middle of the very large eyes, narrowed and rounded behind; cheeks extremely short; mandibles small but similar to those of the worker; clypeus convex, with broadly rounded, entire anterior border. Antennæ long, scapes as long as the first and second funicular joints together, the first joint about $1\frac{1}{2}$ times as long as broad; remaining joints cylindrical, somewhat increasing in length and thickness towards the tip. Thorax elongate, narrowed behind, narrower than the head; pronotum as broad as long, convex in front, overarching the pronotum; epinotum long and sloping, but with distinct base and declivity, the former slightly impressed and fully twice as long as the declivity, the angle between the two surfaces rounded. Petiole and postpetiole with distinct but low nodes, the former nearly three times as long as high, the postpetiole broader than the petiolar node, about as long as broad. External genital valves small, bluntly pointed at their tips. Legs slender. Venation of wings as in the other species, but the discoidal cell small and the veins not strongly marked.

Sculpture and pilosity as in the worker. Mandibles and antennæ yellowish white; anterior half of head brownish yellow, posterior half blackish; thorax and abdomen brownish yellow, first gastric segment dark brown, except at the base. Legs yellow. Wings grayish hyaline, with very pale brownish veins and pterostigma.

Described from a number of workers and two males taken by Mr. H. O. LANG at Kamakusa, British Guiana. The males are much smaller in proportion to the workers than in the other species. Perhaps this is a subgeneric character.

In 1909 I published a key for the identification of the workers of the various species of *Megalomyrmex*. This I here revise and include several species that have been described more recently: —

- (1). Mandibles rather feeble and flat, their blades minutely denticulate, with only two teeth, which are apical; promesonotal suture not impressed, not very distinct. Small species (subgenus *Wheelerimyrmex* MANN). (2). Mandibles more robust and convex, with 5—6 large subequal teeth; promesonotal suture more distinct and more

or less impressed. Small and large species. (subgenus *Megalomyrmex sens. str.*). (4).

- (2). Metasternal angles, or lobes well-developed; antennæ slender. Length 3.5—4 mm (Mexico).

silvestrii WHEELER.

Metasternal angles feebly developed; antennæ longer and stouter. Length 3.5—4 mm (Peru and Bolivia). (3).

- (3). Body reddish brown, head and first gastric segment, except anteriorly, somewhat darker. (Peru and Bolivia.)

sjöstedti sp. nov.

Head and first gastric segment much darker; petiolar node somewhat higher and more pointed, epinotum slightly more angular. (British Guiana.) var. *langi* var. nov.

- (4). Mandibles striated. (5).

Mandibles smooth, sparsely punctate. (6).

- (5). Antennal clubs 3-jointed; mandibles 5-toothed. Head and thorax rugulose-punctate, subopaque. Length 5 mm (female 6.5 mm). (Brazil.)

wallacei MANN.

Antennal clubs 4-jointed; mandibles 6-toothed. Head and thorax smooth and shining. Length 4—4.75 mm (Costa Rica).

modestus EMERY.

- (6). Small species, not more than 4—5 mm long. (7).

Larger species, usually more than 6.5 mm long (9).

- (7). Occipital border of head not raised, nor marginate. Length 4.7—5 mm (Brazil).

theringi FOREL.

Occipital border of head raised, or marginate. Distinctly smaller (8).

- (8). Head narrower behind than in front; scapes extending about $\frac{1}{3}$ their length beyond the posterior corners of the head. Epinotal declivity obtusely submarginate on the sides. Length 4.1—4.3 mm (Brazil).

goeldii FOREL.

Head as broad behind as in front; scapes not extending more than $\frac{1}{4}$ their length beyond the posterior corners of the head. Eyes larger, placed further forward. Mesoeipinotal impression longer and less acute; epinotal declivity distinctly marginate on the sides. Color more vividly yellow. Length 3.5—3.7 mm (Brazil).

pusillus FOREL.

- (9). Head not narrowed behind, its occipital border not raised, nor marginate. Epinotum bluntly bidentate. Length 6.8 mm (Costa Rica; Panama).

foreli EMERY.

Head narrowed behind, its occipital border distinctly raised or marginate. Epinotum not bidentate, at most bituberculate. (10).

- (10). Epinotum with two elevated tubercles; postpetiole with a small spine on its ventral side. Length 7.5 mm (Peru).
latreillei EMERY.
Epinotum not distinctly tuberculate; postpetiole unarmed beneath. (11).
- (11). Anterior slope of petiole seen in profile nearly straight. (12).
Anterior slope of petiole in profile distinctly concave. (13).
- (12). Reddish testaceous; mesonotum convex and rounded. Length 7—9 mm (Bolivia, Peru). *balzani* EMERY.
Yellow; mesonotum flat and horizontal, not higher than the base of the epinotum. Length 8 mm (Brazil).
duckeri FOREL.
- (13). Tubercles of epinotum absent, its longitudinal impression very faint or absent. (14).
Tubercles of epinotum present, its longitudinal impression distinct. (15).
- (14). Rufotestaceous; petiolar peduncle rather short, with a small, acute anteroventral spine; epinotum with a faint longitudinal impression. Length 8—9.5 mm (Colombia to Costa Rica). *leoninus* FOREL.
Piceous; petiolar peduncle longer, without an anteroventral spine. Length 10 mm (Peru).
staudingeri EMERY.
- (15). Basal surface of epinotum bordered with two high, ear-like lobes, between which it is deeply concave; petiolar node very large, anteroposteriorly compressed and scale-like, its peduncle short. Length 8—8.5 mm (Surinam).
emeryi FOREL.
Base of epinotum horizontal, without ear-like lobes.
Petiolar node of the usual shape, not scale-like. (16).
- (16). Piceous; petiole without an anteroventral spine; epinotum strongly angular in profile, tuberculate. Length 8 mm (Brazil). *nasatus* FOREL.
Rufotestaceous; petiole with an anteroventral spine; epinotum more rounded in profile, scarcely tuberculate. Length 7—8 mm (Brazil). *bituberculatus* FABR.
92. *Solenopsis savissima* F. SMITH. ♀. Brazil (HJ. MOSÉN); Kartabo, British Guiana (WHEELER).
93. *Solenopsis savissima* var. *morosa* SANTSCHI. ♀. Buenos Aires and Montevideo (KINBERG), Chaco de Santiago, Argentina (WAGNER); Bolivia (N. HOLMGREN).

The specimens from Bolivia are slightly paler than most of the others.

