59.57,96(735W)

Article XXI.— THE ANTS OF TEXAS, NEW MEXICO AND ARIZONA.

(Part I.)

By William Morton Wheeler.

Plates XXVI and XXVII.

Although the ant-fauna of Texas, New Mexico and Arizona comprises a greater number of species than that of the whole remaining portion of America north of Mexico, it has never been made the subject of systematic investigation. In the following study I have brought together the scattered and rather meager materials published by previous authors and have added several new forms, especially of *Pheidole*, a cosmopolitan genus represented by a great number of species in tropical and subtropical America. A residence of four years (1899–1903) in central Texas, several excursions to the Trans Pecos deserts of that State, and a journey through New Mexico and Arizona during the spring of 1905, have enabled me not only to secure the large series of specimens now deposited in the American Museum of Natural History, but also to observe the living ants in their natural environment. This, as every myrmecologist knows, is often of the greatest importance in determining the status of species, subspecies and varieties.

In obtaining material for the following study from a number of localities which I have been unable to visit, I have received generous assistance from several collectors, especially from Messrs. C. F. Baker, J. H. Batty, C. R. Biedemann, C. T. Brues, T. D. A. Cockerell, C. G. Hartmann, H. Heath, G. von Krockow, W. H. Long, J. F. McClendon, A. L. Melander, C. Schaeffer, H. Skinner, C. H. T. Townsend, E. S. Tucker and H. Viereck, and Misses Mary Cooper, Lillie Gerhardt, Margaret Holliday, Clara Klaumann, Anna Pritchett, and Augusta Rucker. These collectors have, indeed, contributed a large part of the more valuable data recorded in the following pages.

Family FORMICIDÆ.

Subfamily Ponerinæ.

1. **Stigmatomma pallipes** (*Haldeman*).

Typhlopone pallipes Haldeman, Proc. Acad. Nat. Sci. Phila., II, 1844, p. 54, ☿.

Arotropus binodosus PROVANCHER, Natural. Canad., XII, 1881, p. 207, ♀, fig. 32, 33; Entom. Canad. Hymén., 1883, p. 539, ♀, figs. 73 and 74.
Amblyopone binodosus PROVANCHER, Addit. Faun. Canad. Hymén., 1887, p. 240, ☿, ♂, fig.
Stigmatomma pallidipes DALLA TORRE, Catalog. Hymenopt., VII, 1893, p. 14.
Stigmatomma pallipes EMERY, Zool. Jahrb., Abth. f. Syst., VIII, 1894, pp. 261, 262, ☿ ♀ ♂; WHEELER, Biol. Bull., II, No. 2, 1900, p. 56 et seq., figs. 5–7.

A single worker taken under a stone in Shoal Creek, Austin, Texas, by Mr. C. T. Brues. This is the only record of the occurrence of this subboreal ant at so low a latitude.

2. **Acanthostichus texanus** *Forel.*

FOREL, Ann. Soc. Ent. Belg., XLVIII, 1904, pp. 168, 169, ♀.

"*Female.* Length: 5.6 mm.

The whole body, which is narrow and cylindrical, is nowhere more than 0.8 mm. broad (0.6–0.8). Mandibles trenchant, smooth, shining, strongly curved downward, with only a few scattered punctures. Eyes situated behind the middle, at the third fifth of the head. Head subrectangular, much longer than broad, distinctly broader behind than in front, broadly excised behind. Thoracic dorsum hardly convex, without a distinct border, shouldered and barely submarginate, with the dorsal portion as long as the scutellum. Basal surface of epinotum nearly square, but passing over onto the sides and declivity through a rounded though sudden curve. Node of petiole forming nearly a rectangular parallelopipedon, $\frac{1}{6}$ to $\frac{1}{5}$ longer than broad, a little higher behind than in front and with all its sides rounded as in the case of the basal surface of the epinotum. The anterior border is a little more suddenly, the lateral borders on the contrary, more evenly rounded. The petiole bears a backwardly curved tooth on its lower surface. First gastric segment more elongate than in *serratulus*; pygidium less depressed, bordered with a shorter series of less numerous but equally long spinules. Antennæ and legs short and thick. The scapes, which are considerably arched, reach only half way to the posterior corners of the head; funicular joints very short and thick. Antennæ 12-jointed. Wings lacking.

Perfectly smooth and very shining. Pilosity erect and fine, yellowish, pointed, of medium length, rather sparse both on the tibiæ and the scapes. Pubescence very much scattered but distinct and rather coarse.

Reddish brown. Legs, antennæ, mandibles and venter of a somewhat yellowish red.

Brownsville, Texas. (Wickham).

This species is very distinct from the others in lacking the sharp thoracic and petiolar margin, and in its more elongate shape. It approaches *brevicornis* Emery." (Forel.)

3. **Cerapachys (Parasyscia) augustæ** *Wheeler.*

WHEELER, Biol. Bull., III, 1902, pp. 181–184, figs. 1 and 2, ☿ ♀; Psyche, Oct.–Dec., 1903, pp. 205–209, fig.

Of this interesting form I have seen specimens from only two colonies, one taken by Miss Augusta Rucker, the other by myself at Austin, Texas. It lives in small communities under large stones and is hypogæic in its habits.

4. **Proceratium croceum** *Roger.*

Emery (Zool. Jahr., Abth. f. Syst., VIII, 1894, p. 264) mentions a worker of this species from Texas.

5. **Platythyrea punctata** *F. Smith.*

Platythyrea punctata F. SMITH, Catalog. Hymen. Brit. Mus., VI, 1858, p. 108, No. 9, ☿ ♂. FOREL, Rev. Suisse. Zool., IX, 1901, p. 335, 336; WHEELER, Bull. Am. Mus. Nat. Hist., XXI, 1905, pp. 80, 81, fig. A–C.

Platythyrea inconspicua MAYR, Verh. zool. bot. Ges. Wien, XX, 1870, p. 961, ♀; EMERY, Ann. Soc. Ent. France (6) X, 1890, p. 56, ☿.

Platythyrea pruinosa MAYR, Verhand. zool. bot. Ges. Wien, XX, 1870, p. 962, ☿; FOREL, Trans. Ent. Soc. London, 1893, p. 358, 359, ☿ ♂.

There is a specimen of this species from Brownsville, Texas, in the United States National Museum. It may also be expected to occur in Southern Florida, as I have taken it as far north as New Providence in the Bahamas.

6. **Pachycondyla harpax** *F. Smith.*

Ponera amplinoda BUCKLEY, Proc. Ent. Soc. Phila., VI, 1866, p. 171, No. 33, ☿.

Pachycondyla harpax F. Smith EMERY, Zool. Jahrb., Abth. f. Syst., VIII, 1894, p. 266, ☿; FOREL, Biol. Centr. Am., Hymen., III, 1899–1900, p. 12; WHEELER, Biol. Bull., II, 1900, pp. 1–31 passim, figs. 2, 3, 8.

Worker. Length: 7–8.5 mm.

Head, excluding the mandibles, a little longer than broad, slightly broader through the eyes which are well in front of the middle of the head; sides straight and subparallel, the posterior border broadly excised. Mandibles large, with about 10 teeth and with concave external borders. Clypeus broadly rounded in front, very convex in the middle. Cheeks without a carina. Antennæ rather robust, scapes not quite reaching the posterior corners of the head; four basal and the terminal joint of funiculus distinctly longer than broad, remaining joints about as broad as long. Thorax rather flat above, pronotum with an impressed median line and a sharp margin on each side; promesonotal suture very distinct, mesoëpinotal

suture obsolescent. Epinotum with a flattened basal surface much shorter than the declivity which is also flattened, bounded on each side by a crenated margin, and passing over into the basal surface through a rounded obtuse angle. Petiole very thick, as high as the epinotum in profile, with flat anterior and posterior surfaces, as long above as below, with the upper surface faintly rounded. Seen from above it is broader than the epinotum, hardly broader than long, with a straight posterior border and the outline of the front and sides forming a semicircle. Gaster truncated in front, with a very indistinct constriction behind the first segment, rather rapidly tapering and with a powerful sting. Legs robust.

Mandibles and clypeus somewhat shining, the former rather finely and irregularly punctate, the latter rugulose. Head and thorax opaque, punctate-rugulose, sides of latter finely longitudinally striated. Petiole and gaster somewhat more shining, finely and densely shagreened or punctulate.

Hairs and pubescence yellowish gray, the former coarse, erect, moderately abundant, and present also on the antennal scapes; the latter most abundant and longest on the gaster.

Black; mandibles, clypeus, frontal carinæ, antennæ, tip of gaster, sting, coxæ, and legs dark red; scapes, coxæ and femora often darker or quite black, except at their articulations.

Female. Length: 8–9 mm.

Very closely resembling the worker except in the usual sexual characters. The petiole is higher and not so thick anteroposteriorly, and distinctly broader than long when seen from above. The wings are brownish hyaline, with yellow veins and brown stigma. The upper surface of the pro- and mesonotum and scutellum is coarsely and rather densely punctate. Mandibles and middle of clypeus smooth and shining, the former with large and widely scattered punctures.

Male. Length: 7–8 mm.

Head, excluding the eyes, about as broad as long, rounded behind, with very short cheeks. Mandibles very small and far apart, rapidly tapering to a truncated, minutely denticulate tip. Clypeus carinate in the middle, with a sinuous anterior border. Antennæ very long and slender, first joint twice as long as the second but only about $\frac{1}{3}$ as long as the third joint. Joints 3–13 very long and cylindrical, the basal being somewhat longer than the terminal. Thorax through the wing insertions as broad as the head through the eyes, pro-mesonotum convex above, the latter with distinct Mayrian furrows. Epinotum rounded, without distinct basal and declivous surfaces, with a prominent V-shaped ridge, which has its point directed forward and surrounds the flatter declivity. Petiole thick and rounded above and on the sides, not as high and not more than half as broad as the epinotum; seen from above it is fully $\frac{1}{3}$ as long as broad and transversely elliptical. Gaster with a distinct constriction between the first and second segments. Legs slender.

Body somewhat shining. Head finely and densely punctate. Thorax above indistinctly punctate, with sharply, longitudinally striated pleuræ. Epinotum irregularly and transversely rugose, the rugæ converging and becoming confluent with the V-shaped ridge. Petiole and gaster very minutely and inconspicuously punctate.

Pile and pubescence similar to those of the worker and female, but less abundant, especially on the thorax.

Black; mandibles, mouthparts and legs sordid yellow; femora more or less infuscated. Wings like those of the female.

Texas: Austin, Del Rio (Wheeler); Barksdale (Brown); Brownsville (C. Schæffer).

Louisiana (Mrs. A. T. Slosson).

This species is abundant in Central Texas where it nests in small colonies under stones and logs. The workers move about in the early morning in the shade of the vegetation in search of insect food. The nests are irregular galleries and chambers in the soil. The larvæ are tuberculate and are fed on pieces of insects and myriopods. For a fuller account of the habits of this ant see my paper "A Study of Some Texan Ponerinæ" (Biol. Bull., II, 1900, pp. 1–31).

7. **Neoponera villosa** (*F. Smith*).

Pachycondyla villosa DALLA TORRE, Catalog. Hymenopt., VII, 1893, p. 35; FOREL, Biol. Central. Am., Hymenopt., III, 1899–1900, p. 14.
Neoponera villosa EMERY, Ann. Soc. Ent. Belg., XLV, 1901, p. 47.

Worker. Length: 12–13 mm.

Head, excluding the mandibles, a little longer than broad, with faintly rounded, subparallel sides and broadly excised posterior margin. Eyes large and convex, in front of the middle of the sides. Cheeks with a sharp carina extending from the eye to the clypeal border. Between this ridge and the antennal insertions the surface is concave. Mandibles with faintly concave outer borders and about 13 subequal teeth. Clypeus convex in the middle, with a slight median excision in its anterior border. Antennæ moderately long; scapes surpassing the posterior angles of the head by about their own breadth; funicular joints all distinctly longer than broad. Thorax long and narrow, but little broader in front than behind. Pronotum with angular humeri and sharp lateral borders. Promesonotal and mesoëpinotal sutures distinct. Basal surface of epinotum flat, much longer than the sloping and somewhat concave declivity, which is bordered on the sides by strong anteriorly converging ridges. Petiole in profile with straight anterior and rounded posterior surface, the latter continuous with the dorsal surface, from above somewhat longer than broad and nearly as broad as the epinotum, triangular, with straight sides converging anteriorly, and with sharp semicircular upper border to the node. Gaster truncated in front, with a distinct constriction between the first and second segments. Sting long and powerful. Legs long.

Subopaque; mandibles covered with very fine longitudinal striæ and coarse, sparse punctures. Head, thorax and body densely punctate, the punctures on the head being somewhat larger than those on the remainder of the body.

Pile and pubescence golden yellow, on the posterior portion of the thorax and petiole silvery white; pile coarse, erect and sparse even on the antennal scapes, the pubescence abundant and more or less concealing the ground color and sculpture.

Black; mandibles, frontal carinæ, coxæ, legs, sting and in some specimens also part of the petiole, dark red.

Female. Length: 14 mm.

Closely resembling the worker except in the usual sexual characters. Wings brownish, with dark brown veins and stigma.

Male. Length: 12 mm.

Head, excluding the eyes, distinctly longer than broad, rounded and convex behind, with short cheeks. Mandibles very small and far apart, rapidly tapering to a blunt, edentulous point. Clypeus rather long, evenly convex. Antennæ very long and slender, scape thickened, twice as long as the first funicular joint but less than $\frac{1}{3}$ as long as the second. Joints 2–13 very long but gradually diminishing in length distally. Thorax broader through the wing-insertions, than the head through the eyes. Epinotum narrow, convex and rounded. Petiole similar to that of the worker, but its node is much more rounded in profile; seen from above it is considerably longer than broad, rounded behind and with the sides slightly concave and converging in front. Gaster with a marked constriction between the first and second segments.

Sculpture, pilosity and coloration similar to those of the worker. Mandibles, mouthparts and subgenital plate yellowish.

Texas: Brownsville (C. Schaeffer); Alice and Kenedy (Wheeler); Victoria (Hunter).

This well-known species of tropical America occurs only in southwestern Texas and according to my observations does not extend farther north than San Antonio. Southward it is known to extend through Mexico, Central America, Brazil and Paraguay. At Kenedy I found a small colony nesting in the ground at the foot of a tree. The workers run about rapidly in the bright sun on trees and fence-posts in search of insect food.

8. **Ponera opaciceps** *Mayr.*

Ponera opaciceps Dalla Torre, Catalog. Hymenopt., VII, 1893, p. 40; Forel, Trans. Ent. London, 1893, p. 363, ☿; Emery, Zool. Jahrb., Abth. f. Syst., VIII, 1894, p. 267, ☿; Emery, Bull. Soc. Ent. Ital., XXVIII, 1896, p. 22; Forel, Ann. Soc. Ent. Belg., XLV, 1901, p. 124, ☿; Wheeler, Ann. Soc. Ent. Belg., XLV, 1901, p. 199, ☿; Wheeler, Bull. Am. Mus. Nat. Hist., XXII, 1906, p. 335, ☿.

This species is not uncommon under stones in moist places at New Braunfels, Granite Mountain and Austin, Texas, and in the lower portion of the Grand Canyon, Arizona. It occurs also in Mexico, the Antilles and Brazil and as far south as Montevideo (Silvestri). It is allied to our northern *P. coarctata pennsylvanica,* but the punctation of the head is extremely fine. It differs from *P. fœda* in its larger size (3.10 mm.) darker color and distinctly angular epinotum.

9. **Ponera trigona** *Mayr.* var. **opacior** *Forel.*

FOREL, Trans. Ent. Soc. London, 1893, pp. 363, 364, ☿ ♀; EMERY, Bull. Soc. Ent. Ital., XXVIII, 1896, p. 22, ☿.

Texas: Austin, McNeil, Marfa (Wheeler); Plano (E. S. Tucker); Paris (Miss Augusta Rucker).

New Mexico: Las Vegas (T. D. A. Cockerell).

Colorado: Canyon City (P. J. Schmitt).

California: Palo Alto (H. Heath).

Florida: Jacksonville (Mrs. A. T. Slosson).

Mexico: Ojos del Diablo, Chihuahua (C. H. T. Townsend).

In the worker of this species the eyes are situated at about the anterior fourth of the head, the maxillary palpi are 1-jointed, and joints 3–6 of the antennal funiculi are much broader than long.

10. **Ponera ergatandria** *Forel.*

FOREL, Trans. Ent. Soc. London, 1893, pp. 365, 367, ☿ ♀ ♂; EMERY, Bull. Soc. Ent. Ital., XXVIII, 1896, p. 22, ♀; FOREL, Biol. Centr. Am., Hymenopt., III, 1899–1900, p. 16.

"*Worker.* Length: 2.3–2.9 mm.

Narrow and much elongated. Mandibles relatively short, with 4 teeth in front and distinctly denticulated behind. Clypeus short, rather strongly two-notched in front. Frontal furrow longer than half the distance from the frontal carinæ to the occiput. Eyes vestigial, of two or three facets, situated a little in front of the anterior fifth of the sides of the head. The scapes do not reach the posterior sixth of the head. The pronotum is longer than broad, much longer and narrower than in *P. fœda*, *trigona* and *opaciceps*, not enlarged at its anterior corners, which are absolutely effaced. Epinotum as is *P. contracta* but the basal surface is a little longer than the declivity, and the latter is not even marginate, but rounded on all sides. Petiole much narrower, lower and a little thicker than in *P. contracta*, otherwise of the same form. It is at least twice as broad as thick, of the same height as the first gastric segment. Gaster very long and narrow, hardly constricted behind the first segment, which is narrower, lower and less truncated in front than *P. fœda*, *contracta* and *punctatissima*. Legs much shorter than in any of these species.

Shining, finely punctate, like *P. contracta*, but the punctation of the head is finer.

Pilosity and pubescence longer and paler, very apparent.

Body sordid brownish yellow, with the lower portion of the head, certain portions of the thorax and the middle of the gastric segments deep brown. Legs antennæ, mandibles and tip of abdomen more or less pale, sordid yellowish or brownish.

Female. Length 2.7–2.9 mm.

Shorter and broader than the worker, otherwise presenting the same characters,

but more deeply and strongly sculptured. Wings subhyaline; veins and stigma very distinct. Much smaller than the females of the European species.

Male. Length: 3 mm.

Apterous, ergatoid; much elongated and very narrow. In other respects extremely close to the dimorphic male of *P. punctatissima* (*P. androgyna* Roger), but still more closely resembling the worker from which it differs only in the following characters: It is blind, with a small pigment spot in place of the eyes. Head elongated, rectangular, ¼ longer than broad. The scapes hardly reach to the posterior fourth of the head and are subclavate. Funicular joints broader and more widely separated from one another. The teeth of the mandibles are somewhat more obtuse. The clypeus is a little longer and less vaulted. The gaster has one more segment and the male genital organs are altogether normal; the scales are large, the external genital valvules short, triangular. The pygidium has no spine and the hypopygium is rounded. Pale sordid yellow; antennæ and anterior portion of the head and middle of the gaster somewhat more brownish. The antennæ, moreover, are 12-jointed and the narrow thorax is in all respects like that of the worker." (Forel.)

Of this interesting species, which, as Forel has shown, has egatoid males, I have taken a few workers under stones along the sources of the Comal River at New Braunfels, Texas. Previously the species was known only from the island of St. Vincent and Costa Rica.

11. **Ponera inexorata** *Wheeler.*

WHEELER, Psyche, June, 1903, pp. 94, 95, ☿ ♀, fig. 2.

This ant occurs under stones in rather dry rocky places at Austin, San Angelo and Fort Davis, Texas. The worker differs from the other known North American forms, except *P. gilva,* in its larger size, and from all except this and *ergatandria* in its yellow color. The epinotum is not sharply marginate on the sides as in *gilva,* and the mandibular teeth are more numerous.

12. **Leptogenys (Lobopelta) elongata** (*Buckley*) *Wheeler.*

Ponera elongata BUCKLEY, Proc. Ent. Soc. Phila., VI, 1866–67, p. 172, ☿.
Ponera texana BUCKLEY, *ibid.*, p. 170, ☿.
Lobopelta septentrionalis MAYR, Verhandl. k. k. zool. bot. Ges. Wien, XXXVI, 1886, pp. 438, 439, ☿.
Leptogenys septentrionalis EMERY, Zool. Jahrb., Abth. f. Syst., VIII, 1894, p. 268, ☿.
Leptogenys (Lobopelta) elongata WHEELER, Biol. Bull., II, 1900, pp. 2, 7, fig. 4, ☿ ♀ ♂; Trans. Tex. Acad. Sci., IV, pl. 2, No. 2, 1902, p. 9; Biol. Bull., VI, 1904, pp. 251–259, fig.

Texas: Austin, New Braunfels and Belton (Wheeler); Brownsville (C. Schaeffer).

Florida: Belleair (Mrs. A. T. Slosson).

Colorado (Cresson).

Maryland (Pergande, Mayr).

This interesting ant, as I have shown (Biol. Bull., VI, 1904, p. 251–259), feeds largely, if not exclusively on slaters (*Armadillidium, Oniscus*). There is no winged female but a gynæcoid worker that functions as the reproductive individual of the colony. The yellow males are nocturnal and fly to electric lights.

13. **Odontomachus clarus** *Roger.*

Odontomachus clarus ROGER, Berl. Entom. Zeitschr., V, 1861, p. 26, No. 81, ☿; DALLA TORRE, Catalog. Hymenopt., VII, 1893, p. 50; FOREL, Ann. Soc. Ent. Belg., XLV, 1901, p. 124, ☿; WHEELER, Ann. Soc. Ent. Belg., XLV, 1901, p. 199. ☿.

Odontomachus texana BUCKLEY, Proc. Ent. Soc. Phila., VI, 1867, p. 335, No. 37, ☿.

Odontomachus hæmatodes WHEELER, Biol. Bull., II, No. 1, 1900, *passim*, fig. 1.

Texas: Austin, San Antonio, Marble Falls, San Angelo, Milano, Alpine and Fort Davis (Wheeler); Meridian (W. H. Long).

Arizona: Huachuca Mountains (C. Schæffer).

Mexico: Cuernavaca (Wheeler), Guadalajara (J. F. McClendon).

This form may be regarded, as Forel suggests, as a pronounced subspecies of *O. hæmatodes* allied to the subspecies *insularis* Guérin and *hirsutiusculus* Smith. It differs from these forms and the typical *hæmatodes* in the following characters: In the worker the sculpturing of the head is much finer and leaves more of the sides and occipital region sparsely punctate and shining; the pronotum is transversely instead of longitudinally striated, and the petiole is not suddenly constricted above and then produced into a long point, but tapers more gradually to a short point. In the male the circular ridge on the epinotum is much feebler than in the male of *hæmatodes*, and the legs and antennæ are more deeply infuscated. The same difference obtains between the females of *clarus* and *hæmatodes* as between the corresponding workers, except in the sculpturing of the pronotum, which is transverse in both. The coloring of the head, thorax, petiole and legs is much lighter and more yellowish than in any of the forms of *hæmatodes* known to me, except the var. *pallens* Wheeler from the Bahamas. For an account of the habits, larvæ, etc., of *O. clarus* see my paper in the Biol. Bull., II, 1900.

Subfamily DORYLINÆ.

14. **Eciton cœcum** (*Latreille*).

(Pl. XXVI, Fig. 3.)

?*Formica omnivora* OLIVIER, Encycl. Method., Ins., VI, 1791, p. 496, No. 28, ☿.
Formica cæca LATREILLE, Hist. Nat. Fourm., IX, 1802, p. 270, fig. 56, ☿.
Labidus latreillei JURINE, Nouv. Méth. Class. Hymén., 1807, p. 283, ♂; LATREILLE, Gen. Crust. et Insect., IV, 1809, p. 123, ♂; LATREILLE, Nouv. Dict. Hist. Nat., 2 Ed., XVII, 1816, p. 141, ♂; SCHUCKARD, Ann. Nat. Hist., V, 1840, p. 199, No. 3, ♂; WESTWOOD, Arcan. Entom., I, 2, 1842, No. 4, ♂; *Labidus latreillei* MAYR, Wien. ent. Zeit., V, 1886, p. 33, ☿.
Labidus jurinei SHUCKARD, Ann. Nat. Hist., V, 1840, p. 198, No. 2, ♂.
Labidus jurinei WESTWOOD, Arcan. Entom., I, 2, 1842, p. 75, No. 3, ♂.
Mutilla fulvescens BLANCHARD, Cuvier, Régn. Animal, 3 Ed., Insect., II, 1849, t. 118, f. 2, ♂.
Labidus sayi HALDEMAN, Stansbury's Explor. Utah, 1852, p. 367, t. IX, f. 1–3, ♂.
Labidus pilosus F. SMITH, Catalog. Hymén. Brit. Mus., 1859, p. 7, No. 9, ♂.
Labidus atriceps F. SMITH, Catalog. Hymén. Brit. Mus., VII, 1859, p. 5, No. 6, ♂.
Eciton vastator F. SMITH, Journ. Ent., I, 1860, p. 71, ☿.
Eciton erratica F. SMITH, Journ. Ent. Soc., I, 1860, p. 71, ☿; BATES, Natur. Amazons, II, 1863, p. 358, ☿.
Nycteresia cœca ROGER, Berl. entom. Zeitschr., 1861, p. 22, ☿.
Myrmica rubra BUCKLEY, Proc. Ent. Soc. Phila., 1866, p. 335, ☿.
Pseudodichthadia incerta ERN. ANDRÉ, Suppl. aux Fourmis, 1885, p. 8. f. 1–5; Spec. Hymén. Europ., II, 1886, p. 840, f., ♀.
Eciton cœcum MAYR, Wien. Entom. Zeit., V. 1886, p. 119, ☿; Verh. zool. bot. Ges. Wien, XXXVI, 1886, p. 440, ☿. FOREL, Biol. Centr. Am., Hymén., III, 1899–1900, pp. 25, 26, 160, ☿ ♀; EMERY, Mem. R. Accad. Sci. Ist. Bologna, 1900, p. 9, ♂ ☿; WHEELER, Amer. Natur., XXXV, 1901, pp. 158, 159, ☿ ♂ ♀.
Eciton jurinei MAYR, Wien. Ent. Zeit., V, 1886, p. 33, ♂.
Labidus sayi CRESSON, Trans. Amer. Ent. Soc., Suppl., Vol., 1887, p. 259.
Labidus servillei EMERY, Bull. Soc. Ent. Ital., XXII, 1890, p. 39, ♂.
Eciton omnivorum EMERY, Bull. Soc. Ent. Ital., XXIII, 1891, p. 163, ☿; *ibid.*, XXVI, 1894, p. 179, t. ii, f. 9a–d; Zool. Jahrb., Abth. f. Syst., VIII, 1894, p. 258, ♀.
Eciton smithii DALLA TORRE, Wien. Ent. Zeit., XI, 1892, p. 89; Catalog. Hymenopt., VII, 1893, p. 6, ♂.
Ecitcn latreillei var. *sayi* DALLA TORRE, Catalog. Hymen., VII, 1893, p. 4, ♂.

Texas: Austin, Fort Davis (Wheeler); Hockley; Meridian (W. H. Long); Barksdale (Brown) Dallas (Boll).

Utah: Fort Gates (Haldeman).

Mexico: Nautla, Vera Cruz (C. H. T. Townsend).

The above extensive synonymy is attributable to the wide geographical distribution and common occurrence of this species, which extends from

Texas to Argentina, and the extraordinary polymorphism of the genus, the three phases having been assigned to as many genera even by the same authors. As many other Ecitons are known only from male or worker specimens their synonymy will probably undergo great changes when all the sexual forms are known. But it will be a very long time before we are in possession of this knowledge, owing to the extremely recondite habits of these ants. The males of *E. cæcum* are common about the electric lights at Austin from the latter part of March to late in April. The workers are subterranean, or hypogæic and forage in galleries just beneath the surface of the ground or under large stones. They feed not only on all sorts of insects but even on carrion (dead dogs, cats, etc.). They may be caught in traps baited with kernels of walnuts and pecans, of which they seem to be very fond. *E. omnivorum* would therefore be a very appropriate name for this species, although it is not certain that it is really the species thus designated by Olivier.

15. **Eciton esenbecki** (*Westwood*).

(Pl. XXVI, Figs. 1 and 2.)

Labidus esenbecki Westwood, Arcan. Ent., I, 1845, pp. 75, 76, pl. 20, fig. 4, ♂.
Eciton esenbecki Mayr, Wien. Ent. Zeitr., V, 1886, p. 33, ♂; Dalla Torre, Catalog. Hymenopt., VII, 1893, p. 2, ♂; Forel, Biol. Centr. Am., Hymenopt., III, 1899–1900, p. 25, ♂; Emery, Mem. Real. Accad. Ist. Bologna, 1900, pp. 7–16, ♂.

Male. Length: 15 mm.

Head, including the eyes, twice as broad as long, prolonged and suddenly constricted behind the very prominent eyes and ocelli and then broadening out with rounded posterior corners. Frontal carinæ not reaching to the anterior ocellus, converging behind and terminating abruptly without curving outward. Distance between eye and posterior ocellus a little greater than the distance between the posterior ocelli. Mandibles very long, gradually tapering to slender, pointed tips, straight at the base and tip and slightly compressed, but bent somewhat angularly at the middle. Clypeus unarmed, with straight anterior border. Antennal scapes somewhat longer than joints 1–4 of the funiculus; funiculus tapering towards the tip. Thorax robust, through the wing insertions a little broader than the head through the eyes. Scutellum without a median sulcus. Meta- and epinotum each with a median depression, the latter also with angular sides. Petiole more than twice as broad as long, with elevated border and dorso-median depression; anterior corners rounded; posterior corners more acute. Gaster cylindrical, with deflected tip and prominent genitalia; subgenital plate bifurcate, with pointed tips; lateral plates broader and more rounded. Legs slender; anterior pair small, middle and hind pairs much longer; middle metatarsus more than half as long as the tibia; claws toothed.

