

A MONOGRAPH OF THE WESTERN HEMISPHERE BUMBLEBEES (HYMENOPTERA: APIDAE; BOMBINAE)

II. The Genus *Megabombus* Subgenus *Megabombus*

H. E. MILLIRON

Entomology Research Institute

Canada Department of Agriculture

Ottawa, Canada

MEMOIRS OF

THE ENTOMOLOGICAL SOCIETY OF CANADA — No. 89

Editor: D. P. Pielou

Published by

THE ENTOMOLOGICAL SOCIETY OF CANADA, OTTAWA

1973

CONTENTS

	PAGE
Introduction	81
Genus <i>Megabombus</i> D.T.	81
Subgenus <i>Megabombus</i> D.T.: Key to species groups	82
Alpinus Group: Key to species	84
<i>Megabombus</i> (M.) <i>balteatus</i> (Dahlb.)	85
<i>Megabombus</i> (M.) <i>hyperboreus</i> (Schönh.)	89
<i>Megabombus</i> (M.) <i>kirbyellus</i> (Curt.)	94
<i>Megabombus</i> (M.) <i>polaris</i> (Curt.)	98
<i>Megabombus</i> (M.) <i>strenuus</i> (Cr.)	108
Subterranean Group: Key to species	113
<i>Megabombus</i> (M.) <i>appositus</i> (Cr.)	113
<i>Megabombus</i> (M.) <i>borealis</i> (Kby.)	117
Dumoucheli Group: Key to species	120
<i>Megabombus</i> (M.) <i>atratus</i> (Fkln.)	125
<i>Megabombus</i> (M.) <i>rubriventris</i> (Lep.)	137
<i>Megabombus</i> (M.) <i>bellicosus</i> (Sm.)	138
<i>Megabombus</i> (M.) <i>brasiliensis</i> (Lep.)	143
<i>Megabombus</i> (M.) <i>fervidus</i> (F.): Key to subspecies	147
<i>Megabombus</i> (M.) f. <i>fervidus</i> (F.)	147
<i>Megabombus</i> (M.) f. <i>californicus</i> (Sm.)	155
<i>Megabombus</i> (M.) f. <i>sonomae</i> (How.)	160
<i>Megabombus</i> (M.) <i>dahlbomii</i> (Guér.)	162
<i>Megabombus</i> (M.) <i>diligens</i> (Sm.)	166
<i>Megabombus</i> (M.) <i>excellens</i> (Sm.)	169
<i>Megabombus</i> (M.) <i>medius</i> (Cr.)	172
<i>Megabombus</i> (M.) <i>morio</i> (Swed.)	177
<i>Megabombus</i> (M.) <i>opifex</i> (Sm.)	185
<i>Megabombus</i> (M.) <i>pennsylvanicus</i> (De G.): Key to subspecies	189
<i>Megabombus</i> (M.) p. <i>pennsylvanicus</i> (De G.)	190
<i>Megabombus</i> (M.) p. <i>sonorus</i> (Say)	196
<i>Megabombus</i> (M.) <i>pullatus</i> (Fkln.)	201
<i>Megabombus</i> (M.) <i>steindachneri</i> (Handl.)	205
Nigrodorsalis Group: Key to species	211
<i>Megabombus</i> (M.) <i>nigrodorsalis</i> (Fkln.): Key to subspecies	212
<i>Megabombus</i> (M.) n. <i>nigrodorsalis</i> (Fkln.)	212
<i>Megabombus</i> (M.) n. <i>montezumae</i> (Ckll.)	216
<i>Megabombus</i> (M.) <i>digressus</i> Mltn.	218
<i>Megabombus</i> (M.) <i>trinominatus</i> (D.T.)	220
Mexicanus Group: Key to species	223
<i>Megabombus</i> (M.) <i>brevivillus</i> (Fkln.)	224
<i>Megabombus</i> (M.) <i>mexicanus</i> (Cr.)	227
<i>Megabombus</i> (M.) <i>transversalis</i> (Oliv.)	232

A MONOGRAPH OF THE WESTERN HEMISPHERE BUMBLEBEES
(HYMENOPTERA: APIDAE; BOMBINAE). II¹

INTRODUCTION

Previously published sections of this work under the running title "A Monograph of the Western Hemisphere Bumblebees" have been a Bibliography (Ent. Soc. Can. Mem. 65, pp. 1–lii, 1970) and Part I, "The genera *Bombus* and *Megabombus* subgenus *Bombias*" (Ent. Soc. Can. Mem. 82, pp. 1–80, 1971). All literature citations throughout this work will be found in the bibliography except in a few instances where they are given in footnotes at appropriate places. To follow separately are: Part III (covering the genus *Pyrobombus* subgenus *Cullumanobombus*); Part IV (covering the genus *Pyrobombus* subgenus *Pyrobombus*); and Part V (treating the tribe Psithyrini); an Appendix; and an Index to the entire work.

Genus *Megabombus* D.T.
Subgenus *Megabombus* D.T.

[*Bremus* Panz., 1805, h. 85, No. 20. Type: *Apis agrorum* F., 1787, p. 301; designated by Sandhouse, 1943, p. 532]. Generic name invalidated, Int. Com. Zool. Nomen., Opin. 135, 1939.

Adventoribombus (*Agrobombus*) Skor., 1922a, p. 150. Type: *Agrabombus* [sic!] *adventor* Skor., 1914a, p. 119, (*lapsus*); designated as "*Agrobombus* (*Adventoribombus*) *adventor* Skor.", 1922a, p. 150, by Sandhouse, 1943, p. 522, (virtual tautonymy).

Agrabombus [sic!] Skor., 1914a, p. 119, (*lapsus*).

Agrobombus (*Bombus*) Vogt, 1911, p. 52. Type: (*Apis*) *Bombus agrorum* (F.), 1787, p. 301, (*nec Apis agrorum*, Schrk., 1781, p. 397); designated by Sandhouse, 1943, p. 523, (virtual tautonymy).

Alpinibombus [sic!] Skor., 1937b, p. 57; Hkn., 1939, pp. 60, 61, (*lapsi*).

Alpinobombus Skor., 1914a, p. 123. Type: (*Apis*) *Bombus alpinus* (L.), 1758, p. 579; indicated by Krüger, 1920, p. 353; [*Bremus*] *Bombus alpinus* (L.), designated by Frison, 1927e, p. 66.

Callobombus (*Bombus*) D.T., 1896, p. 503. *Emend.*

Chromobombus (*Bombus*) D.T., 1880, p. 40. Type: *Apis muscorum* L., 1758, p. 579; designated by Sandhouse, 1943, p. 538.

Diversobombus (*Bombus*) Skor., 1914e, p. 406. Type: *Bombus diversus* Sm., 1869, p. 207; designated by Sandhouse, 1943, p. 546, (virtual tautonymy).

Exilobombus [*Exilnobombus*, *emend. mihi*] (*Mucidobombus*) Skor., 1922a, p. 150. Type: *Mucidobombus* (*Exilobombus*, sic!) *exiln* Skor., 1922a, p. 150, (= *Bombus nymphae* Skor., 1909c, p. 409, *vide* Skorikov, 1922a, p. 150; [*syn. inquirendum*]). Monobasic. Nomenclature by Sandhouse, 1943, p. 552, *in erratum partim*.

Fervidobombus Skor., 1922a, p. 153. Type: (*Apis*) *Bombus fervidus* (F.), 1798, p. 274; [*Bremus*] *Bombus fervidus* (F.), designated by Frison, 1927e, p. 69, (absolute tautonymy).

Hortibombus [sic!] Skor., 1937b, p. 47 (footnote), (*lapsus*).

¹Supported in part by Penrose Fund Grants No. 1931 (1955) and No. 2640 (1959) both from the American Philosophical Society, Philadelphia, Pa., and by G-13012 (1960) from the National Science Foundation, Washington, D.C. The writer expresses his sincere thanks for this financial assistance.

- Hortobombus* (*Bombus*) Vogt, 1911, p. 56. Type: (*Apis*) *Bombus hortorum* (L.), 1761, p. 424; designated by Sandhouse, 1943, p. 559, (virtual tautonymy).
- Kallobombus* (*Bombus*) D.T., 1880, p. 40. Type: (*Apis*) *Bombus soroensis* (F.), 1776, p. 246; designated by Sandhouse, 1943, p. 561.
- Laesobombus* (*Agrobombus*) Skor., 1922a, p. 150. Type: *Bombus laesus* Mor., 1875a, p. 3. Monobasic.
- Mucidobombus* Skor., 1922a, p. 149. Type: *Bombus mucidus* Gerst., 1869, p. 324; designated by Sandhouse, 1943, p. 574, (virtual tautonymy).
- Orientalibombus* Rich., 1929b, p. 378. Type: *Bombus orientalis* Sm., 1854, p. 402. Original designation.
- Pomobombus* (*Bombus*) Krüg., 1917, p. 65. Type: [*Bremus*] *Bombus pomorum* (Panz.), 1805, h. 86, No. 18; designated by Sandhouse, 1943, p. 589, (virtual tautonymy).
- Rhodobombus* (*Bombus*) D.T., 1880, p. 40. Type: [*Bremus*] *Bombus pomorum* (Panz.), 1805, h. 86, No. 18; designated by Sandhouse, 1943, p. 596.
- Ruderariobombus* (*Agrobombus*) Krüg., 1920, p. 350. Type: (*Apis*) *Bombus ruderarius* (Müll.), 1776, p. 165. Present designation, (virtual tautonymy).
- Senexibombus* [*Bremus*] Fris., 1930a, p. 3. Type: [*Bremus*] *Bombus senex* Voll., 1873, p. 229. Original designation.
- Soroensibombus* (*Bombus*) Vogt, 1911, p. 63. Type: (*Apis*) *Bombus soroensis* (F.), 1776, p. 246. Monobasic.
- Subterraneobombus* (*Bombus*) Vogt, 1911, p. 62. Type: (*Apis*) *Bombus subterraneus* (L.), 1758, p. 579; [*Bremus*] *Bombus subterraneus* (L.), designated by Frison, 1927e, p. 68, (absolute tautonymy).
- Tricornibombus* (*Agrobombus*) Skor., 1922a, p. 151. Type: *Bombus tricornis* Rad., 1888a, p. 319, pl. 12, fig. 3. Monobasic.