94. *Solenopsis sævissima* var. *interrupta* SANTSCHI. ♀. Moreno, Argentina (O. NORDENSKJÖLD); Mendoza, Argentina (JENSEN-HAARUP).
95. *Solenopsis gayi* Spinola. ♀. Valparaiso, Chile (KINBERG).
96. *Solenopsis tenuis* MAYR. ♀. Brazil (H. MOSÉN).
97. *Solenopsis picea* EMERY subsp. *subadpressa* FOREL. ♀. Mojos, Bolivia (N. HOLMGREN).
98. *Solenopsis novem-maculata* sp. nov.

Worker. Length 1.2 mm.

Head suboblong, about $\frac{1}{6}$ longer than broad, as broad in front as behind, with straight sides and feebly concave posterior border. Eyes very small, consisting of about 7 or 8 minute ommatidia, situated nearly $\frac{1}{5}$ the distance from the clypeus to the posterior corners. Frontal groove distinct as far back as the middle of the head. Clypeus short, abrupt, with two distinct carinæ but without teeth on the anterior border, which is straight in the middle and feebly sinuate on each side. Mandibles narrow, their apical borders oblique, 4-toothed, the terminal tooth very large. Antennæ slender, the scapes reaching nearly $\frac{2}{3}$ the distance between the eyes and posterior corners of the head. Club as long as the remainder of the funiculus, swollen, the basal only about $\frac{1}{3}$ as long as the apical joint; joints 2—7 small and narrow, but broader than long. Thorax elongate, pro- and mesonotum low and rounded above, mesoëpinotal constriction short and acute, not very deep; epinotum small, distinctly longer than broad, rounded, without distinct base and declivity. Petiole not longer than high, its peduncle short, strongly marked off from the node, the ventral surface convex. Postpetiole scarcely broader than the petiolar node, transversely elliptical, convex above. Gaster elongate-elliptical, larger than the head, its anterior border straight and transverse. Legs slender.

Smooth and shining, with very sparse and indistinct piligerous punctures.

Hairs whitish, delicate, sparse and short on the body, more abundant, shorter and more reclinate on the appendages.

Pale yellow, head slightly darker; a brown spot on each of its posterior corners, on each of the posterior corners of the first, second and third gastric segment and a median unpaired brown spot on the fourth segment.

Described from three specimens taken by Prof. NILS HOLMGREN at Mojos, Bolivia. This species, which seems to be rather closely related to *S. sulfurea* ROGER, is easily recognized by its unarmed clypeus and peculiar maculation.

99. *Wasmannia auropunctata* ROGER var. *laevifrons* EMERY.
 ♀♀. Mojos and Tuiche, Bolivia and Chaquimayo, Peru
 (N. HOLMGREN).

Female (undescribed). Differing from the typical *auropunctata* in having the head and thorax somewhat darker brown and their rugæ more pronounced, the epinotal spines a little longer and stouter and the gaster somewhat smoother and more shining.

100. *Procryptocerus striatus* F. SMITH subsp. *convergens* MAYR.
 ♀. São Leopoldo, Brazil (J. W. STAHL); Rio de Janeiro,
 Brazil (KINBERG).
 101. *Cephalotes atratus* L. ♀♂. Llinquipata, Peru (HOLMGREN);
 Manaos, Amazonas (ROMAN).

In his recent table of the various forms of *Cephalotes* (Bull. Soc. Ent. France 1920, p. 149), SANTSCHI separates certain subspecies of *C. atratus* on the presence or absence of two teeth or tubercles between the pronotal spines. A study of many colonies in the field shows that these teeth are entirely absent in small and well-developed in large workers of the same colony. There is a question, therefore, in regard to the validity of some of SANTSCHI's forms.

102. *Cryptocerus multispinus* EMERY. ♀. Puna, Bolivia (KINBERG).
 103. *Cryptocerus cristatus* EMERY. ♀. Antioquia, Colombia.
 104. *Cryptocerus cordatus* F. SMITH. ♀. Buturu, Bolivia (HOLMGREN).
 105. *Cryptocerus* (*Paracryptocerus*) *pusillus* KLUG. 4 ♀. Brazil
 (HJ. MOSÉN); Rio Perene, Peru (C. H. T. TOWNSEND).
 106. *Atta cephalotes* L. ♀. Chaquimayo, Peru (HOLMGREN).
 107. *Atta sexdens* L. ♀♂. São Paulo, Brazil (A. HENIE); Rio
 de Janeiro, Brazil (HELLMAN), Manaos, Amazonas (ROMAN).
 108. *Atta sexdens* var. *rubropilosa* FOREL. ♀. Mojos and Tuiche,
 Bolivia (HOLMGREN).
 109. *Atta vollenweideri* FOREL. ♀. Charubamba, Bolivia (HOLMGREN).

In the tip of a fruit.

110. *Atta columbica* Guerin. ♀. Remedios, Colombia (NISSER).
 111. *Acromyrmex lobicornis* EMERY. ♀. São Leopoldo, Brazil
 (J. W. STAHL).
 112. *Acromyrmex lobicornis* var. *pencosensis* FOREL. ♀. Puerto
 Madryn and Punta Arenas, Argentina (O. NORDENSKJÖLD).

Very abundant in sandy grounds. Lives surely under the surface.

113. *Acromyrmex disciger* MAYR. ♀. Brazil (HJ. MOSÉN).
 114. *Acromyrmex niger* F. SMITH. ♀♀. Buenos Aires, Argentina (KLINCKOWSTRÖM); Chaco de Santiago, Argentina (WAGNER); São Leopoldo, Brazil (J. W. STAHL).
 115. *Acromyrmex coronatus* FABR. ♀. Yanalomas, Bolivia (HOLMGREN).
 116. *Acromyrmex moelleri* FOREL var. *andicola* EMERY. ♀♀. Llinquipata, Peru (N. HOLMGREN).

Leaf cutting ant. Dec. 1st.

117. *Acromyrmex muticinosus* FOREL var. *homalops* EMERY. ♀. S. Brazil (F. SAHLBERG).
 118. *Trachymyrmex holmgreni* sp. nov.

Worker. Length 3—3.5 mm.