Opaque; finely granular; head, thorax and legs covered with sparse piligerous

punctures. Tips of mandibles, genitalia and posterior edges of gastric segments smooth and shining.

Hairs and pubescence fulvous, the latter confined to the gaster and antennal funiculi, the former long and erect on all parts of the body, including the antennal scapes. In addition to these hairs there is a pair of prominent tufts of very long hairs on the epinotum, petiole and first gastric segment. On the succeeding segments the hairs are arranged in four tufts, two on each side. On the terminal segments the hairs are more abundant and their arrangement in definite tufts is less apparent. Venter with shorter and more curved hairs.

Ferruginous throughout; wings yellowish hyaline, with yellow veins and stigma.

A single specimen taken by C. Schaeffer at Las Borragas, near Brownsville, Texas, during June (Brooklyn Museum). It is probable that this is the male of *Eciton crassicorne* F. Smith, the worker form of which is not uncommon in Mexico.

16. **Eciton (Acamatus) schmitti** *Emery.*

(Pl. XXVI, Fig. 13.)

Eciton schmitti EMERY, Zool. Jahrb., Abth. f. Syst., VIII, 1894, pp. 258, 259, ☿; Bull. Soc. Ent. Ital., XXVI, p. 183, ☿; WHEELER, Amer. Natur., XXXV, 1901, pp. 161–163, f. I, ♂.

Eciton sumichrasti WHEELER, Amer. Natur., XXXIV, 1900, pp. 563–574, f. 1–3, ☿ ♀.

Eciton (Acamatus) schmitti EMERY, Mem. Real. Accad. Sci. Ist. Bologna, 1900, p. 16.

Texas: Austin, McNeil, Del Rio and Fort Davis (Wheeler); Meridian and Denton (W. H. Long); Paris (Miss Augusta Rucker).

New Mexico: Clayton and Las Vegas (Wheeler).

Colorado: Salida and Colorado Springs (Wheeler).

Missouri: Doniphan (P. J. Schmitt); Columbia (A. M. Ferguson).

North Carolina: Black Mountains (Wm. Beutenmüller).

Next to *E. cæcum* this is the commonest and most widely distributed species of *Eciton* in the United States. Like many of the smaller species of the genus it is fond of kidnapping the brood of other ants. For an account of its habits see my papers in the American Naturalist (1900–1901).

17. **Eciton (Acamatus) sumichrasti** *Norton.*

Eciton sumichrasti DALLA TORRE, Catalog. Hymen., VII, 1893, p. 6, ☿; EMERY, Zool. Jahrb., Abth. f. Syst., VIII, 1894, p. 259, ☿; Bull. Soc. Ent. Ital., XXVIII, 1896, p. 47, ☿; FOREL, Biol. Centr. Am., Hymenopt., III, 1899–1900, p. 27, ☿.

Eciton (Acamatus) sumichrasti EMERY, Mem. Real. Accad. Sci. Ist. Bologna 1900, p. 16.

This species, which differs from the preceding in having the cheeks of the worker more deeply pitted or foveolate, is recorded by Mayr from Texas, but I have never been able to find it in that state. What I took to be *sumichrasti*, when I first began to study ants, was *schmitti*. The former species is, however, very common in Mexico. I have taken it at Cuernavaca, Morelos and have received specimens from Tapotlan, Jalisco (C. H. T. Townsend) and Guadalajara, (J. F. McClendon). Its habits appear to be very similar to those of *E. schmitti*.

18. **Eciton (Acamatus) californicum** *Mayr.*

Eciton californicum DALLA TORRE, Catalog. Hymen., VII, 1893, p. 2, ☿; EMERY, Zool. Jahrb., Abth. f. Syst., VIII, 1894, p. 259, ☿; Bull. Soc. Ent. Ital., XXVIII, 1896, p. 48, ☿.

Eciton (Acamatus) californicum EMERY, Mem. Real. Acc. Sci. Ist. Bologna, 1900, p. 16.

Several workers taken at Las Vegas and Romeroville by T. D. A. Cockerell appear to belong to this species. They agree very closely with a series of specimens collected at Palo Alto, California by Dr. Harold Heath.

19. **Eciton (Acamatus) opacithorax** *Emery.*

(Pl. XXVI, Fig. 4.)

Eciton californicum MAYR; subsp. *opacithorax* EMERY, Zool. Jahrb., Abth. f. Syst., VIII, 1894, p. 259, ☿; Bull. Soc. Ital., XXVI, 1894, p. 184, ☿; Forel, Biol. Centr. Am., Hymen., III, 1899–1900, p. 28, ☿.

Eciton (Acamatus) opacithorax EMERY, Mem. Real. Accad. Ist. Bologna, 1900, p. 15, 16, ☿.

Eciton opacithorax, WHEELER, Amer. Natur., XXXV, 1901, p. 163–165, f. 2 e and 3, ♀ ♂.

The types of this species are from Doniphan, Missouri. I possess specimens also from Belmont, North Carolina (P. J. Schmitt), Austin, Texas and the Las Cruces Mountains, California (H. Heath). A female specimen which I took in a nest at Austin differs from the female of *E. schmitti* in the following particulars: The eyes are much smaller and distinctly concave, the posterior corners of the head and lateral borders of the pronotum are rounder, the head and thorax more shining and covered uniformly with coarse punctures. The color is somewhat paler. Length 12 mm.

The habits of this species, so far as I have been able to observe, are similar to those of *E. schmitti*, but it is much less abundant.

20. **Eciton (Acamatus) wheeleri** *Emery.*

EMERY, Bull. Soc. Ital., XXXIII, 1901, pp. 55, 56, f. 8, ☿.

Worker. Length: 2.3–4 mm.

Head somewhat longer than broad, with arcuate sides and projecting posterior angles in the form of somewhat outwardly curved teeth. Eyes very distinct. Frontal carinæ curving around the antennal insertions and in front of these forming a pair of pellucid projections. Mandibles narrow, with oblique and indistinctly denticulate masticatory border. Antennal scapes reaching to the eyes, basal funicular joints a little broader than long, the penultimate joints a little longer than broad. Thorax elongate, with a faint, saddle-shaped depression between the meso- and epinotum, the latter about half as long as the promesonotum. Pronotum with a transverse carina in front, epinotum rounded behind. Petiole a little longer than broad, unarmed beneath. Postpetiole a little broader than the petiole, broader than long.

Head with numerous coarse piligerous punctures on the sides, but smooth for the most part. Thorax opaque, entirely rugose-reticulate, with scattered piligerous punctures, sides of the pronotum and mesothoracic dorsum somewhat shining, prothoracic dorsum somewhat more opaque. Petiole somewhat less opaque than the epinotum; postpetiole faintly shining, distinctly reticulate, with less pronounced piligerous punctures than the petiole and epinotum. Gaster shining. Claws simple.

Hairs long and abundant, erect or suberect, both on the body and appendages.

Rich ferruginous red; thorax and pedicel somewhat darker; gaster and legs paler.

Types from Hays County, Texas. This species occurs also in the adjacent county of Travis, at Austin, and I have received specimens from Guadalajara, Mexico (J. F. McClendon). It is closely related to *E. opacithorax* but differs in the more robust petiole and the peculiar, slightly diverging teeth into which the corners of the head are prolonged.

21. **Eciton (Acamatus) pilosum** *F. Smith.*

Eciton pilosum DALLA TORRE, Catalog. Hymen., VII, 1893, p. 5, ☿; EMERY, Bull. Soc. Ent. Ital., XXVI, 1894, p. 183, ☿; FOREL, Biol. Centr. Am., Hymenopt., III, 1899–1900, p. 27, ☿; EMERY, Mem. Real. Accad. Ist. Bologna, 1900, p. 16, ☿; WHEELER, Amer. Natur., XXXV, 1901, p. 165, ☿.

This species occurs as far north as Austin and New Braunfels, Texas, and extends southward through Mexico and Central America into Brazil.

22. **Eciton (Acamatus) pauxillum** *Wheeler.*

WHEELER, Psyche, June, 1903, pp. 93, 91, f. I, ☿.

A diminutive species of which I have seen only two small colonies, one

at Austin, Texas and one in the Paisano Pass near Alpine Texas. It is related to *E. nitens* Mayr and *commutatum* Emery.

23. **Eciton (Acamatus) commutatum** *Emery.*

Eciton nitens Mayr, Sitzb. Akad. Wiss. Wien, LXI, 1870, p. 398, ☿; Wien. Ent. Zeit., V, 1886, p. 121, No. 14, ☿; Pergande, Proc. Calif. Acad. Sci. (2), V, p. 874.

Eciton (Acamatus) commutatum Emery, Mem. Real. Accad. Ist. Bologna, 1900, p. 14, ☿.

Five workers, collected by Mr. A. L. Melander at Austin, Texas, agree with the descriptions of this species, which is closely allied to, but not identical with, the true *nitens* described by Mayr in 1868 (Annu. Soc. Natural. Modena III, p. 168, No. 9). According to Emery, "the funiculus of the antennæ in *commutatum* is more club-shaped and more thickened at the tip compared with the base, and the terminal joints are shorter than in *nitens*. The postpetiole is a little broader and decidedly shorter than the petiole, whereas in *nitens* it is but little shorter and much more distinctly broader than the petiole."

24. **Eciton (Acamatus) harrisi** (*Haldeman*).

(Pl. XXVI, Fig. 10.)

Labidus harrisii Haldeman, Stansbury's Explor. Utah, 1852, p. 367, ♂; Cresson, Trans. Am. Ent. Soc., 1872, p. 194, ♂.

Eciton harrisi Dalla Torre, Catalog. Hymenopt., VII, 1893, p. 3, ♂; Emery, Zool. Jahrb., Abth. f. Syst., VIII, 1894, p. 261, ♂; Forel, Biol. Centr. Am., Hymenopt., III, 1899–1900, p. 28, ♂; Wheeler, Amer. Natur., XXXV, 1901, p. 165, f. 2a, ♂.

Eciton (Acamatus) harrisi Emery, Mem. Real. Accad. Ist. Bologna, 1900, pp. 7, 17, f. 18, ♂.

Utah: Fort Gates (Haldeman).

Texas: Austin, July 27, July 4 and Aug. 1 (Wheeler); Waco (Wm. Prather); Brownsville (C. Schaeffer); Dallas (Boll).

New Mexico: Mesilla (T. D. A. Cockerell).

Arizona: Palmerlee, Cochise County (C. Schaeffer); Nogales, June 22 (Oslar).

Mexico: Sinaloa (J. H. Batty).

This species, which may prove to be the male of *E. pilosum*, is easily distinguished by its short, straight mandibles with straight inner and convex outer borders.

25. **Eciton (Acamatus) mexicanum** (*F. Smith*).

(Pl. XXVI, Fig. 11.)

Labidus mexicanus F. SMITH, Catalog. Hymen. Brit. Mus., VII, 1859, p. 7, No, 10, ♂; CRESSON, Trans. Am. Ent. Soc., 1872, p. 194.

Eciton (Labidus) subsulcatum MAYR, Verh. zool. bot. Ges. Wien, XXXVI, 1886, p. 440, ♂.

Labidus subsulcatum CRESSON, Trans. Amer. Ent. Soc., Suppl. Vol., 1887, p. 259.

Eciton mexicanum DALLA TORRE, Catalog. Hymen., VII, 1893, p. 4, ♂; EMERY, Zool. Jahrb., Abth. f. Syst., VIII, 1894, p. 260, ♂; FOREL, Biol. Centr. Am., Hymenopt., III, 1899–1900, p. 27, ♂; WHEELER, Amer. Natur., XXXV, 1901, p. 165.

Eciton (Acamatus) mexicanum EMERY, Mem. Real. Accad. Ist. Bologna, 1900, p. 17, f. 19, ♂.

Texas: (Belfrage); Austin, July 4 (Miss M. Holliday); Dallas (Boll).
Arizona: Nogales, July 18 (Oslar).
Mexico.

The male of this species is easily distinguished from all the known males of the genus by the peculiar shape of the mandibles which are narrow, straight at the base and curved at the tips, with the middle of the external margin concave and a low but distinct projection on the inner margin.

26. **Eciton (Acamatus) arizonense** sp. nov.

(Pl. XXVI, Fig. 5.)

Male. Length: 12–13 mm.

Head, including the eyes, twice as broad as long, not prolonged behind the eyes and ocelli, which are very large and prominent. Lateral ocellus only about $\frac{1}{4}$ its diameter from the eye; median ocellus situated far back and almost between the lateral ocelli. Clypeus unarmed, with straight anterior border. Frontal carinæ separated by a deep depression, very prominent, continued back to near the anterior ocellus and curving round the antennal insertions. Mandibles falcate, about twice as long as the eyes, straight at the base but thence uniformly curving and tapering to a slender point. Antennal scape robust, about as long as joints 1–4 of the long and gradually tapering funiculus. Thorax short and robust, about twice as long as high. Scutellum without a longitudinal furrow. Epinotum rounded above, concave below. Petiole more than half as long as broad, depressed in the middle in front, with rounded posterior angles. Gaster long and cylindrical, with small genitalia; subgenital plate with a shorter, more obtuse median and two longer, more acute lateral teeth; outer appendages not spreading. Legs feeble; middle metatarsus about half as long as the tibia; claws toothed.

Head smooth and shining; remainder of the body somewhat more opaque.

Mandibles and antennal scapes very finely punctate. Thorax and gaster very finely and delicately shagreened, except the posterior edges of the segments which are smooth and shining.

Body and appendages covered with rather silky, pale yellow, appressed pile, which is longest and least appressed on the epinotum and petiole.

Rich reddish brown. Wings yellowish hyaline, with yellow veins and stigma.

Texas: Brownsville (C. Schaeffer); Austin, June 27 (Miss Holliday).

New Mexico: Las Cruces (T. D. A. Cockerell).

Arizona: Nogales, June 31, July 15 (E. J. Oslar).

In general appearance this species very closely resembles *E. mexicanum* F. Sm., but may be at once distinguished by its long sickle-shaped mandibles and longer pile, especially on the posterior portion of the thorax and petiole, dentate claws and less projecting pronotum. In *mexicanum* the subgenital plate is bidentate. In this and many other respects *E. arizonense* resembles *E. spoliator* Forel but it differs in its greater size and larger eyes, in not having the head coarsely and deeply punctured, etc.

27. **Eciton (Acamatus) oslari** sp. nov.

(Pl. XXVI, Fig. 8.)

Male. Length: 11 mm.

Head distinctly less than twice as broad as long, projecting and much rounded behind the large eyes. Ocelli large and prominent, the lateral ones less than their diameter from the eyes. Clypeus unarmed, with a broadly excised anterior border. Frontal carinæ prominent, separated by a deep groove and continued around the antennal insertions posteriorly. Mandibles narrow and rather long, falcate, bent from their very bases, and uniformly tapering to a sharp point. Antennæ long, scape but little thicker than the funiculus and hardly longer than its three basal joints; funiculus of nearly uniform breadth throughout. Thorax nearly twice as long as high. Pronotum with a marked concavity on its anterior surface, so that the mesonotum overarches the head very prominently. Scutellum rounded behind, without a median furrow. Metanotum rounded, epinotum rectangular in profile, with its horizontal basal surface only half as long as its perpendicular declivity. Petiole 1⅓ times as broad as long, rectangular, with straight, parallel sides and straight posterior margin; its upper surface very convex. Gaster long and cylindrical, with connate lateral valves and small bifurcate subgenital plate. Legs small and feeble; metatarsus of median pair half as long as the tibia. Claws minutely toothed.

Head and mandibles shining, sharply and sparsely punctate. Thorax, petiole and legs subopaque, finely and rather indistinctly punctate.

Pile yellowish gray, appressed, short but rather dense on the thorax, petiole and gaster, somewhat longer and more erect on the antennal scapes, mandibles, mesopleuræ, legs and venter.

Posterior half of head, upper surface of mesonotum and scutellum, black, remainder of body including the appendages reddish brown. Wings gray, with yellowish brown veins and prominent dark brown stigma.

Described from a single specimen collected by E. J. Oslar at Nogales, Arizona, July 15, 1903 (Cornell Univ. Coll., Lot, 256).

This species resembles *arizonense* but differs in the color of the body and wings, the narrower thorax and gaster, smaller mandibles, greater development of the head behind the eyes, smaller ocelli, less prominent frontal carinæ, and more slender antennæ. In color and form it is even more closely related to *E. harrisi*, but the mandibles have a very different shape, the frontal carinæ are not continued so far postero-laterally, and the petiole is larger.

28. **Eciton (Acamatus) spoliator** *Forel.*

(Pl. XXVI, Fig. 12.)

Eciton spoliator Forel, Biol. Centr. Am., Hymén., III, 1899–1900, p. 29, ♂.
Eciton (Acamatus) spoliator Emery, Mem. Real. Accad. Ist. Bologna, 1900, p. 17, ♂.

"*Male.* Length: 8.5 mm.

With the appearance of *E. melsheimeri*, but the mandibles are much larger and the head has a different form. Mandibles long, arcuate and shining, when their tips touch each other enclosing a space which is longer than the head and forms about ¾ of a circle. They are smooth, shining and punctate, very narrow and pointed at their tips. Labrum deeply bifid. Frontal carinæ rather far apart, diverging in the form of welts, separating the ocelli from the antennary fossæ, prolonged backward and disappearing towards the eyes. These are rather small, not occupying altogether ⅔ of the side of the head. Head transversely rectangular, 1½ times as broad as long. Its posterior border is feebly and broadly concave, with rounded, but very distinct posterior angles. Eyes oval. Mesonotum elongate elliptical, somewhat fusiform, broadened in the middle, narrowed in front and behind. Epinotum with a short horizontal base and a subvertical declivity. Petiole, seen from above, rectangular, transverse, with straight, parallel, lateral borders, the posterior border broadly but feebly concave, posterior angles prominent, anterior angles rounded and the anterior border excised in the middle. Seen from the side it shows a strong transverso-median convexity, with the surface sloping anteriorly and posteriorly, slightly transverse and concave towards the base. There is a feeble constriction behind each gastric segment. Hypopygium with two long and very acute lateral points and a short acute median point which is not present in *E. melsheimeri*. The antennal scapes reach to the lateral ocelli. Antennæ and legs of moderate length.

Shining, with deep, coarse and scattered punctures on the head and thorax, finer and more abundant punctures on the petiole and gaster.

Hairs long, abundant and yellow, on the under side of the petiole, on the tip of the gaster and mandibles. Remainder of body, legs and scapes covered with yellow oblique pubescence, which is very abundant on the gaster, sparse on the thorax and especially on the head, passing here and there into the pilosity. On the borders of the petiole there is a brush of rather straight, short hairs.

Entirely yellowish red, with the head, excepting the mandibles and antennæ, black. Wings hairy, smoky brown, with brown veins and stigma.

Costa Rica (Alfaro)" (Forel).

Two specimens labeled "Texas (Belfrage)," received from Dr. W. H. Ashmead under the name of "*Acamatus fuscipennis* Cresson," agree so closely with the above description that I do not hesitate to assign them to Forel's species.

29. **Eciton (Acamatus) nigrescens** (*Cresson*).

(Pl. XXVI, Fig. 7.)

Labidus nigrescens CRESSON, Trans. Am. Ent. Soc., IV, 1872, p. 194, ♂.
Eciton nigrescens MAYR, Wien. Ent. Zeit., V, 1886, p. 33 ♂; EMERY, Zool. Jahrb., Abth. f. Syst., VIII, 1894, p. 261.

Male. Length: 10 mm.

Head, including the eyes, less than twice as broad as long, convex above, without posterior angles behind. Frontal carinæ obtuse, curving outward behind but fading into the swollen sides of the front before reaching the eyes. Clypeal border straight, unarmed. Eyes small, but protruding. Ocelli small, the lateral pair separated from the eyes by a distance nearly equal to the length of the latter. Mandibles very broad, flat, with convex external and internal borders, curved only at their narrow bases, with acute, suddenly tapering tips. Antennæ long and robust; scape shorter than joints 1–3 of the funiculus; first funicular joint much shorter than long, remaining joints gradually tapering distally. Thorax robust, mesonotum with a prominent, median, longitudinal ridge which runs into a slight depression at the anterior end. Scutellum and metanotum without median depressions. Epinotum with short base, long, abrupt and flattened declivity and rounded, bulging sides. Petiole 2½ times as broad as long, a little broader behind than in front, with rounded anterior corners and nearly rectangular, moderately acute posterior corners. Its upper surface seen from the front is slightly convex in the middle and slightly concave anteriorly and on each side behind; the margins are not reflected. Gaster rather slender, with faint but distinct constrictions between the segments. Hypopygium with two acute lateral teeth and no median tooth. Middle metatarsus more than half as long as the tibia. Claws with minute teeth.

Somewhat shining; mandibles, head and thorax coarsely punctate, the thorax more densely; gaster still more finely and densely punctate.

Hairs dull yellowish, not abundant; long on the head and sides of the thorax, considerably shorter and more appressed on the gaster and legs. Eyes distinctly hairy.

Black; antennæ, tips of mandibles, articulations of legs, tarsi, posterior margins of gastric segments, hypopygium and insertions of wings, dark red. Wings dusky hyaline, with dark brown stigma and somewhat lighter veins.

The type of this species, from Texas, is in the Museum of the Philadelphia Academy of Sciences. I have redescribed it from a Kansas specimen in the United States National Museum. This specimen agrees very

closely with Cresson's description except that the wings are paler, and possibly faded with age. It is closely allied to *E. schmitti* and *E. opacithorax* in having very small eyes, but it differs from both of these species in the color of the gaster. From *opacithorax* it differs also in the shorter and more robust thorax, thicker antennæ, and in having broader mandibles, with convex instead of straight external border. From *schmitti* it differs in having the head more convex behind the eyes, in the presence of a distinct mesonotal ridge, two instead of three teeth on the hypopygium, in the smaller size, much paler wings and sparser hair. *E. nigrescens* is also allied to *E. harrisi*, especially in the shape of the mandibles, but is a more robust species and besides the darker color, has much smaller eyes and ocelli and a proportionally longer head.

30. **Eciton (Acamatus) melsheimeri** (*Haldeman*).

(Pl. XXVI, Fig. 9.)

Dorylus (*Labidus*) *melshæmeri* HALDEMAN, Stansbury, Explor. Salt. Lake, 1852, p. 368, ♂.

Eciton melshæmeri MAYR, Wien. Ent. Zeit., V, 1886, p. 33, ♂; DALLA TORRE, Catalog. Hymenopt., VII, 1893, p. 4, ♂; EMERY, Zool. Jahrb., Abth. f. Syst. VIII, 1894, p. 261, ♂; WHEELER, Amer. Natur., XXXV, 1901, p. 165, ♂.

Labidus melshæmeri CRESSON, Trans. Am. Ent. Soc., Suppl. Vol., 1887, p. 259.

Eciton melsheimeri FOREL, Biol. Centr. Am., Hymenopt., III, 1899-1900, p. 28, ♂.

Eciton (*Acamatus*) *melshæmeri* EMERY, Mem. Real. Accad. Ist. Bologna, 1900, p. 17, ♂.

Utah: Fort Gates (Haldeman).

Texas: Austin (Wheeler, Miss Holliday); Brownsville (C. Shaeffer); Plano (E. S. Tucker); Dallas (Boll).

Mexico: Paso de Telaya, Vera Cruz (C. H. T. Townsend).

This species is common at Austin about electric lights during the spring and summer months. It ranges as far south as Guatemala and Costa Rica.

31. **Eciton (Acamatus) minus** (*Cresson*).

(Pl. XXVI, Fig. 6.)

Labidus minor CRESSON, Trans. Am. Ent. Soc., IV, 1872, p. 195, ♂.

Eciton minor MAYR, Verh. zool. bot. Ges. Wien., XXXVI, 1886, p. 441, ♂.

Labidus minor CRESSON, Trans. Am. Ent. Soc., Suppl. Vol., 1887, p. 259, ♂.

Eciton minus DALLA TORRE, Catalog. Hymen., VII, 1893, p. 4, ♂; EMERY, Zool. Jahrb., Abth. f. Syst., VIII, 1894, p. 261, ♂; FOREL, Biol. Centr. Am., Hymen-

opt., III, 1899–1900, p. 29, ♂; EMERY, Mem. Real. Accad. Ist. Bologna, 1900, p. 17, ♂; WHEELER, Amer. Natur., XXXV, 1901, p. 165, ♂.

This small species seems to be much less abundant than the preceding. I have seen specimens from Texas collected by Belfrage but I have not taken it at Austin.

Subfamily MYRMICINÆ.

32. **Pseudomyrma flavidula** *F. Smith.*

Pseudomyrma flavidula F. SMITH, Catal. Hymen. Brit. Mus., VI, 1858, p. 157, No. 15, ☿; NORTON, Amer. Natur., II, 1868, p. 65, ☿; MAYR, Sitzb. Akad. Wiss. Wein, LXI, 1870, p. 408; EMERY, Bull. Soc. Ent. Ital., XXII, 1890, p. 79, t. 6, f. 4, ☿; DALLA TORRE, Catalog. Hymenopt., VII, 1893, p. 57; EMERY, Zool. Jahrb., Abth. f. Syst., VIII, 1894, p. 269, ☿; Boll. Mus. Zool. Anat. Comp. Torino, XI, 1896, p. 2 (extr.), ☿; FOREL, Trans. Ent. Soc. London, 1897, p. 300, ☿; Biol. Centr. Am., Hymenopt., III, 1899–1900, pp. 92, 93, ☿; Ann. Soc. Ent. Belg., XLIX, 1905, p. 158, ☿; WHEELER, Bull. Am. Mus. Nat. Hist., XXI, 1905, pp. 83–85, ☿ ♀ ♂.

Texas: Barksdale (Brown); New Braunfels and Austin (Wheeler).

This species, which is easily distinguished from *P. pallida* by the two black spots at the base of the gaster, is common throughout tropical America (West Indies, Florida, Central and South America). It nests in hollow stems, preferring in Texas the twigs of the hop-tree (*Ptelea trifoliata*). The northernmost limit of its range must be reached near Austin, where it is not at all common. The Texan specimens agree in all respects with specimens in my collection from Miami, Florida, Bahamas and Atoyac, Guadalajara and Colima in Mexico.

33. **Pseudomyrma pallida** *F. Smith.*

Pseudomyrma pallida F. SMITH, Trans. Ent. Soc. London (2), III, 1855, p. 159, No. 9, ☿; Catalog. Hymen. Brit. Mus., VI, 1858, p. 159, No. 21, ☿; DALLA TORRE, Catalog. Hymen., VI, 1893, p. 58, ☿; EMERY, Zool. Jahrb., Abth. f. Syst., VIII, 1894, p. 269, ☿; FOREL, Biol. Centr. Am., Hymen., III, 1899–1900, p. 92; EMERY, Bull. Soc. Ent. Ital., XXXVII, 1905, p. 119, ☿; FOREL, Ann. Soc. Ent. Belg., L, 1906, p. 231.

Worker. Length: 3.5–4 mm.

Head 1⅓ times as long as broad, as broad in front as behind, with feebly but broadly excised posterior margin and slightly convex sides. Clypeus notched on each side. Eyes half as long as the side of the head, the preocular region being half as long as the postocular. Antennal scape reaching only ⅓ the distance from its insertion to the occipital border of the head; first joint of funiculus nearly as long

as the three succeeding joints; joints 2–10 as broad as long, terminal joint somewhat longer. Thorax with distinct promesonotal and mesoëpinotal constrictions, metathoracic and epinotal stigmata equally prominent. Pronotum very feebly margined on the sides, mesonotum transversely elliptical, about ⅓ as long as the pronotum; epinotum about twice as long as the declivity, with which it forms a rounded obtuse angle. Petiole slender but hardly pedunculate at the base, nearly four times as long as broad, broadest behind the middle, slightly flattened above, rounded and not marginate on the sides. In profile the node is low and rounded, with gently ascending, barely concave anterior, and somewhat shorter, convex posterior slopes. Postpetiole pyriform, more than twice as broad as the petiole, as broad as long. Gaster and legs as usual, femora thickened.

Smooth and shining; mandibles, head and thorax very finely punctate, the punctures on the posterior portions of the head and lateral surface of the thorax somewhat more distinct.

Hairs yellow, erect, delicate and very sparse, mainly on the gaster and anterior parts of the head. Pubescence pale, almost imperceptible except on the gaster and petiole, where it is very short and does not obscure the shining surface.

Honey yellow; head and thorax sometimes slightly reddish; mandibular teeth, eyes and ocelli black.

Texas: Waco, New Braunfels, and Austin (Wheeler); Brownsville (C. Schaeffer).

Arizona: Huachuca Mountains (C. Schaeffer).

Mexico: Ojo del Cerro Chilicote, Chihuahua (C. H. T. Townsend).

Florida: Key West (Pergande).

The workers taken in Chihuahua are larger (5–5.5 mm.) than the Texan specimens, but it is probable that the species is depauperate in the latter locality, where it is by no means common. *P. pallida* is so similar to *flavidula* that some doubt may be entertained as to its specific rank. The two gastric spots of *flavidula* are sometimes very faint, and if entirely lacking this species would be hard to distinguish from *pallida*. Coloration is known to be highly variable in certain species of *Pseudomyrma*.