Key to Species Groups

Females

1. Mesobasitarsite terminated distoposteriorly as sharp acute angle or spinose process 2
 Mesobasitarsite terminated distoposteriorly as more or less rounded right or obtuse angle, never sharply pointed, distal third (or more) covered with dense, short fine paler pubescence; head medium in length to elongate, frontal outline triangular or nearly so; malar space wide, not noticeably convex, medium to long; metabasitarsal outer surface never strongly concave longitudinally; pubescence long, fine, loose, or shaggy; queen usually robust *Alpinus* (p. 84)
2. Head rather short for the group, frontal outline broadly triangular; malar space weakly convex, not longer than $1\frac{1}{4}$ times distance between and including mandibular articulations; metabasitarsal outer surface always strongly concave longitudinally; pubescence coarse, short, compact; wings always dark (black or blackish) *Mexicanus* (p. 223)
 Not with this combination of characters 3
3. F1 nearly twice length of F2, subequal to F2 plus F3; flagellum less than twice length of scape; clypeus usually at least nearly as high as basal width; mandibular sulcus obliquus distinct; metabasitarsite distoposteriorly acute, extended beyond anteroventral angle, posterior margin deeply incised just beyond auricle; hypopygium often carinate on distal half 4

- F1 distinctly less than twice F2, not subequal to F2 plus F3; flagellum approximately twice length of scape; ocelli noticeably below supraorbital line, lateral ones slightly farther apart than either is from compound eye; clypeus distinctly wider basally than high; metabasitarsite with distal end weakly emarginate to subtruncate, about equally wide at both ends, posterior margin not deeply incised near auricle; hypopygium non-carinate; pubescence relatively long, fine, uneven, somewhat shaggy; wings infuscated with brown *Nigrodorsalis* (p. 211)
4. Clypeus about as high as wide at base, median surface (mostly) convex, polished, impunctate or nearly so; labral shelf short, extending laterally not much beyond intertubercular depression; mandibular sulcus obliquus very distinct; corbicular surface without distinct median longitudinal convexity, rather smooth, polished; metabasitarsite rather deeply incised just beyond prominent auricle; wings infuscated with brown *Subterraneus* (p. 113)
- Clypeus wider at base, with variable degree of convexity, median area always distinctly punctate or sculptured; shelf continuous across much of labrum; corbicular surface usually irregular, granulate; wings dark (black or blackish) in all except two Neotropical species (*viz.*, *dahlbomii*, *opifex*) *Dumoucheli* (p. 120)

Males

1. Outer surface of hind tibia not strongly convex, smooth, polished, hairless beyond proximal third except narrowly along posterior and anterior borders; F1 distinctly shorter than F3, *or* malar space very long (fully 2 times distance between and including mandibular articulations), flagellum usually 3 times as long as scape, median segments sometimes weakly arcuate; metabasitarsite widest at or beyond middle, most strongly arched at proximal third; pubescence always fine, long, loose, *or* shaggy *Alpinus* (p. 84)
- Hind tibia rather elongate-narrow, outer surface strongly convex, covered with short stiff reclining hairs, posterior fringe variable, usually of stiff, weakly curved *or* reclining hairs; flagellum narrow, 3 times or more length of scape, median segments much longer than thick, each often noticeably arcuate beneath; metabasitarsite elongate, rectangular, usually concave on outer surface, distal end often truncate, subtruncate, *or* only weakly emarginate, posterior fringe never with especially long, fine arcuate hairs 2
2. Hind tibial posterior fringe fine, not dense, with many hairs much longer than widest portion; F1 and F2 about equal, together as long as F3; metabasitarsite with some long fine hairs along basal posterior margin equal *or* exceeding in length distal subtruncate width, distoposterior angle either near 90° *or* broadly rounded, never sharply produced; mesobasitarsite elongate-narrow, not much wider than length of succeeding segment; pubescence fine, not compact; wings infuscated with brownish, never dark *Nigrodorsalis* (p. 212)
- Not as above 3
3. F1 about equal to F2, much shorter than F3; malar space usually convex; hind tibial posterior fringe (and metabasitarsal) of rather dense, short uniformly stiff straight reclining hairs; distal end of metabasitarsite subtruncate, distoposterior angle never sharply produced; pubescence short, coarse, dense *or* compact, even; wings always dark (black *or* blackish) *Mexicanus* (p. 224)
- Not with this combination of characters 4
4. F1 about twice as long as distal thickness, together with F2 distinctly longer than either F3 *or* F4; hind tibial outer posterior half flat *or* concave; labral callosities well separated, ventral labral margin with noticeable indentation; metabasitarsal posterior fringe short, fine, uniform, inconspicuous *Subterraneus* (p. 113)
- F1 less than twice as long as wide distally, F1 plus F2 not more than equal *or* subequal to either F3 *or* F4; hind tibial outer surface rather evenly convex; metabasitarsal posterior fringe relatively short, basal hairs usually conspicuously longer *Dumoucheli* (p. 122)

ALPINUS GROUP

KEY TO SPECIES

Females

1. Malar space equal or subequal to distance between and including mandibular articulations; second mandibular keel wide, rather abruptly constricted before attaining margin; clypeus with scattered medium punctures; F1 less than $1\frac{1}{2}$ times as long as distal width, F2 nearly quadrate to rectangular; metabasitarsite subtruncate distally, distoposterior angle broadly acute (rounded); hind tibial outer surface usually rather coarsely alutaceous; abdominal T1–2 usually dull to golden yellow, T3 most often with at least some yellowish to all yellow, sometimes entirely black, T4–5, sides of T6 with pale yellow or rufescent, sometimes entirely black; queen oval, robust (variable) *polaris* (Curt.) (p. 98)
 Not with this combination of characters; malar space always at least slightly longer than distance between and including mandibular articulations; F2 more rectangular; second mandibular keel gradually narrowed before attaining margin 2
2. Head elongate; malar space at least $1\frac{1}{2}$ times as long as distance between and including mandibular articulations; F1 nearly twice as long as distal width; metabasitarsal distoposterior angle rather acute (narrowly rounded) 3
 Head broadly triangular; malar space slightly longer than distance between and including mandibular articulations; clypeus well covered with rather deep medium punctures; second mandibular keel relatively narrow, sharp, rather evenly attenuated toward margin; thoracic dorsum fulvous to virescent pale yellow, except wide interalar black band; abdominal T1, T2, T3 (usually) yellow, T4 (mostly) black, T5, sides of T6 usually rufescent; form oval, robust, large *strenuus* (Cr.) (p. 108)
3. Median clypeal area evenly covered with rather small, fine shallow punctures; second mandibular keel moderately wide, gradually narrowed much before attaining margin; malar space fully $1\frac{1}{2}$ times width between and including mandibular articulations; F2 distinctly shorter than F3; thorax pallid yellow, except well-defined interalar black band; abdominal T1–2 yellow, T3 usually black (sometimes yellow distally), T4–5 (largely) rufescent; form elongate-oval, moderate in size *kirbyellus* (Curt.) (p. 94)
 As above except head more coarsely punctate; malar space shorter; thoracic dorsum pallid yellow, except pleura (at least below) fulvous; abdominal T1–2 pallid yellow, T3 usually black with some yellowish distally, T4–5 often with much pale yellow to whitish; form somewhat more robust than above *balteatus* (Dahlb.) (p. 85)
 Median clypeal area well covered with mixture of small, larger punctures; second mandibular keel wide, distally more markedly narrowed before attaining margin than either above; malar space $1\frac{1}{4}$ times as long as distance between and including mandibular articulations; F2 subequal to F3; thoracic dorsum fulvous to dull yellow, except wide interalar black band; abdominal T1–2 yellow, remainder of abdomen usually entirely black; form oval, robust, large *hyperboreus* (Schönh.) (p. 89)

Males

1. Malar space about $1\frac{1}{2}$ times as long as distance between and including mandibular articulations; F1 plus F2 distinctly longer than F3 2
 Malar space only slightly longer than distance between and including mandibular articulations; F3 more nearly subequal to F1 plus F2 3
2. F1 about $1\frac{1}{2}$ times as long as distal width, slightly longer than F2, F3 twice as long as thick; ocular one-third of ocellocular area rather strongly punctate; metabasitarsite narrower basally, posterior margin weakly arcuate, fringe much shorter distally than proximally, outer surface not distinctly convex near base; thorax yellow,

- except usually rather poorly defined interalar black band; abdominal T1, T2, T3 (part or all) yellow, T4 usually black (sometimes more or less yellow or rufescent), T5 (mostly) – 7 usually rufescent (variable); genitalia (Pl. XII), eighth sternum with well-developed pointed mid-distal process *kirbyellus* (Curt.) (p. 94)
- As above, except eighth sternum with only moderately developed mid-distal process, sometimes absent altogether *balteatus* (Dahlb.) (p. 85)
- F1 less than 1½ times as long as distal width, distinctly longer than F2, F3 less than twice as long as greatest thickness; ocular one-third of ocellocular area weakly punctate; metabasitarsite rectangular, outer basal surface noticeably swollen (or convex), posterior fringe distally not greatly shorter than proximally; thoracic pleura brownish black or black, dorsum yellow, except for poorly defined rather wide interalar black band; abdominal T1–2 yellow, remainder of abdomen usually entirely black; genitalia (Pl. XII) *hyperboreus* (Schönh.) (p. 89)
3. F2 distinctly longer than widest portion; ocular one-third of ocellocular area with rather dense small punctures; hind tibial outer surface with conspicuous fine reclining hairs; thoracic dorsum and pleura (mostly) fulvous to virescent yellow, except rather wide poorly defined interalar black band; abdominal T1–2, T3 (mostly) yellow, T4, T5 (mostly) black, T6–7 rufescent (variable); genitalia (Pl. XII) *strenuus* (Cr.) (p. 108)
- F2 only slightly longer than thick; ocular one-third of ocellocular area sparsely, weakly punctate; hind tibial outer surface mostly weakly alutaceous to shining, free of fine hairs; thorax drab to pale yellow, usually without defined interalar black band; abdominal T1–2, sometimes T3 (mostly) drab yellow, T4–5 usually black with variable mixture of pale hairs, T6–7 rufescent (variable); genitalia (Pl. XII) *polaris* (Curt.) (p. 98)

Megabombus (M.) *balteatus* (Dahlb.)