Allied to *T. iheringi* EMERY and *tucumanus* FOREL. Head as broad as long, its posterior border straight, except in the middle, where it is distinctly notched, the sides behind the eyes rather straight and subparallel, the occipital corners each with a short, stout spine. Mandibles long and narrow, 8—9-toothed, deflected at their tips, their external borders nearly straight. Clypeus rather convex, the anterior border depressed, broadly rounded, rather deeply notched in the middle. Frontal lobes moderately large, subtriangular; frontal carinae diverging behind and reaching nearly to the posterior corners. The pre-ocular carina bends into the scrobal depression and is connected with the frontal carina by a row of minute tubercles. Eyes small, somewhat convex. Antennae rather slender, scapes reaching nearly twice their greatest diameter beyond the posterior corners of the head; at the base with a large, broad, shovel-shaped lobe, which is twice as broad as the scape and when the antenna is in repose fills the angular space between the frontal lobe and carina. The scape is slightly narrowed just beyond the lobe and then enlarged apically. All the funicular joints longer than broad. Pronotum with acute inferior teeth and the lateral spines above rather acute and somewhat longer than broad at the base. The median pronotal spines are represented by a pair of large tubercles. Lateral mesonotal spines stouter and shorter than the pair in front of them on the pronotum, the remaining, sloping portion of the mesonotum with only a few tubercles. The epinotal spines are long, slender and nearly erect, longer than their distance apart at the base, but much shorter than the base of the epinotum. Petiole small, as broad as long, rounded above and laterally, with a few small, scattered tubercles. Postpetiole also as broad as long, about twice as broad as the petiole, rounded

in front and on the sides, somewhat impressed behind but with straight, entire posterior border. Gaster suboblong, about $\frac{1}{5}$ longer than broad, a little broader behind than in front, with straight anterior and lateral borders, the latter submarginate and tuberculate. The dorsal surface of the first segment has a distinct median and a pair of lateral longitudinal impressions and is covered with coarse and rather acute tubercles which are more or less connected with one another by reticulations. Legs rather long.

Opaque; mandibles shining, indistinctly punctate and at the base somewhat striolate. Ground surface of body not distinctly punctate; tubercles not abundant, noticeably sparse and small on the sides of the head and thorax, on the petiole and sides and ventral surface of gaster; large and conspicuous on the antennal scapes, especially on their lobes; moderately developed on the front of the head and on the legs.

Hairs brown in some lights, yellowish in others, curved or hooked, sparse and arising only from the tubercles, most numerous on the posterior portion of the gaster.

Ferruginous brown; mandibles, except their teeth, more yellowish red; the tubercles dark brown, the appendages scarcely paler than the remainder of the body.

Described from 20 specimens taken by Prof. NILS HOLMGREN at Mojós, Bolivia.

This species is easily distinguished from *T. iheringi* by its longer antennal scapes, their much broader lobes, the much feebler development of the tuberculation, especially on the smaller postpetiole, etc. It is apparently more closely related to *tucumanus* and its subsp. *cordovanus* BRUCH. Judging from SANTSCHI's description, however, *holmgreni* is smaller than these forms and the latter has much larger eyes.¹ *T. pruinosus* EMERY is also an allied form but has shorter antennæ, a less emarginate clypeus and the tubercles on the body are even less numerous than in *holmgreni*.

119. *Trachymyrmex urichi* FOREL subsp. *panamensis* subsp. nov.

Worker. Length 3.5—3.8 mm.

¹ After the completion of the manuscript of this paper Dr. F. SANTSCHI kindly sent me syntypes of *Trachymyrmex tucumanus* subsp. *cordovanus* and of his var. *fracticornis* of the same species. Comparison shows that *holmgreni* is very close to *cordovanus*, but differs in its duller coloration, decidedly broader and less polished mandibles, much broader and more spreading antennal lobes, more erect epinotal spines, and narrower gaster, with the longitudinal impressions on the first segment more marked. The blackish pilosity is much shorter, finer and less conspicuous, especially on the gaster. *T. holmgreni* might be regarded as an extreme subspecies of *tucumanus*.

Differing from the typical *urichi* and the subsp. *fuscus* EMERY and *marthæ* FOREL in its color, the body and appendages being uniformly ferruginous red, the middle on the vertex, base of mandibles and anterior border of clypeus a little darker. The eyes are perceptibly smaller, the antennal scapes and basal funicular joints longer, the occipital, pro- and mesonotal spines distinctly longer and stouter.

Described from numerous specimens which I took during November 1911 on the islands of Taboga (type-locality), Tabogilla and Otoque, in the Bay of Panama.

120. *Trachymyrmex phaleratus* sp. nov.

Worker. Length 2.8—3.3 mm.

Allied to *T. intermedius* FOREL. Head nearly square, as broad as long, the posterior border slightly concave in the middle, the occipital corners each with a stout, well-developed spine. Mandibles narrow, deflected, with sinuate external borders, the apical borders with 8 to 9 oblique teeth. Clypeus flat, the anterior border somewhat projecting, feebly emarginate in the middle. Frontal lobes moderately large, semicircular; frontal carinae not very strongly diverging behind, subsiding before reaching the posterior corners at a point where they meet the straight preocular carinae. Antennae slender; scapes reaching about twice their greatest diameter beyond the posterior corners of the head; the funicular joints all distinctly longer than broad. Eyes moderately convex, shorter than their distance from the anterior border of the head. Pronotum with rather acute inferior teeth and a pair of stout, acute lateral spines, which are of about the same size and shape as the lateral mesonotal spines. There are no median spines on the pronotum but only a pair of tubercles. Slope of mesonotum with a small bituberculate spine followed by a tubercle on each side. Epinotum with moderately long and acute spines directed backward, upward and outward, somewhat longer than their distance apart at the base and a little more than half as long as the base of the epinotum. Petiole distinctly longer than broad, with a very short peduncle, the sides of the node subparallel, its surface with a few acute tubercles. Postpetiole nearly twice as broad as the petiole, as long as broad, broadest behind, with semicircular impressed posterior area and straight, entire posterior border. Gaster suboblong, about $1\frac{1}{4}$ times as long as broad, slightly broader behind than in front, with straight sides, submarginate above, the dorsal surface without longitudinal impressions but covered uniformly with large, rather acute tubercles, which have a tendency to become reticulately connected at their bases; sides

and venter without tubercles; those on the legs and head small.

Mandibles at the base opaque and finely striated, shining at the tips and especially along the dental border; remainder of body opaque, not distinctly punctate.

Hairs brownish, short, hook-shaped, arising from the tubercles, well-developed both on the body and appendages.

Dull ivory yellow; femora and tibiae somewhat paler and more whitish; antennal funiculi, mandibles and tarsi reddish; mandibular teeth black; clypeus brown; a dark brown line or series of spots extending from the clypeus to the occiput, a brown spot on each side of the vertex and at the posterior end of each antennal scrobe; one on each side of the pronotum and also on the mesopleuræ. The first gastric segment above has a large dark brown spot at the base and a still larger one at its posterior end, the two being connected by a slender median and two broader lateral longitudinal stripes. The venter of the first segment has three large dark brown spots, which are confluent at the base, the median being much the largest and covering most of the sclerite.

Female (decalated). Length 4.5 mm.