34. **Pseudomyrma brunnea** *F. Smith.*

Pseudomyrma brunnea F. Smith, Trans. Ent. Soc. London, 1877, pp. 63–64, ☿; Dalla Torre, Catalog. Hymen., VII, 1893, p. 56, ☿; Emery, Zool. Jahrb., Abth. f. Syst., VIII, 1896, p. 269, ☿; Forel, Biol. Centr. Am., Hymen., III, 1899–1900, p. 97, ☿.

Worker. Length: 2.5–3 mm.

Head nearly 1½ times as long as broad, as broad in front as behind, with straight posterior border and rounded posterior corners and slightly convex sides. Clypeus notched on each side. Eyes large, fully half as long as the head. Preocular less than half as long as the postocular border of the head. Antennal scape hardly reaching to a third of the distance between its insertion and the posterior corner of the head.

Basal funicular joint fully as long as the 3 succeeding joints taken together, joints 2–5 broader than long, succeeding joints as long as broad, terminal joint much longer than broad. Thorax with a well developed, depressed suture between the pro- and mesonotum and a deep, rather long impression between the meso- and epinotum. Mesonotum transverse, distinctly angular in front, less than $\frac{1}{3}$ as long as the pronotum which is bluntly marginate on the sides; epinotum large and prominent, its declivity as long as the basal surface which is convex and somewhat flattened in the middle; angle between the two surfaces much rounded. Petiole distinctly pedunculate, less than four times as long as wide, in profile with a gently rising, but not convex anterior slope, low rounded node, not marginate laterally, shorter convex posterior slope and straight lower surface, with a prominent tooth near the anterior end. Post petiole pyriform a little longer than broad, with a short but distinct anterior peduncle. Legs robust; femora incrassated.

Smooth and shining, finely punctate; thorax slightly opaque.

Hairs whitish, erect, exceedingly sparse, confined to the tip of the gaster and anterior portion of the head. Pubescence extremely short and inconspicuous.

Dark brown; mandibles yellow, with black teeth; clypeus, antennæ, prothorax, petiole, tibiæ and tarsi more or less yellowish or light brown; gaster black.

Female. (deälated) Length: 4 mm.

Very similar to the worker. Head somewhat longer, with more parallel sides. Mesonotum, scutellum and postpetiole yellowish like the pronotum and petiole. Epinotum short, convex and rounded, subopaque.

Texas: New Braunfels and Waco (Wheeler); Esperanza Ranch, Brownsville (C. Schaeffer).

The types of this species are from Mexico. It is known to occur also in tropical Florida.

35. **Pseudomyrma gracilis** *Fabr.* var. **mexicana** *Roger.*

Pseudomyrma mexicana Roger, Berl. Ent. Zeitschr., VII, 1863, p. 178, No. 67, ☿.
Pseudomyrma gracilis var. *mexicana* Emery, Bull. Soc. Ent. Ital., XXII, 1890, p. 60, t. 5, f. 16, ☿; Dalla Torre, Catalog. Hymen., VII, p. 57; Forel, Biol. Centr. Am., Hymen., III, 1899–1900, p. 91.

Two workers and a winged female taken by Mr. C. Schaeffer on the Esperanza Ranch at Brownsville, Texas, may be assigned to this variety, although they are all very small, the workers measuring only 6 mm., the female 9 mm. *P. gracilis* is notoriously variable in coloration, but in this character the Brownsville specimens are very similar to the typical *mexicana.*

36. **Myrmecina graminicola americana** *Emery.*

Myrmecina latreillei subsp. *americana* Emery, Zool. Jahrb., Abth. f. Syst., VIII, 1894, p. 271, ☿; Wheeler, Bull. Am. Mus. Nat. Hist., XXI, 1905, p. 376, ☿.

A single worker measuring 2.6 mm. taken on the banks of the Comal River at New Braunfels, Texas, and a male from Plano (E. S. Tucker) agree very closely with specimens from New York and Connecticut. In the worker the epinotal spines are moderately large and have strongly upturned, rather blunt tips. The teeth at the base of the epinotum are very prominent and acute. As Emery has shown, the North American differ from the European forms of *graminicola* in lacking a distinct median keel on the clypeus and in having blunter clypeal teeth. The teeth on the base of the epinotum and the epinotal spines are highly variable in our forms, as I find from an examination of specimens from numerous nests and localities.

37. **Myrmecina graminicola americana** var. **brevispinosa** Emery.

Myrmecina latreillei subsp. *americana* var. *brevispinosa* Emery, Zool. Jahrb., Abth. f. Syst., VIII, 1894, p. 271, ☿ ♀ ♂; Wheeler, Bull. Am. Mus. Nat. Hist., XXII, 1906, p. 335, 336, ☿.

Several workers from Austin Texas and Indian Garden, Grand Cañon, Arizona have short, nearly straight, acute epinotal spines, hardly longer than broad at the base, and of a yellowish or brownish color.

38. **Myrmecina graminicola texana** subsp. nov.

Several workers collected in Shoal Creek, Austin, Texas have all but the middle and posterior portion of the first gastric segment somewhat opaque and finely granular or shagreened. The epinotal spines are nearly as long as those of the typical *americana* and sharply turned up at their rather blunt tips. The teeth on the base of the epinotum are very prominent, acute and turned forward. The clypeal teeth are blunt and rounded, the clypeal carinæ obsolete. Length, 2–2.9 mm.

39. **Monomorium pharaonis** (*L.*)

Monomorium pharaonis Dalla Torre, Catalog. Hymen., VII, 1893, p. 68, ☿ ♀ ♂; Emery, Zool. Jahrb., Abth. f. Syst., VIII, 1894, p. 275; Forel, Biol. Centr. Am. Hymen., III, 1899–1900, p. 78; Wheeler, Bull. Am. Mus. Nat. Hist., XXI, 1905, pp. 376, 377.

Texas: Austin and Galveston (Wheeler).

This Old World ant is rare and sporadic in houses in Texas but whether this is due to recent importation or to the difficulty of establishing itself

where there are so many other species of Formicidæ, I have not been able to determine.

40. **Monomorium minutum** *Mayr.* var. **minimum** (*Buckley*).

Myrmica minima BUCKLEY, Proc. Ent. Soc. Phila., 1866, p. 338, ☿; DALLA TORRE, Catalog. Hymen., VII, 1893, p. 112, ☿ ♀.

Myrmica atra BUCKLEY, *ibid.*, p. 342, ♀.

Monomorium minutum var. *minimum* EMERY, Zool. Jahrb., Abth. f. Syst., VIII, 1894, p. 274, 275, ☿ ♀ ♂; WHEELER, Bull. Am. Mus. Nat. Hist., XXI, 1905, p. 377; *ibid.*, XXII, 1906, p. 336.

Texas: Austin and Limpio Cañon, Fort Davis (Wheeler); Paris (Miss Augusta Rucker); Plano (E. S. Tucker).

New Mexico: Las Valles, 5,900 ft. (Miss Mary Cooper); Las Vegas Hot Springs, 7,000 ft. (T. D. A. Cockerell).

Arizona: Prescott and Grand Cañon (Wheeler).

Nevada: King's Cañon, Ormsby County (C. F. Baker).

Colorado: Colorado Springs and Buena Vista (Wheeler).

Mexico: Guadalajara (J. F. McClendon).

This tiny black species is easily distinguished from the closely allied *M. carbonarium* F. Smith by the shape of the epinotum and petiole. In *minimum* the epinotum is rounded, without a distinct angle between the basal surface and declivity, and the petiole is only slightly compressed antero-posteriorly, whereas in *carbonarium* and its subspecies *ebeninum* Forel the epinotum is somewhat cuboidal and is distinctly angular in profile, and the petiole is strongly compressed anteroposteriorly, with the upper border of the node transverse and even slightly concave in the middle. The females of the typical *minimum* are always winged, so far as I have observed, whereas the subspecies *ergatogyna* Wheeler from Catalina and California and *C. carbonarium* have ergatomorphic females. Moreover, according to my observations, *M. minutum* always nests in the ground in small crater nests or under stones, whereas *carbonarium* nests in twigs, Tillandsias and other vegetable cavities.

41. **Erebomyrma longi** *Wheeler.*

Erebomyrma longi WHEELER, Biol. Bull., IV, 1903, pp. 140–144, ☿ ♀ ♂.

Texas: Denton (W. H. Long).

This singular species is probably cleptobiotic in the nests of termites. Emery has recently described a second species of the genus (*E. peruviana*) from Marcapata, Peru. (Bull. Soc. Ent. Ital. XXXVII, 1905, p. 139 *nota.*)

42. **Solenopsis geminata** (*Fabricius*).

Solenopsis geminata Dalla Torre, Catalog. Hymen., VII, 1893, p. 76, 77; Emery, Zool. Jahrb., Abth. f. Syst., VIII, 1894, pp. 276, 277; Forel, Biol. Centr. Am., Hymen., III, 1899-1900, pp. 79, 80; Fenner, Ent. News, VI, 1895, p. 216.
Solenopsis xyloni McCook, Comstock's Rep. on Cotton Insects, 1879, p. 188, f. 37, 38.

Texas: Austin, New Braunfels, Fort Davis (Wheeler).

Arizona: Phoenix (Wheeler); Tucson (Fenner).

According to Forel: the American form of this well-known tropicopolitan "fire-ant" or "hormiga brava" is black or brownish, with the head of the worker maxima reddish. "This is the form described by Fabricius. The form of tropical Asia (*S. geminata* F. r. *rufa* Jerdon) is a different race [subspecies], which has between the mesosternum and the prosternum on each side, a tooth directed downward and backward. The node of the petiole is also thicker, and the color is always a reddish yellow or orange, with only the posterior half of the gaster brown. This race alone is cosmopolitan and has been transported to the Antilles (and to Mexico, Durango) while the true (dark colored) *geminata* is confined to tropical America."

Among the American forms two subspecies have been distinguished, *gayi* Spinola of Chile and *pylades* Forel of Mexico. The latter is based on a female specimen and probably represents a very distinct species near *S. mælleri* of Brazil. After examining a great number of nests of this abundant ant in the southwestern states, Mexico and the West Indies I have concluded that at least three distinctly marked varieties should be recognized in these regions. One is the typical dark form and seems to have been the one which McCook called *xyloni*. His description is exceedingly brief and the female which he says is "uniform amber color" must have been immature. This typical form is the most abundant and widely distributed, making its nests in open, sunny places, by preference in dark or black soil. The nests are straggling, irregular craters with several, often confluent openings. The ants store seeds and are at the same time highly carnivorous. The worker maxima of this form does not exceed 5 mm.; the female measures 6–7 mm., the male 5–5.3 mm. The worker is dark brown or even black, with the whole head or often only its anterior portion, the legs, antennæ, and articulations of the petiole, red or yellow. The male is black with yellow mandibles, antennæ, legs and thoracic sutures and a dark median and two parapsidal spots on the thorax.

43. **Solenopsis geminata** var. **diabola** var. nov.

Texas: Montopolis, Austin, Lampasas, Langtry (Wheeler); Paris

(Miss Augusta Rucker); Dallas (W. D. Hunter); Granite Mountain (W. H. Long); Plano (E. S. Tucker).

Arizona: Tempe (Wheeler).

California: Needles (Wheeler).

This variety resembles the oriental subspecies *rufa* in color, but there is no mesosternal spine. The worker maxima is 6.5–7.5 mm. in length, the female 7–8 mm., the male 5.5–6 mm. The worker is a rich orange red with the mandibles and more or less of the posterior portion of the gaster black. In the female each gastric segment has a broad, dark brown band across its posterior portion, and there are anteromedian and parapsidal brown blotches on the thorax. The male is black, with a dark brown thorax and pale yellow thoracic sutures, mandibles, antennæ and legs. The scutellum and metanotum are much darker than the remainder of the thorax. In both the female and worker the scattered punctures on the head are much smaller than in the typical *geminata*. The types are from Montopolis near Austin, Texas. It seems to occur only in sand, or in very sandy soil especially on the banks of rivers and creeks. The specimens taken at Needles, California, and Tempe, Arizona, in the sands on the banks of the Gila and Colorado Rivers, are smaller and paler in coloration (maxima 3.5–4 mm.; female 6.5–7 mm.; male 5 mm.) and form a transition to the following variety:

44. **Solenopsis geminata** var. **aurea** *Wheeler.*

WHEELER, Bull. Mus. Nat. Hist., XXII, 1906, p. 336, ☿ ♀ ♂.

Texas: Austin, Fort Davis, Terlingua (Wheeler); Huntsville (Miss Anna Pritchett).

New Mexico: Alamogordo (H. Viereck).

Arizona: Grand Cañon, Yucca (Wheeler).

Mexico: Guadalajara (J. F. McClendon).

This variety is decidedly smaller than the typical form (worker 2–3.5 mm.; female 5–5.5 mm., male 5 mm.). The worker and female are deep yellow with brown margins to the gastric segments, the head is very smooth and shining, with very small punctures. The clypeal teeth are small and acute and there is no mesosternal tooth. Thorax of male dark brown or black. A female and four workers from the mountains near Claremont, California (C. F. Baker) seem to represent a transition from this variety to the typical form. They have the whole of the gaster black. The female is very small (less than 5 mm.) and has the upper surface of the head, thorax and pedicel brown. *S. aurea* inhabits dry, stony situations and does not

build open crater nests, but so far as I have observed, always lives under large stones. It appears to be nocturnal or hypogæic, unlike the typical *geminata,* which is found abroad at all hours of the days.

45. **Solenopsis pilosula** sp. nov.

(Pl. XXVI, Figs. 26 and 27.)

Worker, Length· 2–2.7 mm.

Head rectangular, distinctly longer than broad, with straight posterior margin and parallel sides. Clypeus short, broadly rounded, with four small, acute, subequal teeth, the mesial pair of which are slightly further apart than the outer and mesial tooth on each side. Mandibles with oblique, 4-toothed blades. Eyes minute, with less than 5 facets in their transverse diameter, situated $\frac{1}{4}$ the distance from the anterior to the posterior corner of the head. Antennæ slender, tip of scape reaching half way between the eye and the posterior corner of the head. Club about the same length as the remainder of the funiculus, its basal $\frac{1}{3}$ the length of its terminal joint, remaining portion of funiculus very slender, first joint as long as the 4 succeeding joints together, joints 2–7 decidedly broader than long. Prothorax $\frac{2}{3}$ as broad as the head, with rounded humeri and flattened dorsal surface. Epinotum half as long as the pronotum and as broad as long; in profile its basal surface is flat above and except for the pronounced mesoëpinotal suture, continuous in outline with the pro- and mesonotum; more angular on the sides, concave in the middle; declivity abrupt, hardly half as long as the basal surface. Petiolar node as broad as the epinotum, transversely elliptical from above, twice as broad as long; in profile as high as the front of the epinotum, thick and rounded, with short concave anterior slope and abrupt posterior slope, and a distinct anteroventral tooth. Postpetiole slightly narrower than the petiole, subglobular, somewhat broader than long; in profile much lower than the petiole, with small but distinct anteroventral tooth; node rounded, rising abruptly in front and more sloping behind. Gaster larger than the head, broadly excised in front, flattened dorsoventrally. Legs slender, femora but little thickened.

Smooth and shining, mandibles striato-punctate, body covered with evenly distributed punctures which are coarsest and most conspicuous on the upper surface of the head, finest on the gaster.

Body and appendages covered with fine, rather dense, erect, yellow hairs which are long on the gaster and pedicel and distinctly shorter on the other portions of the body.

Deep yellow; mandibular teeth black; border of clypeus brown; legs and antennæ somewhat paler than the body.

Male. Length: 4.25–4.5 mm.

Head small, excluding the eyes about as broad as long, cheeks very short, postocular region rounded and convex. Eyes projecting, elliptical. Clypeus with a large, rounded tubercular convexity in the middle and straight transverse anterior border. Mandibles pointed, with very oblique, obscurely dentate blades. Antennæ short; first and second joints incrassated, remaining joints slender; first

joint about twice as long as the second, which is subglobular but distinctly longer than broad; joints 3 and 4, especially the latter, very slender, subequal, longer than broad, remaining joints increasing somewhat in length distally. Thorax large and robust; epinotum rounded with subequal base and declivity; the former sloping, the latter abrupt. Petiole from above a little longer than broad, with the sides bluntly angular in the middle; in profile the node is very angular, with long concave anterior and somewhat shorter and more abruptly concave posterior slope. Seen from behind the node is distinctly notched in the middle. Postpetiole much broader than the petiole and fully $1\frac{1}{2}$ times as broad as long, with the sides more angular in the middle than those of the petiole.

Smooth and shining; ocellar area of head opaque, granular; regions between the antennæ and eyes finely striated. Mesonotum and scutellum coarsely and sparsely punctate. Epinotum and pedicel indistinctly punctate-rugulose. Gaster glabrous.

Pilosity white, similar to that of the worker but much sparser.

Body deep black. Mandibles and antennal scapes and venter dark piceous brown, funiculi, legs and genitalia sordid yellow, femora more or less infuscated. Wings whitish hyaline, with very pale yellow veins and stigma.

Described from several workers and males taken at Alice, Texas, July 16, while the colony was coming to the surface from a small indistinct crater, to celebrate its nuptial flight.

This species is certainly different from any of the described North American forms and I can find nothing like it among the long series of Emery's South American species of many of which I possess cotypes through the kindness of Professor Emery and Dr. Silvestri. In Emery's table the new species goes down to *S. wasmanni* but it certainly differs in its smaller size, lighter color, pilosity and sculpture and last, but not least, in having monomorphic workers.

46. **Solenopsis salina** sp. nov.

(Pl. XXVI, Figs 24 and 25.)

Worker. Length: 1.8–2 mm.

Head rectangular, distinctly longer than broad, with straight posterior border and very slightly convex, parallel sides. Clypeus short, not produced in the middle, its carinæ rather feeble, median teeth acute and turned outward, lateral teeth much broader, shorter and blunter. Mandibles with oblique 4-toothed blades. Antennæ rather long, tip of scape extending to half the distance between the eye and the posterior corner of the head; club as long as the remainder of the funiculus, of rather uniform diameter throughout, basal less than $\frac{1}{3}$ as long as the terminal joint; first joint of funiculus about as long as joints 2–4; joints 2–7 slender, about as long as broad. Eyes rather small, with only 3–4 facets in their longitudinal diameter, situated fully $\frac{1}{3}$ the distance from the anterior to the posterior corner of the head. Pro- and mesonotum about half as broad as the head, longer than

broad, rather convex, mesoëpinotal suture pronounced; epinotum small and narrow above, broader and more rounded below, as long as broad, in profile rounded, without a distinct angle between the base and declivity, which are of about equal length. Petiole from above narrower than the epinotum, pedunculate in front and subglobular behind. In profile it has a thick and rounded node with a long, concave anterior slope and a pronounced anteroventral tooth. Postpetiole as broad as the petiole, globular, about as long as broad, in profile but little lower than the petiole, with slope slanting downward and backward, and a minute but distinct anteroventral tooth. Gaster a little larger than the head, with very faint excision in its anterior border. Legs moderately stout, femora but little thickened.

Smooth and shining, upper surface of head, especially in front and on the sides, with scattered rather coarse punctures; punctures on the remainder of the body very small.

Body and appendages covered with rather abundant, erect, coarse, white hairs.

Deep yellow; teeth of mandibles and anterior border of clypeus dark brown.

Described from a number of workers taken from a single colony at Fort Davis, Texas. The ants were running in a dense file on the dry ground, apparently in the act of moving to a new nest. A great many specimens of the same species were sent me by Mr. C. H. T. Townsend who took them on the Santo Domingo Ranch at the Ojos del Diablo, Chihuahua, Mexico. According to a note accompanying the specimens they were found in a nest "under a large stone in grass encrusted with the saline deposit from the water of hot springs."

S. salina resembles the preceding species but differs in its smaller size, more rounded epinotum, the shape of the clypeal teeth, porportionally larger eyes, smaller cephalic punctures and larger antennal scapes.

47. **Solenopsis krockowi** sp. nov.

(Pl. XXVI, Figs. 28 and 29.)

Worker. Length: 2.25–2.5 mm.

Head rectangular, longer than broad, with straight posterior and slightly convex lateral margins. Eyes with about 4 facets in their longitudinal diameter, situated $\frac{1}{3}$ the distance from the anterior to the posterior corners of the head. Mandibles with oblique, 4-toothed blades. Clypeus short, not projecting, with two very small, acute median teeth and shorter and less acute lateral teeth. Antennæ slender, scapes slightly thickened towards their tips which reach half way between the eyes and the posterior corners of the head. Club slender, as long as the remainder of the funiculus, its basal about half as long as its apical joint. First funicular joint as long as the three succeeding joints together; joints 2–7 slender, as long as broad. Thorax slender, prothorax a little more than half as broad as the head, about $1\frac{2}{5}$ as long as broad through its broadest portion, very round and convex in front; with pronounced mesoëpinotal constriction. Epinotum small, distinctly longer than broad, with rather flattened basal and declivous surfaces of about equal length and

meeting at a rounded obtuse angle. Petiolar and postpetiolar nodes seen from above of the same breadth and of similar transversely elliptical shape, although the former is twice as broad as long, the latter nearly as long as broad. In profile the petiolar node is higher than the postpetiole, with short concave anterior slope, rounded summit and abrupt, straight posterior slope. The antero-ventral tooth is compressed and very blunt. The postpetiole in profile has its anterior surface inclined backward and downward and has a minute anteromedian tooth. Gaster larger than the head, with rather prominent anterior corners and slightly concave anterior margin. Legs rather slender.

Smooth and shining, head sparsely punctate.

Hairs yellow, erect, moderately long and abundant on the body and appendages.

Yellow throughout, with black mandibular teeth.

Female. Length: 7–7.25 mm.

Body long and slender, head, including the eyes, nearly as broad as the thorax through the wing insertions; excluding the mandibles, nearly as long as broad, somewhat narrowed anteriorly, with straight posterior border. Mandibles and clypeal teeth similar to those of the worker. Antennæ slender, scape reaching to the posterior corner of the eye; club similar to that of the worker but shorter than the remainder of the funiculus, all the joints of which are distinctly longer than broad. Thorax more than twice as long as broad, elongate elliptical, mesonotum flattened above, epinotum steep, rounded, without distinct basal and declivous surfaces. Petiole nearly 1½ times as long as broad, with a thick, transverse node, with its upper margin distinctly impressed in the middle; ventromedial tooth compressed and blunt. Postpetiole slightly broader than the petiole, with a faintly concave anterior and convex posterior surface; seen from behind it is somewhat flattened above. Gaster elongate, oblong, with straight anterior margin, somewhat flattened dorsoventrally. Wings long. The venation of the fore wing is peculiar in having the inner branch of the cubital connected with the outer branch by a distinct transverse vein and in having a small portion of the inner branch extending proximally from the transverse vein and thus representing the distal portion of a second cubital cell.

Smooth and shining, mandibles more opaque, striato-punctate. Head, thorax and gaster punctate, the first very coarsely and rather densely, the last very finely and sparsely, the thorax and scutellum with punctures of intermediate size but lacking in a broad median dorsal streak which is very glabrous. Petiole and postpetiole somewhat punctate on their upper surfaces.

Hairs yellow, erect, denser and relatively shorter on the head and thorax.

Head and thorax rich chestnut brown; mandibles, anterior portion of head and ventral portion of thorax more yellowish. Gaster deep yellow, first segment chestnut brown above with the exception of the anterior and posterior border, the succeeding segments each with a narrow transverse chestnut band near the posterior margin. Antennæ and legs deep yellow. Wings hyaline, with yellow veins and a large brown stigma.

Described from several females and numerous workers taken by Mr. Gneomar von Krockow under a stone in Box Cañon, Sacramento Mountains, New Mexico, July 6, 1906.

The worker of this species is very similar to that of *S. pilosula*, but differs in its rich yellow color, its larger eyes, smaller clypeal teeth, shorter petiolar

node and smaller cephalic punctures. From *salina* it differs in its larger size, purer yellow color, and more gibbous pronotum.

48. **Solenopsis molesta** (*Say*).

Myrmica molesta SAY, Bost. Soc. Journ. Nat. Hist., I, 3, 1836, p. 293, No. 6, ♀; LECONTE, Writ. of Th. Say., Entomol., II, 1859, p. 737, No. 6, ♀.
Myrmica minuta SAY, Bost. Soc. Journ. Nat. Hist., I, 1836, p. 294, No. 7, ☿; SMITH, Catalog. Hymen. Brit. Mus., VI, 1853, p. 129, No. 61, ☿.
Myrmica exigua BUCKLEY, Proc. Entom. Soc. Phila., 1866, p. 342, ☿ ♀.
Solenopsis debilis MAYR, Verh. zoöl. bot. Ges. Wien, XXXVI, 1886, p. 461, ☿ ♀ ♂; DALLA TORRE, Catalog. Hymen., VII, 1893, p. 75, ☿.
Solenopsis molesta EMERY, Zool. Jahrb., Abth. f. Syst., VIII, 1894, pp. 277, 278; WHEELER, Bull. Am. Mus. Nat. Hist., XXI, 1905, pp. 277–378.

New Mexico: Las Valles; Las Vegas (T. D. A. Cockerell).

Mayr mentions specimens of this common northern species from "Texas" as being in the Museum of Stockholm. I have never found it in southwestern or central Texas where its place is taken by *S. texana*. It probably occurs, however, in the north eastern portion of the State.

49. **Solenopsis molesta** var. **validiuscula** *Emery*.

EMERY, Zool. Jahrb., Abth. f. Syst., VIII, 1894, p. 278, ☿.

According to Emery the worker of this variety differs from that of the common form of the species in the Northeastern States by its larger size, darker color and more distinct lateral teeth on the clypeus. Without an examination of the types, however, it is not easy to fix on the exact western form that should bear this name. Specimens sent me from Manzanares, by Miss Mary Cooper and from San Ignacio and Las Valles (5900 ft.) New Mexico, by T. D. A. Cockerell, are but little larger than the typical *molesta* and decidedly darker. At Woodland Park, Colorado (8500 ft.), I have taken a still larger and darker form, the workers of which measure fully 2 mm. and are of a rich chestnut color, with brownish yellow mandibles, legs and antennæ. This may be called var. *castanea* var. nov. It grades into the variety *validiuscula* through smaller and paler forms which I have taken at Manitou and Colorado Springs, Colorado. A cotype of *S. texana* var. *truncorum* Forel, in my collection is very similar to *castanea* but has a paler thorax.

50. **Solenopsis texana** *Emery*.

Solenopsis pollux var. *texana* EMERY, Zool. Jahrb., Abth. f. Syst., VIII, 1894, p. 278, ☿.

Solenopsis texana FOREL, Soc. Ent. Belg., XLV, 1901, p. 345, ☿ ♀ ♂.

Texas: Austin, June 25; Belton; McNeil; Henrietta (Wheeler).

Forel has described two subspecies of *texana*, *carolinensis* and *truncorum*, from North Carolina and I have described one (*catalinæ*) from the island of Santa Catalina, Cala. Examination of a cotype specimen sent me by Professor Emery and many workers taken from the above mentioned localities in Texas, convinces me that *texana* is very closely allied to *molesta*. It is somewhat smaller (1–1.2 mm.), of a paler yellow color, has a slightly more rounded epinotum and more nearly equal petiole and postpetiole, but I can detect no other differences of importance. The female measures 3.8 mm., has a brown head and the remainder of the body yellow. The male measures 3.5 mm. and is a deep black, with the appendages, wing veins and venter sordid yellowish. The female of the typical *molesta* is longer (5 mm.) and darker, the male of about the same size, with the head and thorax dark brown and the gaster pale.

51. **Pheidole kingi instabilis** *Emery.*

Pheidole kingi ERN. ANDRÉ subsp. *instabilis* EMERY, Bull. Soc. Ent. France, 1901, pp. 120, 121, ☿ ☿; WHEELER. Bull. Amer. Mus. Nat. Hist., XXIII, 1907, pp. 2–4, pl. i and v, figs. 1–9, 63.

Pheidole kingi var. *instabilis* FOREL, Ann. Soc. Ent. Belg., XLV, 1901, p. 130, ☿ ☿; WHEELER, *ibid.*, p. 203, ☿ ☿.

Soldier. Length: 4.5–5 mm.

Head very large (2 mm. long), oblong, nearly 1½ times as long as broad, with straight, parallel sides, broadly and angularly excised posterior margin and a broad, deep groove extending forward from the occiput, nearly to the frontal area. Posterior corners angular. Eyes small, less than ½ the distance from the anterior to the posterior corners of the head. Mandibles convex, with two large, blunt apical teeth. Clypeus broad and short, without a median carina, but with a large median notch in the anterior border. Frontal area distinct, subtriangular, without a median carinula. Frontal carinæ short and small. Antennæ very short and slender, the tip of the scape reaching only to the eye; all the joints of the funiculus longer than broad; club shorter than the remainder of the funiculus. Pronotum less than half as broad as the head, convex above, with rounded but distinct humeri. Promesonotal suture distinct. Mesonotum rather angular and convex behind, but without a distinct torulus. Epinotum short, with subequal base and declivity, concave in the middle between the spines, which are acute, about as long as broad and twice as far apart as broad at their bases, directed upwards. Petiole twice as long as broad, violin-shaped, hardly broader behind than in front, with concave sides. Node compressed antero-posteriorly, with horizontal and rather thin upper border. There is no anteroventral tooth. Postpetiole hardly twice as broad as the petiolar node, fully twice as broad as long. Gaster circular or broadly elliptical, much smaller than the head, flattened dorso-ventrally.