Bombus balteatus Dahlb., 1832, p. 36, (*nec ignitus* v. *balteatus* Skor., 1933b, p. 61): *Alpinibombus* [sic!] *balteatus*, Skor., 1937b, p. 58 (p.p.): *Alpinobombus kirbyellus*, Skor., 1922a, p. 151, (p.p., list), [n. syn.]: *Bombus batteatus* [sic!] Ezl., 1859, p. 144, (= *balteatus* Dahlb., 1832, p. 36): *Bombus kirbyellus*, auctt., (*nec kirbiellus* Curt., 1835a, Append., p. xii): *Bombus kirbyellus* v. *lysholmi* Fr., 1904c, p. 519, [n. syn.]: *Bombus tricolor* Zett., 1838, p. 474, (*nec tricolor* Dahlb., 1832, p. 41, ♂ not ♀ = *Apis cullumana* Kby., 1802, p. 359), [n. syn.]: *Bombus* (B.) *kirbyellus*, Fkln., 1912, p. 290, (p.p.): *Bombus* (B.) (*Kirbyellus* group) Fkln., 1912, p. 289, (p.p.): *Bombus pleuralis*, Fr., 1902, p. 486, [n. syn.]: *Bombus* (*Alpinobombus*) *balteatus* v. *arizonensis*, Brs., 1951, p. 1253, *In* Muesebeck et al., (*nec ignitus* v. *balteatus* Skor., 1933b, p. 61), [n. syn.]: *Bombus* (*Alpinobombus*) *balteatus* v. *alexanderi*, Brs., 1951, p. 1253, *In* Muesebeck et al., (*nec ignitus* v. *balteatus* Skor., 1933b, p. 61), [n. syn.]: *Bremus* (*Alpinobombus*) *kirbyellus* v. *alexanderi* Fris., 1927e, p. 66, (*nec kirbiellus* Curt., 1835a, Append., p. lxii), [n. syn.]: *Bremus* (*Alpinobombus*) *kirbyellus* v. *arizonensis* Fris., 1927e, p. 66, (*nec kirbiellus* Curt., 1835a, Append., p. lxii), [n. syn.]: *Bremus kirbyellus* v. *alexanderi* Fris., 1923b, p. 308, (*nec kirbiellus* Curt., 1835a, Append., p. lxii), [n. syn.]: *Bremus kirbyellus* v. *arizonensis* Fris., 1923b, p. 309, (*nec kirbiellus* Curt., 1835a, Append., p. lxii), [n. syn.]: *Megabombus* (M.) (*Alpinus* group) Mlrm., 1961a, p. 57, (p.p.): . . . *balteatus*, Mlrm., 1960a, p. 89, (♀ H.E.M. lectotype): . . . *tricolor*, Mlrm., 1960a, p. 97, (♂ H.E.M. lectotype).

DESCRIPTION. Queen. Length, 23.0 mm; width at wing bases, 10.0 mm; abdomen, 12.0 mm, width across T2, 9.5 mm; front wing length, 17.0 mm, width, 6.25 mm. *Head:* Frontal outline (excluding mouthparts) broadly trapezoidal, about as wide as high, dorsolaterally rounded; vertical region weakly concave to nearly flat laterad of ocelli; ocelli situated in nearly

straight transverse line, removed from one another by their widest diameter, the lateral ones little farther apart than each is from upper inner margin of compound eye, contiguous to supraorbital line; ocular half (or more) of ocellular area rather weakly irregularly punctate, the ocellar half (or less) smooth and polished, the vertex laterad and behind with rather numerous medium punctures; outline of compound eye more narrowly rounded above than below, the inner margin nearly straight, about $3\frac{1}{2}$ times higher than greatest width; clypeus only slightly wider than high, rather strongly convex dorsally and laterally, less so over median area, covered with medium punctures becoming small, shallow, and less numerous on disc; labrum mostly covered with short straight hairs, slightly more than twice as wide as thick, its ventral margin irregularly arcuate, its tubercles ventrally flat, roughly punctate, mesially as far apart as about the length of F2; malar space $1\frac{1}{2}$ times as long as distance between (and including) mandibular articulations, smooth and weakly convex except dorsoventrally strongly concave at juncture with lower parafacial region; flagellum $1\frac{1}{2}$ times longer than scape, F1 distinctly longer than F2 and subequal to F3, about $1\frac{1}{2}$ times as long as F2-3. *Legs*: Mesobasitarsite little less than 3 times longer than greatest width, its outer surface evenly rather deeply concave mid-longitudinally, the distoanterior angle arcuately rounded in recess of the acutely rounded distoposterior angle; outer hind tibial surface microscopically alutaceous, convex mid-longitudinally from base to well beyond middle; metabasitarsite with outer surface broadly evenly concave mid-longitudinally, covered with short recumbent pubescence, slightly more than $2\frac{1}{2}$ times longer than its widest dimension, the arcuate distoanterior angle a little in recess of the acutely rounded distoposterior angle, distal margin nearly subtruncate, the posterior margin weakly evenly arcuate. *Pubescence*: Noticeably longer and looser on face, vertex, posteriorly on scutellum, and on most of abdomen; otherwise, finer, denser, and more even than that of *kirbyellus*; corbicular fringe rather dense, nearly straight basally to weakly unevenly arcuate distally, for the most part distinctly longer than greatest width of corbicular; basal half of metabasitarsal posterior fringe rather short, loose, arcuate, beyond very short to absent distally. *Color*: Head black with slight admixture of yellowish hairs on vertex; thoracic dorsum anterior of tegulae, upper half of mesopleurum beneath and forward of tegula, most of scutellum and abdominal T1-2 ochraceous yellow; interalar black band definitive, moderate in width; all thorax below, legs, abdominal T3 (except distal margin), and most of abdominal venter black; distal margin of abdominal T3, T4-6 covered with pale fulvous to whitish pile (usually the latter predominantly white, sometimes largely rufescent often resembling that in *kirbyellus*, or predominantly black); wings lightly infumated throughout.

Worker. Length, 13.0 mm; width at wing bases, 6.5 mm; abdomen, 7.0 mm, width across T2, 6.5 mm; front wing length, 11.5 mm, width, 4.0 mm. The morphology of this caste is in all respects relatively similar to that of the queen, except that the taxonomic features of average-sized specimens are naturally more diminutive. *Color*: Head entirely black except some admixture of lighter vertical hairs; wings paler than those of the queen; legs, thoracic pleura (except some palish pubescence beneath and anterior of tegulae), broad interalar band, abdominal T3, and most of abdominal venter black; thoracic dorsum anterior of tegulae, scutellum posteriorly and abdominal T1, T2 (except black along distal margin) stramineous; T4-6 pale rufescent yellow (often whitish to pronounced rufescent).

Male. Length, 17.0 mm; abdomen, 8.5 mm, width across T2, 6.5 mm; front wing length, 14.5 mm, width, 5.0 mm. *Head*: Frontal outline (excluding mouthparts) narrowly trapezoidal, the dorsal angles broadly rounded, about as high as broad; compound eye slightly more than $2\frac{1}{2}$ times higher than wide, somewhat more narrowly rounded above than below, inner margin straight, the outer margin evenly concave outwardly; vertex very weakly concave and irregularly punctate behind ocelli; ocular third (or less) of ocellular area with weak punctation, the ocellar two-thirds smooth and polished; ocelli situated in weak arc on supraorbital line, somewhat farther removed from one another than their diameter, the median one located slightly more forward; malar space $1\frac{1}{2}$ times longer than distance between (and including) mandibular articulations, weakly irregularly convex, mostly smooth and polished; labrum little more than twice as wide as median thickness, its ventral margin truncate with rounded lateral corners, its surface irregularly punctate with weak polished callosities and mostly covered with uneven pubescence; flagellum 3 times longer than scape, F1 and F2 nearly equally long, together at most only $1\frac{1}{2}$ times longer than F3. *Legs*: Mesobasitarsite nearly 4 times longer than greatest width, subrectangular, its distal margin emarginate with equally extended rounded angles, the outer surface only weakly concave in the middle; metabasitarsite subrectangular, slightly more than 3 times longer than greatest width of segment, distally emarginate, its outer surface shallowly concave, its posterior margin weakly evenly arcuate throughout, the posterior fringe mostly long and loose, the longest hairs about twice the extreme width of segment. *Pubescence*: Moderately long and loose, rather even throughout except somewhat shaggier on abdomen. Genitalia, seventh and eighth abdominal sterna (cf. with *kirbyellus*, Pl. XII). *Color*: Head black except clypeus

and area beneath antennal bases suffused with dull yellow, and most of vertex and occipital region pale yellow; thoracic dorsum anterior of tegulae, mesopleuron (mostly) and scutellum tawny (or pale) yellow, the moderately wide interalar black band poorly defined and suffused with considerable ochraceous yellow hairs; legs mostly blackish, the fringes with burnt sienna; abdominal T1–2 tawny yellow, T3 and basal one-third of T4 black, remainder T4–6 and most of abdominal venter pallid drab yellow with rufescent tinge to white (often T4–6 vivid rufescent); wings subhyaline as in the worker.

