

designations of the types of Forel's subgenera, thus bringing about a certain amount of confusion, to overcome which I have been obliged to propose a number of new subgeneric names.¹

Subgenus *Camponotus*, sensu stricto

Large species. Clypeus without carina or the carina is little apparent, without anterior lobe or the anterior lobe feebly projecting, more or less rectangular (*japonicus*) or rounded (*sansabeanus*); its anterior margin not notched in the middle. Head of worker major and female not truncate or obtuse in front; but little broader behind than in front. Mandibles strongly arched, with 4 or 5, sometimes 6 teeth. Dorsum of the thorax convex, continuous in profile; dorsum of the pronotum rounded or sometimes depressed in the worker major, with slightly projecting humeri. *C. ocreatus* and *C. sansabeanus* connect this subgenus with the next. Nests as a rule in wood. (Holarctic, especially in North America: one species in Madagascar).

Type: *Formica herculeana* Linnaeus subspecies *ligniperda* (Latreille).

Subgenus *Myrmoturba* Forel

Clypeus carinate, with a very pronounced lobe at its anterior margin, as a rule rectangular, rarely of another shape. Head of the worker major as a rule much broader behind than in front, often emarginate at its posterior border; that of the worker minor with parallel lateral margins or narrowed behind, so that the posterior border is much reduced. Mandibles as a rule with 6 or 7 teeth. Dorsum of the thorax arched as in the preceding subgenus; rarely the epinotum in profile is slightly depressed, saddle-shaped. Sculpture variable, in certain South American species (such as *C. chilensis*) the gaster is covered with an abundant fur of pubescence. Nests as a rule in the ground or underneath stones. Numerous transitions to other subgenera. (Cosmopolitan).....Type: *Formica maculata* Fabricius.

Subgenus *Dinomyrmex* Ashmead (= *Myrmogigas* Forel)

Large or very large species. Head of the worker minor narrowed behind into a neck, or at least without distinct posterior border, save for its articulation with the thorax. The remainder as in *Myrmoturba* to which this subgenus is closely connected. Nests in rotten wood. (Ethiopian, Malagasy, Indomalayan, Australian, Papuan, Neotropical).....Type: *Formica gigas* Latreille.

Subgenus *Myrmosericus* Forel

As in *Myrmoturba*, but the integument entirely opaque, very finely sculptured, silky and more or less covered with a rather abundant pilosity, especially on the gaster. Nests in earth or sand. (Mediterranean, Ethiopian, Oriental).

Type: *Formica rufoglauca* Jerdon.

Subgenus *Myrmothrix* Forel

As in *Myrmoturba*, but the head of the worker major is, as a rule, massive and rather rounded; that of the worker minor not narrowed behind. Large or medium-sized species, with abundant pilosity on the body and, with few exceptions, on the

¹Wheeler, Wm. M. 1921. 'Professor Emery's subgenera of the genus *Camponotus* Latr.' Psyche, XXVIII, pp. 16-19. Santschi has recently proposed four additional subgenera of *Camponotus*: *Myrmisolepis*, *Myrmopelta*, *Myrmoplatypus*, and *Myrmepinotus* (1921. 'Retouches aux sous-genres de *Camponotus*.' Ann. Soc. Ent. Belgique. LXI, pp. 310-312). This paper came too late for the new subgenera to be included in the present account.

scapes and legs. The integument is almost always opaque and sometimes silky. Tarsi not compressed. One species in Brazil (*C. femoratus*) forms gardens in epiphytes; others build carton nests or nest in the ground or in rotten wood. (Neotropical).

Type: *Formica abdominalis* Fabricius (Wheeler, 1913); *F. rufipes* Fabricius (Forel, 1914).

Subgenus **Myrmaphænus** Emery

Head of worker longer than broad, with almost parallel lateral margins, rather depressed; its posterior margin emarginate. Clypeus, as a rule, without lobe, even sometimes with emarginate anterior border, with or without carina. Head of worker minor broadened behind. Integument opaque, finely sculptured, with coarse and short or longer and finer pilosity, in one species (*C. blandus*) silky. Thorax as in the preceding subgenera. Tibiæ and tarsi, as a rule, compressed. (Neotropical).