Very similar to the worker. The antennal scapes are shorter. The pale ground color of the body is more brownish, but the dark markings are similar. The mesonotum has a median longitudinal dark brown band, expanding behind, the epinotal declivity a large transverse spot of the same color below the spines and the sides of the petiole and postpetiole are dark brown. The markings of the gaster are like those of the worker but somewhat more pronounced.

Described from numerous specimens taken by Miss ANNA TAYLOR and Mr. S. F. M. FLOYD at Kartabo, British Guiana. The nest was in clay, the entrance being a peculiar funnel-like structure about an inch in diameter and shaped somewhat like a human ear.

This species is obviously most closely related to the Guatemalan *T. intermedius* FOREL, of which I possess specimens from Manatee, British Honduras (J. D. JOHNSON) and Buena Ventura, Isthmus of Tehuantepec (A. PETRUNKEWITCH), but is easily distinguished by its decidedly shorter antennal scapes, narrower mandibles and very different coloration.

121. *Trachymyrmex abortivus* sp. nov.

Worker. Length 2 mm.

Allied to *humilis* WHEELER and *irmgardæ* FOREL. Head subrectangular, fully as broad as long, a little narrower in front than behind, with nearly straight posterior border,

rounded, unarmed posterior and occipital corners and straight sides. Eyes well in front of the middle of the head, moderately convex, as long as their distance from the clypeus. Mandibles rather narrow, with sinuate external and about 9-toothed apical borders. Clypeus moderately convex in the middle, its anterior border flattened and feebly notched. Frontal lobes moderately large, subtriangular; frontal carinæ diverging behind and subsiding near the posterior corners. Preocular carinæ straight, continued back a little beyond the eyes but not crossing the scrobes, which are rather poorly developed. Antennal scapes extending slightly beyond the posterior corners of the head; the 2-jointed club as long as the remainder of the funiculus *minus* the first joint; joints 2—5 slightly longer than broad, 6—8 as broad as long. Thorax with all the spines reduced to tubercles or teeth, the lateral spines of the pronotum represented by short bituberculate projections, the median teeth by a pair of feeble elevations. The inferior teeth are distinct and rather acute. Mesonotum and base of epinotum with small acute tubercles on the sides above, the spines of the epinotum reduced to a pair of small, acute teeth, not longer than broad at their bases. Petiole small and very short, nearly twice as broad as long, with a few very minute, scattered tubercles. Postpetiole very large, twice as broad as the petiole and two-thirds as broad as the gaster, as long as broad, broadest in the middle where the sides are subparallel, rather convex above in front, impressed behind, the posterior border straight and entire, the surface with small, sparse tubercles. Gaster elliptical, with subparallel sides, about $1\frac{1}{5}$ times as long as broad, without lateral marginations or longitudinal impressions on the dorsal surface, covered rather uniformly both dorsally and ventrally with large acute tubercles. Legs rather stout, especially the fore femora and tibiæ, their surfaces indistinctly and finely tuberculate.

Opaque; mandibles very finely longitudinally striate; surface of body and appendages very finely punctate-rugulose; frontal lobes and space between frontal carinæ more rugulose-tuberculate, as are also the posterior corners of the head. The antennal scrobes are distinctly rugulose.

Hairs pale, very short, inconspicuous, hooked, arising from the tubercles, longest on the gaster.

Deep ferruginous brown; gaster and upper surface of head darker; tarsi, mandibles and antennal clubs paler and more reddish; legs slightly paler than the thorax.

A single specimen taken by myself at Kartabo, British Guiana in a sandy area behind the Tropical Laboratory.

This species is distinctly smaller and darker than *T. hu-*

milis, with less anteroposteriorly compressed petiole and longer and more rectangular postpetiole. *T. irmgardæ* FOREL and *bugnioni* FOREL of Colombia, which also belong to the same group of species with large postpetiole and much reduced spinulation, also differ from *abortivus* in their larger size. Both of these species have the petiole only slightly broader than long, the postpetiole of *irmgardæ* being, moreover, broader than long and more than twice as broad as the petiole, in *bugnioni* three times as broad.

122. *Cyphomyrmex paniscus* sp. nov.

Worker. Length 2.5—2.8 mm.

Head as broad as long, somewhat broader behind than in front, suboctagonal, the eyes rather small, round and convex, near the anterior third. The sides of the head have two angles, one represented by the eyes and one half way between them and the posterior corners which are produced as ear-like lobes, much as in *C. auritus* but shorter, though extending a distance equal to their width beyond the posterior border of the head. The latter is broadly concave, somewhat deepened in the middle. Mandibles long and narrow, with sinuate external borders and the apical borders furnished with 7 or 8 oblique teeth, the terminal pair large, the others gradually diminishing in size towards the base. Clypeus short, abrupt, its anterior border sinuate in the middle and on each side; posteriorly beneath each frontal lobe it bears a long blunt tooth. Frontal lobes small and narrow, separated from the frontal carinæ only by a slight obtuse angle, the carinæ not strongly diverging behind, forming the inner borders of pronounced antennal scrobes and terminating in the ear-like processes above mentioned. The external borders of the scrobes are formed by the preocular carinæ which are straight and also continuous with the ear-like lobes. Vertex with a pair of low carinæ, converging behind. Antennal scapes rather slender, slightly surpassing the ear-like lobe; all the funicular joints distinctly longer than broad. Pronotum with a median tubercle, two large lateral tubercles and an inferior, rather acute tooth on each side. Mesonotum with four laterally compressed tubercles, the anterior pair largest, larger than the lateral pair of the pronotum. All these tubercles are as long as broad at the base and might be described as blunt teeth. Promesonotal constriction pronounced. Base of epinotum posteriorly straight and horizontal, longer than the abrupt declivity, the angle formed by two blunt teeth, the bases of which are continued forward as a pair of ridges on the base of the epinotum. Petiole small, with a very short and narrow

peduncle, the node from above subrectangular, broader than long, a little broader in front than behind, with a pair of anterior pits and an unpaired median posterior pit. Postpetiole large, also subrectangular, nearly as long as broad, $1\frac{1}{2}$ times as broad as the petiole, somewhat narrowed and rounded in front, its posterior border feebly sinuate in the middle and on each side, its dorsal surface very convex anteriorly, concave in the middle behind, with four blunt longitudinal ridges, the median pair strongest, but somewhat interrupted in the middle, so that they appear as elongate tubercles. Gaster suboblong, about $1\frac{1}{4}$ times as long as broad, nearly twice as broad as the postpetiole, the sides compressed and submarginate, the median line slightly impressed anteriorly. Legs rather long and stout, tarsi slender, fore pair not dilated.

Opaque, granular or very indistinctly and finely rugulose; mandibles finely striate and finely and sparsely punctate, shining along the dental border.