Mandibles and clypeus shining, the former coarsely and sparsely punctate, the latter longitudinally rugose, especially on the sides. Head subopaque, or glossy; somewhat more shining in the middle, sculptured throughout, the cheeks and front being rather finely longitudinally rugose, the posterior half transversely rugose and punctate, the rugæ becoming coarser on the posterior corners. Thorax subopaque, more shining on the pro- and mesonotum, finely and irregularly striate or rugose; the striæ being more distinct on the pro- and mesonotum, the punctures on the side; epinotum punctate. Petiole and postpetiole subopaque, with shining nodes. Gaster smooth and shining, with scattered piligerous punctures.

Hairs yellow, erect, moderately long and abundant on the body, legs and antennal scapes.

Head rich ferruginous red; borders of mandibles and anterior border of clypeus broadly blackened. Thorax, petiole, postpetiole, legs and antennæ more piceous brown, with yellow joints and sutures. Gaster black or dark brown.

Worker. Length: 1.5–1.8 mm.

Head, excluding the mandibles a little longer than broad, rectangular, with distinctly excised posterior border. Mandibles with two acute apical and several smaller basal teeth. Clypeus rather flat, with a distinct median excision in the anterior border. Frontal area distinct, subelliptical. Frontal carinæ small. Eyes just in front of the middle of the head. Antennæ resembling those of the soldier but with proportionally shorter clubs and the scape extending a little beyond the posterior corners of the head. Thorax in profile much flatter dorsally than the soldier's, especially in the promesonotal region, and the epinotal spines very minute, in some specimens almost obsolete. Petiole fully three times as long as broad, somewhat broader behind than in front where it is pedunculate; node small and rounded; postpetiole a little broader than the node of the petiole, about as broad as long, subglobular. Gaster about as large as the head. Legs rather long.

Smooth and shining; mandibles subopaque, striated; cheeks longitudinally rugose. Mesopleuræ and epinotum evenly punctate.

Hairs yellow, suberect, very sparse on the head, thorax and gaster, more abundant and shorter on the antennal scapes and legs.

Dark brown or piceous, head and gaster often somewhat darker than the thorax and pedicel; mandibles, legs and antennæ sordid yellowish or brownish yellow. In many specimens the greater portion of the femora and tibæ is dark brown.

Intermediates. Length: 2–4 mm.

These combine the characters of the soldier and worker in varying degrees according to their size. In the largest individuals the head is proportionally smaller than that of the soldier, with the longitudinal rugæ on the anterior half of the head, but only the sparse punctures of the soldier on the posterior half, so that this region is shining. The head grows proportionally shorter, smoother and darker in color and the antennæ longer, as we pass down the series to the forms most like the worker and differing from it only in having somewhat larger heads, with the longitudinal rugæ confined to the anterior third, and very small scattered punctures on the posterior portion. At the same time the mandibles become less convex and more acute, the occipital furrow more shallow without disappearing completely, the striæ become obsolete on the promesonotum, the epinotal spines become smaller and the petiole and postpetiole come to resemble those of the typical worker.

52. **Pheidole pilifera coloradensis** *Emery.*

Pheidole pilifera (ROGER) var. *coloradensis* EMERY, Zool. Jahrb., Abth. f. Syst., VIII, 1893, pp. 290, 291, ♀ ☿.

Soldier. Length: 4–4.5 mm.

Allied to *Ph. pilifera.* Head large, excluding mandibles a little longer than broad, with parallel sides, rounded posterior corners, deeply excised posterior border and pronounced vertical groove which is continued forward to the frontal area. Mandibles convex, with two apical, two small basal and a few irregular intermediate teeth. Clypeus short, with a median carina, and very faintly and sinuately excised anterior margin. Frontal area subtriangular, moderately impressed, with a median carinula. Eyes rather large, about ¼ the distance from the anterior to the posterior corner of the head. Frontal carinæ very short, each continued as a ridge mesially bounding a distinct depression as long as the antennal scape. Antennæ slender; scapes reaching a little behind the posterior borders of the eyes; club somewhat shorter than the remainder of the funiculus, joints 2–8, about as long as broad. Thorax in front about half as broad as the head, with distinct humeral callosities. Promesonotum without a transverse constriction; convex and somewhat angular behind. Mesoëpinotal constriction pronounced. Base and declivity of epinotum of about equal length, concave between the spines which are robust, erect and blunt at their tips, somewhat more than half as long as the basal surface and further apart than long. Petiole from above nearly square, with abrupt, anteroposteriorly compressed and deeply notched node; in profile without a median ventral tooth. Postpetiole more than twice as broad as the petiole and fully three times as broad as long, with prominent lateral conules which are convex anteriorly and concave posteriorly. Gaster elliptical, smaller than the head. Legs rather long.

Mandibles shining, coarsely punctate, at the base longitudinally rugose. Clypeus irregularly rugose throughout. Head subopaque, more shining on the posterior half. Cheeks and anterior half of upper surface longitudinally punctate-rugose; smoother behind, with large elongate foveolæ scattered over the surface, and finely granular along the groove to the occiput. Thorax subopaque, middle of promesonotum and epinotum narrowly shining. Surface of former rugulose-punctate, latter densely punctate. Petiole subopaque, finely granular on the sides. Postpetiole shining above. Gaster smooth and shining.

Hairs dark yellow, erect or suberect, rather short and moderately abundant, covering the surface of the body, legs and antennal scapes.

Dark brown; mandibles legs and anterior fourth of head reddish yellow. Border of mandibles and anterior border of clypeus black. Antennæ, posterior portion of head and sides of thorax light brown, clubs of antennæ infuscated. Posterior edges of gastric segments yellowish.

Worker. Length: 2–2.3 mm.

Head, excluding mandibles, as broad as long, with straight posterior border. Eyes nearly as large as those of the soldier, a little in front of the middle of the head. Clypeus with broadly rounded, entire anterior border. Antennæ slender; scape extending nearly three times its apical diameter beyond the posterior corners of the head. Thorax resembling that of the soldier but humeri less pronounced and epinotal spines more slender. Petiole from above oblong, fully twice as long as broad, as

broad in front as behind, with slightly concave sides; node similar to that of the soldier. Postpetiole about twice as broad as the petiole, somewhat broader than long, with the sides rather sharply angled in the middle. Gaster somewhat smaller than the head.

Head, thorax and petiole opaque, densely punctate; mandibles and cheeks longitudinally striated. Posterior portion of the clypeus, frontal area, postpetiole and gaster smooth and shining.

Hairs whitish; very sparse, suberect on head and body; short and appressed on the legs and antennal scapes.

Dark brown, head darker, often black; mandibles, clypeus, cheeks, legs and antennæ much paler.

Female. Length: 6–6.5 mm.

Head, excluding the mandibles, slightly broader than long, a little broader behind than in front, with very faintly and broadly excised posterior margin. Mandibles, clypeus and antennæ similar to those of the soldier. Tip of scape reaching to half the distance between the eye and the posterior corner of the head. Thorax robust, through the wing insertions as broad as the head. Mesonotum and scutellum flattened. Epinotum like that of the soldier, spines very robust, obtuse, more than twice as far apart as long, directed backward and upward. Petiole similar to that of the soldier but with very acute tooth-like anterior corners and slightly concave sides. Postpetiole nearly three times as broad as the petiole and three times as broad as long, with the sides prolonged into long, rather blunt conules which are convex anteriorly and slightly concave posteriorly. Gaster oblong elliptical, about the size of the thorax.

Mandibles shining, coarsely punctate and towards the base striate; clypeus and head subopaque, the former irregularly rugose, the latter rather coarsely and longitudinally rugose, with punctate interrugal spaces and depressions for the antennæ. Mesonotum and scutellum coarsely and sparsely punctate, the former with fine longitudinal striæ on its posterior half. Epinotum subopaque, punctate-rugulose on the sides and with coarse transverse rugæ between the spines. Petiole and postpetiole subopaque, the former finely, the latter more coarsely punctate. Gaster shining, very finely shagreened.

Hairs yellow, abundant, suberect, more appressed on the gaster and dorsal portion of thorax.

Very dark brown, almost black; mandibles, clypeus, anterior third of head, legs and antennæ, except their clubs, yellowish brown. Wings yellowish hyaline, with yellow veins and stigma.

Male. Length: 4–4.3 mm.

Head, excluding the mandibles, about as broad as long, rounded and prominent behind, with very short cheeks. Mandibles small, tridentate. Clypeus convex, with entire anterior border. Antennal scape distinctly shorter than the two first funicular joints together, first funicular joint elliptical, distinctly longer than broad, but broader than the succeeding subequal and cylindrical joints. Thorax decidedly broader than the head through the eyes, long and flattened above. Epinotum with evenly convex basal surface as long as the nearly vertical declivity; spines minute, about as long as broad at their bases and very acute. Petiole from above oblong, with a conical rounded node; postpetiole about twice as broad as the petiole and

nearly twice as broad as long, with rather acutely angled sides. Gaster and legs as usual.

Mandibles and clypeus subopaque, the former minutely striate; head subopaque, rather coarsely longitudinally punctate-rugose in front of the ocelli, transversely rugose between the paired ocelli. Thorax subopaque. Mesonotum finely and longitudinally striated but smooth and shining in the middle and on each parapsis. Mesopleuræ with similar sculpture but smooth and shining below. Scutellum very coarsely punctate. Epinotum granulate-rugose, the rugæ being regularly transverse on the declivity but indistinct and more irregular on the sides. Gaster smooth and shining.

Hairs sordid white, short, suberect and rather abundant, especially on the head and thorax; conspicuous on the legs, but short and delicate on the antennæ.

Black or dark brown; mandibles, antennæ, legs, wing insertions, posterior edges of gastric segments and genitalia sordid yellow. Wings like those of the female.

Colorado: West Cliff, Boulder and Pueblo (P. J. Schmitt); Colorado Springs and Buena Vista (Wheeler).

New Mexico: Pecos, Old Pecos Pueblo and Las Vegas (T. D. A. Cockerell).

The specimens from New Mexico differ from the typical form in having the occipital region of the head finely and transversely rugose, and may be regarded as representing a distinct variety, *neomexicana* var. nov.

Ph. coloradensis was regarded by Emery as merely a variety of the eastern *pilifera*, but I believe that it is sufficiently constant to be elevated to the rank of a subspecies. The head is much smaller and very differently sculptured. In the soldier of the typical *pilifera* from Illinois and Kentucky the whole head is opaque, especially behind and in that region coarsely reticulate rugose and the postpetiole is proportionally longer and narrower, with blunter lateral conules. Among my specimens I am able to recognize two distinct forms from the Eastern States. The soldier of one of these, which must be similar to the form mentioned by Emery from Carolina, has the head sculptured much like *coloradensis* behind, that is, shining and grossly punctate or foveolate, but the occiptal portion is crossed by transverse rugæ which are very distinct in the occipital notch. This form which I have taken near Bronxville, New York, and at Great Notch, New Jersey, and have received from Boonton, New Jersey (H. Viereck) may be called var. *simulans* var. nov. It is clearly transitional to the western form in the shape of the postpetiole, although the head is nearly as large as in the typical *pilifera*. Another form which I have taken on Long Island and have received from Massachusetts (G. B. King) has a much shorter head, which, excluding the mandibles, is but little longer than broad. The longitudinal rugæ of the fore part converge towards each other on the occipital lobes and meet in the occipital groove thus producing a very differ-

ent appearance from that of the soldier of the typical *pilifera*. The pro- and mesonotum are transversely reticulate rugose, the epinotal spines acute and directed upward. The postpetiole has acute lateral conules. This form may be called *septentrionalis* subsp. nov.

The habits of *Ph. coloradensis*, *simulans* and *septentrionalis* are very similar to those of *pilifera*. They live under stones or in small crater nests and store their chambers with the seeds of grasses and other plants.

53. **Pheidole ceres** *Wheeler.*

Pheidole ceres WHEELER, Bull. Am. Mus. Nat. Hist., XX, 1904, pp. 10–13, ☿ ☿ ♀ ♂; *ibid.*, XXII, 1906, p. 337; *ibid.*, XXIII, 1907, p. 14.

Colorado: Ute Pass, Cheyenne Mt., Woodland Park, and Florissant (Wheeler), Boulder (P. J. Schmitt, T. D. A. Cockerell).

New Mexico: San Geronimo and Manzanares (Miss Mary Cooper), San Ignacio and Las Vegas (T. D. A. Cockerell.)

Arizona: Grand Cañon, (Wheeler).

Texas: Ft. Davis (Wheeler).

This ant lives under stones in rather dry situations at an altitude of 5000–9000 ft. It garners seeds like the preceding species. It resembles *Ph. pilifera coloradensis* in the sculpturing of the head of the soldier, but is much smaller and the worker is smooth and shining instead of opaque and punctate.

In two colonies taken at Fort Davis and infested with Chalcided parasites (*Orasema wheeleri* Ashm.) there were a few individuals intermediate in the size and sculpture of the head between the soldiers and workers. I have never found this condition in the uninfested colonies in this or other localities.

54. **Pheidole proserpina** sp. nov.

Soldier. Length: 2.6–3 mm.

Allied to *Ph. ceres*. Head of moderate size, excluding the mandibles a little longer than broad, slightly narrower behind than in front, with excised posterior border and deep occipital furrow. Mandibles convex, with two large apical teeth. Clypeus very short, with a median carina and a deep notch in the middle of the anterior border. Eyes rather large, flattened, $\frac{1}{4}$ the distance from the anterior to the posterior corners of the head. Frontal area small, impressed, subtriangular, without a median carinula. Frontal carinæ short. Antennal scapes curved at the base, their tips reaching to about $\frac{1}{3}$ the distance from the eye to the posterior corner of the head; club much shorter than the remainder of the funiculus; joints 2–8 as long as broad. Thorax robust, in front about half as broad as the head, with prominent but rounded humeri. There is a distinct transverse depression between

the pro- and mesonotum and the latter is elevated to form a distinct torus. Epinotum with subequal base and declivity, the former rather flat and forming an obtuse angle with the latter, concave between the spines which are acute, longer than broad at the base and directed backward and slightly upward and outward. Petiole about twice as long as broad, much broader behind than in front, with concave sides; node compressed anteroposteriorly, its upper border seen from behind transverse, distinctly emarginate in the middle. Postpetiole hardly twice as long as the petiolar node, nearly three times as broad as long, with short and rounded lateral angles. Gaster broadly elliptical, about the size of the head. Legs rather long.

Mandibles and clypeus shining, the former distinctly striated and sparsely punctate; clypeus, cheeks and front back to a level with the eyes finely longitudinally striated, followed by a narrow opaque zone of very fine punctures, at the level of the eyes; more than the posterior half of head smooth and shining, with indistinct scattered punctures. Thorax, petiole and postpetiole opaque, finely and densely punctate throughout, pronotum and petiolar node in some specimens somewhat shining. Gaster shining, very finely shagreened.

Hairs sparse, suberect, rather long, yellowish on the body, legs and antennal scapes.

Black; mandibles and clypeus, except their borders, the cheeks in front of the eyes, chin, legs and posterior edges of gastric segments ferruginous yellow, sides of thorax and femora brown.

Worker. Length: 2–2.3 mm.

Head, excluding the mandibles, somewhat longer than broad, with rather convex lateral and straight posterior border. Mandibles with two large apical and several small basal teeth. Clypeus rather convex, with a distinct median notch in its border. Antennæ slender, scapes extending about $\frac{1}{4}$ their length beyond the posterior corners of the head. Thorax similar to that of the soldier, but with more rounded pronotum. Mesonotum convex and separated by a transverse depression from the pronotum in front and from the epinotum behind. Basal surface of latter flattened, longer than the declivity. Spines acute, similar to those of the soldier, but more vertical. Petiole slender, nearly three times as long as broad, widest behind, with concave sides. Node similar to that of the soldier and with a faint median depression in its upper border. Postpetiole about half again as broad as the petiolar node, a little broader than long, with roundly angulate sides. Gaster somewhat larger than the head.

Mandibles and clypeus subopaque, the former coarsely punctate, except at the base, where they are very finely striated, the latter and the cheeks with coarse longitudinal rugæ. Front finely striated anteriorly. Head finely and regularly reticulate on the sides and occiput but smooth and shining on the vertex. Thorax, petiole and postpetiole subopaque, finely and regularly reticulate throughout, middle of pronotum in some specimens somewhat shining. Gaster glabrous.

Hairs whitish, long, obtuse, but not enlarged at their tips; very sparse and suberect; conspicuous on the scapes and legs.

Piceous brown; head and gaster darker, clypeus paler. Mandibles and anterior corners of head yellow.

Described from several soldiers and workers taken from a single nest under a stone on the banks of the Gila River at Tempe, Arizona.

This species is closely related to *Ph. ceres* but differs in the sculpturing of the head and thorax of both soldier and worker, the more acute epinotal spines and notched petiolar node of the soldier.

55. **Pheidole soritis** sp. nov.

Soldier. Length: 3.3–3.5 mm.

Allied to *Ph. ceres.* Head large, excluding the mandibles distinctly longer than broad, about as broad behind as in front, with slightly convex sides and moderately deep occipital excision and groove, and a rather broad vertical depression in the region of the groove. Eyes rather large, moderately convex, $\frac{1}{3}$ the distance from the anterior to the posterior margin of the head. Mandibles convex, with two large blunt apical teeth. Clypeus short, rather feebly carinate in the middle and with a small median notch in its anterior border. Frontal area deeply impressed, straight in front, rounded behind, without a median carinula. Frontal carinæ very short. Antennæ slender, scapes reaching only a short distance beyond the posterior corner of the eye; club as long as the remainder of the funiculus, joints 2–8 about as broad as long. Thorax rather slender, in front less than half as broad as the head, humeri rounded; mesonotum convex and separated by a distinct transverse depression from the moderately convex pronotum, its posterior surface flattened. Epinotum with subequal base and declivity, concave between the spines, which are rather blunt, directed outward and backward and barely longer than broad at their bases, which are continued forward and backward as prominent ridges bordering the depressed median portion of the epinotum. Petiole twice as long as broad, distinctly broader behind than in front, with slightly concave sides. Node rather thick, with blunt transverse upper border, not impressed in the middle. Postpetiole less than twice as broad as the petiole, broader than long, with angular lateral corners, which are rather acute in some specimens and very blunt in others. Gaster elongate elliptical, smaller than the head. Legs rather long and slender.

Mandibles shining, striated at their bases and elsewhere with coarse elongate punctures. Head subopaque or glossy, frontal area very smooth and shining. Clypeus finely longitudinally rugose in the middle. Head covered with longitudinal rugæ separated by faintly punctate interrugal spaces. Along either side of the occipital groove the longitudinal become continuous with a system of transverse rugæ on each occipital lobe and these in turn are continuous anteriorly with the longitudinal rugæ on the sides of the head. Just in front of the occipital lobes the sculpture on the upper side is somewhat fainter, so that the surface is more shining, and in this region there are scattered elongate punctures in addition to the rugosity. Thorax, petiole and postpetiole opaque, densely punctate, except the pro- and mesonotum, which are finely and sharply transversely rugose. Gaster smooth and shining.

Hairs glistening white, sparse, suberect and not very abundant, appressed and inconspicuous on the legs. The antennal scapes have only a few suberect hairs and these are on the anterior surfaces.

Black: head deep reddish brown; mandibles except their borders, cheeks, chin and sides of clypeus, legs, antennæ and articulations of pedicel and thorax, yellowish brown.

Worker. Length: 2–2.3 mm.

Head rectangular, excluding the mandibles hardly longer than broad, with straight posterior margin and very large prominent eyes which are just in front of the middle. Mandibles with several teeth, those at the base being but little smaller than the two at the apex. Clypeus convex, with a faintly emarginate anterior border. Antennæ extending beyond the posterior corners of the head to a distance barely exceeding the diameter of their tips. Thorax similar to that of the soldier but there is no sharp transverse impression between the pro- and mesonotum so that in profile these two regions seem to be almost continuous and have a low rounded outline. Epinotal spines small, blunt and tooth-like, directed upward. Petiole slender, nearly three times as long as broad, slightly broader behind, with a rounded conical node. Postpetiole somewhat broader than the petiolar node, nearly as long as broad, with slightly angular sides. Gaster elongate elliptical, about as large as the head. Legs slender.

Smooth and shining, mandibles subopaque, very finely striated. Cheeks and frontal region with fine longitudinal rugæ. Pleuræ, meso- and epinotum, petiole and postpetiole opaque, densely and uniformly punctate; anterior portion of mesonotum and upper surface of petiole and postpetiole more shining, like the pronotum and back of head. Gaster glabrous.

Hairs whitish, short, obtuse and very sparse, on the legs delicate and appressed.

Black; mandibles except the teeth, clypeus, antennæ, tarsi and bases and tips of femora and tibiæ, brownish yellow; antennal clubs dark brown.

Described from numerous soldiers and workers taken from a single colony nesting under a stone in the desert near Albuquerque, New Mexico. In this species the head of the soldier is proportionally longer and larger than in *ceres* and *proserpina* and the rugose sculpturing is very different, extending, as it does, over the whole head and looping around the occipital lobes. There can be little doubt that both this and the preceding species are harvesting ants like *Ph. ceres.*

56. **Pheidole sitarches** sp. nov.

Soldier. Length: 3–3.5 mm.

Head large, excluding the mandibles, longer than broad, very nearly as broad behind as in front, with subparallel sides, and deep occipital groove and incisure. There is a pronounced depression at the groove and the middle of the head is convex. Mandibles convex, with two large apical and two small basal teeth. Clypeus short, carinate, with a small but distinct median notch in its anterior border. Frontal area impressed, triangular, somewhat rounded behind, with a median carinula. Frontal carinæ short. Antennæ slender, scape reaching to posterior corner of eye, which is large and flat and situated less than $\frac{1}{3}$ the distance from the anterior to the posterior corner of the head; antennal club shorter than the remainder of the funiculus; joints 2–8 slightly longer than broad. Thorax short, robust, in front nearly half as broad as the head. Humeri prominent but rounded. Mesonotum convex and somewhat angular, separated by a rather shallow transverse groove from the pronotum, but by a deep constriction from the epinotum. The latter with sub-

equal and declivous surfaces, meeting in a concavity between the spines, which are rather acute, as long as broad at the base and directed upward, backward and outward. The spines are laterally compressed and their bases are continued forward and backward as ridges bounding the epinotal concavity on each side. Petiole suboblong, twice as long as broad, nearly as broad in front as behind, with concave ridges and rather prominent anterior angles; node considerably compressed anteroposteriorly, with transverse upper border, distinctly excised in the middle. Postpetiole nearly twice as broad as the petiole, somewhat more than twice as broad as long, with prominent lateral conules. Gaster broadly elliptical, flattened, much smaller than the head. Legs rather slender.

Mandibles shining, with coarse, elongate punctures. Clypeus subopaque, longitudinally rugose. Frontal area shining, Head opaque, very finely and densely punctate throughout and with fine longitudinal rugæ on the anterior half along each side of the occipital groove, where they pass over into a faint system of fine transverse rugæ on the occipital lobes, but become obsolete on reaching the posterior corners of the head. Thorax, petiole and postpetiole opaque, finely and densely punctate; promesonotum also somewhat irregularly rugulose above. Gaster smooth and shining.

Hairs pale yellowish or white, suberect and rather long, pointed on the head and appendages, obtuse and clavate on the thorax, petiole and gaster. On the gaster they are very regular and conspicuous. Antennal scapes and legs with delicate appressed hairs, the former also with a few coarse, erect hairs on their anterior surfaces.

Ferruginous red; borders of mandibles, gaster and upper portion of thorax, petiole and postpetiole black. Legs yellowish. Antennæ of the same color as the head, which is usually ferruginous but may vary to dark brown in soldiers of the same colony.

Worker. Length: 1.4–1.6 mm.

Head, excluding the mandibles, a little longer than broad, rectangular, with very faintly emarginate posterior border and eyes in front of the posterior half. Mandibles with several teeth, the apical pair of which are only slightly longer than the others. Anterior border of clypeus very faintly and sinuately emarginate in the middle. Tips of antennal scapes reaching only a little beyond the posterior corners or the head. Thorax resembling that of the soldier, pronotum rather depressed above, with a feeble promesonotal depression. Epinotal spines small and rather acute, directed upward. Petiole about twice as long as broad, somewhat broader behind than in front, node somewhat compressed as in the soldier but not emarginate above. Postpetiole a little broader than the petiolar node and a little broader than long, with indistinctly angulated sides. Gaster elongate elliptical, smaller than the head.

Smooth and shining; mandibles opaque, finely striatopunctate, cheeks and front with fine longitudinal striæ. Mesopleuræ, epinotum, petiole and postpetiole opaque, densely and uniformly punctate, upper surfaces of nodes somewhat shining.

Pilosity similar to that of the soldier but the hairs are less abundant and are obtuse also on the head. There are no erect hairs on the antennal scapes.

Black or dark brown; gaster usually darker than the head, thorax and pedicel; mandibles, clypeus and anterior portion of head, antennæ and legs more or less yellow.

Female. Length: 4–4.3 mm.

Head, excluding the mandibles, about as long as broad, rectangular, with nearly straight posterior border and parallel sides. Eyes large, just in front of the middle of the sides. Clypeus and mandibles like those of the soldier. Frontal area short, crescentic. Antennal scapes reaching about ⅓ the distance from the eye to the posterior corner of the head. Thorax but little broader than the head, flattened above. Epinotal spines robust, short and rather acute, directed backward, outward and upward. Petiolar node high and much compressed anteroposteriorly, its summit rounded, not impressed in the middle. Postpetiole barely twice as broad as the petiole, about 2½ times as broad as long, with prominent but rather blunt lateral conules. Gaster elongate elliptical.

Head, thorax and pedicel opaque; mandibles very coarsely striatopunctate, head traversed by coarse longitudinal rugæ, separated by rather wide reticulate interstices, the rugæ diverging to the posterior corners of the head. Mesonotum and scutellum shining, the former coarsely and sparsely punctate, with two densely striated posteromedian areas. Mesopleuræ shining, coarsely punctate above. Epinotum coarsely rugose-punctate, smooth between the spines. Petiole and postpetiole finely and obscurely punctate.

Hairs sordid yellow, pointed, rather abundant, suberect, shorter and more appressed on the antennæ and legs.

Dark brown; gaster, pedicel, epinotum and mandibular teeth black; mandibles, antennæ and legs dull yellowish red.

Texas: Mount Barker near Austin; New Braunfels (Wheeler).

This species seems to be very variable. The form which I regard as typical has the rugosity perceptible over the whole surface of the head and the thorax and pedicel are decidedly blackened, at least on the dorsal surface. It is rather closely related to *Ph. soritis* but the petiole has a very different shape and the coloration and pilosity are different. The head sometimes varies considerably in size in soldiers of the same nest, reminding one of the conditions in *Ph. instabilis*. *Ph. sitarches* nests under stones. In the neighborhood of Austin I have found it only among the dry limestone hills of the Edwards Plateau escarpment. It collects and stores seeds, but is quite unable, as I have observed on several occasions, to prevent them from germinating in the chambers of the nest during damp weather.

57. **Pheidole sitarches** var. **transvarians** var. nov.

Both the soldiers and workers of this form show a distinct transition to the following subspecies *rufescens*. The head of the soldier is dull and opaque behind and the rugæ are discernible only on the occipital lobes, where they are often very faint, and on the front where they are more distinct. The head is ferruginous, without any trace of infuscation, the neck, ventral portion and sutures of the thorax are also reddish. The workers

are much paler than in the typical *sitarches*, but the head is smooth and shining and does not show any of the sculpture so characteristic of the worker of the following subspecies. I have seen only soldiers and workers which were taken from a single colony on Mt. Barker near Austin Texas.

58. **Pheidole sitarches rufescens** subsp. nov.

Soldier: Head with the sculpture of the preceding variety, the transverse striæ on the occipital lobes often obsolete or obsolescent. Epinotal spines very blunt, erect. Head, thorax and pedicel reddish yellow, base of first gastric segment, antennæ and legs paler. Borders of mandibles black.

Worker: Head and thorax finely and densely punctate; the former smooth and shining only in the middle of the front and on the vertex, the latter somewhat shining on the middle of the mesonotum. Color like that of the soldier except that the head is yellow with much of the upper surface infuscated.

Female. The head, thorax, pedicel and basal third of the gaster are rich ferruginous red and the legs and antennæ are scarcely paler. Wings yellowish hyaline, with yellow veins and brown stigma.

Texas: Bull Creek, Walnut Creek, Mt. Bonnel, Mt. Barker near Austin, San Angelo (Wheeler).

This form may be readily distinguished from the typical *sitarches* by its color, the less pronounced rugosity of the head and especially by the largely punctate head and pronotum of the worker. In no case, however, is there a tendency to infuscation of the head in the soldiers though this may vary considerably in size in individuals from the same colony, as in the typical form. A number of soldiers collected by Father P. J. Schmitt at Doniphan, Missouri appear to belong to this subspecies.

The habits of *rufescens* are the same as those of the typical *sitarches* and it occurs in the same localities.

59. **Pheidole sitarches rufescens** var. **campestris** var. nov.

The soldier of this form which I have taken at Henrietta, Texas, agrees very closely with that of *rufescens*. It is somewhat larger (3.6 mm.) and the petiole is broader behind. The worker, however, has the head and thorax entirely opaque and densely punctate, and as it is also darker in color than *rufescens* it closely resembles the worker of *Ph. pilifera*.

60. **Pheidole sciophila** sp. nov.

(Pl. XXVI, Figs. 18 and 19.)

Soldier. Length: 2.8–3 mm.