Type: *Camponotus leydigi* Forel.

Subgenus **Myrmepomis** Forel (= *Myrmolophus* Emery)

Worker with the humeral angles of the pronotum dentiform; median crest of mesonotum and epinotum and the tarsi much compressed. (One Neotropical species).

Type: *Formica sericeiventris* Guérin.

Subgenus **Myrmotarsus** Forel

Species analogous to *Myrmothrix* and *Myrmaphænus*. Head, as a rule, depressed in its anterior portion; mandibles projecting; clypeus, as a rule, without carina. Fore tarsi with a dense brush; tibiæ and tarsi compressed. Legs and scapes more or less villose. (Malayan).

Type: *Formica mistura* F. Smith (Wheeler, 1913); *F. irritabilis* F. Smith (Forel, 1914).

Subgenus **Myrmoplatys** Forel

Head still more depressed in front than in the preceding subgenus, which the species of the present group resemble. Legs not pilose; tibiæ and tarsi not compressed. In myrmecophilous plants. (Indomalayan)..... Type: *Camponotus korthalsæ* Emery.

Subgenus **Myrmosaulus** Wheeler (= *Myrmosphincta* Emery, 1920; not of Forel, 1912)

Head of the worker major heart-shaped; that of the worker minor rounded and narrowed behind, in certain species, so as to have no posterior margin or even (*C. camelinus*) to form a neck as in certain species of *Dinomyrmex*. Thorax, as a rule, slender; pronotum rounded, not margined; a more or less pronounced depression on the dorsum in front of the epinotum which is more or less raised as a rounded protuberance (very distinctly in *C. cinerascens* and *C. camelinus*). Spiracles of the metanotum visible dorsally. Scale of the petiole more or less nodiform. Legs villose except in *C. aurocinctus*. In *C. batesi* of Madagascar, the dorsum of the thorax is scarcely depressed in front of the epinotum; only the worker minor was known to Emery. (Indomalayan, Australian; one species of Madagascar doubtfully placed here)..... Type: *Formica cinerascens* Fabricius.

Subgenus **Myrmophyma** Forel (including *Myrmocamelus* Forel, in part)

Head in the small worker, as a rule, with parallel lateral margins; in most cases it is compressed laterally; the eyes are usually placed much behind the middle. In the worker maxima and female the head is broad, often with the vertex strongly swollen. Clypeus variable, without or with a lobe, which may be rounded or square, sometimes toothed or emarginate; often the lobe is distinct in the worker minor and disappears in the worker major. Mandibles strongly arcuate. The thorax is variable in profile: either uniformly arched, with the sloping face of the epinotum more or less abrupt; or the promesonotum protuberant, the epinotum is little arched or even feebly saddle-shaped (character of the subgenus *Myrmocamelus*); or the concavity of the epinotum is more pronounced (subgenus *Myrmosaga*). Pronotum sometimes more or less obtusely margined (*C. innexus*, *C. æneopilosus*, *C. inflatus*, etc.). Scale of the petiole more or less thickened; in *C. hoplites* armed with a spine. This subgenus passes into *Myrmoturba* through *C. testaceipes* and *C. claripes*, and into the next subgenus through the species with short and uniformly arched thorax. Nests in the ground; sometimes in termitaria. (Australian, Papuan).

Type: *Camponotus capito* Mayr (Wheeler, 1913; Emery, 1920).

Subgenus **Myrmogonia** Forel

Characterized by the thorax of the worker, which in profile is strongly curved, convex and not interrupted. Epinotum compressed and reduced to a ridge on the dorsum. The remainder as in the species with short and high thorax of the preceding subgenus. Nests in the ground. (Australian) . . Type: *Camponotus laminatus* Mayr.