Hairs silvery, extremely fine and appressed, not squamiform, distinct on the gaster, legs and front of head.

Brownish ferruginous, legs and funiculi slightly paler, vertex darker in some specimens; mandibles more reddish, with blackish teeth.

Female. Length 3.3—3.5 mm.

Very similar to the worker. Teeth on the clypeus very large and conspicuous, the ear-like lobes of the head larger, the lateral teeth of the pronotum and those on the epinotum large and projecting, the median pronotal tubercle lacking. Mesonotum longer than broad, with a V-shaped impression; scutellum with two broad, blunt teeth. First gastric segment as broad as long, with broader and deeper median impression than in the worker.

Sculpture, pilosity and color as in the worker. Wings dull reddish brown, with veins of the same color.

Male. Length 2.5 mm.

Head including the eyes, about as long as broad, the eyes and ocelli small, the antennal scrobes and their carinae absent, the ear-like lobes represented merely by a pair of small flattened teeth. Mandibles as in the worker but smaller. Clypeus without posterior teeth. Frontal carinae small and suberect. Antennae slender. Pronotum with acute lateral but no inferior teeth. Mesonotum subtriangular, as broad as long, convex in the middle anteriorly and on each side behind, with well-developed Mayrjan furrows. Scutellum somewhat as in the female. Epinotum bluntly dentate, with subequal base and declivity, the former straight and sloping. Petiole about $1\frac{1}{2}$ times as long as broad, with very low, rounded node, its

ventral surface anteriorly with an acute tooth which is directed forward. Postpetiole resembling that of the worker. Gaster broadly elliptical, scarcely impressed above near the base. Legs long and slender, the femora bent in the middle.

Sculpture, pilosity and color as in the worker and female but the gaster slightly shining, or lustrous.

Described from twelve workers, three males and nine females taken by HJ. MOSÉN in Brazil.

This species is related to *auritus* MAYR and *strigatus* MAYR but differs from both in not having the gaster costate, from *auritus* in the shorter ear-like processes of the head, shorter petiole, larger and differently shaped postpetiole, from *costatus* also in its larger size, broader and differently shaped head, etc. It is also distinct from *olitor* FOREL, *bicornis* FOREL and *bigibbosus* EMERY. It approaches *salvini* FOREL, but this form has very large frontal lobes, a very different epinotum, pilosity, etc.

123. *Cyphomyrmex bigibbosus* EMERY subsp. *faunulus* subsp. nov.

Worker. Length 1.8—2.2 mm.

Differing from the 'typical form as briefly described by EMERY in its somewhat smaller size and in having no projections on the sides of the head behind the eyes. The teeth on the clypeus are small and acute. The ear-like lobes which terminate the antennal scrobes are shorter than in *auritus* MAYR but curved forward at their tips in the same manner. The median pronotal tubercle is indistinct and the sides of the segment have a longitudinal ridge instead of a tooth or tubercle. The pair of very prominent tubercles on the mesonotum are as long as broad at their bases. The sides of the first gastric segment are submarginate anteriorly.

Pilosity extremely fine, indistinct and appressed. Opaque; ferruginous brown, often with a delicate bluish bloom; the head and gaster darker, legs and funiculi paler and more reddish; mandibles red with dark brown borders and blackish teeth.

Female. Length nearly 3 mm.

Closely resembling the worker. Head broader and the ear-like lobes somewhat larger, antennal scapes somewhat shorter. Pronotum on each side with a ridge terminating behind in a projection. Mesonotum subtriangular, as broad as long; scutellum with two blunt teeth which are longer than broad at their insertions. Epinotum sloping, with distinct base and declivity and very feeble indications of teeth at the angles. Gaster as broad as long.

Sculpture, color and pilosity as in the worker; wings uniformly infuscated, with reddish brown veins.

Described from several workers and a single female taken by me at Kartabo and Camaria, British Guiana. The specimens belonged to small colonies which were nesting in cavities in rotten logs. The fungus-gardens consisted of particles of insect excrement covered with a delicate white mycelium and resembled the gardens of *Myrmicocrypta squamosa* and of small species of *Apterostigma*, e. g. *mayri*, which live in the same situations.

124. *Cyphomyrmex rimosus* Spinola. ♀♂♂. Llinquipata, Peru and Charubamba and Mojos, Bolivia (HOLMGREN).

Lives under stone together with a little, whitish podurid. Also collected under the bark of a mouldering stem. It collects pieces of flowers to its mushrooms cultivations, April 25th. June 1st. Dec 12th.

125. *Cyphomyrmex rimosus* subsp. *transversus* EMERY.

According to EMERY this form is a synonym of FOREL's var. *olindanus*. This view is supported by a comparison of cotypes of the latter in my collection with specimens of *transversus* from Coxipó, Matto Grosso (SILVESTRI), identified by EMERY. These specimens, and a series of workers taken by Dr. W. M. MANN in Natal, Brazil all agree in having a rather deep median groove on the first gastric segment and its sides are submarginate in front, characters which are not observed in other forms of *rimosus*. The lateral tubercles on the mesonotum are fused to form semicircular ridges, the sides of the postpetiole are more developed behind and the median concavity of the segment is longer and broader. It seems to me that this form and the subsp. *salvini* FOREL might be properly regarded as distinct species.

126. *Myrmicocrypta foreli* MANN subsp. *surianensis* subsp. nov.

Worker. Differing from the typical *foreli* in its darker and more brownish coloration, in having the head broader, more nearly square and scarcely narrowed in front. In profile the impression in the mesonotum and the mesoëpinal impression are distinctly shallower and longer and the epinotal spines are reduced to small teeth, which are not longer than broad at the base. The peduncle of the petiole is somewhat shorter, the node a little broader and the anteroventral tooth is longer and more distinct than in the typical *foreli*.

Described from eight workers taken by Prof. N. HOLMGREN at Suriani, Bolivia.

127. *Apterostigma peruvianum* sp. nov.

Workers. Length 3.4—3.6 mm.