Redescribed from hypotypes. **Queen**, Lapp[land], Petsamo, 2–7, 1929, Håkan Lindb[erg]; **worker**, Saana [Finland], 29–7, 1957, R. Elfving; **male**, Malla [Finland], 5–8, 1957, R. Elfving [all, HEM].

TYPE. My (1960a: 89) lectotypus ♂ in the Dahlbom Collection, Zoological Institute, University of Lund, Lund, Sweden.

TYPE LOCALITY. Lapponia (Sweden). Number of specimens at hand: 44 (excluding numerous specimens from the Eastern Hemisphere). In flight: Insufficient records preclude any informative remark. It is probable that the species activity coincides with that of *hyperboreus* (Schönh.) (*cf.*). At least it is known that workers appear in late June and that the new queens and males are evident in July–August. Distribution: I have every reason to believe that this species occurs throughout the western range of *kirbyellus* (Curt.) in the Western Hemisphere, but less commonly. Evidently it ranges from sea level in the offshore islands of Alaska and disjunctly in the Rocky Mountains, possibly as far south as the high elevations in north-central New Mexico. Available records indicate a high altitudinal range of 3500 ft and more. Floral visitations: The following records compiled by Richards (1927b: 23) under *Bombus balteatus* (composite of *balteatus* (Dahlb.) and *kirbyellus* (Curt.)) comprise several very questionable visitations, but are given here, as well as under *kirbyellus* (*cf.*): *Aconitum*, *Andromeda*, *Astragalus*, [*Bartisia*] [= *Baptisia*], *Campanula*, *Cirsium*, *Comarum*, *Geranium*, *Hieracium*, *Lathyrus*, *Leontodon*, *Lotus*, *Melampyrum*, *Mulgedium*, *Oxytropis*, *Papaver*, *Pedicularis*, *Polygonum*, *Salix*, *Sibbaldia*, *Silene*, *Solidago*, *Trichera*, *Vaccinium*, and *Vicia*. With few exceptions these plant genera occur in the Western Hemisphere, but it is uncertain which should be associated with *balteatus* (Dahlb.).

NOTE. Varieties *alexanderi* described by Frison (1923b: 308) and *arizonensis* (p. 309) assigned by that author to *kirbyellus* (Curt.) cannot belong to that species. I have studied the Frison types. The Oslar specimens, upon which these descriptions were based, were never taken at the designated localities in Arizona. The Patagonia Mountains (including the locality Oracle) in Arizona are ecologically unfit for the establishment or survival of any high altitude bumblebee species; certainly not any of those of the high and lower arctic fauna. In 1962, I visited the “type localities” of the so-called varieties and failed to conclude that they ever existed there. The ecological conditions at the highest of the Patagonia Mountains are unfavorable for the existence of either *kirbyellus* or *balteatus*. It is most probable that the Oslar specimens before Frison were actually taken somewhere in the Colorado Rockies, or possibly at some high altitude in north-central New Mexico, but not anywhere in Arizona.

COMMENTS. No troublesome morphological variations are noted, except the usual variation in sculpture referred to in the redescription, and a very slight range in the length of the female malar space. Chromatically, however, specimens of this species exhibit the same variability as is found in specimens of *kirbyellus* (Curt.) and *polaris* (Curt.) with respect to the coloration of the abdominal terga beyond T2. In general, it is evident that the female yellow of Eastern Hemisphere *balteatus* is commonly of a deeper, richer shade than that of Western Hemisphere specimens (*cf.* this under *hyperboreus*, Comments), and the physical nature of the pubescence of the

latter generally tends to be shaggier, more uneven, and somewhat looser. The body of this species is wider and more robust than that of *kirbyellus*; the interalar black band is narrower and more definitive in both the female castes and male of *kirbyellus* throughout the distribution.

This species is in all respects closely related to *kirbyellus* (Curt.) with which it has been repeatedly confounded by all authorities since 1832. The only reliable means of separating the females is by the difference in length of the malar space and more robust form, these differences often demanding sharp discrimination between this species and *polaris* (Curt.); coloration is not to be accepted as a criterion for differentiation between these related boreal species (i.e., *balteatus*, *kirbyellus*, and *polaris*).

It should be noted that in the male the following morphological features are useful for the separation of this species from *kirbyellus*: F1 about equal to F2, whereas in *kirbyellus* it is definitely longer; F1 and F2 combined are only little longer than F3, but in *kirbyellus* these segments are much longer ($9.6 \text{ mm} < 9.5 \text{ mm}$); the penultimate flagellar segment is definitely shorter than F3, whereas in *kirbyellus* it is only slightly shorter. With respect to the male genitalia of these two species, in *balteatus* the mesal margin of the outer clasper is strongly concave outwardly, the distal mesal process blunt (in *kirbyellus* the mesal margin is more evenly concave and the distal process is sharp); the inner squamal margin is more deeply emarginate and its distal and proximal points sharper and stronger than those of *kirbyellus*; the sagittal heads are narrower and their external points more prominently spinate; distally the volsella is more emarginate with a more pronounced mesoproximal extension or lobe; the distal margin of the eighth abdominal sternum usually is subtruncate or at most with only a moderate median projection; the distal half of the seventh sternum of this species has somewhat finer, more numerous pubescence than in *kirbyellus*, and a distal margin that is shallowly emarginate medially. The student is referred to the figure of the eighth abdominal sternum by Richards (1927b, pl. 1, fig. 6) which represents true *balteatus*.

The distribution of this taxon in the Western Hemisphere is not properly understood and more attention should be devoted to its occurrence. It is certain that the species exists in parts of the State of Alaska, including some of its off-shore islands, and at many high altitudes of the Rocky Mountains through Canada and possibly as far south as the north-central part of the State of New Mexico in the United States, thus a range overlapping most of the known western North American distribution of *kirbyellus*. Some of the specimens which I have examined in the past and assigned to *kirbyellus* (especially males) might rather belong to *balteatus*; this invites further detailed study by future students of some of my *kirbyellus* records listed in this work. It is unlikely that the disclosure of misidentifications will alter significantly the distributional Western Hemisphere range of *balteatus*, as now understood. As far as the material available for study has indicated, it is reasonably certain that *balteatus* does not occur anywhere east of the Rocky Mountains in the Canadian arctic, whereas, in the low Canadian arctic *kirbyellus* is rather common.

This taxon is treated herein as a distinct species of the *Alpinus* group. Heretofore, it has been a source of much confusion with *polaris* (Curt.) and *kirbyellus* (Curt.) in both hemispheres.

CANADA

QUEENS

Alberta: 1 M[oun]t Edith, 7 J[uly] '02, (J. Fletcher, Ottawa) [MASS]. **Yukon Territory:** 1 Old Crow, V-22-57, F.S.L.W. [HEM]; 2 old Crow, V-22-57, F.S.L.W. [MCZ].

UNITED STATES

QUEENS

Alaska: 1 Makushin Bay, Unalakleet [not Unalaskal.], VII-15-07, E. C. Van Dyke [USNM]; 1 Umiat, 24-VI-47, K. L. Knight [HEM]; 2 Unalakleet, May 29, 1921, S. Hadwen [INHS—one compared with ♀ *balteatus* (Dahlb.), Lund Collection, H.E.M., 1960]; 1 Unalakleet, May 31, 1921, S. Hadwen; 1 M[oun]t McKinley Nat[ional] Park, (M[ile] P[o]st 72), July 19, 1950, D. B., elev. 3500' [both, HEM].

WORKER

Alaska: 1 Umiat, 29-VI-27, C. Schultz [HEM].

MALES

Alaska: 3 Kodiak, 7-19-95, [Ac. 4859, AMNH] [INHS]; 24 Kodiak, 7-19-95, [Ac. 4859, (A[merican] M[useum of] N[atural] H[istory])] [AMNH]; 1 Kodiak, 7-19-95, (Ac. 4859, AMNH) [MASS]; 1 M[oun]t McKinley Nat[ional] Forest (Sable Pass), Aug. 12, 1950, elev. 4000', D.B.; 2 M[oun]t McKinley Nat[ional] P[ar]k (Mile Post 69), July 13, 1950, elev. 3000', D.B. [all, HEM]; 1 Seward, 7-10-15 [AMNH]; 1 Worthington Glacier (campground), August 1951, W.L. Jellison [USNM]. **Colorado:** 1 Ward, M[oun]t[t?], 8-30-99 [ANSP]. **New Mexico:** ? north-central high altitudes.

Megabombus (M.) hyperboreus (Schönh.)

Bombus hyperboreus Schönh., 1809, p. 57: *Alpinibombus* [sic!] *hyperboreus hyperboreus*, Skor., 1937b, p. 57: *Alpinobombus hyperboreus*, Skor., 1922a, p. 151, (list): *Apis alpina* Fab. (O.), 1780, p. 119 (*et seq.*), (*nec A. alpina* L., 1758, p. 579), [n. syn.]: *Bombus arcticus*, auctt., (*nec arcticus* Kby., 1824, p. 216; *nec Apis arctica* Acerbi, 1802, p. 353, pl. 1, fig. 7), [n. syn.]: *Bombus hyperboreus* v. *vulpinus* Fr., 1935, p. 4, [n. syn.]: *Bombus* (*Alpinibombus* [sic!]) *hyperboreus* v. *eskimo* Skor., 1937b, p. 57: *Bombus* (*Alpinibombus* [sic!]) v. *eskimo* mod. *henrikseni* Skor., 1937b, p. 57: *Bombus* (*Alpinobombus*) *hyperboreus*, Brs., 1951, p. 1253, *In Muesebeck et al.*: *Bombus* (*Alpinobombus*) *hyperboreus eskimo* mod. *henrikseni*, Kromb. et al., 1958, p. 261: *Bombus* (*Alpinobombus*) *hyperboreus* [ssp.] *hyperboreus*, Yarr., 1955, p. 151: *Bombus* (*Alpinobombus*) *hyperboreus hyperboreus*, Kromb. et al., 1958, p. 261: *Bombus* (*Alpinobombus*) *hyperboreus* v. *natvigi* Rich., 1927b, p. 9, [n. syn.]: *Bombus* (*Alpinobombus*) *hyperboreus natvigi*, Kromb. et al., 1958, p. 261, [n. syn.]: *Bombus* (*B.*) *arcticus*, Fkln., 1912, p. 302, (p.p.), (*nec arcticus* Kby., 1824, p. 216; *nec Apis arctica* Acerbi, 1802, p. 353): *Bombus* (*B.*) (Kirbyellus group) Fkln., 1912, p. 289, (p.p.): *Bremus hyperboreus*, Fris., 1919b, p. 456: *Bremus* (*Alpinobombus*) *hyperboreus*, Fris., 1927e, p. 66: *Megabombus* (*M.*) (*Alpinus* group) Mlrn., 1961a, p. 57, (p.p.): . . . *hyperboreus*, Mlrn., 1960a, p. 92, (♀ H.E.M. lectotype).