Subgenus **Myrmosaga** Forel

Head of the worker major broad and emarginate behind; that of the worker minor truncate behind; with rounded posterior angles and parallel sides. Clypeus generally with a short, rounded lobe, sometimes truncate, the lateral portions, as a rule, very distinct. Thorax in profile with the same three characteristics as in the subgenus *Myrmophyma*. Pronotum never margined. Scale of the petiole more or less thickened. Integument always shining and finely sculptured. In the male of *C. gibber* the ocelli are placed on the protuberance of the vertex. (Malagasy).

Type: *Camponotus kelleri* Forel (Wheeler, 1913); *C. quadrimaculatus* Forel (Forel, 1914).

Subgenus **Mayria** Forel

Differs from the other subgenera in the low, short, and narrow first segment of the gaster. Small, smooth, with the thorax as in *Myrmoturba*, and 6-toothed mandibles. Habits unknown. Emery is inclined to unite this with *Myrmosaga*. (Malagasy) Type: *Mayria madagascariensis* Forel (= *Camponotus repens* Forel).

Subgenus **Myrmonesites** Emery

No great difference between the worker major and the worker minor. Head rounded trapezoidal, broader behind, obtuse in front. Clypeus strikingly short, its anterior margin rounded; in *C. mocquerysi* narrowly notched in the middle. Mandibles short. Thorax with pronounced sutures; pronotum depressed and, as a rule, obtusely margined; a more or less pronounced notch on the dorsum in front of the

epinotum, which is differently shaped in the several species. Metanotum not apparent on the dorsum, but its spiracles are visible from above. Scale of the petiole more or less thickened and low. (Malagasy).....Type: *Camponotus putatus* Forel.

Subgenus **Myrmopytia** Emery

Includes only *C. imitator* Forel, of Madagascar, which is quite distinct especially in the structure of the thorax of the worker.

Subgenus **Myrmentoma** Forel

Body shining. Clypeus narrow, with deep foveæ, extending almost over the whole of its lateral portions: the anterior margin with a median, very distinct notch. Dorsum of the thorax either continuous or interrupted in profile. Head of the male short, the funiculus with short joints. (Holarctic)....Type: *Formica lateralis* Olivier.

Subgenus **Orthonotomyrmex** Ashmead (= *Orthonotus* Ashmead)

Species, as a rule, of heavy build, with opaque integument, sometimes silky, or with a few short, coarse and obtuse hairs. The size of the workers varies but little, as a rule. Head of the worker major very broad behind, never truncate in front; that of the worker minor trapezoidal, broadened behind. Clypeus with or without lobe. Dorsum of the thorax more or less interrupted by a notch in front of the epinotum; sometimes the dorsum is even and the mesoëpinotal suture alone is deeply marked, the epinotum itself being margined on the sides and behind (as in *C. robustus*); the epinotum is usually margined, rarely forming a rounded protuberance (*C. dofleini*; *C. wasmanni*). Pronotum margined or not margined, sometimes with projecting humeral angles; in *C. wasmanni* it is armed with a pair of short spines. Scale of the petiole squamiform or nodiform. (Ethiopian, Malagasy, Mediterranean, Indomalayan)....Type: *Formica sericea* Fabricius (Ashmead, 1905; Wheeler, 1913; Emery, 1910).

Subgenus **Myrmotrema** Forel

Size and head of the worker as in the preceding subgenus. Thorax with or without dorsal notch. In the worker major and female the anterior part of the head is covered with round pits, deeply cut in as though made with a punch. (Ethiopian, Malagasy, one species in India).....Type: *Camponotus foraminosus* Forel.

Subgenus **Myrmopiromis** Wheeler (= *Myrmepomis* Emery, 1920; not of Forel, 1912)

Head as in the preceding subgenus, but without the deep pits on the cheeks of the worker major and female; pronotum often margined and sometimes with raised humeri (*C. fulvopilosus*, *C. ellioti*, *C. themistocles*). Most of the species have coarse, obtuse hairs, pale colored (white, yellow, or russet), more or less abundant, sometimes forming a fur-coating on the gaster or on the dorsum of the thorax (Ethiopian, Malagasy).....Type: *Formica fulvopilosa* De Geer.