Head rather small, excluding the mandibles a little longer than broad, rectangu-

lar, with rather straight subparallel sides, broadly and angularly excised posterior margin and rather deep and narrow occipital groove. Eyes moderate, slightly convex, about $\frac{1}{5}$ the distance from the anterior to the posterior corners of the head. Mandibles convex, with a single basal and two large acute apical teeth. Clypeus short, convex in the middle, without a median carina but with a median notch in the anterior border. Frontal area small, impressed, triangular, with a distinct median carinula. Frontal carinæ about $\frac{1}{3}$ as long as the antennal scapes. Antennæ well developed, scape curved and distinctly flattened at the base, reaching half the distance between the eye and the posterior corner of the head; club shorter than the remainder of the funiculus, joints 2–8 longer than broad. Thorax robust, in front half as broad as the head, with prominent, angular humeri. Pronotum flattened posteriorly and with marginate sides. Mesonotum in profile low, but angular and separated by a distinct transverse depression from the pronotum and behind by a similar but deeper depression from the epinotum. Epinotum in profile with subequal base and declivity, but between the spines forming a single concave sloping surface. Spines longer than broad at the base, acute, directed backward, outward and slightly upward, their bases continued anteriorly and posteriorly to form ridges bounding the sloping space between. Petiole about twice as long as broad, distinctly broader behind in the region of the node and with acutely angular anterior corners. Node much compressed anteroposteriorly, with a rather sharp, indented upper margin. Postpetiole barely twice as broad as the petiolar node, less than twice as broad as long, broader in front, where it has rather rounded lateral angles. Gaster broadly elliptical, distinctly smaller than the head. Legs moderate.

Mandibles shining, coarsely punctate. Clypeus smooth in the middle, opaque on the sides where it is obscurely rugose. Head opaque except the posterior corners which are shining and very coarsely and sparsely punctate. The opaque portion is very densely and uniformly punctate, cheeks and the anterior half of the front also longitudinally rugulose. Thorax, petiole and postpetiole opaque, densely and finely punctate; the pro- and mesonotum also obscurely and sparsely rugulose. Gaster smooth and shining, base of the first segment subopaque and granular.

Hairs sordid yellowish, very long, acute, suberect and sparse; most conspicuous and regular in their arrangement on the gaster. Scapes and tibiæ with very few erect hairs, the remaining hairs on the appendages shorter and more appressed.

Dark brown; mandibles, cheeks, chin and tarsi brownish yellow; clypeus and antennal clubs somewhat lighter than the head; gaster and inner borders of mandibles black.

Worker. Length: 1.8–2 mm.

Head, excluding the mandibles, a little longer than broad, with evenly rounded sides and straight posterior margin. Eyes in front of the middle of the sides. Mandibles with two somewhat larger apical and several minute basal teeth. Clypeus convex, with hardly a trace of a median notch in the anterior border. Antennæ long and slender; scapes not curved or flattened at the base, surpassing the posterior corners of the head by about $\frac{1}{3}$ of their length. Thorax more slender and with much more rounded humeri and pronotum than in the soldier; mesonotum depressed. Base of epinotum longer than the declivity and flattened rather than concave. Spines similar to those of the soldier, shorter than the distance separating their bases and directed more upward. Petiole nearly three times as long as broad, very slightly broader behind than in front; node compressed anteroposteriorly but

with entire upper border. Postpetiole a little broader than the petiole and slightly broader than long, with rounded sides. Gaster about the size of the head, somewhat narrowed anteriorly and with straight anterior border. Legs rather long.

Mandibles and clypeus shining, the former with their blades coarsely punctate and their bases finely striated. Head, thorax, petiole and postpetiole opaque and densely punctate; a longitudinal strip on the front and vertex as broad as the distance between the frontal carinæ smooth and shining; cheeks and inner margins of frontal carinæ longitudinally rugose. Gaster smooth and shining.

Hairs similar to those of the soldier, but obtuse on the gaster, though not enlarged at the tips.

Head and gaster black, thorax and pedicel, femora, tibiæ and antennæ dark brown; mandibles, clypeus and tarsi yellowish.

Female. Length: 4.5–5 mm.

Head, excluding the mandibles, distinctly broader than long, broader behind than in front, with nearly straight posterior border. Eyes large, flattened, their posterior orbits at the middle of the head. Mandibles, clypeus and antennæ like those of the soldier. Thorax flattened above. Epinotum with strong acute spines, which are as long as broad at their bases. Petiole and postpetiole similar to those of the soldier, but the lateral angles of the latter more prominent and acute. Gaster elongate elliptical, convex above, with rounded sides.

Mandibles and clypeus shining, the former coarsely striatopunctate, the latter smooth in the middle and rugulose on the sides. Head opaque, only the occiput and extreme posterior corners smooth and shining. Front and vertex covered with rather fine, sharp longitudinal rugæ. On the lateral portions the rugæ are still finer and denser. Pronotum and epinotum opaque, finely punctate-rugulose. Mesonotum, paraptera, scutellum and mesopleuræ glabrous, very sparsely punctate, the punctures on the mesopleuræ being very large. The posterior portion of the mesonotum has a finely striated area on each side of the middle line. Petiole and postpetiole finely punctate-rugulose, the upper surface of the latter somewhat shining. Gaster shining, very finely shagreened.

Hairs pale, erect and extremely sparse; the gaster also with some short appressed hairs. Legs and antennæ with similar appressed hairs, the anterior surface of the scapes with a few long erect ones.

Black; thorax, legs and antennæ dark brown; mandibles, clypeus, cheeks, chin, tarsi, paraptera, sutures and articulations of thorax and legs, dull or brownish yellow. Wings hyaline, with pale yellow veins and stigma.

Male. Length: 3–3.3 mm.

Head, excluding the eyes, distinctly longer than broad, much produced behind, with extremely short cheeks, very large eyes and ocelli. Mandibles very small, their tips barely meeting, bidentate. Clypeus convex behind with rounded anterior border. Antennal scape shorter than the first and second funicular joints together, first funicular joint much swollen, elliptical, longer than broad, remaining funicular joints decreasing in thickness and increasing in length to the tip. Thorax robust, broader through the wing insertions than the head through the eyes. Epinotum with angular projections in the place of the spines. Petiole similar to that of the soldier, but with rounded entire node. Postpetiole a little broader than the petiole, nearly as long as broad, broader behind than in front, rounded above and on the sides. Gaster and legs of the usual structure.

Head, petiole and postpetiole subopaque, very finely and obscurely punctate, the front feebly longitudinally striated. Thorax and gaster smooth and shining.

Hairs yellowish, suberect, rather sparse and short; longest and most conspicuous on the head, epinotum and pedicel.

Head black; clypeus, thorax, pedicel and gaster brown; mandibles, antennæ, thoracic sutures and legs brownish yellow. Wings like those of the female.

Texas: Austin and New Braunfels (Wheeler).

At first sight this species would seem to belong to the same group as *Ph. ceres*, but the structure of the thorax and sculpture of the soldier are very different. The mandibles of *Ph. sciophila* are less convex and more acutely toothed than in the harvesting species, so that I am inclined to believe that this ant is entomophagous. It nests in rather small communities in the shade of thickets and trees near water. The males and winged females were taken June 20 to 22.

61. **Pheidole xerophila** sp. nov.

(Pl. XXVII, Fig. 37.)

Soldier. Length: 4–4.3 mm.

Head, excluding the mandibles, somewhat longer than broad, a little broader behind than in front, with subparallel sides, somewhat flattened dorsoventrally, with deeply and angularly excised posterior border, and narrow occipital groove. Eyes moderate, flattened, $\frac{1}{3}$ the distance from the anterior to the posterior corners of the head. Mandibles convex, with two blunt apical teeth and faint traces of a pair of basal denticles. Clypeus very short, rather flat, with distinct median carina and with a broad but shallow median notch in its anterior border. Frontal area large, indistinct, carinulate, fused with the clypeus. Frontal carinæ about $\frac{1}{3}$ as long as the antennal scapes. Antennæ small and slender. Scape curved at the base but not flattened, its tip reaching to the posterior orbit; club shorter than the remainder of the funiculus, first funicular joint nearly as long as joints 2–5 together; joints 2–9 as broad as long. Thorax robust, pronotum somewhat less than half as broad as the head, with rounded humeri, very convex above and forming a single mass with the mesonotum which is slightly angular behind. Mesoëpinotal constriction pronounced. Epinotum with subequal base and declivity forming nearly a right angle with each other in profile. Spines short, acute, hardly longer than broad at the base, directed upward and outward; region between the spines with distinctly basal and declivous surfaces though separated by a rounded angle. The bases of the spines are continued anteriorly and posteriorly to form low but distinct ridges bounding the epinotal surface. Petiole but little longer than broad, broader behind than in front, with a high, anteroposteriorly compressed node, with rounded summit, which, seen from behind, is transverse but not impressed in the middle. Petiole half again as broad as the petiolar node, twice as broad as long, with prominent but blunt lateral conules. Gaster broadly elliptical, flattened, smaller than the head. Legs slender and rather short.

Shining; thorax and petiole a little less glabrous than the head and gaster. Mandibles coarsely, uniformly and rather densely punctate. Clypeus and anterior third of head sharply and longitudinal rugose, remainder of the head with sparse, rather small piligerous punctures. Pro- and mesonotum and especially the neck, with fine sharp transverse rugæ. Pleuræ finely, longitudinally rugulose. Epinotum, petiole and postpetiole covered with dense, shallow punctures, except the upper surfaces of the nodes which are rather smooth.

Hairs yellow, erect, abundant, moderately long, covering the body, legs and antennal scapes; most conspicuous on the cheeks and gular surface of the head.

Ferruginous; borders of mandibles black; gaster dark brown or blackish, except the base of the first segment which is ferruginous and the posterior edges of all the segments which are yellow. Legs brownish yellow.

Worker. Length: 2.3–2.5 mm.

Head, excluding the mandibles, a little longer than broad, rectangular, with very faintly excised posterior margin and slightly rounded sides, and eyes in front of its middle. Mandibles with several teeth. Clypeus broadly and sinuately emarginate. Frontal area distinct, faintly impressed, triangular. Tips of antennal scapes extending a short distance beyond the posterior corners of the head; joints 2–8 of funiculus very small, slightly broader than long; club about as long as the remainder of the funiculus. Thorax similar to that of the soldier; epinotal spines very small and acute, directed outward and upward. Petiole more than twice as long as broad, slightly broader behind than in front; node compressed, with entire, transverse upper border. Postpetiole $1\frac{1}{2}$ times as broad as the petiolar node, subrectangular, with rounded anterior corners. Gaster about as large as the head. Legs slender.

Shining; mandibles subopaque, very faintly striated. Cheeks longitudinally rugose, remainder of head glabrous. Epinotum and postpetiole finely and densely punctate, the nodes smoother and somewhat shining.

Hairs pale yellow, similar to those of the soldier but much less abundant. Scapes and legs with a few sparse erect hairs.

Black; gaster and antennal scapes dark brown; mandibles, clypeus, frontal carinæ, extreme bases and tips of antennal scapes, funiculi and legs brownish yellow.

Male. Length: 4 mm.

Head, excluding the eyes, about as long as broad, produced posteriorly; cheeks short but distinct; eyes and ocelli prominent. Mandibles with a pointed apical and a few very minute basal teeth, their tips overlapping. Clypeus convex, with broadly rounded, entire anterior border. Antennal scape as long as the first two joints of the funiculus; first funicular joint swollen, ovate, a little longer than broad, remaining joints subequal, cylindrical, of uniform breadth. Thorax long and very robust, much broader through the wing insertions than the head through the eyes. Epinotum angular in profile, basal surface longer than the declivity; spines represented by blunt projections. Pedicel robust, similar to that of the soldier; petiolar node more rounded and less compressed anteroposteriorly; postpetiole with more acutely angular sides. Gaster broad, elliptical, and somewhat flattened. Genitalia large and prominent.

Shining; posterior and lateral portions of head opaque, finely granular. Mesonotum and scutellum sparsely punctate. Epinotum and pedicel opaque, the former punctate-rugulose, the latter granular, the nodes shining above.

Hairs yellow, erect and abundant, especially on the thorax, but proportionally shorter than in the soldier.

Black; clypeus, pronotum, pleuræ and venter dark brown; mandibles, antennæ, wing-insertions, paraptera, border of scutellum, articulations of the pedicel, genitalia and legs brownish yellow, the femora and tibiæ somewhat darker. Wings grayish hyaline, with yellow veins and conspicuous dark brown stigma.

Texas: Fort Davis, June 9 (Wheeler).

Although this species is related to the *vinelandica* series, it nevertheless differs from all the other North American species known to me in the flattened and peculiarly sculptured head of the soldier, the shape of the thorax and the pilosity. It inhabits small crater nests in the dry open soil of the desert and is, without doubt, a harvesting species.

62. **Pheidole xerophila tucsonica** subsp. nov.

A number of soldiers and workers taken from numerous crater nests in the deserts about Tucson, Arizona are sufficiently distinct to be regarded as a separate subspecies. The soldiers of this form have a black or very dark cherry red, subopaque and much more heavily sculptured thorax, the transverse rugæ on the pro- meso- and epinotum being very coarse. The petiolar node has a median excision in its border. The worker is somewhat larger than that of the typical form and the whole pro- and mesonotum are opaque and punctate like the epinotum.

63. **Pheidole xerophila tucsonica** var. **gilvescens** var. nov.

Several soldiers and workers taken at Phoenix and Tucson, Arizona represent an apparently constant color variety of *tucsonica*. In the soldier the head, thorax and pedicel are ferruginous, the gaster and legs yellow. The sculpture of the thorax is intermediate between *tucsonica* and the typical *xerophila*. The petiolar node is emarginate. The worker is yellow with the head more reddish above. The pronotum is shining as in the typical *tucsonica*. The spines of the epinotum are extremely small and acute. It is difficult to decide whether this form is to be attached to the typical *xerophila* or to the subspecies *tucsonica*.

64. **Pheidole barbata** sp. nov.

Soldier. Length: 4.5 mm.

Head large, flattened, excluding the mandibles a little longer than broad, with rather convex sides and deeply, angularly excised posterior margin. Occipital

groove pronounced but very narrow at the bottom. Eyes moderate, flattened, their posterior orbits somewhat less than $\frac{1}{3}$ the distance from the anterior to the posterior corners of the head. Mandibles convex, with two blunt apical teeth. Clypeus short, flattened in the middle, without any trace of a carina, with a shallow, sinuate excision in the middle of its anterior border. Antennæ small and slender; scape curved but not flattened at the base, its tip reaching to the posterior orbit. Club somewhat shorter than the remainder of the funiculus; joints 2–8 of the latter clearly longer than broad. Frontal area shallow, subtriangular, with a rather indistinct median carinula. Frontal carinæ only about $\frac{1}{3}$ as long as the antennal scapes. Thorax rather long, with very deep and broad mesoëpinotal constriction, anteriorly $\frac{1}{3}$ as broad as the head. Thorax rather slender; pronotum with prominent humeral angles between which its surface is perfectly straight and transverse, so that when seen from the front this portion of the pronotum is rectangular. The mesonotum is convex, hemispherical, separated by a suture and not by a distinct depression from the pronotum; its surface is steep and forms almost a right angle with the base of the epinotum. The latter is straight in profile and somewhat shorter than the declivity with which it forms nearly a right angle. Spines very broad at their bases, short and acute, directed upward and slightly outward. The surface between the spines is concave with a slender median ridge or ruga traversing nearly its entire length. Petiole about $1\frac{2}{3}$ as long as broad, somewhat broader behind than in front, with slightly concave subparallel sides and distinct anterior angles; node not compressed anteroposteriorly, but with long flattened anterior, and shorter posterior slope and acute, transverse and broadly excised upper border. Postpetiole twice as broad as the petiolar node, about three times as broad as long, with the sides angularly produced in the middle. Gaster broadly elliptical, nearly as large as the head. Legs long and slender.

Shining throughout; mandibles covered with sparse, rather small punctures. Clypeus smooth in the middle, rugulose on the sides. Anterior fourth of head, with sharp, longitudinal rugæ, denser and coarser on the cheeks and mesial to the frontal carinæ. Frontal area smooth. Remainder of the head with small widely scattered piligerous punctures except over a small area mesial to the eyes where the punctures are much larger and slightly elongate. Thorax and pedicel smooth, except the pleuræ and base of petiole which are rather coarsely and obscurely rugulose, and the upper surface of the postpetiole, which is somewhat granular and coarsely punctate. Gaster smooth.

Hairs yellow, tapering, abundant and rather long on the head, thorax, pedicel and gaster, but shorter on the legs and antennæ. They are longest and most conspicuous on the lower surface of the head.

Piceous brown, thorax and mandibles more ferruginous; basal half of gaster and legs sordid yellow, borders of mandibles black.

Worker. Length: 2–2.2 mm.

Head, excluding the mandibles, barely longer than broad, with rounded posterior corners and rather convex posterior border. Eyes near the middle of the sides. Mandibles with oblique, multidenticulate blades. Clypeus broadly rounded in front, without any trace of a median excision in its anterior border. Frontal area impressed, triangular. Antennæ slender, scapes surpassing the posterior corners of the head by about $\frac{1}{4}$ their length. Thorax slender. In profile the pro- and mesonotum are angular owing to a transverse ridge representing the straight ridge between the

humeri in the soldier. Mesoëpinotal constriction pronounced; base and declivity of epinotum forming an obtuse angle in profile; spines represented only by small angular elevations. Petiole from above oblong, 2½ times as long as broad, node low and rounded; postpetiole oblong, less than twice as broad as the petiole and less than twice as broad as long. Gaster somewhat larger than the head. Legs long and slender.

Glabrous; mandibles opaque, striatopunctate.

Pilosity similar to that of the soldier and also abundant on the lower surface of the head.

Black; gaster, legs and antennæ brown; mandibles, anterior border of clypeus and tarsi dull yellow.

Described from a single soldier and a number of workers taken from a small crater nest on the Mojave desert near Needles, California, close to the boundary of Arizona.

This species is peculiar in the structure of the thorax and petiole of the soldier, especially in the transverse ridge of the pronotum, which is also indicated in the worker. The latter would readily be taken for a *Monomorium* owing to its unarmed epinotum, shining surface and the shape of the pedicel.

65. **Pheidole macclendoni** sp. nov.

(Pl. XXVII, Fig. 36.)

Soldier. Length: 5.5. mm.

Head very large, convex, as broad in front as behind, excluding the mandibles somewhat longer than broad, with straight subparallel sides, deeply and angularly excised posterior border and deep occipital groove. Eyes small, somewhat flattened, ⅓ the distance from the anterior to the posterior corners. Mandibles very convex, with two blunt apical teeth. Clypeus short, flattened, without a median carina and with a deep median notch in the anterior border. Antennæ slender, scape curved, but not flattened at the base, its tip reaching to the posterior orbit; club shorter than the remainder of the funiculus; joints 2–8 nearly 1½ times as long as broad. Frontal area impressed, longitudinally rugose. Frontal carinæ more than ⅓ as long as the antennal scapes. Thorax robust, in front nearly ½ as broad as the head, pronotum transversely swollen between the prominent humeri, mesonotum with a transverse welt or torulus in the middle, bounded in front and behind by a depression. Epinotum with subequal base and declivity and long spines, which are very blunt at their tips and directed upward and slightly outward. Petiole from above violin-shaped, as broad in front as behind, with concave sides and an anteroposteriorly compressed node, broadly and deeply emarginate above. Postpetiole 2½ times as broad as the petiole and about twice as broad as long, with prominent and rather acute lateral conules which are convex both on their anterior and posterior surfaces. Gaster broadly elliptical, flattened, much smaller than the head. Legs long, with incrassated femora.

Shining; mandibles covered with sparse, rather small punctures. Clypeus

rather smooth in the middle, rugose on the sides. Head smooth, very sparsely and finely punctate, except the anterior half, which is longitudinally rugose, the rugæ tending to become somewhat reticulate posteriorly. The space between the frontal carinæ is entirely filled with rugæ which extend a little farther back than those on each side of the eyes. Pro- and mesonotum obscurely, transversely rugose above. Meso- and metapleuræ with coarse longitudinal rugæ, the former also finely punctate. Upper surface of epinotum and base of petiole irregularly punctate-rugose. Postpetiole and gaster smooth and shining.

Hairs golden yellow, pointed, erect, abundant and rather long, especially on the thorax, pedicel and gaster; more appressed but long on the legs and antennal scapes.

Ferruginous; borders of mandibles, clypeus and occipital groove black; gaster dark brown; base of first segment and legs, except the femora, brownish yellow.

Worker. Length: 2–2.5 mm.

Head, excluding the mandibles as broad as long, rectangular, with straight posterior and parallel lateral borders, with the eyes a little in front of the middle. Mandibles with several small teeth. Clypeus convex, with a broad and sinuate median excision in its anterior border. Frontal area small, deeply impressed. Antennal scapes extending a short distance beyond the posterior corners of the head. Thorax resembling that of the soldier, but pro- and mesonotum lower, more rounded and with sloping humeri; the mesonotum evenly sloping, without a transverse welt. Base and declivity of epinotum subequal, the former flattened or slightly convex in profile, spines very minute, acute. Petiole oblong, three times as long as broad; with a compressed, rather acute, transverse node which is not notched in the middle. Postpetiole nearly twice as broad as the petiole, as long as broad, with rounded sides. Gaster smaller than the head.

Shining; mandibles subopaque, finely striatopunctate. Sides of head as far back as a little behind the eyes longitudinally rugose and punctate, more opaque than the front, vertex and occiput. Meso- and epinotum subopaque, very finely punctate; the former also with faint transverse rugæ. Petiole subopaque, its node and the postpetiole shining.

Pilosity much like that of the soldier.

Black or very dark brown; legs brown; mandibles, tarsi and articulations of the legs more yellowish.

Intermediates. Length: 3.5–4.5 mm.

These appear to be fairly numerous in the nests of this species. They differ from the soldiers in their much smaller heads which are sometimes only $\frac{1}{3}$ to $\frac{1}{2}$ as long, the postpetiole, which is narrower and less angularly produced on the sides, and the epinotal spines which are smaller and acute. The head of the soldier is 2.6 mm. in length, that of the intermediates varies from 1–2 mm.

Texas: Laredo (J. F. McClendon); Corsicana (Miss Mary Cooper).

This ant, which is in all probability a harvester, is readily distinguished from all the other described species of *Pheidole* from the United States by the huge, thick, and largely smooth head of the soldier. The intermediates are readily distinguished from the soldiers of *xerophila* by the different sculpture of the thorax, shape of petiole and the more slender and acute epinotal spines.

66. **Pheidole rhea** sp. nov.

Female (deälated). Length: 14.3 mm.

Head, excluding the mandibles, a little broader than long, broader behind than in front, with prominent and rather sharp posterior corners and broadly and angularly excised posterior border. Occipital groove deep in front and behind the ocelli. Eyes rather large and convex, their posterior orbits a little in front of the middle of the head. Mandibles convex, with strongly deflected tips, and two acute apical teeth. Clypeus flattened in the middle, without a median carina and with a deep narrow notch in the middle of its anterior border. Frontal area deeply impressed, triangular. Frontal carinæ prominent, about half as long as the antennal scapes, which are much curved at their bases, flattened but not dilated, and reaching the posterior orbits with their tips; club much shorter than the remainder of the funiculus; joints 2–8 subequal, distinctly longer than broad; the first joint as long as the two succeeding joints together. Thorax robust, flattened above, not quite as broad through the wing insertions as the head through the posterior corners. Epinotum with its basal surface much shorter than the somewhat concave declivity into which it passes between the spines. The latter are very long, pointed and directed backward and distinctly downward at their tips. Petiole from above a little broader than long, suborbicular, with convex, irregularly rounded sides and without a peduncle. Node with a flattened anterior slope and abrupt, concave posterior slope; the summit compressed anteroposteriorly, rather sharp, deeply, broadly, and angularly notched so that it is really bicornuate. Postpetiole about $1\frac{2}{3}$ as broad as the petiole, nearly three times as broad as long, convex and rounded in front, concave behind; the two surfaces meeting to form a transverse ridge which is prolonged on each side into a rather slender, pointed conule. Gaster oblong-elliptical, flattened. Legs rather long and slender.

Mandibles shining, covered with very sparse, elongate punctures or foveolæ, at the extreme base opaque and densely punctate. Clypeus smooth and shining in the middle, transversely and rather finely rugose on the sides. Frontal area shining. Head subopaque, covered throughout with coarse longitudinal rugæ, which diverge towards the posterior corners. On the cheeks and sides of the front the interrugal spaces are punctate-recticulate, on the posterior corners they present coarse, shallow and somewhat elongate foveolæ. Thorax subopaque; pronotum, meso- and metapleuræ covered with sharp, dense, longitudinal rugæ. Mesonotum and scutellum shining, the former smooth and very finely shagreened in the middle, longitudinally rugose and coarsely punctate on the sides. Scutellum with a few coarse piligerous punctures, its posterior border and the paraptera with short coarse parallel striæ. Mesonotum and upper surface of epinotum subopaque, densely punctate-rugulose. Petiole and postpetiole nearly opaque, rather coarsely punctate-rugulose. Gaster shining, entire first segment and posterior portions of remaining segments more densely shagreened or granular and somewhat opaque, base of remaining segments smoother and more shining.

Hairs coarse, brownish yellow, erect, and abundant, especially on the head, antennal scapes and legs.

Black; gaster with a deep reddish tinge at the bases of the second and third segments; tips of antennal scapes, funiculi, trochanters and tarsi dull yellowish red.

Described from a single specimen taken at Nogales, Arizona (Oslar; Cornell University Collection).

This female is of such huge size and presents so many singular characters that I have not hesitated to describe it although the soldier and worker are unknown, for it is too large to be the queen of any of the other described species from the United States except, perhaps, *Ph. titanis*. The color and sculpture of the soldier and worker of this species are, however, very different.

67. **Pheidole vinelandica** *Forel.*

Pheidole bicarinata race *vinelandica* FOREL, Ann. Soc. Ent. Belg., XXX, 1886, C. R. p. xlv, ♀☿ ☿ ♀ ♂.

Pheidole vinelandica MAYR, Verh. zool. bot. Ges. Wien, XXXVI, 1886, p. 458, ♀☿; *Ibid.*, XXXVII, 1887, p. 591, ♀☿, and 606, ☿; DALLA TORRE. Catalog. Hymen., 1893, pp. 97, 98; EMERY, Zool. Jahrb., Abth. f. Syst., VIII, 1894, p. 292, ♀☿ ☿; FOREL, Ann. Soc. Ent. Belg., XLV, 1901, p. 348, ♀☿ ☿ ♀ ♂; WHEELER, Bull. Am. Mus. Nat. Hist., XXII, 1906, pp. 336, 337.

Texas: Austin, Marble Falls, Langtry (Wheeler); Paris (Miss Augusta Rucker);

Arizona: Grand Cañon, 3,700 ft. (Wheeler).

Many series of specimens of this species from different parts of the country show that it is hardly distinct from *Ph. bicarinata* Mayr. The soldier of the typical *vinelandica* differs from that of *bicarinata* in having larger frontal carinæ and a transversely rugose instead of a finely punctate epinotum. The Texan specimens of *vinelandica* agree very closely with typical specimens from New Jersey and North Carolina, but specimens from Colorado (Canyon City, Colorado Springs, Boulder) have the epinotum with distinct and often rather coarse transverse rugæ, while the frontal carinæ resemble those of the typical *vinelandica*. This species is highly variable in color, some forms having dark chestnut brown soldiers with nearly black workers, whereas in others the soldiers are reddish yellow and the workers pale brown.

Ph. vinelandica nests in dry, sandy soil fully exposed to the sun's heat and light. Its tiny nest entrances are surrounded by diminutive craters, barely an inch in diameter. Occasionally it is also found nesting under stones.

68. **Pheidole vinelandica** var. **longula** Emery.

EMERY, Zool. Jahrb., Abth. f. Syst., VIII, 1894, p. 292, ☿.

Texas: San Angelo, Alice, Henrietta and Austin (Wheeler); Denton (W. H. Long).

The soldier of this form differs from that of the typical *vinelandica* in

its proportionally longer head, with more parallel and less rounded sides and in the sculpture of the epinotum, which has fine but distinct transverse rugæ in addition to the fine punctation. It presents the same color variations as the typical form of the species.

69. **Pheidole vinelandica buccalis** subsp. nov.

The soldier of this form differs from that of the typical *vinelandica* in its somewhat larger size (3.5 mm.), in having a somewhat narrower thorax and in the coloration, which is piceous brown, with the disks of the mandibles and a large spot on each cheek dull orange. The latter is sharply defined against the dark brown border of the head. The chin, posterior corners of the head, pleuræ and appendages are slightly paler than the remainder of the body. The rugæ on the base of the epinotum are rather indistinct. The worker too, is larger and darker than that of the typical *vinelandica,* measuring nearly 2 mm. in length. The female measures 5 mm. and is dark brown and very opaque, with the anterior third of the head, the mandibles, tibiæ, tarsi, tips and bases of the femora dull brown. The hairs on the body are more abundant than in the typical form of the species.

Arizona: Ash Fork; Prescott (Wheeler).

Described from a single deälated female and many soldiers and workers.

70. **Pheidole casta** sp. nov.

(Pl. XXVI, Figs. 22 and 23.)

Soldier. Length: 3.5–3.7 mm.