DESCRIPTION. **Queen.** Length, 23.0 mm; width at wing bases, 10.5 mm; abdomen, 12.0 mm, width across T2, 10.0 mm; front wing length, 17.5 mm, width, 6.0 mm. **Head:** Frontal outline (excluding mouthparts) trapezoidal, little higher than wide, arcuately rounded dorso-laterally; vertical region slightly concave laterad of ocelli; ocelli positioned in nearly straight transverse line considerably below supraorbital line, the interocellar line nearly equal to the ocellocular line; ocular half of ocellocular area weakly irregularly punctate, ocellar half smooth and polished, vertex behind and laterad of ocelli irregularly punctate; outline of compound eye ventrally arcuately rounded, acutely rounded dorsally, nearly 3 times higher than greatest breadth; clypeus almost $\frac{1}{2}$ wider than high, somewhat concave laterally and dorsally, weakly convex over median anterior area, rather evenly sculptured with irregular medium punctures; labrum about $2\frac{1}{2}$ times wider than thick, its anterior (ventral) margin broadly arcuate, the labral tubercles roughly sculptured, their weak summits directed slightly ventromesad, the inter-tubercular depression not sharply defined and less than length of F1; malar space little more than $1\frac{1}{2}$ times longer than distance between (and including) mandibular articulations, smooth and polished, area beneath compound eye weakly irregularly sculptured, the ventral half ad-

joining mandibles convex; flagellum nearly twice as long as scape, F1 distinctly longer than F2 and little longer than F3, about $\frac{2}{3}$ as long as F2-3 combined. *Legs*: Mesobasitarsite elongate rectangular, nearly 3 times longer than greatest width of segment, its outer surface moderately concave longitudinally, the distoposterior angle subacute and not extended beyond distoanterior angle; outer hind tibial surface weakly unevenly concave, microscopically alutaceous, weakly concave and much more alutaceous distoposteriorly; metabasitarsite somewhat less than $2\frac{1}{2}$ times as long as widest dimension, the outer surface shallowly concave longitudinally, the posterior margin evenly weakly arcuate to distal third then nearly straight, the distoposterior angle roundly acute and somewhat extended beyond rounded distoanterior angle. *Pubescence*: Rather long and loose throughout, longer and more uneven posteriorly on mesoscutellum and over distal abdominal terga; corbicular fringe long, moderately dense, nearly straight except distally, the longest hairs $1\frac{1}{2}$ times as long as greatest width of corbicular; metabasitarsal posterior fringe rather long and arcuate on basal half, beyond short to absent distally. *Color*: Head black with intermixture of lighter pile on postvertex; thorax anterior of tegulae yellow (or ochraceous yellow) intermixed with black (normally this area is entirely ochraceous yellow), the interalar area widely covered with black, without sharply delimited usually rather broad interalar black band that is typical of this species, the posterior half of mesoscutellum mostly tawny yellow. Abdominal T1-2 light ochraceous yellow, remaining terga black with intermixture of some pale-tipped hairs laterally on T3-6.

Worker. Length, 15.0 mm; width at wing bases, 6.0 mm; abdomen, 8.0 mm, width across T2, 6.5 mm; front wing length, 11.0 mm, width, 4.0 mm. In all other morphological respects relatively similar to the queen. *Color*: Thorax dorsally and laterally ochraceous yellow with rather narrow interalar black band. Abdominal T1-2 ochraceous yellow, T3 especially, and terga beyond with burnt sienneous yellow intermixed with black. The few workers seen indicate that this caste is without pale pubescence on abdominal T3-6, but has a sharply defined interalar black band, as in the typical queen.

Male. Length, 18.0 mm; abdomen, 10.0 mm, width across T2, 7.0 mm; width at wing bases, 7.0 mm; front wing length, 15.5 mm, width, 5.0 mm. *Head*: Frontal outline triangular (excluding mouthparts), nearly as wide as high; compound eye rather small, about $2\frac{1}{2}$ times higher than widest dimension, rounded below and narrowly unevenly rounded above, inner margin nearly straight, the outer margin weakly concave outwardly; vertex weakly concave, roughly irregularly punctate; ocular half of ocellular area with coarse well-separated punctures, the ocellar half smooth and polished; ocelli in nearly straight line, situated slightly below supraorbital line, somewhat closer to one another than widest dimension of each; malar space about $1\frac{1}{2}$ times longer than distance between (and including) mandibular articulations, irregularly convex (more evenly and strongly so over ventral half) and polished with micro-pubescence especially on posterior half; labrum little more than twice as wide as thick, its ventral margin broadly rounded laterally, slightly concave medially, the surface irregularly sculptured, with weak "crescent" shaped polished tubercles, beneath transversely indented across, entirely covered with sparse irregular short pubescence; flagellum almost 3 times longer than scape, F1 distinctly longer than F2, only $\frac{2}{3}$ as long as F3. *Legs*: Mesobasitarsite $3\frac{1}{2}$ times longer than greatest width, most of its outer surface evenly concave longitudinally, the obtusely rounded distoposterior angle in recess of distoanterior angle, posterior fringe average length on basal half longer than width of segment, sharply shorter and even along distal half; metabasitarsite slightly less than $3\frac{1}{2}$ times as long as widest dimension of segment, shallowly concave longitudinally over most of posterior two-thirds, the distoposterior angle obtusely rounded, posterior margin very weakly evenly arcuate throughout, its slightly arcuate fringe averaging distinctly longer than greatest width of segment. *Pubescence*: Generally shaggy, long, loose, uneven throughout. Genitalia, seventh and eighth abdominal sternum (Pl. XII). *Color*: Vertical region of head, thorax anterior of tegulae, upper area of mesopleura, most of scutellum and abdominal T1-2 sienneous yellow, remainder of body dull black, the posterior fringes of hind tibia and metabasitarsite, likewise some scattered hairs on the distal abdominal terga, tinged with burnt sienna.

Redescribed from hypotypes. *Queen*, Cambridge Bay, N.W.T. [Canada], 20-VII-50, E.H.N. Smith; *worker*, Sondrestrom Air Base, Greenland, 17-VII-1952, W.J. Brown, [both, CNC]; *male*, East Fork (Toklat Bridge), M[oun]t McKinley Nat[ional] Park, Alaska, July 25, 1950, D. Bolinger [HEM].

TYPE. Examined my (1960a: 92) lectotype ♀ in the Naturhistoriske Riksmuseet, Stockholm, Sweden.

TYPE LOCALITY. Lapponia (Sweden). Number of specimens at hand: 173. In flight: The queens from early May to shortly after mid-August, and males from near mid-July to near mid-August. No *bonafide* workers have been seen from the Western Hemisphere. Distribution: (vertical), sea level to 3500 ft; (horizontal), Greenland, through Canada's northern Northwest Territories and Yukon Territory to northern Alaska. A northern circumpolar species. Floral visitations: *Dryas*, *Epilobium*, *Papaver*, *Pedicularis*, *Potentilla*, *Salix*, *Saxifraga*, and *Silene*. Associations: This species habitually usurps the nests of *Megabombus* (*M.*) *polaris* (Curt.) in both hemispheres and, because of the shortness of season at most places, rarely produces any offspring of its own kind except the sexuals. Workers, generally uncommon or rare, are sometimes in evidence in the southernmost European distributional range, where the longer season permits the usual production of all castes, such as evidently is true in parts of Norway, Sweden, and Finland. It would be unusual to find workers of this species at any location in the Western Hemisphere.

COMMENTS. No significant morphological variations have been noted in either female (caste) or male. In length, queens are 21.0–23.0 mm, and males 16.0–19.0 mm. Slight variation in length of the queen malar space is evident; and, in the male, minor structural differences exist especially with respect to the inner outline of the squama; however, none of these poses a problem in the identification of this species. Insufficient worker material precludes remarks on morphological variation but, presumably, the length of the malar space in this caste varies slightly as in the queen. In the queen the following chromatic variations occur: The yellow might be drab, viridescent, or golden on the thorax and basal abdominal terga, and the pubescence on the lower portions of the mesopleuron is sometimes tinged with burnt sienna; the interalar area is normally rather wide, well-defined black, but varies to a broad black area with suffused margins well extended onto the mesoscutum anteriorly of tegulae and posteriorly onto much of the scutellum; some specimens show a noticeable amount of dull yellow on the postvertex, others have varying amounts of noticeable drab yellow or pale burnt sienna on the distal half of abdominal T3 and numerous hairs so pale-tipped on T4–6, though ordinarily T3–6 in the queen of this species are wholly black. Similar chromatic variations should be expected in the worker. Chromatically, the male is much more diverse than the female; the vertical region of the head, most of the mesopleuron, and abdominal T1–3 sometimes are covered with pale or drab yellow, and T4–7 might be variously covered with pale to pale-tipped black hairs. The interalar black band of the male is sometimes narrowly weakened and very indefinite (more so than in the female); however, on most males this band is rather wide and without sharp anterior and posterior margins.