Allied to *A. wasmanni* FOREL and *moelleri* FOREL, but quite distinct. Head without the mandibles about $1\frac{1}{2}$ times as long as broad, the sides straight and subparallel in the middle, the postocular region rapidly but evenly narrowed to a short neck, so that in profile the vertex is not as convex and projecting as in the two species mentioned. The neck lacks a reflected margin, or collar. Eyes small, convex, with impressed orbits, situated behind the median transverse diameter of the head. Mandibles narrow, with feebly concave external borders, the apical somewhat longer than the basal border, with numerous minute teeth, those at the tip larger and more oblique. Clypeus very convex in the middle behind, depressed anteriorly and laterally, the anterior border rounded and entire. Frontal lobes small and rounded, neither thickened nor much elevated; shorter than the frontal carinae which diverge gradually posteriorly. Front distinctly concave; vertex without longitudinal ridges or swellings. Antennae rather slender, joints 2—9 of the funiculi distinctly longer than broad. Thorax shaped much as in *wasmanni*, with strong mesoëpinal constriction and the portions of the thorax in front of it decidedly larger and broader than the epinotum; the promesonotum convex and evenly rounded above, the median longitudinal ridges on the mesonotum feeble, lateral ridges lacking. Base of epinotum straight and horizontal in profile, about twice as long as the declivity and passing into it through a rounded angle. Petiole twice as long as broad, somewhat broader behind than in front, with straight sides and acute posterior corners; in profile twice as long as high, with indistinct, very feebly developed, rounded node and with an extremely minute tooth on the anteroventral border. Postpetiole as long as broad, trapezoidal, about twice as broad behind as the petiole, with straight sides and entire posterior border, the dorsal surface somewhat impressed behind; the ventral surface with an anterior and a posterior tooth-like projection, the latter the more pronounced. Gaster broadly elliptical, evenly convex above and below, the sides of the first segment with only feeble traces of marginations near the middle. Legs long and slender as usual, the hind femora slightly bent near the middle, the fore metatarsi thickened at the base.

Antennal funiculi shining, otherwise opaque; mandibles very finely, densely and indistinctly striolate. Surface of the head, thorax and gaster finely and indistinctly rugulose and

uneven, the gaster, postpetiole and tibiae covered with minute piligerous papillae.

Hairs rather short and not very abundant, golden grayish, appressed, both on the body and appendages, in some specimens more oblique on the extensor surfaces of the tibiae.

Ferruginous brown; head darker; antennae and legs paler and more reddish; mandibles brownish yellow, with dark brown teeth and external borders.

Female (deälated). Length about 5.5 mm.

Very similar to the worker, the head broader and more convex behind. The scutellum and epinotum each bluntly bidentate; the mesonotum slightly longer than broad, longitudinally impressed in the middle and on each side. Postpetiole a little broader than long.

Sculpture, pilosity and color as in the worker. Described from a dozen workers and a single female taken by Prof. N. HOLMGREN at Llinquipata, Peru. Six workers taken by Prof. J. C. BRADLEY at Perene, Peru agree very closely with the syntypes, except in having the body of a somewhat darker brown color.

The nest under stone. It has mushrooms cultivations. Nov.

128. *Apterostigma jubatum* sp. nov.

Worker. Length 4—4.5 mm.

Related to *A. branneri* MANN, but more robust. Head about $1\frac{1}{4}$ times as long as broad, slightly narrower in front than behind, suddenly constricted into a short, rather broad neck, without reflected border, the vertex very convex and projecting, from above broadly rounded, the sides somewhat impressed at the eyes, which are round and convex and distinctly behind the median transverse diameter of the head. Mandibles rather broad, with straight external borders, the apical borders somewhat longer than the basal, rather coarsely but evenly denticulate. Clypeus convex in the middle behind, depressed on the sides and along the anterior border which is broadly rounded and entire. Frontal lobes large, very thick, convex and erect, rounded in front, straight behind, closely approximated at the beginnings of the frontal carinae which diverge rapidly behind. Vertex without longitudinal swellings. Antennae stout; funicular joints 2—8 distinctly broader than long, the ninth joint as long as broad. Thorax robust compared with that of other species, the mesoepinotal constriction pronounced but rather short; the profile outline of the mesonotum presenting two distinct angles, one at its anterior, the other near its posterior end, the outline between being straight and sloping. These angles are produced by

two thickenings in the prominent, parallel mesonotal ridges, or carinæ, which do not meet at their anterior ends. Dorsal and ventral outlines of the mesoëpinotal constriction slightly concave. Epinotum rather small, sloping, the base convex and rounded, the declivity shorter and rather indistinctly marked off from the base. Seen from above the latter has a pair of longitudinal ridges and the epinotal spiracles are large, prominent and somewhat tubular. Petiole short, not more than $1\frac{1}{2}$ times as long as broad, broader behind than in front, with straight sides, in profile with rather low, subangular node, situated at the middle, its anterior and posterior slopes straight and subequal; the tooth at the anteroventral border small and blunt. Postpetiole as long as broad, trapezoidal, somewhat more than twice as broad behind as the petiole, with feebly rounded sides and dorsal surface, the latter somewhat impressed behind, the posterior border straight and entire, the ventral surface with a tooth-like projection in front. Gaster subcircular, evenly convex above and below, the sides of the first segment distinctly marginate in the middle. Legs rather long, with stout tibiæ, the femora somewhat curved near the middle, the fore metatarsi distinctly enlarged ad the base.

Opaque; only the antennal clubs somewhat shining; mandibles very finely striated and sparsely punctate. Body finely granular, the gaster, tibiæ and antennal scapes covered with minute piligerous papillæ.

Hairs rather long and coarse, dull grayish for the most part, golden on the tarsi, appressed on the body and femora, but longer, more abundant and oblique on the extensor surfaces of the tibiæ, upper surface of the gaster, anterior surfaces of antennal scapes, vertex of head and on the dorsal surface of the mesonotum where they form a distinct crest, or mane. The hairs of this crest are jet-black, and there are some dark hairs mingled with the gray also on the occiput and abdomen. Sides of thorax not very hairy.

Ferruginous brown; tarsi and mandibles, except their borders, somewhat paler and more reddish.

Female (déalated). Length nearly 5 mm.

Very similar to the worker; eyes somewhat larger; ocelli very small. Mesonotum convex, as broad as long, with a pair of indistinct longitudinal swellings; scutellum flattened, terminating behind in two blunt teeth. Epinotum steeply sloping, with subequal base and declivity. The pilosity is shorter and much less abundant than in the worker, especially on the tibiæ, gaster and dorsal surface of head and mesonotum; the

granulation of the body apparently somewhat coarser. In other respects like the worker.

Described from numerous workers and a single female, which I took at Kartabo, British Guiana. They were living in cavities in rotten logs in fungus-gardens a few inches in diameter.

This is a well-marked species, easily recognized by its stout build and thoracic outline, the prominent black mane on the mesonotum and the very thick, convex frontal lobes. It somewhat resembles *branneri* MANN, but the thorax is stouter, the mesonotum higher and more angular above, the epinotum shorter and of a different shape, the head more abruptly narrowed behind, the gaster more marginate on the sides, the legs stouter, etc.

129. *Apterostigma auriculatum* sp. nov.

Worker. Length 4—4.5 mm.