Head, excluding the mandibles, about $1\frac{3}{4}$ times as long as broad, flattened, slightly broader in front than behind, with subparallel sides and rather deeply and narrowly excised posterior border. Eyes rather small, flattened, situated about $\frac{1}{4}$ the distance from the anterior to the posterior corners. Mandibles convex, with two larger apical and two very indistinct basal teeth. Mentum with two acute teeth. Clypeus with a short but prominent carina and a distinct notch in the middle of the anterior border. Frontal area rather large, shallow, with a median carinula. Frontal carinæ prominent but rounded, about $\frac{1}{3}$ as long as the antennal scapes, which are short, slender and somewhat curved at their bases, and with slightly thickened tips that extend a little beyond the posterior orbits. Clubs as long as the remainder of the funiculi; joints 2–8 distinctly broader than long. Thorax robust, through the angular humeri about $\frac{2}{3}$ as broad as the head. Upper portion of pro- and mesonotum about as broad as long, the latter without a transverse groove, but with an abruptly declivous posterior surface. Basal surface of epinotum a little longer than the declivity, slightly concave. Spines acute, as long

as broad at the base, directed upward and slightly outward and continued forward at their bases as sharp ridges. Space between the spines sloping. Petiole from above violin-shaped, a little more than 1½ times as long as broad, with prominent anterior angles. Node anteroposteriorly compressed, with straight, entire upper border. Postpetiole about twice as broad as the petiole, nearly three times as long as broad, with prominent and rather acute conules in the middle of the sides. Gaster elongate elliptical, somewhat larger than the head. Legs short, with incrassated femora and tibiæ.

Shining; mandibles sparsely punctate; clypeus shining in the middle, subopaque and longitudinally rugose on the sides. A little less than the anterior half of the head longitudinally rugose, except in the rather pronounced antennal sulcus. Posterior portion of head sparsely punctate. Epinotum, petiole and postpetiole subopaque, very finely punctate; extreme base of epinotum transversely rugose.

Hairs pale yellow, erect and moderately abundant on the body, short and appressed on the legs and antennæ.

Reddish yellow; antennæ, legs and gaster paler, borders of mandibles, anterior border of clypeus and articulations of antennæ black.

Worker. Length: 1.3–1.5 mm.

Head, excluding the mandibles, rectangular, a little longer than broad, with straight posterior border. Mandibles with two prominent apical and several smaller basal teeth. Eyes moderate, just in front of the middle of the head. Anterior border of clypeus not emarginate in the middle. Antennal scapes reaching to the posterior corners of the head. Thorax rather long, with convex, hemispherical pronotum, and rounded humeri. Mesoëpinotal depression pronounced but narrow. Epinotum with subequal base and declivity. Spines short, acute and erect, their bases prolonged forward as ridges along the sides of the basal surface. Petiole less than half as broad as the epinotum, about twice as long as broad, somewhat broader behind than in front. Node rather compressed in profile, with long, somewhat concave anterior, and short abrupt posterior slope. Postpetiole distinctly broader than long, about twice as broad as the petiole, subcampanulate, with rounded sides. Gaster about the size of the head. Legs rather short.

Shining; mandibles finely and indistinctly punctate, anterior ⅔ of head finely longitudinally rugose and subopaque, more reticulate around the eyes. Epinotum and posterior portion of mesonotum subopaque, evenly and sharply punctate. Petiole and postpetiole opaque on the sides and below. Gaster glabrous.

Pilosity similar to that of the soldier but shorter and less conspicuous.

Brownish yellow, mesonotum somewhat darker, gaster, legs and antennæ paler. Head chestnut brown, with paler mandibles and clypeus. Mandibular teeth black.

Described from several soldiers and workers found in the cañon of the Rio Grande at Langtry, Texas, nesting in the ground under cedars.

This species is related to *Ph. tysoni* Forel of the Atlantic States and to *Ph. subarmata* Mayr and *cornutula* Emery of the American tropics. The head of the soldier is much longer and the humeri more acute than in *tysoni* and the frontal carinæ are not produced into teeth and the clypeus is not entire as in *subarmata* and *cornutula*. The workers of all of these forms

are hardly distinguishable; the head of the *casta* worker, however, seems to be more rectangular and less glabrous than in the three species mentioned.

71. **Pheidole humeralis** sp. nov.

(Pl. XXVII, Fig. 39.)

Soldier. Length: 3–3.3 mm.

Head large, suboblong, excluding the mandibles 1½ times as long as broad, slightly narrower behind than in front, with sharp anterior angles, broadly and angularly excised posterior border and pronounced occipital groove. Eyes small, about ¼ the distance from the anterior to the posterior corners. Mandibles very convex, without distinct apical teeth. Clypeus short, flattened in the middle, with broadly excised anterior margin. Frontal area elliptical, deeply impressed, with a median carinula. Antennæ short, scapes reaching to the eyes, slender, curved at their bases, joints 2–8 of the funiculus small, about as long as broad, subequal. Frontal carinæ nearly as long as the antennal scapes. Thorax through the humeri, which are very broad and angular, about half as broad as the head. Pronotum from above trapezoidal; in profile somewhat angularly convex in the middle and in the mesonotal region. Mesoëpinotal constriction pronounced. Epinotum in profile with subequal base and declivity, the former horizontal, the latter sloping. Spines robust, long and blunt at the tips, directed outward and backward. Between them the base and declivity are confluent in a narrow groove in the middle. Petiole from above violin-shaped, 1⅔ times as long as broad, broader behind than in front, with pronounced anterior angles. Node not compressed anteroposteriorly, except at the summit, which is transverse and only faintly excised in the middle when seen from behind. Postpetiole 1½ times as broad as the petiole and fully twice as broad as long, with indistinctly angular sides. Gaster elliptical, flattened, about as large as the head. Legs of moderate length.

Smooth and shining; mandibles coarsely punctate; clypeus smooth in the middle, longitudinally rugose on the sides. Anterior half of the head with sharp longitudinal rugæ, which extend only about half as far back between the frontal carinæ as on the sides of the head. Shining posterior half of head with distinct scattered punctures. Thorax glabrous, except meso- and metapleuræ which are subopaque and obscurely punctate-rugose. Petiole and postpetiole shining above, opaque on the sides and below. Gaster glabrous.

Hairs yellowish, suberect or reclinate, long and abundant, especially on the gaster, shorter on the antennal scapes and legs.

Ferruginous; borders of mandibles, anterior border of clypeus, postpetiole and gaster dark brown or black; clubs of antennæ, and frontal carinæ and petiole brown, legs in some specimens yellowish.

Worker. Length: 1.8–2 mm.

Head, excluding the mandibles, but little longer than broad, with an angularly excised posterior margin and pronounced but very short occipital groove. Eyes moderate, flattened, just in front of the middle of the head. Mandibles with several minute and acute denticles of which the apical are scarcely larger than the basal.

Clypeus with a broad but feeble excision in its anterior border. Antennal scapes reaching to the posterior corners of the head. Humeral angles of thorax rounded, not prominent as in the soldier. Upper surface of mesonotum moderately and evenly rounded. Epinotum similar to that of the soldier; spines well-developed, acute. Petiole more than twice as long as broad, but little broader behind than in front; node rather thick, with long, slightly concave anterior slope, short abrupt posterior slope, and rounded summit. Postpetiole but little broader than the petiole, slightly broader than long, with rounded sides. Gaster somewhat smaller than the head, with straight anterior border. Legs rather slender.

Smooth and shining; mandibles coarsely punctate towards their tips, striated at the base. Sides of front, cheeks and regions about the eyes finely longitudinally rugose. Remainder of head and the mesonotum with small, very sparse piligerous punctures. Meso- and epinotum, sides and ventral portions of petiole and postpetiole, densely punctate or reticulate. Gaster glabrous, very sparsely punctate.

Pilosity like that of the soldier but somewhat sparser, conspicuous and suberect on the antennal scapes and legs as well as on the body.

Black or very dark brown; mandibles, antennæ, coxæ, tarsi, tips and bases of the femora and tibiæ yellowish. Antennal clubs, and scapes except their tips, clypeus and anterior corners of head, brown.

Described from several soldiers and workers taken by Miss Mary Cooper at Corsicana, Texas.

This species is quite distinct in the peculiar structure of the thorax of the soldier. In this respect it resembles *Ph. barbata* but is much smaller and the head is proportionally longer, the postpetiole narrower, with less angular sides and the gaster smaller. The workers of the two species are also very different, that of *barbata* having much longer and more slender legs and antennæ and lacking the occipital groove and the spines on the epinotum.

72. **Pheidole marcidula** sp. nov.

Soldier. Length: 2.5 mm.

Head, excluding the mandibles, about $\frac{1}{4}$ longer than broad, slightly broader in front than behind, with slightly bulging sides, angularly excised posterior margin and deep occipital groove. Eyes moderate, a little less than $\frac{1}{3}$ the distance from the anterior to the posterior corners. Mandibles convex, with two stout apical teeth. Clypeus short, rather deeply impressed in the middle, with broadly excised anterior margin. Frontal carinæ very short; frontal area triangular, rather shallow, with a median and two lateral carinulæ. Antennæ slender, scapes reaching to a little beyond the eyes. Club a little shorter than the remainder of the funiculus. Funicular joints 2–8 fully as long as broad. Thorax robust, less than half as broad as the head, humeri prominent but rounded, mesonotum longer than broad in profile, convex in the middle, but anteriorly and posteriorly somewhat flattened. Mesoëpinotal constriction rather broad and shallow. Epinotum with subequal base and declivity and blunt spines, which are less than half as long as their bases, directed upward and slightly outward. Petiole somewhat violin-shaped, about twice as

long as broad, and a little broader behind than in front; node compressed anteroposteriorly. Postpetiole less than twice as broad as the petiole, 1½ times as broad as long, with blunt but distinct lateral angles in front of the middle. Gaster conspicuously smaller than the head. Legs rather slender.

Head and gaster shining; thorax, petiole and postpetiole nearly opaque. Mandibles covered with coarse, sparse punctures. Clypeus smooth in the middle, very finely striated on the sides. Cheeks and front traversed by sharp, but not very coarse, longitudinal rugæ, some of which extend back in the occipital groove and meet a series of transverse rugæ which are confined to the bottom of this groove and the adjacent region in front, but lengthen and extend out posteriorly onto the occipital lobes where they disappear. Thorax and pedicel very finely rugulose-punctate, mesonotum slightly smooth and shining above.

Hairs pale yellow, moderately abundant, suberect, shorter on the legs and antennæ, somewhat obtuse on the gaster.

Yellow; the head and antennal clubs a little more reddish; the mandibles and clypeus reddish brown, the former bordered with black.

Worker. Length: 1.3–1.5 mm.

Head, excluding the mandibles, a little longer than broad, with distinctly and angularly excised posterior border. Eyes rather large, convex, just in front of the middle of the head. Mandibles with larger apical and smaller basal teeth. Clypeus convex, with the anterior border narrowly excised in the middle. Antennal scapes nearly reaching the posterior corners of the head. Mesonotum evenly rounded above. Mesoëpinotal impression distinct. Epinotum with subequal base and declivity. Spines as long as broad at their bases, acute, flattened, directed outward, upward and backward. Petiole nearly three times as long as broad, hardly broader behind than in front, sides slightly concave at the middle, node compressed anteroposteriorly, with entire upper border. Postpetiole a little broader than the petiole and a little broader than long, subglobular. Gaster smaller than the head. Legs rather long.

Smooth and shining; mandibles subopaque, finely striatopunctate. Cheeks and front with only a few indistinct longitudinal rugæ. Meso- and epinotum, sides and ventral surfaces of petiole and postpetiole subopaque, finely and densely punctate.

Hairs very sparse, suberect on the body, pointed on the head, clavate and obtuse on the remainder of the trunk, but especially on the thorax, petiole and postpetiole, where they are arranged in pairs somewhat as in *Leptothorax* workers. Hairs on antennæ and legs shorter denser and appressed.

Yellow; legs somewhat whitish; mandibular teeth and corners of clypeus reddish.

Described from a single soldier and seven workers taken from a small colony under a stone at Barton Creek near Austin, Texas.

This species is related to *vinelandica* but the sculpturing of the head in the soldier and worker is much less extensive, the mesonotum of the soldier is much longer and narrower, and the pilosity of the worker is very different.

73. **Pheidole pinealis** sp. nov.

(Pl. XXVII, Fig. 38.)

Soldier. Length: 3.2–3.5 mm.

Head large, excluding the mandibles, about ¼ longer than broad, as broad in front as behind, with subparallel sides, angularly excised posterior margin and deep occipital groove extending forward as far as the frontal area. Eyes rather small, convex, about ⅓ the distance from the anterior to the posterior corners of the head. Mandibles convex, with two stout apical teeth. Clypeus flattened in the middle behind, impressed in front, with a distinctly excised anterior border. Antennæ well-developed, scapes reaching to a little beyond the eyes. Club somewhat shorter than the remainder of the funiculus; joints 2–8 as long as broad. Frontal carinæ about ½ as long as the antennal scapes. Frontal area shallow, triangular, with a median carinula. Thorax, robust, about half as broad as the head. Mesonotum as broad as long, with prominent humeri. Epinotum with subequal base and declivity, the latter sloping. Spines longer than broad at the base, very acute, directed upward and slightly outward and backward. Petiole nearly twice as long as broad, somewhat violin-shaped, but little broader behind than in front; node high, much compressed anteroposteriorly, with rather sharp upper border distinctly excised in the middle. Postpetiole nearly three times as broad as the petiole and three times as broad as long, with prominent, rather acute lateral conules. Gaster broadly elliptical, smaller than the head. Legs of moderate length.

Smooth and shining; mandibles coarsely and sparsely punctate. Clypeus irregularly rugulose in the middle, longitudinally rugose on the sides. Anterior third of head coarsely rugose, posterior ⅔ with coarse and sparse piligerous punctures. Mesonotum between the humeri with sharp transverse rugæ. Entire epinotum densely punctate, pleuræ and ventral portions of petiole and postpetiole indistinctly rugulose. Gaster with small, scattered, piligerous punctures.

Hairs yellowish, coarse, and rather abundant, suberect; shorter and more reclinate on the antennal scapes and legs than on the body.

Ferruginous brown; head, pronotum, pleuræ and legs more yellowish; borders of mandibles, anterior border of clypeus and a sharply defined sagittate blotch on the middle of the head, dark brown or black.

Worker. Length: 1.3 mm.

Head, excluding the mandibles, nearly as broad as long, subrectangular, with angularly excised posterior border. Eyes moderately large, convex, a little in front of the middle of the head. Mandibles with two larger apical and several small basal teeth. Clypeus with feebly excised anterior border. Antennal scapes reaching a little beyond the posterior corners of the head. Mesonotum rounded, without prominent humeri. Epinotum similar to that of the soldier. Petiole about twice as long as broad, scarcely broader behind than in front, with concave sides and compressed node, the transverse upper border of which is not excised in the middle. Postpetiole about half again as broad as the petiole, somewhat broader than long, with rounded sides. Gaster about the size of the head. Legs moderate.

Smooth and shining; mandibles striatopunctate; cheeks and front of head longitudinally rugose. Mesopleuræ, epinotum and ventral portions of petiole and postpetiole opaque, densely punctate. Hairs similar to those of the soldier, but less abundant. Brown; gaster darker, mandibles yellowish.

Described from eleven soldiers and a single worker taken from a nest under a stone in Limpio Cañon about 10 miles west of Fort Davis, Texas. The chambers of the nest were stored with large seeds.

This species is very closely related to *Ph. vinelandica* but the soldier has a larger head, prominent pointed conules on the postpetiole and a black spot on the vertex. The worker *pinealis*, judging from the single specimen I have seen, is much less pilose and of a more uniform color than that of *vinelandica*.

74. **Pheidole desertorum** *Wheeler.*

WHEELER, Bull. Am. Nat. Hist., XXII, 1906, pp. 337–339, ☿ ☿ ♀ ♂.

Texas: Ft. Davis. (Wheeler).
Arizona: Ash Fork, Prescott, Phoenix, and Tuscon (Wheeler).

75. **Pheidole desertorum** var. **comanche** *Wheeler.*

WHEELER, Bull. Am. Mus. Nat. Hist., XXII, 1906, p. 339, ☿ ☿.

Texas: Paisono Pass and Terlingua (Wheeler).

76. **Pheidole desertorum** var. **maricopa** *Wheeler.*

WHEELER, Bull. Am. Mus. Nat. Hist., XXII, 1906, pp. 339, 340, ☿ ☿.

Arizona: Grand Cañon, 3876 ft. (Wheeler).

77. **Pheidole dentata** *Mayr.* var. **commutata** *Mayr.*

Pheidole commutata MAYR, Verh. zool. bot. Ges. Wien, XXXVI, 1866, p. 459, ☿ ☿; MAYR, *Ibid.*, XXXVII, 1887, p. 598, ☿, 604, ☿; DALLA TORRE, Catalog. Hymen., VII, 1893, p. 93; EMERY, Zool. Jahrb., Abth. f. Syst., VIII, 1894, p. 295.

Pheidole dentata subsp. or var. *commutata* FOREL, Ann. Soc. Ent. Belg., XLV, 1901, p. 352.

Pheidole dentata var. *commutata* WHEELER, Bull. Am. Mus. Nat. Hist., XII, 1907, p. 18, pl. iii, figs. 37–40.

Texas: Laredo (J. F. McClendon); Hearne, Denton and Meridian (W. H. Long); New Braunfels, Austin, Galveston, Alice and Granite Mt. (Wheeler). Also in Florida and Missouri.

I quite agree with Forel that this form is not specifically distinct from Mayr's *dentata* and that this in turn should not be regarded as a variety of *morrisi* but as an independent species. As Mayr observed, the soldiers of *commutata* are highly variable in color even in the same colony, some

being nearly black, while others are red, with a brown or black gaster. The workers, too, vary in a similar manner. The females are rich red, with a broad, dark brown band across each gastric segment. The antennal scapes of this sex are distinctly but very slightly flattened and dilated at their curved bases, though this is not the case in the soldiers. *Ph. commutata* is perhaps the most abundant *Pheidole* in Central Texas where it nests under stones or in and under old logs, or makes untidy fused craters with many openings about the roots of trees or other plants. It is a highly carnivorous species with no tendency to harvest seeds. Forel's *Ph. dentata* var. *faisonica* from North Carolina is hardly distinct from the Texas and Florida form.

78. **Pheidole morrisi** *Forel* var. **impexa** var. nov.

(Pl. XXVII, Fig. 31.)

Texas: Del Valle near Austin (Wheeler).

A deälated female, a male and several soldiers and workers, taken from a compact crater nest about 5 inches in diameter in pure sand, differ sufficiently from typical specimens from North Carolina to be regarded as a distinct variety. The soldier and worker are much more hairy and the anterior portion of the head of the former is much more coarsely rugose. In the female there are no dark blotches on the head and mesonotum and the dark brown color of the gaster is confined to a narrow band across the posterior portion of each segment. The male is pale yellow throughout, with only the posterior two thirds of the head infuscated. The male of the variety *vanceæ* Forel of North Carolina has the thorax brown above and the wings have somewhat darker veins than *impexa*. The males of the typical form from the sandy pine barrens of Lakehurst, New Jersey, are black, with slightly infuscated wings and brown veins. I am unable to distinguish the soldiers, workers and females of this form from North Carolina specimens received from Forel. This author describes the males among his specimens as "sordid yellowish testaceous, with the upper surface of the head brownish." The types of this species are from Vineland, New Jersey. In the females of all the forms of *morrisi* the antennal scapes are distinctly dilated and flattened at the base.

79. **Pheidole titanis** *Wheeler.*

(Pl. XXVII, Fig. 30.)

WHEELER, Psyche, June, 1903, pp. 95-97, ♀ ☿.

Texas: Chisos Mts. (O. W. Williams); Paisano Pass (Wheeler).

This and *Ph. rhea* are the largest species known to occur in the United States and are among the largest of the genus.

80. **Pheidole hyatti** Emery.

(Pl. XXVII, Fig. 32.)

EMERY, Zool. Jahrb., Abth. f. Syst., VIII, 1894, pp. 295–296, ♃ ☿.

Soldier. Length: 4–4.5 mm.

Head rather small, excluding the mandibles about as broad as long, as broad behind as in front, with angularly excised posterior border, deep occipital furrow and rounded posterior lobes; sides slightly convex. Eyes rather large, somewhat convex, ⅓ the distance from the anterior to the posterior corners. Mandibles not very convex, with two stout apical and several small basal teeth. Clypeus flattened and indistinctly carinate in the middle, with a pronounced excision in the anterior border. Antennal scapes reaching nearly to the posterior corners of the head, distinctly dilated and flattened at their curved bases and of nearly equal diameter throughout. Club somewhat shorter than the remainder of the funiculus; funicular joints 2–8 considerably longer than broad. Frontal carinæ prominent, about half as long as the antennal scapes. Frontal area triangular, rather deep, with a median carinula. Thorax in front with prominent but rounded humeri, half as broad as the head. Pronotum rounded above, mesonotum rounded anteriorly, transversely impressed in the middle and angular behind. Mesoëpinotal constriction deep. Epinotum with the base slightly longer than the declivity, the former narrowly grooved in the middle, the latter somewhat concave. Spines moderate, acute, as long as broad at the base, directed upward and slightly backward and outward. Petiole violin-shaped, nearly twice as long as broad, a little broader behind than in front, with concave sides. Node but little compressed anteroposteriorly, rounded and blunt above, without a median excision. Postpetiole less than twice as broad as the petiole, about twice as broad as long, broader in front than behind, with rounded sides. Gaster somewhat smaller than the head. Legs rather slender.

Mandibles smooth and shining, sparsely punctate, except at the base where they are longitudinally striated. Middle of clypeus and front and posterior corners of the head shining; remaining portions of clypeus and head subopaque, sides of clypeus longitudinally rugose. Portions of head lateral to the frontal carinæ reticulate-rugose, with a general longitudinal trend to the rugæ and punctate interstices on the middle of the head. The rugæ subside more and more and the punctures remain, but in turn become finer and disappear on the shining posterior corners. Occipital furrow transversely crenate. Thorax, petiole and postpetiole subopaque, finely and densely punctate, except the upper surface of the pro- and mesonotum, which is smooth and shining. Gaster shining, finely shagreened.

Hairs yellow, coarse and erect both on the body and appendages, rather abundant and of unequal length, especially on the gaster.

Ferruginous; legs more yellowish, gaster brownish, teeth of mandibles and anterior border of clypeus black.

Worker. Length: 2.5–3 mm.

Head, excluding the mandibles, longer than broad, elliptical, rounded behind. Eyes large, convex, just in front of the middle. Mandibles with two longer apical and several smaller basal teeth. Clypeus flattened, with its anterior margin nearly straight. Antennæ slender; scapes surpassing the posterior corners of the head by more than ¼ of their length, slender and not dilated or much curved at the base, somewhat enlarged distally; joints 2–8 of the funiculus fully twice as long as broad. Thorax long, resembling that of the soldier, but the promesonotal region is more rounded on the sides. Petiole more than twice as long as broad, resembling that of the soldier; postpetiole but little broader than the petiole, as long as broad, subglobular. Gaster about the size of the head. Legs long and slender.

Shining; mandibles striatopunctate; cheeks and sides of front finely and longitudinally rugose. Sides of pro- and mesonotum, the whole epinotum, petiole and postpetiole subopaque, finely and densely punctate.

Pilosity and color as in the soldier.

Female. Length: 6.5–7 mm.

Head, excluding the mandibles broader than long and broader behind than in front. Posterior margin but little excised, occipital groove shallow. Eyes large, in front of the middle of the head. Mandibles and clypeus as in the soldier. Antennal scapes more dilated and flattened at their curved bases. Thorax through the insertion of the fore wings distinctly broader than the head. Epinotal spines short and acute, with very broad bases. Petiole and postpetiole similar to those of the soldier, but the former segment with a higher and sharper node, distinctly excised in the middle. Wings very long (8 mm.).

Mandibles shining, coarsely punctate, with fine striæ at the base. Clypeus smooth and shining in the middle, rugulose on the sides. Head subopaque, reticulate-rugose even on the posterior corners, but the front is smoother and has only a few longitudinal rugæ on each side near the carinæ. Thorax somewhat shining, especially above, mesonotum finely striated and coarsely punctate, smooth and shining in front. Paraptera and scutellum with smaller, scattered punctures. Pleuræ indistinctly, epinotum much more coarsely reticulate-rugulose, as are also the petiole and postpetiole. Gaster shining, distinctly shagreened.

Hairs similar to those of the soldier but proportionally shorter.

Head, thorax and appendages yellowish ferruginous; petiole, postpetiole and gaster brown. Teeth of mandibles and anterior border of clypeus dark brown. Wings yellowish hyaline, with yellow veins and stigma.

Texas: San Angelo, Marfa, Ft. Davis, Paisano Pass (Wheeler).
California: Catalina (C. F. Baker); San Jacinto (Pergande, Emery).
Mexico: Chihuahua (C. H. T. Townsend); Cuernavaca (Wheeler).

81. **Pheidole hyatti** var. **ecitonodora** var. nov.

Texas: Austin and Belton (Wheeler); Paris (Miss Rucker).
New Mexico: Las Truches (Miss L. Gerhardt).
Colorado: Cañon City (Schmitt); Colorado City (Wheeler).
This is the common form in Texas and New Mexico and differs from

the preceding in the darker coloration of the soldier, worker and female, which have the gaster black. Often, too, the whole body of the soldier and worker is dark brown or black, with somewhat paler legs and antennæ. In the female the wings seem to be shorter (7 mm.), at least in the Texan specimens. The soldiers have the rank fecal odor of *Eciton* workers. The male measures 4–4.5 mm. and is sordid yellow or light brown, with dark brown head and gaster and tridentate mandibles. Like the typical form of the species this variety lives in populous colonies under stones and is highly predacious. Sometimes more than a dozen deälated females may be found in a single nest.

82. **Pheidole texana** *Wheeler.*

(Pl. XXVII, Figs. 33 and 34.)

WHEELER, Psyche, June, 1903, pp. 97–99, ♀ ☿.

Texas: Travis County.

Allied to *Ph. hyatti* but easily distinguished by the heavy reticulate sculpturing of the head, thorax, petiole and postpetiole in both soldier and worker. The antennal scapes of the soldier reach nearly half way between the eyes and the posterior corners of the head.

83. **Pheidole cockerelli** sp. nov.

Soldier. Length: 4–5 mm.

Head rather small, excluding the mandibles a little longer than broad, as broad in front as behind, with deeply and angularly excised posterior border and narrow but well-developed occipital groove. Sides slightly rounded, with the rather large, moderately convex eyes at the anterior third. Mandibles not very convex, with two strong apical, but no basal teeth. Clypeus faintly carinate in the middle, with a pronounced notch in the anterior border. Antennal scapes flattened and curved at the base, reaching to half way between the eyes and posterior corners of the head; funicular joints 2–8 a little longer than wide. Frontal carinæ prominent, about ⅓ as long as the antennal scapes. Frontal area triangular, impressed, carinulate. Thorax in front half as broad as the head, with somewhat rounded humeri. Pronotum and base of mesonotum convex above, the latter with a transverse depression in the middle and a distinct torus. Mesoëpinotal constriction prominent. Epinotal base longer than the declivity, the former grooved in the middle. Spines slender, acute, ⅓ as long as the base of the epinotum, directed upward and slightly backward and outward. Petiole violin-shaped, a little more than twice as long as broad, with concave sides; node somewhat compressed anteroposteriorly, with a slightly excised upper margin. Postpetiole less than twice

as broad as the petiole and less than twice as broad as long, with rounded scarcely angulated sides. Gaster as large as the head. Legs rather slender.

Mandibles and clypeus shining, the former coarsely punctate and towards the base coarsely striate; the latter with delicate, rather sparse rugæ even on the middle. Head subopaque, only the frontal area and a triangular region immediately behind it smooth and shining, the remainder of the head densely punctate and reticulate-rugose, the sides of the front longitudinally rugose. The posterior portion also with some coarse shallow foveolæ. Thorax, petiole and postpetiole subopaque, and densely punctate, the upper surface of the pro- and mesonotum somewhat shining and transversely rugulose. Gaster shining, distinctly shagreened throughout, with scattered piligerous punctures.

Hairs brownish yellow, acute, suberect, on body, scapes and legs; rather short but moderately abundant.

Deep ferruginous red; gaster, mandibular teeth, anterior border of clypeus and bases of antennal scapes, black.

Worker. Length: 2.6–3 mm.

Head, excluding the mandibles, longer than broad, rounded behind, with large convex eyes just in front of the middle. Mandibles with two large apical and several smaller basal teeth. Clypeus convex, with faintly notched anterior border. Antennal scapes slender, somewhat enlarged distally, not curved nor flattened at the base, surpassing the posterior margin of the head by nearly $\frac{1}{3}$ their length; funiculus similar to that of the soldier but more slender. Thorax like that of the worker, but with more sloping humeri and less angular mesonotum. Petiole nearly three times as long as broad; node high, somewhat compressed, with convex upper border. Postpetiole half again as broad as the petiole, a little broader than long, subglobular. Gaster about as large as the head. Legs slender.

Mandibles subopaque, finely striated and punctate. Clypeus and front shining, remainder of head opaque, densely punctate, cheeks reticulate-rugose. Thorax, petiole and postpetiole opaque and densely punctate, middle of pronotum and the petiolar and postpetiolar nodes smooth and shining. Gaster glabrous.

Pilosity similar to that of the soldier.

Thorax, pedicel and appendages deep ferruginous brown; head and gaster black, mandibles brownish yellow, with black teeth.

New Mexico: Arroyo Pecos, Las Vegas (T. D. A. Cockerell).

Arizona: Prescott (Cockerell, Wheeler); Tempe (F. H. Simmons).