Workers of this species are rare in Western Hemisphere collections. This primarily is due to the inherent characteristic tendency of overwintered queens to usurp the nests of a related species (*M.* (*M.*) *polaris* (Curt.)) and under seasonable circumstances the production of its sexuals (queens and males) seems to be all that is possible at most investigated locations in the high Canadian arctic (*cf.* Milliron and Oliver 1966).

Melanic queens of this species have the thorax predominantly black, dorsally with the lighter pubescence reduced to an intermixture of black and dull yellow on the pronotum, anterior margin of mesonotum and along the posterior margin of the scutellum; melanic males have dull burnt sienna intermixed with black on the thoracic dorsum anteriorly, on the scutellum, and on abdominal T1–2 in place of the usual yellow; such specimens are without any defined interalar black band which is also the condition in melanic queens.

It should be emphasized that the "yellow"-colored areas of most Eastern Hemisphere specimens is deeper (golden to orange-yellow) in contrast to the dull or viridescent yellow common to Western Hemisphere specimens of this species.

CANADA

QUEENS

Northwest Territories: 1 Baker Lake, 23-VII-1947, T.N.F.; 1 Baker Lake, 25-VII-1947, T.N.F.; 1 Baker Lake, 1-VIII-1947, T.N.F.; 1 Baker Lake, 2-VIII-1947, T.N.F.; 1 Baker Lake, 8-VIII-1947, T.N.F.; 1 Baker L[ake], 8-VIII-49, (R.G.); 1 Baker L[ake], 10-VIII-49, (R.G.); 1 Barter Isl[and], June 23, 1914, (Canadian Arctic Expedition, D. Jennes Coll[ection], No. 654); 1 Bathurst Inlet, 22-VI-1951, C.D.B.; 1 Bathurst Inlet, 27-VI-1951, W.I.C.; 1 Bathurst Inlet, 9-VIII-1951, W.I.C.; 1 Bernard Harbour [across Cornation Gulf from Coppermine], Aug. 10, 1915, (Canadian Arctic Expedition, F.J., No. 296); 1 Bernard Harbour [across Cornation Gulf from Coppermine], Aug. 17-18, 1915, (Canadian Arctic Expedition, F.J., No. 415); 1 Bernard Harbour [across Cornation Gulf from Coppermine], Aug. 17-18, 1915, (Canadian Arctic Expedition, F.J., No. 416); 1 Cambridge Bay, 7-VIII-50, G.K.S.; 4 Cambridge Bay, 20-VII-50, E.H.N.S.; 2 Cambridge Bay, 22-VII-50, E.H.N.S.; 1 Cambridge Bay, 25-VII-50, E.H.N.S.; 1 Cambridge Bay, 26-VII-50, E.H.N.S.; 1 Cambridge Bay, 28-VII-50, E.H.N.S.; 1 Cambridge Bay, 6-VIII-50, E.H.N.S.; 2 Cambridge Bay, 6-VIII-50, G.K.S.; 2 Cambridge Bay (Victoria Island), 12-VIII-1959, E.G. Munroe; 1 Chesterfield, 24-VII-1950, J.G.C.; 1 Chesterfield, 31-VII-1950, J.R.V.; 1 Clyde (Baffin Is[land]), 28-VI-1958, J.E.H.M.; 1 Clyde (Baffin Is[land]), 1-VII-1958, J.E.H.M.; 1 Clyde (Baffin Is[land]), 13-VII-1958, J.E.H.M.; 3 Clyde (Baffin Is[land]), 14-VII-1958, J.E.H.M.; 1 Clyde (Baffin Is[land]), 5-VIII-1958, J.E.H.M.; 1 Coral Harbour (Southampton Is[land]), 11-VI-1948, G.E.S.; 1 Coral Harbour (Southampton Is[land]), 19-VI-1952, P.R.E.; 1 Coral Harbour (Southampton Is[land]), 28-VI-1952, P.R.E.; 3 Coral Harbour (Southampton Is[land]), 16-VIII-1959, E.G. Munroe; 1 Eureka (Ellesmere Island), 10-VII-1953, P.F.B.; 1 Eureka (Ellesmere Island), 28-VII-1953, P.F.B.; 2 Eureka (Ellesmere Island), 5-VII-1954, P.F.B.; 1 Frobisher Bay (Baffin Island), 26-VI-1948, T.B.F.; 1 Holman (Victoria Is[land]), 20-VI-1952, B.A.G.; 2 Holman (Victoria Is[land]), 24-VI-1952, B.A.G.; 1 Holman (Victoria Is[land]), 25-VI-1952, B.A.G.; 2 Holman (Victoria Is[land]), 3-VII-1952, B.A.G.; 1 Holman (Victoria Is[land]), 8-VII-1952, B.A.G.; 2 Holman (Victoria Is[land]), 18-VII-1952, B.A.G.; 1 Pelly Bay (East coast [of], 68° 37' N. lat.), 9-VII-56, A. MacPherson; 1 Portage Grove Falls (Handbury L[ake] to Handbury River), 6-8-VII-1925, Hornby & Bullock; 1 Quoich River (65°00' N., 94°30' W.), 22-VII-1950, J.G.C.; 2 Repulse Bay, 29-VI-1950, J.E.H.M. [all, CNC]; 1 Southampton Is[land], VII-4-1930, G.M. Sutton, (C[arnegie] M[useum], Acc. 8925) [CM]; 1 Southampton Is[land], VII-7-1930, G.M. Sutton, (C[arnegie] M[useum], Acc. 8925) [HEM-(H.E.M. *clydensis* homotype)]; 1 Spence Bay, 20-VI-1951, A.E.R.D.; 1 Spence Bay, 22-VI-1951, J.G.C.; 1 Spence Bay, 30-VI-1951, A.E.R.D.; 1 Spence Bay, 1-VII-1951, J.G.C.; 1 Spence Bay, 1-VII-1951, A.E.R.D.; 1 Spence Bay, 2-VII-1951, J.G.C.; 1 Spence Bay, 10-VII-1951, J.G.C.; 2 Spence Bay, 27-VII-1951, A.E.R.D.; 1 Spence Bay, 7-VIII-1951, A.E.R.D.; 1 Spence Bay, 9-VIII-1951, A.E.R.D. [all, CNC].

Yukon Territory: 1 Firth River, 13-VII-1956, R.E.L.; 1 Herschell [Herschel] Is[land], July, 1916, (Canadian Arctic Expedition, F.J., No. 858); 1 Herschel Is[land], 4-VII-1953, C.D.B.; 1 Herschel Is[land], 11-VII-1953, C.D.B.; 1 Herschel Is[land], 11-VII-1953, J.S.W.; 1 Herschel Is[land], 30-VII-1953, C.D.B.; 1 Herschel Is[land], 30-VII-1953, J.S.W.; 8 Herschel Is[land], 1-VIII-1953, J.S.W. [all, CNC]. **Locality unknown:** 1 (Spence Bay?) (no date) [CNC].

GREENLAND (Denmark)

QUEENS

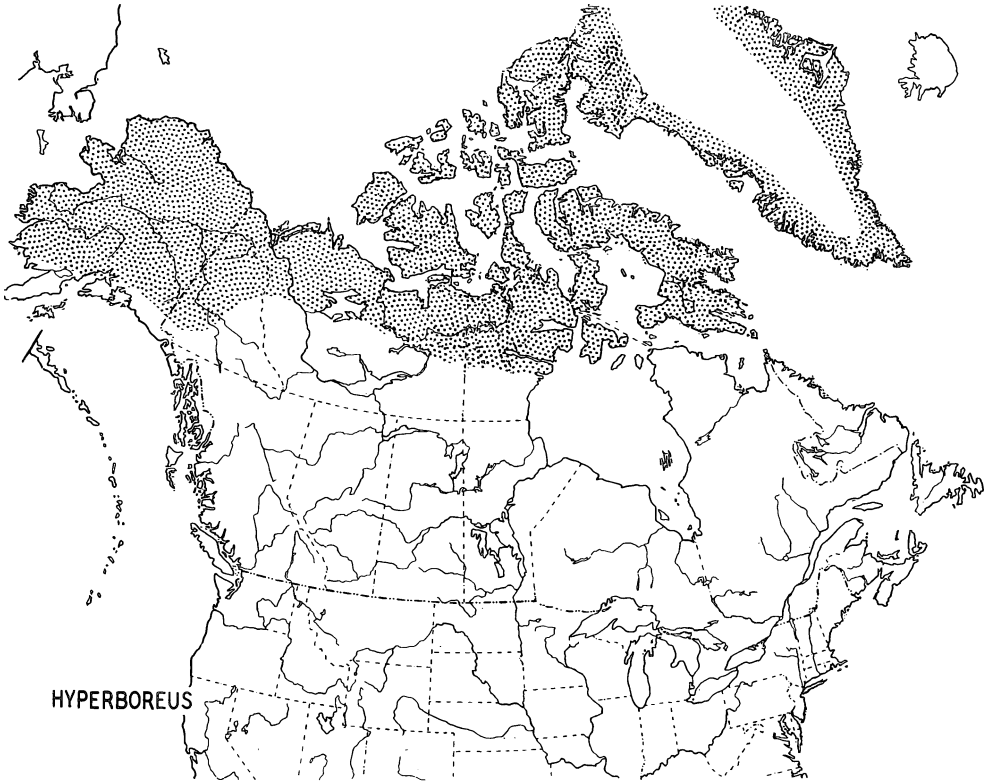
1 Mesters Vig (NE. Greenland), VI-16-1957, A. & T. Washburn; 1 Mesters Vig (NE. Greenland), VIII-13-1957, A. & T. Washburn; 1 Mesters Vig (Kong Oscars Fjord, East Greenland), VI-29-30-1956, A. & T. Washburn; 2 Mesters Vig (Kong Oscars Fjord, East Greenland), VII-15-1956, A. & T. Washburn [all, AMNH]; 1 West Coast, 1916 [AMNH-H.E.M. homotype]; 1 West Coast, 1919 [AMNH]; 1 (locality unknown) [CU].