Subgenus **Myrmorhachis** Forel (= *Myrmacantia* Emery)

Head obtusely truncate in front. Thorax broad and with humeral angles; or the pronotum rounded (*C. aberrans*), in which case the scale of the petiole bears lateral appendages. Petiole variable, nodiform or squamiform, always at least angulose on the sides. Epinotum very variously shaped. (Ethiopian, Malagasy, Indomalayan).....Type: *Camponotus polyrhachioides* Emery.

Subgenus **Myrmopsamma** Forel

Mandibles 5-toothed. Clypeus without carina. Anterior margin of the head below and above, and often also the upper third of the clypeus, with transversal rows of long, psammophorous setæ. Size and shape of the body as in *Myrmoturba* and *Camponotus, sensu stricto*. Sometimes the scape has an anterior tooth-like edge at the base. Arenicolous. (Ethiopian). Type: *Camponotus mystaceus* Emery.

Subgenus **Myrmamblys** Forel (= *Myrmotemnus* Emery, in part)

Differs from the Neotropical *Neomyrmamblys* in the integument which is, as a rule, shining, even on the head of the worker minor, more or less sculptured on that of worker major, soldier and female; in the thorax of the worker being more or less depressed on the dorsum, especially in the species of Malasia. The dimorphism is variously shown in the head, which is more or less truncate in front, the clypeus being always entirely included in the truncation. The antennæ are inserted much in front of the middle of the frontal carinæ (as in *Colobopsis*). There are no transitional forms between worker major and minor. This group is very heterogeneous. (Ethiopian, Asiatic, Indomalayan, Australian). Type: *Camponotus reticulatus* Roger.

Subgenus **Myrmosphincta** Forel

I retain in this group the Neotropical forms which Emery proposed transferring to his subgenus *Myrmotemnus* (= *Myrmamblys* Forel), but which do not seem to fit well there, though agreeing with it in most of their characters.

Type: *Formica sexguttata* Fabricius.

Subgenus **Rhinomyrmex** Forel

Clypeus strongly vaulted and carinate, always forming a beak or nose in front. The single species is imperfectly known. (Sumatra). Type: *Rhinomyrmex klæsi* Forel.

Subgenus **Colobopsis** Mayr

Soldier or worker major and female with the head decidedly truncate in front, the flattened portion often sharply margined; the lower part of the clypeus is left out of the truncation so as to make an angle with its posterior narrow portion. Frontal carinæ diverging, comparatively short, straight or feebly sigmoid; the articulation of the antennæ placed in the middle or behind the middle of these carinæ. In most cases there is no transition between the soldier and the worker minor. Nest in tree-trunks, branches, empty galls, and hollow thorns. (Palearctic, Nearctic, Neotropical, Indomalayan, Australian; the Malagasy species is doubtful).

Type: *Formica truncata* Spinola.

Subgenus **Neomyrmamblys** Wheeler (= *Myrmamblys* Emery, 1920; not of Forel, 1912)

Dimorphism of the workers generally well pronounced in the shape of the head, which is often broad and rounded on the sides, truncate or emarginate behind and more or less obtuse in front in the worker major (*C. punctulatus*, *C. fastigatus*, etc.), or long with the sides more or less parallel and sometimes subtruncate in front (*C. novogranadensis*, *C. personatus*, etc.). Clypeus of the worker minor usually with rounded anterior margin; that of the worker major without lobe. Dorsum of the thorax continuous, without notch. Integument usually opaque. (Neotropical).

Type: *Camponotus fastigatus* Roger.