Head about $1\frac{1}{2}$ times as long as broad, narrowed posteriorly into a short neck, without a reflected border but with a pair of small lenticular swellings on the dorsal side. The narrowing is much less abrupt than in *jubatum*, and more as in *peruvianum*, so that the vertex is less convex and more rounded. The sides of the head are subparallel, impressed in the region of the eyes which are rather large and very convex, hemispherical and situated behind the median transverse diameter of the head. Mandibles rather narrow, with straight external borders, the apical and basal borders subequal, the former with 10 or 11 small teeth. Clypeus rather convex in the middle behind, depressed laterally and along the anterior border, which is broadly rounded and very feebly sinuate in the middle. Frontal carinæ rather large, angular, thick and elevated, but not so much as in *jubatum*. Antennæ moderately long and slender, funicular joints 2—4 as long as broad, 5—9 distinctly, though slightly broader than long. Thorax more slender than in *jubatum*, the pro- and mesonotum in profile of a similar shape, but the latter a little less angular where it passes into the mesoépinal constriction. The pair of ridges on the mesonotum are pronounced and nearly meet anteriorly; the mesonotal constriction also has a pair of short, auriculate ridges which give it a convex dorsal outline in profile, and the epinotum has a pair of lower, blunter ridges, the base in profile being rounded and sloping and passing gradually into the shorter and more sloping declivity. The epinotal spiracles are projecting and somewhat tubular. The pronotum has a blunt humeral swelling on each side. Petiole twice as long as broad, broadest behind, with acute posterior corners, straight

sides and posterior border; the node in profile low, bluntly angular, its summit a little behind the middle, with a distinct longitudinal impression; the anteroventral border with a minute but distinct tooth. Postpetiole slightly broader than long, posteriorly twice as broad as the petiole, the sides subangulate a little behind the middle, the dorsal surface somewhat impressed behind, the posterior border straight and entire. Gaster broadly elliptical, of the usual shape, but with the sides of the first segment strongly marginate. Legs moderately long and thick; femora, especially the hind pair, curved near the middle; fore metatarsi thickened at the base.

Mandibles somewhat glossy, very finely and densely striolate; antennal funiculi shining, otherwise opaque, granulated, with fine, blackish, rather sparse piligerous papillæ, which are most distinct on the gaster, postpetiole, pronotum, posterior portion of head, femora and tibiæ.

Hairs yellowish gray, rather bristly, scarcely curved at the base, oblique, moderately abundant, of rather uniform length on the body and appendages, shorter and more golden yellow on the tarsi.

Ferruginous; the appendages and especially the tarsi, mandibles, clubs of the antennæ and space between the parallel longitudinal ridges of the thorax distinctly paler and more reddish.

Female. Length about 5.5 mm.

Very similar to the worker. Pronotum with a pair of blunt tubercles near its anterior border and a transverse swelling behind. Mesonotum longer than broad, with a pair of blunt, longitudinal convexities in the middle and a shorter convexity on each side. Scutellum with two large, flattened, blunt teeth. Epinotum with a pair of blunt, longitudinal ridges, the base sloping and longer than the more abrupt, concave declivity. Both the petiole and the postpetiole somewhat shorter than in the worker, the anteroventral tooth of the former larger.

Sculpture, pilosity and color much as in the worker. Wings opaque brown, with brown veins, a conspicuous, long, curved, dark brown spot in the cubital cell of the fore wing and the median portion of its base of the same color.

Described from numerous workers and three females taken by Professor ROLAND THAXTER at Four-Roads Point, Port of Spain, Trinidad, in an old log. The worker of this species is very distinct and easily recognized by the peculiar ear-like lobes formed by the pair of short ridges on the mesoëpinotal constriction, a character which does not occur in any of the other described species of the genus.

130. *Apterostigma auriculatum* var. *demerarae* var. nov.

Worker. Length 3.8—4.2 mm.

Slightly smaller than the typical form, of a darker ferruginous brown tint and with distinctly rougher integument; the head and pronotum being more blackish and often with a bluish bloom. Eyes distinctly less convex, the pilosity somewhat shorter and less abundant, the ventral teeth of the petiole and postpetiole larger.

Female (déalated). Length nearly 5 mm.

Differing from the female of the typical *auriculatum* in the same characters as the worker.

Male. Length 4 mm.

Head through the eyes about as broad as long, the vertex prominent, the eyes large and convex. Mandibles triangular, shaped like those of the worker, but smaller and without denticles. Frontal lobes also similar to those of the worker but smaller and more erect. Antennal scapes nearly four times as long as broad, as long as the first and second funicular joints together, the first joint a little longer than broad, the remaining joints cylindrical. Mesonotum and scutellum shaped much as in the female, the epinotum with two blunt teeth which are fully as long as the width of their bases. Petiole, postpetiole and gaster resembling the corresponding parts of the worker. Legs very slender.

Sculpture as in the worker. Pilosity on the body also similar but on the legs much shorter and more appressed.

Black; mandibles, antennæ and legs dark brown; tarsi somewhat paler; wings colored as in the female of the typical *auriculatum*.

Described from numerous workers, two females and a male which I took at Kartabo, British Guiana. They were inhabiting small fungus-gardens, a few inches in diameter, in cavities of rotten logs in the second-growth jungle.

131. *Apterostigma dentigerum* sp. nov.

Worker. Length 4—4.8 mm.

Slender; head nearly $1\frac{3}{4}$ times as long as broad, not very abruptly narrowed behind to a short neck, which has a thick but not reflected border. The vertex of the head is evenly and not strongly convex, the sides straight and subparallel, the eyes strongly convex, rather small, subhemispherical behind the median transverse diameter. Mandibles rather long and narrow, their external borders straight, their apical borders fully twice as long as the basal, with numerous very minute teeth. Clypeus convex in the middle behind, depressed

laterally and along the anterior border, which is semicircular and entire. Frontal lobes thin, moderately large, elevated, their dorsal surfaces concave, their inner and anterior borders rounded, their lateral borders notched and terminating behind in a blunt but distinct tooth, the posterior borders straight, converging to the frontal carinae which are rather far apart anteriorly and rather strongly diverging behind. The front between these carinae is concave, the vertex without longitudinal swellings. Antennae rather long and slender; funicular joints 2—4 as long as broad, 5—9 a little broader than long. Thorax shaped much as in *peruvianum* and *wasmanni*, but the mesoepinotal constriction less pronounced, the pro- and mesonotum convex and evenly rounded above, the latter with two prominent median ridges, which nearly meet anteriorly and are continued posteriorly into the base of the epinotum with only a slight interruption at the constriction. Epinotum rather small, its base, except anteriorly, straight in profile and slightly sloping, passing through a rounded angle into the very short and more abrupt declivity. Epinotal spiracles prominent. Petiole slender, fully twice as long as broad, gradually broadened posteriorly, with straight sides, the posterior angles acute. In profile the node is low and rounded, situated at the posterior end; the anteroventral tooth very small and acute. Postpetiole subtriangular, twice as broad behind as the petiole, the sides straight in front, more rounded posteriorly, the dorsal surface somewhat convex in front, impressed in the middle behind, but with straight, entire posterior border. Gaster elliptical, the first segment distinctly narrowed anteriorly, its sides marginate. Legs slender; middle and hind femora feebly bent near the middle; fore metatarsi thickened basally.