UNITED STATES

QUEENS

Alaska: 2 Barrow, spring [of] 1912, V. Stefanson, (A[merican] M[useum of] N[atural] H[istory], No. 20743) [AMNH]; 3 Collinson P[oint], July 10, 1914, (Canadian Arctic Expedition, F.J., Nos. 861, 862, 864) [CNC]; 1 Dutch Harbor, VI-22-1913 [CM]; 1 Hopper Bay, V-4-1957, R. Rausch [MCZ]; 1 Makuslin Bay (Unalaska I[sland]), VIII-5-07, E.C. van Dyke [USNM]; 1 McKinley P[ark], VIII-1-1938, G.P. Englehardt [H.E.M.-(H.E.M. homotype)]; 1 McKinley Park (Hi[gh]way

Pass), 12-VII-56, (W.C.F.) [USNM]; 1 Umiat, 11-VII-1959, J.E.H.M.; 1 Umiat, 12-VII-1959, J.E.H.M.; 1 Umiat, 21-VII-1959, J.E.H.M. [all, CNC]. **Locality unknown:** 1 (Collinson Point?) (no data) [CNC].



MAP 7.

CANADA

MALES

Northwest Territories: 1 Bathurst Inlet, 15-VIII-1951, W.I.C.; 4 Bernard Harbour [across Coronation Gulf from Coppermine], Aug. 14, 1915, (Canadian Arctic Expedition, F.J., Nos. 400, 405, 407, 410); 1 Bernard Harbour [across Coronation Gulf from Coppermine], July 10, 1916, (Canadian Arctic Expedition, F. J., No. 204) [all, CNC]; 1 Cambridge Bay [Victoria Island], 8-13-48, H.H. Stage (303-48-14, 222) [USNM]; 1 Clyde (Baffin Is[land]), 22-VII-1958, J.E.H.M.; 1 Clyde (Baffin Is[land]), 25-VII-1958, J.E.H.M.; 2 Clyde (Baffin Is[land]), 27-VII-1958, J.E.H.M.; 11 Clyde (Baffin Is[land]), 29-VII-1958, J.E.H.M.; 1 Eureka (Ellesmere Island), 30-VII-1954, P.F.B.; 1 Eureka (Ellesmere Island), 2-VIII-1954, P.F.B.; 1 Lake Harbour (Baffin Island), 17-VIII-1953, W.J.B.; 11 Muskox L[ake] (64°45' N., 108°10' W.), 31-VII-1953, J.G.C.; 1 Muskox L[ake] (64°45' N., 108°10' W.), 2-VIII-1953, J.G.C.; 1 Muskox L[ake] (64°45' N., 108°10' W.), 4-VIII-1953, J.G.C.; 2 Muskox L[ake] (64°45' N., 108°10' W.), 5-VIII-1953, J.G.C.; 1 Muskox L[ake] (64°45' N., 108°10' W.), 6-VIII-1953, J.G.C. [all, CNC]; 1 Smith Island (Jones Sound off Craig Harbour, Ellesmereland), VIII-16-1934 [ANSP]; 1 Spence Bay, 6-VIII-1951, J.G.C.; 1 Spence Bay, 9-VIII-1951, A.E.R.D. [all, CNC]. **Yukon Territory:** 3 Herschell Isl[and], July 1916, (Canadian Arctic Expedition, F.J., Nos. 854, 855, 857) [CNC]. **Locality unknown:** 1 (Bernard Harbour?) (no data) [CNC].

GREENLAND (Denmark)

MALES

1 Cape Hatherton (N[orth] of Etah), Aug. 13, 1925, (McMillan Exp[edition]) [HEM]; 1 Mesters Vig (NE. Greenland), VIII-16-1957, A. & T. Washburn [AMNH]; 3 (locality unknown) (no data) [ANSP].

UNITED STATES

MALES

Alaska: 3 M[oun]t McKinley Nat[ional] Park (Toklat Bridge, East Fork), July 25, 1950, D.B. [HEM].

Megabombus (M.) kirbyellus (Curt.)

Bombus kirbiellus Curt., 1835a, Append., p. lxii, pl. A, fig. 2: *Alpinibombus* [sic!] *balteatus*, Skor., 1937b, p. 58, (p.p.), (*nec balteatus* Dahlb., 1832, p. 36; *nec ignitus* v. *balteatus* Skor., 1933b, p. 61), [n. syn.]: *Alpinobombus kirbyellus*, Skor., 1922a, p. 151, (p.p., list): *Bombus atrifasciatus* Morr., 1903, p. 224: *Bombus balteatus*, auctt., (*nec balteatus* Dahlb., 1832, p. 36), [n. syn.]: *Bombus balteatus kirbiellus*, Aur., 1890, p. 28, (*nec balteatus* Dahlb., 1832, p. 36), [n. syn.]: *Bombus frigidus*, auctt., (*nec frigidus* Sm., 1854, p. 399), [n. syn.]: *Bombus kirbyellus*, Sm., 1854, p. 397, (emend., *kirbiellus* Curt., 1835a, Append., p. lxii): *Bombus kirbyellus* v. *friesi* Skor., 1907, p. 111, [n. syn.]: *Bombus nidulans*, Handl., 1888a, p. 232; Handl., 1891, p. 453, (*nec Apis nidulans* F., 1798, p. 274), [n. syn.]: *Bombus nivalis*, auctt., (*nec nivalis* Dahlb., 1832, p. 40; *nec nivalis* Zett., 1838, p. 474), [n. syn.]: *Bombus putnami* Cr., 1878, p. 185: *Bombus strenuus*, Fr., 1902, p. 487, (*nec strenuus* Cr., 1863a, p. 102), [n. syn.]: *Bombus (Alpinobombus) balteatus*, Brs., 1951, p. 1253, (p.p.), *In* Muesebeck et al., [n. syn.]: *Bombus (Alpinobombus) balteatus*, Rich., 1927b, p. 14, (*nec balteatus* Dahlb., 1832, p. 36). [n. syn.]: *Bombus (B.) kirbyellus*, Fkln., 1912, p. 290, (p.p.): *Bombus (B.)* (*Kirbyellus* group) Fkln., p. 289, (p.p.): *Bremus kirbyellus*, Fris., 1919b, p. 454 (*et seq.*): *Bremus (Alpinobombus) kirbyellus*, Fris., 1927e, p. 66: *Megabombus (M.)* (*Alpinus* group) Mlrm., 1961a, p. 57, (p.p.): ? *Psithyrus kodiakensis* Ashm., 1902b, p. 130.

DESCRIPTION. **Queen.** Length, 22.0 mm; width at wing bases, 9.0 mm; abdomen, 10.0 mm, width across T2, 9.5 mm; front wing length, 18.0 mm, width, 6.0 mm. **Head:** Frontal outline (excluding mouthparts) elongate trapezoidal, distinctly wider than high, arcuately rounded above; vertical region inclined, weakly convex, the ocellar half of ocellocular area smooth and polished posteriorly, the ocular half with irregularly spaced medium punctures; outline of compound eye broadly rounded below, narrowly arcuately so above, almost 3 times longer than wide, the inner margin nearly straight; ocelli rather small, situated below the supraorbital line and equidistant from each other, the interocellar line slightly greater than the ocellocular line; clypeus about as high as wide, rather strongly convex medially but less so to nearly flat ventrally, covered with irregular punctures over dorsal and lateral areas, mid-ventrally with weak sculpture; labrum distinctly more than twice as wide as thick, its tubercles flat, roughly sculptured, non-probiterant and only narrowly divided mesially, with stiff moderately long cluster of pubescence mid-ventrally between; clypeus slightly higher than wide, rather evenly and strongly convex, with coarse punctations except smooth over ventral median area; mandibular space nearly $1\frac{1}{2}$ times longer than wide between (and including) mandibular articulations; flagellum twice as long as scape, F1 about $1\frac{1}{2}$ times longer than distal width, subequal to F2-3 combined. **Legs:** Mesobasitarsite elongate-rectangular, concave mid-longitudinally, its distal margin shallowly emarginate, the distoposterior angle weakly arcuate; metabasitarsite slightly more than $2\frac{1}{2}$ times longer than widest dimension of segment, its outer surface shallowly concave, the distoposterior angle subarcuate and extended beyond arcuate distoanterior angle, the posterior margin evenly arcuate from base to distal end, the posterior fringe irregular in length over proximal half, beyond very short and stronger to distal end. **Pubescence:** Moderately dense and even on most of thorax, less compact and noticeably more uneven on head, scutellum, and abdomen, especially on distal terga. **Color:** Head black except intermixture of pallid yellow below antennal bases and on vertex. Thorax mostly pallid yellow with rather well-defined black interalar band of medium width, the legs black. Abdominal T1-2 pallid yellow, T3-4 mostly black with some admixture of dull yellow or burnt sienna especially distally on T4, T5-6 mostly burnt sienna (distally on T4 and T5-6 varying to vivid rufescent). Wings lightly uniformly infumated with brown throughout.

Worker. Length, 14.5 mm; width at wing bases, 7.0 mm; abdomen, 8.0 mm; width across T2, 6.5 mm; front wing length, 14.0 mm, width, 5.0 mm. Malar space comparatively somewhat shorter than that of queen; all other structural features, including characteristics of pubescence, relatively similar to those of queen. *Color:* In most respects like that of queen.