This species may be best described as half way between *Ph. hyatti* and *texana*. The sculpture of the head of the soldier is coarser than that of *hyatti* but much finer than that of *texana*, although as in the latter species it covers the whole occipital portion. The thorax and pedicel are much less robust than in *texana*, the epinotal spines are more acute, the antennal scapes longer and less flattened and the color is darker. The worker *texana* is easily distinguished from that of *cockerelli* by its much rougher sculpture, the hinder portions of the head being reticulately rugose, and the much larger postpetiole and lighter color.

84. **Pheidole crassicornis porcula** subsp. nov.

(Pl. XXVII, Fig. 35.)

Soldier. Length: 4.5–5 mm.

Head with the posterior angles more rounded than in the typical *crassicornis*, excluding the mandibles as broad as long. Mandibles with two large apical, and several small basal teeth. Clypeus concave and distinctly carinate in the middle, with a median notch in its anterior border. Antennal scapes very much flattened and curved at the base, their tips reaching to $\frac{1}{3}$ the distance between the eyes and the posterior corners of the head; joints 2–8 of funiculus cylindrical, longer than broad. Frontal carinæ high, about $\frac{1}{4}$ as long as the antennal scapes. Frontal area deeply impressed, triangular, with a median carinula. Thorax and pedicel robust, very similar to those of the typical form. Gaster elliptical, flattened, distinctly smaller than the head. Legs rather robust.

Mandibles shining, coarsely punctate and somewhat striated at the base on the outer side. Clypeus shining, smooth in the middle, irregularly rugulose on the sides. Sculpture of head like that of the typical *crassicornis*, except that the posterior portion is more opaque and has scattered shallow foveolæ. Thorax and gaster shining and subopaque, epinotum, petiole and postpetiole opaque, finely and densely punctate.

Hairs pale yellow, coarse, acute, rather long, abundant, erect on the body scapes and legs, almost absent on the upper surface of the gaster. Pubescence lacking.

Head, thorax, legs and antennæ brownish yellow, border of mandibles and clypeus blackish, pedicel and gaster brown.

Worker. Length: 2.25–2.5 mm.

Differing from the worker of the typical *crassicornis* in having the head in front and behind the eyes shining, with scarcely perceptible scattered punctures, the epinotal spines reduced to mere acute denticles and the body of a deeper color. Head and gaster dark brown or almost black. The pilosity is like that of the typical form, there being some erect hairs on the antennal scapes, legs and body but differing in the absence of hairs on the upper surface of the gaster.

Described from several soldiers and workers from a single colony found by Judge O. W. Williams under a stone in the Chisos Mts. Texas.

Were it not for the existence of the next variety I should regard *porcula* as a distinct species on account of its larger size, more flattened scapes, erect pilosity, absence of pubescence on the head and gaster, foveolation of the hind part of the head in the soldier, and the very different sculpture and short epinotal spines of the worker. The next variety, however, is clearly transitional to the typical form from North Carolina, which has the body and appendages singularly devoid of hairs and only a very sparse though distinct pubescence on the head and gaster in the soldier.

85. **Pheidole crassicornis porcula** var. **tetra** var. nov.

The soldier of this variety closely resembles the typical *crassicornis* in the size and in the sculpture of the head, which is very smooth and shining behind, with a few small piligerous punctures. The pilosity is much denser than that of *porcula* on the thorax, pedicel and gaster, and covers the whole upper surface of the gaster. The erect hairs on the antennal scapes are few but distinct and confined to the anterior border; on the legs they are often as abundant as in the typical *porcula*. The longer hairs on the thorax, pedicel and gaster in specimens from some colonies are distinctly obtuse. The head, but not the gaster, has the long, very sparse punctures of the typical *crassicornis*. The mandibles are more finely punctate, the clypeus more opaque than in *porcula*.

The worker of *tetra* has a distinctly and finely punctate head which, however, is much more shining on the sides and behind than in the typical form of the species. The epinotal spines are as long and robust, the color is darker like that of *porcula*.

Described from numerous soldiers and workers taken from five colonies at San Antonio and Austin, Texas. Although there are minor differences in the abundance and obtuseness of the hairs among specimens from different nests, I deem it advisable to erect only one other variety, as it is clear that *crassicornis* is a protean form in respect to pilosity and sculpture and cannot be satisfactorily elucidated without an examination of much more material. The species is not a very common one according to my observations.

86. **Pheidole crassicornis** var. **diversipilosa** var. nov.

Soldiers, workers and females from two colonies taken at Fort Davis, Texas (June 9, '02) approach the typical *crassicornis* still more closely than the last. In the soldier the head and appendages have only sparse, appressed pubescence, with a few short hairs on the vertex. The hairs on the thorax and pedicel are long, erect but not very abundant, whereas the gaster is covered with numerous short, erect hairs which might best be described as the erected and somewhat lengthened pubescence of the typical form. The color of the soldier is dark reddish brown, the gaster nearly black. In the worker the head and pronotum are smooth and shining, much as in the typical *porcula*, but the epinotal spines are intermediate between those of this subspecies and the typical *crassicornis*.

The female measures 6.3 mm. The antennal scapes resemble those of the soldier but extend to half way between the eyes and posterior corners

of the head. The latter and the vertex are shining, sparsely and coarsely punctate. The mesonotum, paraptera, scutellum and gaster are smooth and shining, without sculpture. The epinotum, petiole and post-petiole are subopaque and finely shagreened or punctate. The pilosity is very poorly developed, there being merely a few erect hairs on the thorax and a row of sparse hairs along the edge of each gastric segment. The pubescence is very dilute and rather uniformly distributed over the head, thorax and gaster. Head, thorax, and appendages rich yellowish red, pedicel darker; gaster, ocellar triangle, borders of mandibles and clypeus black. Wings long (8 mm.), hyaline, with honey yellow veins and stigma.

87. **Pheidole constipata** sp. nov.

Soldier. Length: 2.5–2.7 mm.

Head, excluding the mandibles, longer than broad, distinctly narrower in front than behind, with rounded posterior angles, and rather shallow occipital excision and groove; in profile regularly convex above and below, with short but distinct teeth on the mentum. Eyes moderate, less than $\frac{1}{3}$ the distance from the anterior to the posterior corners. Mandibles rather convex, with two large apical teeth. Clypeus flattened in the middle, with broad, shallow excision in its anterior border. Antennal scape reaching to $\frac{1}{3}$ the distance between the eye and the posterior corner; club as long as the remainder of the funiculus: joints 2–8 of the latter distinctly broader than long. On each side the frontal carina is continued back as a ridge more than half as long as the scape, forming the mesial border of a distinct antennal sulcus. Frontal area deeply impressed, subtriangular, carinulate. Thorax robust, in front fully half as broad as the head, with well-developed but not acutely angular humeri. Anterior surface of mesonotum somewhat flattened, continuous with the pronotum and forming a rather abrupt angle with the posterior slope. Meso-ëpinotal constriction pronounced. Epinotum in profile with the base distinctly longer than the declivity, spines blunt and robust, fully half as long as the diameter of the bases, with their anterior and posterior edges continued as ridges bounding the sloping and flattened portion of the ëpinotum. They are as long as the distance between their bases and are directed upward, backward and outward. Petiole $1\frac{2}{3}$ as long as broad, but little broader behind than in front, with slightly concave, sides and a high anteroposteriorly compressed node, which is rather thick above, with transverse border and concave posterior surface. Postpetiole about twice as broad as the petiole and about twice as broad as long, with the sides produced into blunt conules at the middle. Gaster much smaller than the head, elliptical, with straight anterior border. Legs rather robust.

Mandibles and clypeus shining, the former with a few coarse punctures, the latter smooth in the middle, longitudinally rugose on the sides. Head subopaque, very finely and densely punctate, cheeks and region between the frontal carinæ also longitudinally rugose; extreme posterior corners and frontal area glabrous and shining. Thorax and petiole opaque, finely and densely punctate. Postpetiole finely punctate but shining above. Gaster shining throughout, obscurely shagreened.

Hairs on the body pale yellow, short, erect, obtuse and not very abundant; on the legs and antennæ very short and appressed.

Ferruginous; head somewhat darker than the thorax, legs and antennæ; borders of mandibles black, antennal clubs and posterior portion of gaster fuscous.

Worker. Length: 1.5–1.7 mm.

Head, excluding the mandibles, a little longer than broad, subrectangular. Eyes prominent, at the anterior third of the head. Mandibles with two large apical and a few small basal teeth. Clypeus convex, with a pronounced notch in the middle of the anterior border. Antennal scapes reaching to the posterior corners of the head. Frontal carinæ very short; frontal area impressed, subtriangular, carinulate. Thorax similar to that of the soldier, but narrower in front and with much less prominent humeri. Epinotal spines acute, longer than broad at their bases, about $\frac{1}{3}$ as long as the base of the epinotum, directed backward and outward and but little upward. Petiole about twice as long as broad, similar to that of the soldier. Postpetiole $1\frac{1}{2}$ times as broad as the petiole, a little broader than long, with blunt median angles on the sides. Gaster ovate, flattened, slightly smaller than the head. Legs rather robust.

Mandibles, clypeus and frontal area somewhat shining, the first striatopunctate. Head, thorax, petiole and postpetiole opaque, densely punctate throughout. Gaster and legs shining.

Hairs similar to those of the soldier but sparser both on the body and appendages.

Ferruginous; upper surface of head, antennal clubs, petiole, postpetiole, gaster and femora more or less infuscated, as are also the epinotal spines. In some specimens the upper surface of the thorax is also very slightly infuscated on the projecting surfaces.

Female. Length: 4.5 mm.

Head, excluding the mandibles, but little longer than broad, broader behind than in front, with angular posterior corners and nearly straight posterior border. Clypeal notch deeper than in the soldier, frontal carinæ longer. Thorax of the usual shape, through the wing insertions a little narrower than the head. Epinotum with shorter base than declivity and robust spines, which are somewhat longer than broad at their bases. Petiole resembling that of the soldier but relatively shorter. Postpetiole large, fully $2\frac{1}{2}$ times as broad as the petiole, with very blunt but well-developed, median conules on the sides. Gaster elongate elliptical, with somewhat concave anterior border.

Mandibles and clypeus similar to those of the soldier, but somewhat shining. Head opaque and densely punctate throughout, longitudinally rugose even on the sides, posterior corners and occiput more reticulate-rugose. There is a shining depression in front of the anterior ocellus. Thorax subopaque and coarsely punctate, mesonotum, paraptera and scutellum shining, all three of these regions with a few foveolæ on the sides, the mesonotum longitudinally striate in the middle behind. Petiole and epinotum uniformly and densely reticulate-punctate, nearly opaque. Postpetiole more shining, with finer, sparser punctures and a few large foveolæ. Gaster shining, finely and indistinctly shagreened, with coarse piligerous punctures.

Hairs sordid yellow, long, tapering, abundant and suberect over the whole body, somewhat shorter but also suberect on the legs and antennal scapes.

Ferruginous; edges of mandibles, ocellar triangle, antennal clubs and sometimes an indistinct spot on the middle of the mesonotum, fuscous. Wing insertions and gaster black, more or less of the base of the first segment of the latter ferruginous. Legs yellowish. Wings hyaline, with dilute yellow veins and stigma.

Male. Length: 2.6 mm.

Head, including the large eyes, as long as broad, without cheeks but produced behind the eyes. Mandibles small, tridentate, barely overlapping with their tips. Antennæ rather short; scape as long as two basal funicular joints taken together; first funicular joint globose, nearly as broad as long, remaining joints cylindrical, gradually increasing in length and decreasing in diameter to the tip. Thorax robust, flattened above. Epinotum rounded, sloping, without distinct basal and declivous surfaces, unarmed. Petiole and postpetiole similar to those of the worker. Gaster and legs slender.

Smooth and shining; head opaque, densely and finely punctate.

Hairs pale yellow, tapering, short, suberect and sparse on the body, appressed and inconspicuous on the appendages.

Pale, yellow; upper surface of head and gaster fuscous. Wings hyaline, with pale, sordid yellow veins and stigma.

Described from numerous specimens taken from several colonies nesting under stones at Austin and New Braunfels, Texas.

This species belongs to the *flavens* group and is closely related to *Ph. floridana* Emery. The soldier of *constipata* is, however, somewhat smaller, has the middle of the clypeus smooth and shining, without a median carina, and the thorax is punctate and opaque throughout, not shining above as in *floridana*. A typical worker of this latter species, received from Prof. Emery, has longer hairs and lacks the infuscation of the head, gaster, femora, etc. of *constipata*. It would, perhaps, be permissible to regard both of these forms and the next as representing subspecies of flavens.

88. **Pheidole lauta** sp. nov.

Soldier. Length: 2.25–2.5 mm.

Head, excluding the mandibles, a little longer than broad, about as broad in front as behind, with rounded posterior corners, broadly and angularly excised posterior border and rather deep occipital groove. Mentum with short, but distinct teeth. Eyes moderate, $\frac{1}{3}$ the distance from the anterior to the posterior border of the head. Mandibles with two large apical teeth. Clypeus longitudinally depressed in the middle, with several longitudinal ridges and a median keel; anterior border with a broad, shallow excision in the middle. Antennal scapes reaching about $\frac{1}{3}$ the distance between the eyes and posterior corners. Club as long as the remainder of the funiculus; joints 2–8 of the latter about as long as broad. Frontal carinæ continued back as ridges which are as long as the antennal scapes and mesially bound shallow and narrow antennal sulci. Frontal area impressed, subtriangular, carinulate. Thorax robust, through the prominent but rounded humeri about $\frac{1}{2}$ as broad as the head. Pro- and mesonotum convex, together forming a hemispheri-

cal mass in profile, the mesonotum distinctly angulate with abrupt posterior surface. Mesoëpinotal constriction pronounced. Epinotum with base longer than the declivity in profile. Spines stout and acute, longer than broad at the base, as long as the basal surface, continued as ridges anteriorly and posteriorly. Surface of epinotum between the spines oblique and flattened. Petiole about twice as long as broad, slightly broader behind than in front, with concave sides and a high, anteroposteriorly compressed node, which has a rather thin, entire, transverse upper border. Postpetiole a little more than twice as broad as the petiole, a little broader than long, with distinct median conules on the sides. Gaster smaller than the head, elliptical, with straight anterior border. Legs rather long and stout.

Mandibles and clypeus shining, the former with coarse, widely scattered punctures, the latter longitudinally rugose. Head opaque, very finely and densely punctate, posterior $\frac{1}{4}$ smooth and shining, anterior half rather finely, longitudinally rugose except in the antennal sulci which are uniformly punctate. Thorax, petiole and postpetiole reticulate-punctate, subopaque, except for a small, smooth and shining area on the middle of the pronotum. Gaster and legs glabrous.

Hairs yellow, long, tapering, suberect and rather abundant on the body, shorter and more reclinate on the appendages.

Ferruginous, mandibular teeth black; gaster more or less infuscated behind; legs and antennæ yellowish.

Worker. Length: 1.5 mm.

Head, excluding the mandibles, a little longer than broad, with rather rounded sides and a slight emargination of the posterior border. Eyes distinctly in front of the middle. Mandibles with two large apical and several basal teeth. Clypeus flattened, with straight, entire anterior border. Antennal scapes reaching a little beyond the posterior corners of the head. Frontal carinæ short. Frontal area shallow, subtriangular, with a few longitudinal ridges. Thorax similar to that of the soldier but narrower in front and with much more sloping humeri. Petiole as in the soldier. Postpetiole twice as broad as the petiole, as long as broad, with the sides distinctly angulate in the middle. Gaster smaller than the head, elliptical, flattened, with straight anterior border. Legs well developed.

Whole head, including the clypeus, mandibles and frontal area, opaque, finely and densely punctate, cheeks with faint longitudinal rugæ. Thorax, petiole and postpetiole uniformly and densely punctate, opaque. Gaster smooth and shining, with the anterior third of the first segment opaque.

Hairs like those of the soldier, but sparser on the body, obtuse though not enlarged at their tips; on the appendages very delicate, pointed and appressed.

Ferruginous; gaster somewhat darker behind; legs more yellowish.

Female. Length. 4.5 mm.

Head, excluding the mandibles, nearly as broad as long, somewhat broader behind than in front, with nearly straight posterior border. Posterior orbits at the middle of the head. Mandibles like those of the soldier. Clypeus carinate in the middle, with a broad notch in its anterior border. Antennal scapes extending to a little behind the eyes. Thorax through the wing insertions as broad as the head, flattened above. Epinotal spines short and acute, as long as broad at the base. Petiole like that of the soldier, but relatively shorter. Postpetiole fully twice as broad as the petiole, less than twice as broad as long, with very blunt, long conules on the middle of the sides. Gaster suboblong, with concave anterior border. Legs rather slender.

Mandibles shining, sparsely and coarsely punctate. Clypeus, frontal area and head longitudinally rugose, subopaque, front and vertex also finely and densely punctate. Occipital region and posterior corners somewhat smooth and shining. There is no shining impression in front of the anterior ocellus. Thorax shining, pronotum opaque, finely and transversely punctate-rugulose. Mesonotum finely and longitudinally striate except on the middle in front. Scutellum with a few scattered foveolæ. Petiole and postpetiole shining, faintly reticulate-rugulose. Gaster shining, with small, scattered piligerous punctures.

Hairs yellow, rather long and abundant, tapering, suberect both on the body and appendages.

Ferruginous; borders of mandibles and clypeus black; gaster fuscous or black, with the anterior and posterior borders of the segments lighter. Legs yellow.

Male. Length: 3–3.5 mm.

Head, including the large eyes, as long as broad, without cheeks, protruding behind in the ocellar region. Mandibles small, barely overlapping with their acute, tridentate tips. Clypeus subcarinate, rounded in front. Antennæ rather short; scape very small, shorter than the two first funicular joints which are subequal in length, although the first joint is globose and nearly as broad as long. Remaining joints cylindrical, of uniform diameter but gradually lengthening distally. Thorax robust, mesonotum not much flattened above. Epinotum somewhat concave but without traces of spines. Petiole and postpetiole similar to those of the worker, but the node of the former is lower, rounded and not compressed anteroposteriorly. Legs long and slender.

Shining and sparsely punctate; head opaque and very finely punctate.

Hairs yellow, short, moderately abundant, suberect both on the body and appendages.

Uniformly pale yellow; only the ocellar triangle and eyes black. Wings hyaline with pale, sordid yellow veins and stigma.

Described from numerous specimens taken from several colonies nesting under stones at New Braunfels, Texas, about the sources of the Comal River.

This species is even more closely related to *Ph. floridana* than the preceding. The soldier, however, has the clypeus longitudinally rugose in the middle, the thorax almost entirely punctate and the mesonotum less angular. The worker has the base of the gaster opaque whereas this is shining in a type specimen of *floridana* given me by Prof. Emery. From *constipata*, the soldier of *lauta* is readily distinguished by the keeled and rugose clypeus, the long tapering hairs and the finer sculpturing of the head; the worker by the longer antennal scapes, opaque mandibles, clypeus, frontal area and base of first gastric segment; the female by the sculptured clypeus, absence of a smooth depression in front of the first ocellus, more extensively sculptured mesonotum and paler wing insertions; the male in having only the ocellar region instead of the whole upper surface of the head, black.

89. **Pheidole nuculiceps** sp. nov.

Soldier. Length: 2 mm.

Head, excluding the mandibles, as long as broad, very convex above, as broad in front as behind, with rather convex sides, rounded posterior angles and distinct but not very deep occipital excision and groove. Mentum with well-developed, pointed teeth. Mandibles convex, with two large apical teeth. Clypeus without a median carina, rather convex, with a shallow median notch in the anterior border. Antennal scapes reaching nearly half way between the eyes and the posterior corners of the head; joints 2–8 of the funiculus broader than long. Frontal carinæ prolonged backward as ridges nearly as long as the antennal scapes. Frontal area impressed, subtriangular, carinulate. Thorax short and robust, pro- and mesonotum very convex, with prominent humeral angles, the mesonotum angular, with a long, abrupt posterior surface which forms a right angle with the base of the epinotum. Epinotum with the declivity longer than the base. Spines slender and pointed, half as long as the base, a little further apart than long, continued into anterior and posterior ridges at the base and directed upward and slightly backward and outward. Space between the spines concave and sloping. Petiole more than twice as long as broad, distinctly broader in front than behind, with concave sides and a conical node, which is much rounded above and very slightly compressed anteroposteriorly. Postpetiole twice as broad as the petiole, less than twice as broad as long, broadest in front, where its sides are angularly produced. Gaster somewhat smaller than the head, broadly elliptical, flattened, with straight anterior margins. Legs rather long and slender.

Shining; mandibles with rather small, sparse punctures; clypeus smooth in the middle, rugose on the sides. Head throughout with sharp longitudinal rugæ and feebly punctate interrugal spaces. Thorax densely punctate-reticulate, the pro- and mesonotum more opaque, with fine transverse rugæ above. Petiole and postpetiole subopaque, finely and densely punctate, the latter smoother and shining above. Gaster shining, with scattered piligerous punctures.

Hairs yellow, suberect, long, pointed and rather abundant; on the legs and scapes more appressed or reclinate.

Ferruginous red; legs more yellowish; mandibular teeth black.

Worker. Length: 1.3 mm.

Head, excluding the mandibles, but little longer than wide, with rounded sides and slightly concave posterior border, with the eyes just in front of the middle. Mandibles wth two large apical and several small basal teeth. Clypeus convex, its anterior border without a distinct median notch. Antennal scapes extending a little beyond the posterior corners of the head. Thorax similar to that of the soldier but pro- and mesonotum much lower and narrower, and the posterior surface of the latter forming an obtuse angle with the base of the epinotum. Petiole like that of the soldier, but with lower and more conical node. Postpetiole about 1½ times as broad as the petiole, as long as broad, somewhat rectangular, with subparallel sides. Gaster nearly as large as the head.

Mandibles and clypeus shining; head and thorax opaque, densely and finely punctate; cheeks and sides of front also finely reticulate-rugose. Petiole and postpetiole densely punctate with the upper surfaces of the nodes smoother and more shining. Gaster smooth and shining.

Hairs like those of the soldier.

Ferruginous; mandibles, legs and gaster more yellowish.

Described from a single soldier and three workers taken at New Braunfels, Texas, at the sources of the Comal River.

This is very distinct from all the described North American species of the *flavens* group. It resembles *Ph. exigua* Mayr. of South America very closely, but the soldier of *nuculiceps* has the sculpture of the head heavier and covering even the occiput, which is smooth and shining in *exigua*, and the antennal sulcus is not so broad and deep. Two workers of *exigua* received from Prof. Emery are yellow and not ferruginous like those of *nuculiceps*. If *exigua* be regarded as a subspecies of *flavens*, *nuculiceps* should, perhaps, have the same rank.

90. **Pheidole metallescens splendidula** subsp. nov.

(Pl. XXVI, Figs. 20 and 21.)

Soldier. Length: 2.6–3.2 mm.

Head, excluding the mandibles, somewhat longer than broad, as broad in front as behind, with rounded sides, angularly excised posterior border and well-developed occipital groove. Eyes moderate, about $\frac{1}{3}$ the distance from the anterior to the posterior corners. Teeth on the mentum small and indistinct. Mandibles with two large apical teeth. Clypeus flattened in the middle, without a median carina, and with a rounded notch in the anterior border. Antennal sulcus very shallow. Antennal scapes short, extending to about $\frac{1}{4}$ the distance between the eyes and the posterior corners of the head. Funicular joints 2–8 distinctly broader than long. Frontal carinæ not more than $\frac{1}{4}$ as long as the scapes. Frontal area deeply impressed, subelliptical, without a median carinula. Thorax robust, through the rounded humeri about half as broad as the head. Pro- and mesonotum rounded above, the latter angular behind, with oblique, somewhat concave posterior slope. Mesoëpinotal constriction broad and rather deep. Epinotum with subequal base and declivity, sloping between the spines, which are nearly half as long as the base, longer than broad at their insertions and with acute tips, directed backward and slightly upward and outward. Their bases are continued forward and backward as low slender ridges on the sides of the epinotum. Petiole somewhat less than twice as long as broad, broader behind than in front, with concave sides and a high, antero-posteriorly compressed node, which has a blunt, transverse superior border. Post-petiole about twice as broad as the petiole and somewhat less than twice as broad as long, with the sides produced in the middle as distinct angles. Gaster much smaller than the head, elliptical, flattened, with straight anterior border. Legs rather robust, with somewhat incrassated femora.

Mandibles and clypeus shining, the former with coarse, scattered punctures, the latter smooth in the middle with longitudinally rugose sides. Head nearly opaque, densely punctate and on the anterior two thirds longitudinally rugose, the posterior third also with shallow elongated foveolæ and the extreme occipital

portion smooth and shining. Floor of the occipital groove not transversely crenate. Antennal sulci reticulate-rugose. Thorax, petiole, and postpetiole opaque, densely punctate or reticulate; upper surface of postpetiole smoother and shining, pro- and mesonotum loosely and reticulately rugose. Gaster glabrous.

Hairs pale yellow, erect, obtuse, shorter on the head, longer and more conspicuous on the trunk and especially on the gaster. On the legs and antennæ they are very short and tapering, suberect or reclinate.

Ferruginous, varying to dark brown; gaster black with more or less of the base of the first segment ferruginous, the black portion usually with metallic blue reflections which may also extend to the upper portion of the thorax. Middle portion of femora often darker than the remainder of the legs. Edges of mandibles and anterior border of clypeus black.

Worker. Length: 1.3–1.5 mm.

Head, excluding the mandibles, longer than broad, with nearly straight posterior margin and slightly convex sides. Eyes distinctly in front of the middle. Mandibles with two large apical and several small basal teeth. Clypeus convex behind, with very faintly excised anterior border. Antennal scapes reaching a little beyond the posterior corners of the head. Thorax resembling that of the soldier, but the pro- and mesonotum are much lower and narrower. Epinotal spines about $\frac{1}{3}$ as long as the base of the epinotum, acute, longer than broad at their bases. Petiole twice as long as broad, scarcely broader behind than in front, with subparallel sides and high, anteroposteriorly compressed node similar to that of the soldier. Postpetiole less than twice as broad as the petiole, and less than twice as broad as long, with faintly angled sides. Gaster somewhat smaller than the head, elliptical, flattened, with straight anterior border.

Mandibles and clypeus shining, the former sparsely punctate, the latter very smooth in the middle. Head, thorax, petiole and postpetiole subopaque, densely punctate or reticulate, except for a longitudinal strip on the front and vertex, a spot on the middle of the mesonotum and the upper surface of the postpetiole, which are smooth and shining. Cheeks and sides of front longitudinally rugulose. Gaster and legs glabrous.

Pilosity similar to that of the soldier, but sparser. In some specimens the obtuse hairs are white instead of yellow.

Deep metallic violet, the upper surface of the head, excluding the cheeks, the pro- and mesonotum metallic green or blue. In some specimens, possibly immature, the thorax, petiole and postpetiole and base of gaster are red or yellowish with blue or green metallic reflections. Mandibles, antennæ and legs yellow, antennal clubs and middle portions of femora and tibiæ more or less infuscated or black; the femora often metallic violet.

Female. Length: 4–4.5 mm.

Head, excluding the mandibles, nearly square, but little broader behind than in front, sides rather straight, posterior margin feebly concave. Porterior orbits at the middle of the head. There is a very deep impression just in front of the anterior ocellus. Mandibles and clypeus like those of the soldier. Frontal area deep, triangular, with a median carinula. Antennal scapes reaching a little behind the posterior orbits. Thorax of the usual shape, about as broad as the head, much flattened above. Epinotal spines robust, acuminate, somewhat longer than broad at their bases, directed backward and slightly upward, about twice as far apart

at their bases as long. Petiole 1½ times as long as broad, violin-shaped, broader behind than in front, with a high anteroposteriorly compressed node, with transverse summit, feebly notched in the middle. Postpetiole twice as broad as the petiole and somewhat more than twice as broad as long, with acute conules on the middle of the sides. Gaster suboblong, with straight anterior border.

Mandibles, clypeus and frontal area shining, the first coarsely and sparsely punctate, the second longitudinally rugulose even in the middle. Head, subopaque, anterior ¾ longitudinally rugose, occipital region reticulate-rugose. Pronotum and epinotum opaque, the former finely and transversely punctate-rugulose, the latter densely punctate, remainder of thorax shining and sparsely punctate; mesonotum longitudinally striated behind. Petiole and postpetiole subopaque, very finely and densely punctate, nodes somewhat shining above. Gaster shining, with scattered piligerous punctures.

Hairs yellowish, rather short, pointed, suberect, not very abundant; suberect and nearly as long on the legs and scapes as on the body.

Ferruginous; anterior portion of head, antennæ, legs, mandibles, lower portions of thorax and pedicel more yellowish; gaster black, with its anterior corners red. Wings yellowish hyaline with dilute yellow veins and stigma.

Male. Length: 3.2 mm.

Head through the eyes about as broad as long, produced behind, without cheeks. Mandibles small, scarcely overlapping with their acute bidentate tips. Clypeus carinate, angularly rounded in front. Antennæ slender, scapes as long as the two basal joints of the funiculus taken together; first funicular joint globular, as broad as long, remaining joints cylindrical, gradually increasing in length and decreasing in thickness to the tip. Thorax robust, through the wing insertions much broader than the head, flattened above. Epinotum with convex base and slightly concave declivity, unarmed. Petiole twice as long as broad, slightly broader behind than in front, with low, rounded node. Postpetiole about 1½ times as broad as the petiole, broader than long, with faintly angular sides. Gaster and legs slender.

Shining; head opaque, very finely and densely punctate.