Opaque; mandibles very finely and indistinctly punctate-striolate; body and appendages granular, the gaster, posterior portion of head and the tibiae covered with minute piligerous papillae. Antennal funiculi somewhat shining.

Hairs dull gray, rather long and abundant, uneven, soft and flexuous, standing off from the upper surface of the body and the extensor surfaces of the legs, especially of the tibiae, longest on the vertex, mesonotum, postpetiole, dorsum of gaster, tibiae and metatarsi.

Ferruginous brown, the head posteriorly, the pronotum and posterior portion of the gaster often darker; legs, especially the coxae, a little paler; mandibles and antennal clubs yellowish brown.

Female (decalated). Length 5 mm.

Very similar to the worker but more deeply colored and with even more opaque, somewhat velvety integument. Pro-

notum transversely swollen near its posterior border. Mesonotum as long as broad, with a pair of low longitudinal ridges anteriorly. Scutellum short, bluntly bidentate. Epinotum sloping, without distinct base and declivity, with two parallel ridges as in the worker.

Male. Length 3.8 mm.

Head through the very convex eyes as long as broad, with prominent vertex, abruptly narrowed behind into a short, narrow neck. Mandibles like those of the worker but smaller and edentate. Clypeus convex posteriorly. Frontal lobes large, erect, bluntly rectangular. Antennal scapes nearly four times as long as broad, somewhat bent at their tips, as long as the first and second funicular joints together, the first a little longer than broad. Pro- and mesonotum like those of the female but the epinotum in profile subrectangular, with horizontal, feebly convex base, which is a little shorter than the vertical, slightly concave declivity, the angles between the two surfaces represented by short but distinct teeth. Node of petiole rather angular in profile; first gastric segment strongly marginate on the sides as in the worker. Legs very slender.

Sculpture and pilosity as in the worker but the hairs somewhat shorter and less abundant. Color darker, more blackish; sides of thorax and gaster, femora and tibiae paler; mandibles and terminal tarsal joints more yellowish brown. Wings opaque and distinctly infuscated, the anterior pair with a large dark brown spot covering the radial and most of the cubital cell and the base of the same color, with two narrow pale streaks. The hind wings have a dark brown cloud near the anterior border and enclosing a similar pale longitudinal streak.

Described from numerous workers, a single female and two males, which I took from a small flattened fungus garden under a large stone in the jungle at Zent, Costa Rica (Dec. 1911).

This form may be readily distinguished from the other described species of the genus by the peculiar toothed frontal lobes. It is the fourth species to be described from Costa Rica, the three others being *robustum* EMERY, *collare* EMERY and *calverti* WHEELER. I have also taken *A. mayri* FOREL in rotten logs at Alajuela, Costa Rica, and MANN has recently described from Honduras a species *abditum*, which also probably occurs in Costa Rica. It is therefore difficult to decide whether Central America or the Guiana-Brazil region is the true distribution center of the species of the singular genus *Apterosigma*. I may note in passing that the large, handsome *A. urichi* FOREL, originally described from Trinidad is not

uncommon at Kartabo, British Guiana, where I have taken it in rotten logs in the second growth jungle. The small *A. mayri* is even more abundant in the same locality.

132. *Sericomyrmex zacapanus* sp. nov.

Worker. Length 2.5—2.8 mm.

Very close to *S. diego* FOREL but distinctly smaller (*diego* measures 3.3—3.7 mm) and differing in the following characters: The antennal scapes are decidedly shorter and do not reach the posterior corners of the head as in *diego*, the frontal area is larger and more clearly defined, the pronotum a little more distinctly tuberculate on each side behind; the pair of anterior conical tubercles on the mesonotum are more acute, those on the posterior part almost obsolete and much less distinct than in *diego*; the posteriorly diverging ridges on the base of the epinotum are very feebly developed and terminate behind in much shorter, blunter tooth-like projections; the petiole and postpetiole are decidedly smaller, the latter slightly broader in proportion to its length, fully twice as broad as long and indistinctly dentate on each side. The sides of the first gastric segment are more rounded and the dorsal impression and lateral marginations are even less distinct than in *diego*. Sculpture, pilosity and color very much as in that species.

Described from numerous specimens which I took from several small nests in the soil of an orchard at Zacapapa, Guatemala (Dec. 15, 1911), a region noted for its aridity. The specimens have been compared with a syntype of *diego* received from Prof. FOREL. *S. parvulus* FOREL of Brazil is also related to *zacapanus* but has the funicular joints 2—7 much shorter, the pronotum more tuberculate, the first gastric segment more elongate and more distinctly marginate on the sides, etc.

133. *Sericomyrmex impexus* sp. nov.

Worker. Length 2.8—3 mm.

Closely related to *S. urichi* of Trinidad, but slightly smaller and differing in the following characters: The head is less deeply emarginate in the middle behind; the posterolateral tubercles of the pronotum and the two pairs of tubercles of the mesonotum are more acute and the posteriorly diverging ridges on the base of the epinotum and their posterior compressed subdentate ends are more poorly developed. The first gastric segment is more sharply marginate on the sides and has a distinct median longitudinal impression behind and a less distinct impression on each side in front of the middle. The sculpture is like that of *urichi* but the minute pili-

gerous papillæ on the gaster, legs, frontal and occipital surfaces of the head are more numerous and more conspicuous. This is in part due to the peculiarities of the pilosity, the gray appressed pubescence being very short, dilute and inconspicuous compared with that of *urichi* and most of the other species of the genus, so that the surface of the integument is distinctly visible. On the other hand, the blackish hairs are less appressed and more oblique, more numerous, more bristly and longer, especially on the front of the head and dorsal surface of the body than in *urichi* and other species. The ferruginous color is similar but the tint is somewhat deeper than in the species from Trinidad.

Described from seven workers which I took in a sandy spot behind the tropical laboratory at Kartabo, British Guiana.

This species is also closely related to *S. lutzi* WHEELER from British Guiana, but the latter has abundant, soft recumbent pubescence, much shorter and more appressed hairs and decidedly larger anterior mesonotal tubercles.



Tryckt den 7 februari 1925.