Subgenus **Paracolobopsis** Emery

Head of the worker minor rectangular, with the sides compressed as in several *Myrmobrachys*; that of the worker major with the sides parallel or converging in front, obtusely truncate, as in *Colobopsis*, so that the carinate clypeus, protuberant in profile, is only partly comprised in the truncation. Frontal carina sigmoid, with the articulation of the antennæ placed much before their middle. Thorax in profile making a continuous curve; pronotum depressed, more or less margined in front. Integument sculptured and at least partly opaque: the head of the worker major is entirely opaque. There are transitions between the worker major and minor. (Neotropical).

Type: *Camponotus salvini* Forel.

Subgenus **Pseudocolobopsis** Emery

Head of the worker minor elongate, rounded behind, with nearly parallel lateral sides, shining; that of the worker major more or less rectangular, obtuse or truncate in front; sometimes the truncation has a well-defined margin and then includes the entire clypeus. Integument of the head of the worker major and female more or less sculptured, at least in its anterior portion. Dorsum of the thorax arched and continuous. (Neotropical).....Type: *Camponotus macrocephalus* Emery.

Subgenus **Myrmostenus** Emery

Only the female is known. Body extremely lengthened; head very long, narrow, and depressed. The workers may prove to be like those of the preceding subgenus. (Neotropical).....Type: *Camponotus mirabilis* Emery.

Subgenus **Hypercolobopsis** Emery

In the type species the head of the soldier and female is excessively truncate: the oblique anterior face is flat, enclosed by a distinct margin, and contains the entire clypeus and part of the frontal carinæ, so that the articulation of the antennæ is placed just at the limit of the truncation; the head of the worker is narrowed behind as in certain species of *Myrmoturba* and *Dinomyrmex*. The soldier of *C. burtoni* Mann is much as in the type; its worker is unknown. *C. tonduzi*, which is also included by Emery, has the head of the worker shaped as in the type species, but that of the soldier has no distinctly truncate face. (Neotropical).

Type: *Colobopsis paradoza* Mayr.

Subgenus **Myrmobrachys** Forel

Similar to *Myrmotrema*, but without fossæ on the cheeks and with the thorax generally broader at the epinotum, often subdepressed, though not margined or only submargined. As a rule, small and thick-set, often pilose or pubescent. Often living in dry and hollow branches; sometimes in the ground; some species use their larvæ to spin silk nests. (Neotropical).....Type: *Formica senex* F. Smith.

Subgenus **Myrmocladæcus** Wheeler (= *Myrmorhachis* Emery, 1920; not of Forel, 1912)

Thorax usually margined, often bidentate or bispinose. Scale of petiole often spinose or mucronate. Usually small and somewhat like *Polyrhachis*. Thorax sometimes with a dorsal depression. In one species, pronotum dentate. Nests in hollow twigs. (Neotropical).....Type: *Camponotus latangulus* Roger.

Subgenus Myrmeurynota Forel

Pronotum very broad, with a lateral, lamelliform margin, often vaulted. Thorax rapidly narrowing behind. Epinotum very narrow at its sloping face, which often has a peculiar appendage. Gaster broad, short, and small, sometimes more or less spherical. Probably arboreal. (Neotropical).

Type: *Camponotus eurynotus* Forel (Wheeler, 1913); *C. gilviventris* Roger (Forel, 1914).

Subgenus Manniella Wheeler

In the maxima worker the anterior truncated portion of the head is strongly carinate at the sides and posteriorly depressed; the front is strongly depressed between the carinae, the depression margined behind with an elevated ridge. The remainder much as in *Myrmeurynota*. Nest in stalks or twigs. (Neotropical).

Type: *Camponotus sphaericus* Roger.

Subgenus Myrmomalis Forel

The entire body depressed in the worker and female, especially in the worker of *C. obtritatus* which is completely flattened. Head rectangular in the worker major; elongate, trapezoidal in the worker minor; eyes placed laterally and behind the middle. Dorsum of the thorax flat; scale of the petiole low and thick. Integument black, opaque and pilose. Legs long, compressed, hirsute. (Neotropical).

Type: *Camponotus depressus* Mayr.