Hairs yellowish, very slender, acute, suberect, not very abundant; reclinate and inconspicuous on the legs and antennæ.

Pale yellow; head black above, clypeus and gaster dark brown. Wings like those of the female.

Texas: Austin, Montopolis, Del Valle, Marble Falls, and Del Rio (Wheeler); Denton (W. H. Long).

Described from numerous soldiers workers and females and two males taken from small crater nests in the soil. The colonies of this exquisite little ant comprise only a few dozen individuals. My specimens show considerable variation in coloration, especially in the workers, although these are always highly metallic. Emery described the species *metallescens* from workers only. I have found both the workers and soldiers of this form in small crater nests in the sandy grounds about Jacksonville, Florida. The head of the worker is much smoother above than in the subspecies *splendidula* and the soldiers have the rugæ of the head coarser and more

reticulate behind. In this caste, too, there are no metallic reflections on the gaster, which is dark brown or blackish. The specimens from Del Rio resemble the typical Florida form more closely in the sculpturing of the head of the worker, but the gaster of the soldier is metallic blue as in the other Texas specimens. The discovery of the soldiers of *metallescens* shows that Emery was right in supposing that this *Pheidole* belongs to the *flavens* group.

91. **Pheidole lamia** *Wheeler.*

(Pl. XXVI, Figs. 14–17.)

WHEELER, Am. Natur., XXXV, 1901, pp. 534, 535, fig. 11, ♀ ☿.

Soldier. Length: 2.5–2.7 mm.

Head, excluding the mandibles, about twice as long as broad, somewhat wider in front than behind, with straight sides. Posterior border angularly excised, with a very short and broad occipital groove. In profile the head is somewhat deeper in front than behind, with flattened dorsal and ventral surfaces. The front and clypeus are peculiarly truncated, the former presents three large concave areas separated and bordered by prominent ridges, the latter is flat with nearly straight anterior border. The mandibles too, are flattened in the same plane as the clypeus and front, and somewhat triquetral in shape, so that the anterior portion of the head resembles that of the Camponotine subgenus *Colobopsis*. The inner border of each mandible is furnished with two small apical and two very similar basal teeth. Frontal area lacking. The frontal carinæ are straight, nearly parallel, slightly diverging behind, extending back almost half way to the posterior corners of the head and forming the mesial borders of shallow grooves for the antennal scapes. Eyes small, with about 6–8 ommatidia in the longitudinal diameter, situated somewhat less than a fourth the distance from the anterior to the posterior corners of the head. Antennæ short, scape as long as the frontal carinæ, angularly bent at the base. Funiculus exceeding the length of the scape by the length of the club; the latter distinctly shorter than the remainder of the funiculus. First funicular joint as long as the four succeeding joints; joints 2–8 uniform, broader than long. Thorax somewhat shorter than the head, excluding the mandibles; promesonotum $\frac{2}{3}$ as broad as the head, convex and hemispherical above, without humeral angles and with a faint swelling on the posterior slope, which is often abrupt and forms nearly a right angle with the base of the epinotum. Mesoëpinotal constriction pronounced. Epinotum short, its basal surface horizontal, a little longer than the steep and concave declivity; spines short and tooth-like, as broad at the base as long, erect and much farther apart than long. Petiole somewhat less than twice as long as broad, violin-shaped, narrower in front than behind; in profile toothless below, with an abrupt, antero-posteriorly compressed node, the upper border of which, seen from behind, is slightly notched in the middle. Postpetiole twice as broad as the petiole through the node, broader than long, with acute, median lateral conules which are convex anteriorly, and concave posteriorly; in profile very convex above, flattened beneath, with a distinct anteromedian denticle. Gaster elongate elliptical, with parallel

sides, as large as the head. Legs rather robust, with incrassated femora and clavate tibiæ.

Mandibles, clypeus and front opaque, irregularly rugose. Remainder of body smooth and shining; cheeks and space between frontal carinæ with sharp longitudinal rugæ, diverging in the latter region from the median line.

Hairs rather short, erect, pale yellow, covering the body and legs.

Truncated anterior portion of head and mandibles brown, remainder of body yellow; legs slightly paler.

Worker. Length: 1.5–1.8 mm.

Resembling the workers of other species of *Pheidole*. Head, excluding mandibles, barely longer than broad, a little broader behind than in front, with rounded posterior corners and slightly convex sides. Mandibles with two large apical and four smaller basal teeth. Eyes as large as those of the soldier, about $\frac{1}{3}$ the distance from the anterior to the posterior corners of the head. Clypeus convex, with its anterior border faintly and sinuately excised in the middle. Frontal area small, triangular. Antennæ similar to those of the soldier but the scape is not angulate at the base and reaches to the posterior corner of the head. Frontal carinæ very short. Thorax similar to that of the soldier but the promesonotum is less convex and the spines on the epinotum are reduced to minute teeth. Petiole small and narrow, with thicker and more rounded node than in the soldier. Postpetiole a little broader than the petiole, as long as broad, rounded and convex above and on the sides. Gaster elliptical, but little longer than broad.

Smooth and shining throughout.

Pilosity like that of the soldier.

Yellow, with the mandibular teeth and anterior border of clypeus brown.

Texas: Austin.

The soldier of this singular species, of which I have found several colonies under stones, is unlike any other known *Pheidole* in the peculiar structure of the head, and deserves, perhaps, to be placed in a subgenus by itself. This singular structure is so much like that of *Colobopsis* that we are justified in believing that the soldiers use their heads for plugging up the entrances to the nest galleries. The species is truly hypogæic. The large size of the gaster and the small number of soldiers (1–4) found in a colony, suggest that this caste may, perhaps, function as the queen of the species.

92. **Cremastogaster lineolata opaca** *Mayr.* var. **depilis** var. nov.

The study of *Cremastogaster lineolata* specimens from a large number of colonies in the southwest proves to be unusually difficult because the forms show transitions to the Mexican *C. opaca*, which Emery justly regards as merely a subspecies of *lineolata*, to the Californian subspecies *coarctata*, and through the subspecies *læviuscula* to the more typical *lineolata* of the Northern and Eastern States.

In Mexico the var. *dentinodis* Forel, described from specimens which I took at Queretaro, is connected with the typical subsp. *opaca* by a number of intermediate forms collected by J. F. McClendon at Guadalajara, Juanacatlan, and Tuxpan. Some of these are very dark and opaque and, like the typical *opaca*, lack the deticles on the posterior corners of the petiole, which is moreover distinctly broader than long. The epinotal spines are long, very slender and pointed and distinctly diverging. The head is very opaque and finely reticulate-rugose or densely punctate, except for a narrow, shining, frontal streak. The mandibles, clypeus and cheeks are densely and longitudinally striated. This form is connected with the eastern *lineolata* through the variety *subopaca* Emery, a variety which may be more appropriately attached to *opaca* than to the typical *lineolata*. It has the diverging, attenuate spines of the northern form, but the head and gaster are less densely punctate and therefore more shining.

A number of specimens taken at Del Rio, Texas (Wheeler), Alamogordo, New Mexico (Viereck), Cerro Carrigal and Cerro Chilicote, Chihuahua, Mexico (C. H. T. Townsend) may be regarded as a distinct variety (*depilis* var. nov.) intermediate between the typical *opaca* and the form which Emery has described as an independent species under the name of *punctulata*. The typical form of *depilis* from Cerro Carrigal has the thorax, petiole and postpetiole uniformly opaque and densely punctate, the pronotum also finely rugulose. The head is distinctly shining in front but more opaque and densely punctate towards the occiput. The gaster is shining and finely punctate at the base. There are almost no erect hairs on the upper surface of the head, thorax and gaster, but those on the head and gaster are short and closely appressed, those on the legs still shorter and less conspicuous. The head, thorax, pedicel and legs are ferruginous red, the top of the head and the first gastric segment chestnut brown. The epinotal spines are somewhat shorter, less attenuate and more parallel than in the typical *opaca*. There are no denticles at the posterior corners of the petiole. The antennal scapes barely extend beyond the posterior corners of the head. A note accompanying the specimens of *depilis* sent me by Mr. Townsend, says that "they were nesting in the branches of mesquite tenanted by longicorn beetle larvæ, in a tunnel 2 to 3 ft. long. The ants were in constant attendance on Coccids (*Pulvinaria* sp.?) on the outside of the branches and also in the cavities of the nest."

93. **Cremastogaster lineolata opaca** *Mayr.* var. **punctulata** *Emery.*

Cremastogaster punctulata Emery, Zool. Jahrb., Abth. f. Syst., VIII, 1894, p. 287, ☿.

Texas: Austin, Henrietta, Fort Stockton, Fort Davis, Alice, San Angelo (Wheeler); Paris, (Miss Augusta Rucker); Amarillo (T. D. A. Cockerell).

New Mexico: Las Vegas (T. D. A. Cockerell).
Colorado: Cañon City (P. J. Schmitt).
Kansas: Douglas County (Miss Clara Klaumann).
Mexico: Ojos del Diablo, Chihuahua (C. H. T. Townsend).

This form, which, I believe, should be reduced to varietal rank, is very similar to *depilis* in sculpture and coloration. The punctation of the head and thorax, however, are less dense, so that these parts are more shining, and the petiole is always shining in certain lights, not uniformly opaque as in *depilis* and the typical *opaca*. The epinotal spines are parallel and acute and the body is covered with sparse, suberect, obtuse hairs, in addition to the short appressed hairs of *depilis*.

Several deälated females taken at Austin and Alice by myself and by Townsend at Ojos del Diablo, and several winged specimens taken by Cockerell, May 10, at Las Vegas during their marriage flight, measure 6.5–7 mm. They have the whole head opaque, densely and longitudinally striated and punctate like the typical *opaca*, but the thoracic dorsum and gaster are smooth and shining, the mesonotum and scutellum with sparse, coarse punctures. The epinotal spines are short, not longer than broad at the base, rather blunt and directed backward. The head and thorax are black like the gaster, the mandibles, appendages and thoracic sutures deep red.

This variety nests in the ground under stones though it attends aphids on low herbaceous plants. A note accompanying the specimens from Ojos del Diablo describes them as nesting under a stone in grass "encrusted with the saline deposit from hot springs."

94. **Cremastogaster lineolata** *Say*, subsp. **læviuscula** *Mayr*.

Cremastogaster læviuscula Mayr, Verh. zool. bot. Ges. Wien, XX, 1870, pp. 990, 993, ☿; Dalla Torre, Catalog. Hymen., VII, 1893, p. 83 ☿.
Cremastogaster lineolata subsp. *læviuscula* Emery, Zool. Jahrb., Abth. f. Syst., VIII, 1894, pp. 284, 285, ☿.

The types of this subspecies were from Fort Cobb, Texas. I have taken specimens at Austin, Del Valle, Montopolis and Galveston, Texas and have received several from Plano, Texas (E. S. Tucker) and Gallinas Cañon, New Mexico (T. D. A. Cockerell). As the name indicates, this ant is characterized by its smoothness; the head, thorax and pedicel of the worker being shining and very finely punctate above. The epinotal spines are rather long, acute and diverging. The female is readily distinguished from the typical *lineolata* by the color. The head, thorax, pedicel, basal

portion of the first gastric segment and the legs and antennæ are red, with large brown anteromedian and parapsidal blotches on the mesonotum, and black scutellum and mesonotum. The head is coarsely and densely, the upper surface of the thorax more finely punctate. The wings in both sexes are hyaline. Length 8.5–9 mm.

This subspecies is not at all uncommon, nesting in the galls made by *Holcaspis cinerosus* on live-oaks (*Quercus virginiana*) in central Texas. I have often taken females, workers and males together in a single gall. As these colonies are always small and as the colonies of the variety *clara* nesting in the galls on the same trees are always more populous I am inclined to believe that *læviuscula* is merely the incipient nest form of *clara*. This is also indicated by the fact that the males and females of both forms are indistinguishable and the workers of *læviuscula* are always much smaller than those of *clara*.

95. **Cremastogaster lineolata læviuscula** var. **clara** *Mayr.*

Œcodoma (*Atta*) *bicolor* BUCKLEY, Proc. Ent. Soc. Phila., VI, 1867, p. 350, No. 67, ♀.
Cremastogaster clara MAYR, Verh. zool. bot. Ges. Wien, XX, 1870, pp. 990, 993, ♀; McCOOK, in Comstock's Rep. on Cotton Insects, 1879, p. 188, No. 5, ♀.
Cremastogaster leviuscula var. *clara* DALLA TORRE, Catalog. Hymen., VII, 1893, p. 83, ♀.
Cremastogaster lineolata subsp. *læviuscula* var. *clara* EMERY, Zool. Jahrb., Abtb. f. Syst., VIII, 1894, p. 285, ♀.

Texas: Fort Cobb (Mayr); Austin, Del Rio, Alice, Hays County, Langtry, New Braunfels (Wheeler); Laredo (J. F. McClendon); Paris (Miss Augusta Rucker).

Arizona: (Emery).

Mexico: Rio Santa Maria, Chihuahua (C. H. T. Townsend).

Indiana: (Emery).

The workers and females are readily distinguished from those of all the other North American forms of *C. lineolata* by the bright yellowish red color of the head, thorax, pedicel, appendages and extreme base of the gaster, contrasting strongly with the black of the remainder of the gaster. Wings of male and female white, with pale yellow veins. Length of worker 3.5–4.5 mm., female 8–9 mm., male 4–4.5 mm.

This species, as I have said, is probably the mature colonial form of *C. læviuscula*. It nests in large colonies in old logs and occasionally under stones. In its habits and nauseating odor it closely resembles the northern *lineolata*.

96. **Cremastogaster lineolata coarctata** *Mayr.*

EMERY, Zool. Jahrb., Abth. f. Syst., VIII, 1894, pp. 283, 284.

A number of workers taken in attendance on large coccids on mesquite (*Prosopis velutina*) at Tucson, Arizona, agree very well with Emery's description of this variety, which has the head subopaque behind and densely punctate, the thorax and pedicel opaque and confluently punctate. The epinotal spines are long, acute and diverging. The color is much duller than that of the variety *clara* and the entire gaster is black. The antennal scapes surpass the posterior corners of the head by a distance equal to their greatest diameter. Length 3.8–4.5 mm.

97. **Cremastogaster lineolata coarctata** var. **mormonum** *Emery.*

EMERY, Zool. Jahrb., Abth. f. Syst., VIII, 1894, p. 284, ☿.

Texas: Fort Davis, in woody galls on *Quercus cinerea* (Wheeler).

New Mexico: Romeroville (T. D. A. Cockerell).

Utah: Salt Lake and East Mill Creek (C. V. Chamberlin).

The Fort Davis specimens measure 3–3.5 mm., those from Romeroville slightly less. Some of the larger workers from Utah measure 3.5–5 mm. In these the scapes surpass the posterior corners of the head by fully twice their greatest diameter. The sexual forms are also unusually large, the females measuring 10–11 mm.; the males 3.8–4 mm. Both are colored like the corresponding forms of *lineolata*. The wings are faintly smoky, with brown veins and stigma.

98. **Cremastogaster ashmeadi** *Mayr.*

Cremastogaster ashmeadi MAYR, Verh. zool. bot. Ges. Wien, XXXVI, 1886, p. 463, ☿ ♂; DALLA TORRE, Catalog. Hymen., VII, 1893, p. 79; EMERY, Zool. Jahrb., Abth. f. Syst., VIII, 1894, p. 286, ☿.

Texas: Denton (W. H. Long); Paris (Miss Augusta Rucker).

The workers from these localities in northern Texas agree very closely with typical specimens of the Florida form received from Professor Emery and Mr. Pergande.

99. **Cremastogaster arizonensis** sp. nov.

(Pl. XXVII, Fig. 40.)

?*Cremastogaster brevispinosa* var. FENNER, Ent. News., VI, 1895, p. 216.

Worker. Length: 2–3 mm.

Head as broad as long, with slightly concave occipital border. Mandibles

narrow. Antennæ 11-jointed, with the scape not reaching the posterior corner of the head by fully its greatest breadth. Club 2-jointed, joints 2–7 of funiculus broader than long, 8th joint as broad as long. Promesonotum as broad as long, with prominent but rounded shoulders, not marginate on the sides. Mesoëpinotal constriction pronounced. Epinotum broader than long, sloping and flattened between the spines so that there is no distinct basal surface. Near the anterior end there is a small median projection. Spines short, not longer than broad at their bases, much further apart than long and directed upward and in some cases with their tips slightly turned forward. Petiole elliptical, longer than broad, with anterior and posterior ends truncated, distinctly denticulate behind, with a small anteroventral tooth. In profile the height of the segment behind is less than half its length. Postpetiole distinctly broader than long, convex above, transversely elliptical, without any trace of a median longitudinal furrow. Gaster with a very acute, slightly prolonged and upturned tip.

Shining; mandibles opaque, rather coarsely striato-punctate, clypeus and cheeks finely striated longitudinally. Head with very sparse and small punctures. Thorax subopaque, promesonotum and sides and base of epinotum finely striato-punctate, epinotal slope smooth and shining as are also the gaster, petiole and postpetiole.

Hairs and pubescence white and sparse, the former erect, the latter rather uniformly covering the body.

Dark chestnut brown, almost black. Antennæ and legs somewhat paler. Mandibles and gula yellowish.

Numerous specimens found running on cottonwood trees at Tucson and Phoenix, Arizona. This is probably the species cited by Fenner as *C. brevispinosa* var. which he found nesting in "large colonies; one nest observed under root of cotton-wood tree; immense number of ants traveling in columns in many directions, but sluggish and slow in movements."

This species is closely related to *C. brevispinosa* Mayr, *virgula* Forel and *rochai* Forel. From *brevispinosa*, it differs in the shorter antennal scapes, very different sculpture, shorter and less convex base of the epinotum, and in having no traces of a longitudinal impression on the postpetiole, etc. From *virgula* it differs in the much broader postpetiole, which is not constricted in front, the presence of denticles on the petiole, the absence of the marginate sides to the pro-mesonotum, etc. From *rochai* it may be distinguished by its much less pronounced sculpture, smaller anteromedian tooth on the petiole, and much smaller epinotal spines.

100. **Cremastogaster victima missouriensis** *Pergande.*

EMERY, Zool., Abth., f. Syst., VIII, 1894, pp. 287, 288, ☿.

Several workers collected by Miss Augusta Rucker at Paris, Texas, and five workers taken by Miss Clara Klaumann in Dickinson County, Kansas, agree very well with cotypes of this subspecies from Missouri, received from Mr. Pergande.

101. **Cremastogaster minutissima** *Mayr.*

Cremastogaster minutissima MAYR, Verh. zool. bot. Ges. Wien, XX, 1870, pp. 99, 995, ☿ ♀; DALLA TORRE, Catalog. Hymen., VII, 1893, p. 83, ☿ ♀; EMERY, Zool. Jahrb., Abth. f. Syst., VIII, 1894, p. 287.

A number of workers, females and males taken at Austin and New Braunfels, Texas, under stones in shady woods, appear to belong to this small yellow species, which might be more properly regarded as a subspecies of *victima.* The types, which are in the Stockholm Museum, are from Texas. According to Mayr, *minutissima* differs from *victima* in having smaller epinotal spines and a smoother surface, the female having rather prominent erect hairs on the legs. But *victima missourensis* has a smoother surface and the same pilosity in the female, and the males resemble those of *victima* very closely. I am unable to decide this question without more material. Neither of the forms seems to be at all common in Texas.

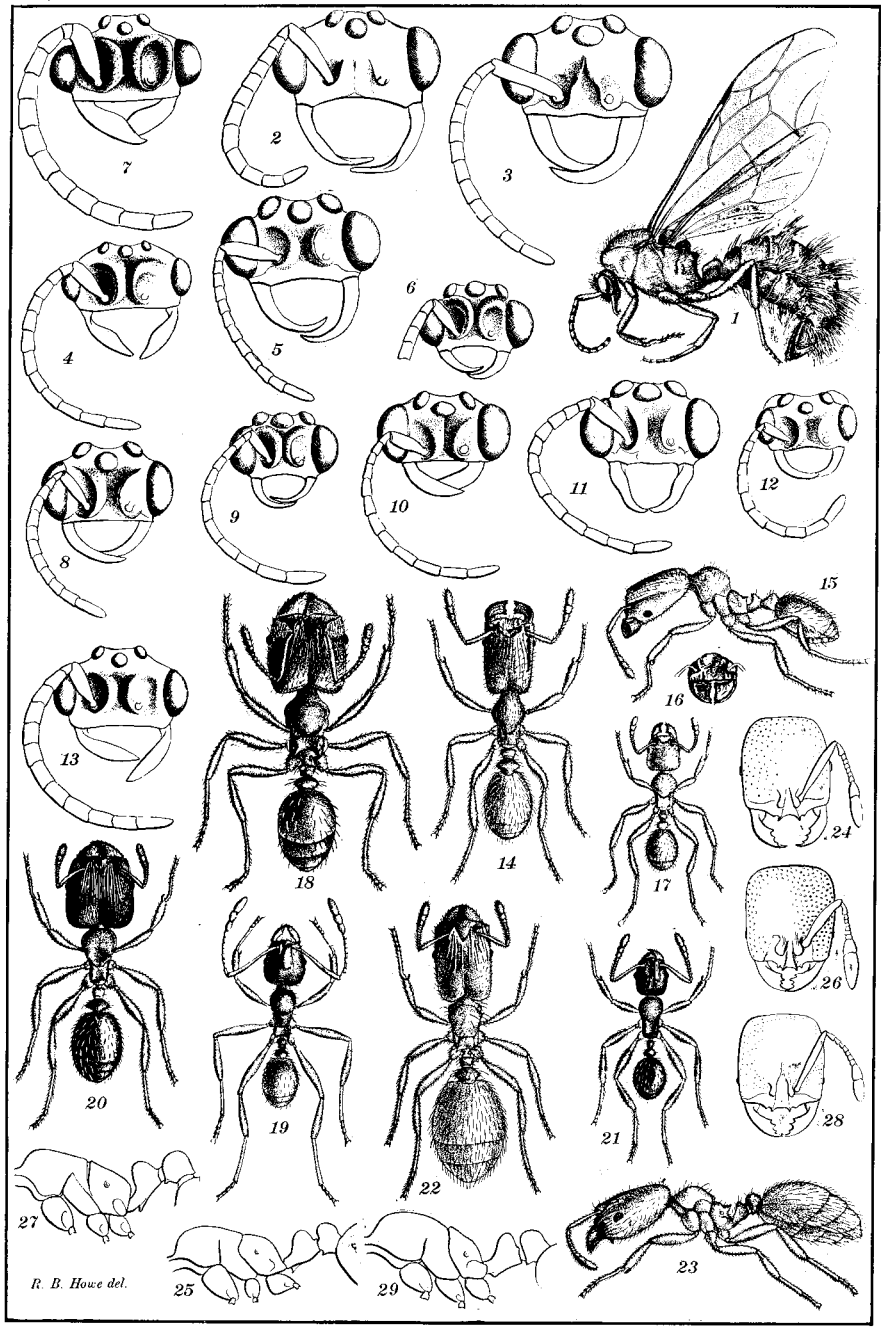
DESCRIPTION OF PLATES.

PLATE XXVI.

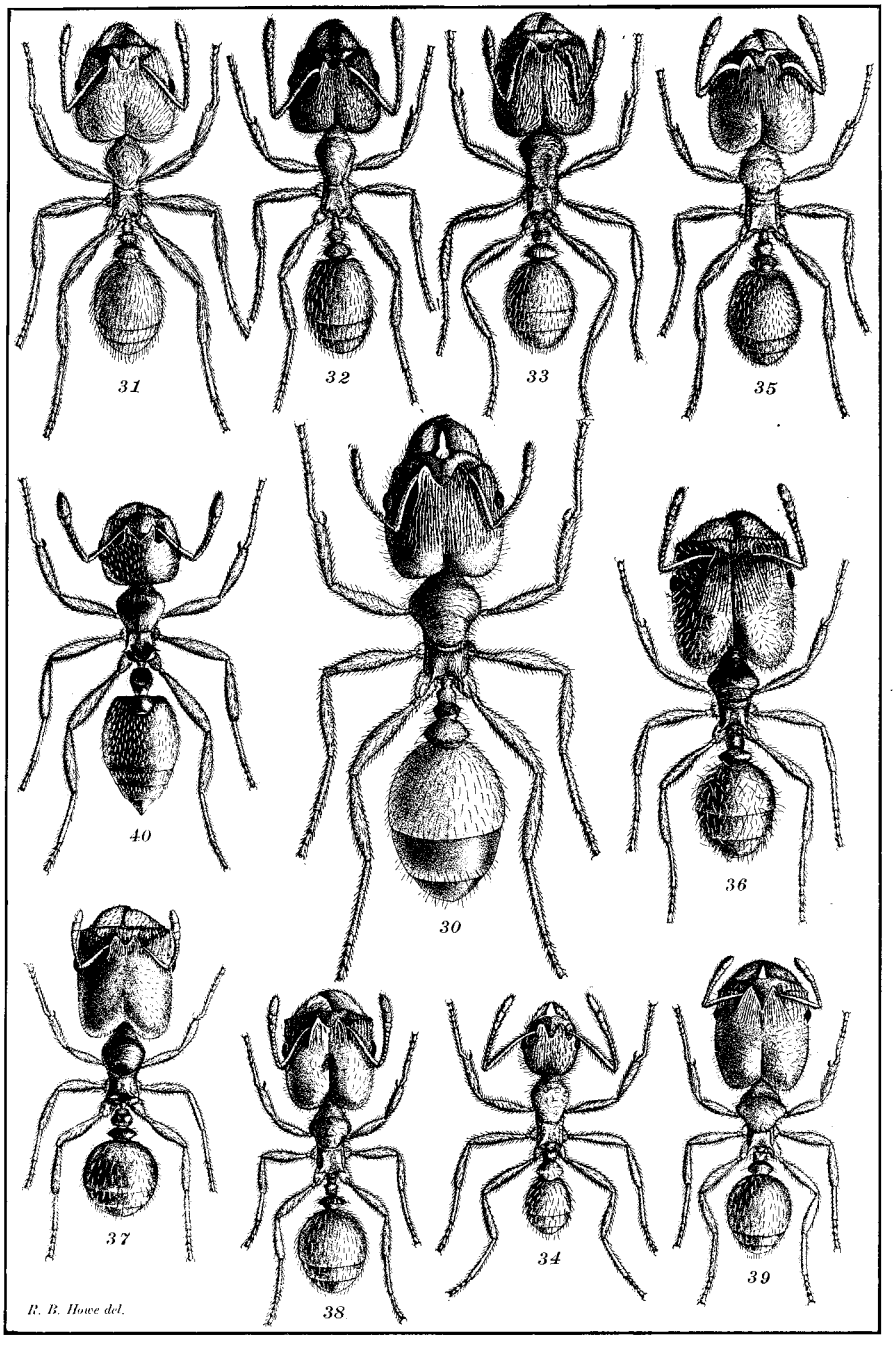
Fig. 1. *Eciton esenbecki* Westwood, ♂.
2. Head of same.
3. *Eciton cæcum* Latreille, ♂. Head.
4. *Eciton* (*Acamatus*) *opacithorax* Emery, ♂. Head.
5. *Eciton* (*Acamatus*) *arizonense* sp. nov., ♂. Head.
6. *Eciton* (*Acamatus*) *minus* Cresson, ♂. Head.
7. *Eciton* (*Acamatus*) *nigrescens* Cresson, ♂. Head.
8. *Eciton* (*Acamatus*) *oslari* sp. nov., ♂. Head.
9. *Eciton* (*Acamatus*) *melshæmeri* Haldem., ♂. Head.
10. *Eciton* (*Acamatus*) *harrisi* Haldem., ♂. Head.
11. *Eciton* (*Acamatus*) *mexicanum* F. Smith, ♂. Head.
12. *Eciton* (*Acamatus*) *spoliator* Forel, ♂. Head.
13. *Eciton* (*Acamatus*) *schmitti* Emery, ♂. Head.
14. *Pheidole lamia* Wheeler, ☿.
15. Same in profile.
16. Head of same from the front.
17. *Pheidole lamia* Wheeler, ☿.
18. *Pheidole sciophila* sp. nov., ☿.
19. *Pheidole sciophila* sp. nov., ☿.
20. *Pheidole metallescens splendidula* subsp. nov., ☿.
21. *Pheidole metallescens splendidula* subsp. nov., ☿.
22. *Pheidole casta* sp. nov., ☿.
23. Same in profile.
24. *Solenopsis salina* sp. nov., ☿. Head.
25. Thorax and pedicel of same in profile.
26. *Solenopsis pilosula* sp. nov., ☿. Head.
27. Thorax and pedicel of same in profile.
28. *Solenopsis krockowi* sp. nov., ☿. Head.
29. Thorax and pedicel of same in profile.

PLATE XXVII.

Fig. 30. *Pheidole titanis* Wheeler, ☿.
31. *Pheidole morrisi* Forel var. *impexa* var. nov., ☿.
32. *Pheidole hyatti* Emery, ☿.
33. *Pheidole texana* Wheeler, ☿.
34. *Pheidole texana* Wheeler, ☿.
35. *Pheidole crassicornis porcula* subsp. nov., ☿.
36. *Pheidole macclendoni* sp. nov., ☿.
37. *Pheidole xerophila* sp. nov., ☿.
38. *Pheidole pinealis* sp. nov., ☿.
39. *Pheidole humeralis* sp. nov., ☿.
40. *Cremastogaster arizonensis* sp. nov., ☿.



ANTS OF TEXAS, NEW MEXICO AND ARIZONA.



Ants of Texas, New Mexico and Arizona.