Male. Length, 17.0 mm; abdomen, 10.0 mm; width across T2, 6.5 mm; width at wing bases, 6.0 mm; front wing length, 15.0 mm, width, 5.0 mm. *Head:* Frontal outline subtriangular (excluding mouthparts), distinctly higher than greatest width through upper postgenae; outline of compound eye weakly arcuate (outwardly) mesially, to nearly straight, arcuately rounded and more narrowed above than below, about $2\frac{1}{2}$ times higher than widest dimension; vertex nearly flat, irregularly punctured behind ocelli, ocellar half of ocellular area mostly smooth and polished, the ocular half with scattered medium punctures; ocelli nearly equidistant apart, situated in a nearly straight line, each adjacent to or on the supraorbital line; malar space $1\frac{1}{2}$ times as long as distance between (and including) mandibular articulations, irregularly smooth and polished; labrum about $2\frac{1}{2}$ times wider than thick, nearly flat with only weak polished callosities; flagellum $1\frac{1}{2}$ times longer than scape, F1 $1\frac{1}{2}$ times longer than distal width, slightly longer than F2 and much shorter than F3 which is nearly as long as F1+2. *Legs:* Mesobasitarsite subrectangular, narrowed basally, about 3 times longer than greatest width, the subarcuate anterior and posterior angles merged with the very weakly emarginate distal end, its outer surface nearly flat and covered with short recumbent pubescence except that which is long and suberect over the basal third; metabasitarsite nearly 4 times longer than greatest width, its outer surface weakly concave mid-longitudinally and covered with short recumbent pubescence, distally weakly emarginate, the posterior margin almost straight with long loose fringe that is progressively shortened along the distal third. *Pubescence:* Longer, somewhat looser, and more shaggy throughout than on the female. Genitalia, seventh and eighth abdominal sterna (Pl. XII) (cf. those of *balteatus* (Dahlb.) by referring to Comments under same.) *Color:* Head mostly black except clypeus (extensively), vertex and postgena pallid yellow, the thorax (except dull blackish over interalar area), legs and abdominal T1-2 pallid yellow, some pubescence on legs with pale sienneous tinge, abdominal T3 largely black mid-basally with conspicuous pale yellow laterally and along distal margin, T4 mostly black except drab yellow laterally and the distal pubescence sienneous tinged, T5-7 pallid yellow with sienneous to rufescent tinge (variable on T5-7 to vivid ferruginous pile). Wings slightly paler than those of female.

Redescribed from hypotypes. **Queen,** Gothic, Colo[rado], 7-1929, 9600 ft, Mary J. Brown; **worker,** Univ[ersity] Sum[mer] Camp, Albany Co[unty], Wyo[ming], 8-16-35; **male,** Lake Agnes, Cameron Pass, Colo[rado], Aug. 21, 1940, elev. 11,000 ft, H.E. Milliron [all, HEM].

TYPE. Not examined. The type ♀ is lost, but the habitus of the species is well depicted in color by Curtis (1835*a*, pl. A, fig. 2). This figure is regarded as the type, *in lieu* of a specimen.

TYPE LOCALITY. Canada. Number of specimens at hand: 204. In flight: May to late September, the males first appearing in early July. Distribution: (vertical), sea level to 14,000 ft; (horizontal), Alaska, southward through British Columbia and Alberta, eastward through Yukon Territory, Northwest Territories, northern Ontario and Quebec to Newfoundland (Labrador), and through the Rocky Mountain States to New Mexico. Floral visitations: *Arnica*, *Erigeron*, *Penstemon* and *Potentilla*. Lutz and Cockerell (1920) added *Poemonium* and *Trifolium*. Richards (1927*b*: 23), under *Bombus balteatus* (composite of *balteatus* (Dahlb.) and *kirbyellus* (Curt.)) compiled the following records, some of which are very doubtful (cf. under *Megabombus* (M.) *balteatus* (Dahlb.)): *Aconitum*, *Andromeda*, *Astragalus*, "Bartisia" [= *Baptisia*], *Campanula*, *Cirsium*, *Comarum*, *Geranium*, *Hieracium*, *Lathyrus*, *Leontodon*, *Lotus*, *Melampyrum*, *Mulgedium*, *Oxytropis*, *Papaver*, *Pedicularis*, *Polygonum*, *Salix*, *Sibbaldia*, *Silene*, *Solidago*, *Trichera*, *Vaccinium* and *Vicia*. The foregoing records by Richards (*loc. cit.*) are European but most of these genera are also common to the Western Hemisphere. It is uncertain which genera should definitely be associated with *Megabombus* (M.) *kirbyellus* (Curt.).

COMMENTS. The length of the malar space varies somewhat in the queens, and to a slightly less extent in the workers. Often there is a small, yet discernible, difference in the comparative lengths of the proximal flagellar segments in both queens and

workers (*e.g.*, the length of F1 to F2, or F1 to F2-3). However, these differences should not present a problem in the separation of this species from a closely related one (*balteatus* Dahlb., *q.v.*). The male is variable in overall size but is otherwise rather stable in all morphological features. Chromatically, the species ranges broadly in the coloration of the abdominal pile so that it is easily confounded with other arctic species. The coloration of the female abdomen (queen and worker) is very variable, especially beyond T3; often the distal terga are almost covered with deep to pale rufescent pile, or wholly with pallid yellow to whitish, or sometimes even predominantly black. There is a similar chromatic variation on the distal abdominal terga of the male. Such differences in appearance cannot always be associated with distributional occurrence; except for senile specimens, ordinarily, abdominal pile of both sexes on T4-6 is predominantly ferruginous on specimens occurring at high inland locations. The belief by some that *kirbyellus* is "red-tailed" in the Western Hemisphere as opposed to only the occurrence of "white-tailed" specimens in the Eastern Hemisphere has no sound basis. Outside the Western Hemisphere this species occurs, under other names, in Kamchatka and northern Siberia along with *balteatus* which becomes more abundant than *kirbyellus* westward throughout the arctic north-central Eurasia. In all respects, the females of these two species are difficult to separate, coloration *per se* being valueless; one of the most reliable features for identification concerns the difference between the distal margins of the male eighth abdominal sterna (*cf.* with Comments under *balteatus* (Dahlb.)).

CANADA

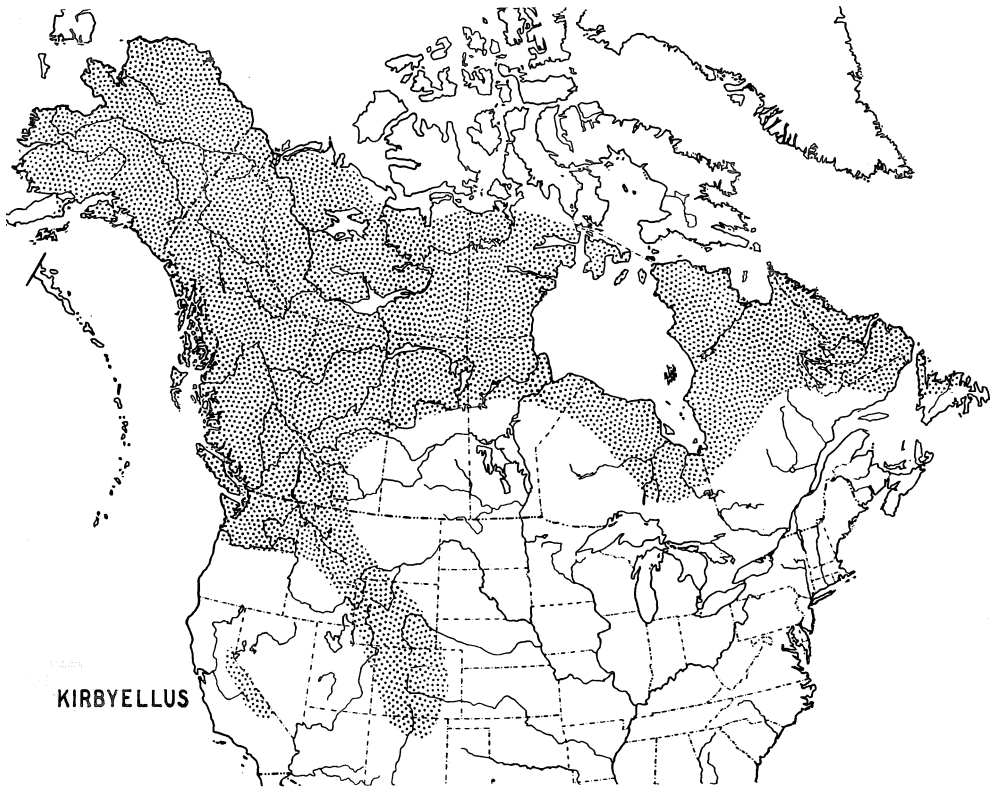
QUEENS

Alberta: 1 Highwood Summit (mi. 118, Kananaskis-Coleman H[igh]w[a]y), 14-VIII-1955, J.R.M., 7200-8000' [CNC]; 1 Jasper Park, VIII-1915 [AMNH]. **British Columbia:** 1 Kuass Pass, July 24, 1946 [CM]; 2 Moosehorn Lake; 1-VIII-1960, W.W.M., *Potentilla* meadow; 2 Summit L[ake] (mi. 392, Alaska H[igh]w[a]y), 16-VI-1959, E.E.M.; 2 Summit L[ake] (mi. 392, Alaska H[igh]w[a]y), 20-VI-1959, R.E.L.; 1 Summit L[ake] (mi. 392, Alaska H[igh]w[a]y), 25-VI-1959, R.E.L.; 1 Summit L[ake] (mi. 392, Alaska H[igh]w[a]y), 27-VI-1959, R.E.L.; 1 Summit L[ake] (mi. 392, Alaska H[igh]w[a]y), 7-VII-1959, R.E.L. [all, CNC]; 2 Upper Peace R[iver] Dist[ri]ct, VIII-8-1932, J. de N. Henry [ANSP]. **Northwest Territories:** 1 Aklavik, 29-VI-1956, R.E.L.; 1 Baker Lake, 2-VIII-1947, T.N.F.; 1 Bathurst Inlet, 1-VIII-1951, C.D.B.; 1 Chesterfield, 9-VIII-1950, J.R.V.; 1 Norman Wells, 9-VI-1949, S.D.H.; 1 Norman Wells, 9-VII-1949, S.D.H.; 1 Norman Wells, 23-VII-1949, W.R.M.M.; 1 Norman Wells, 20-V-1953, C.D.B.; 1 Reindeer Depot (Mackenzie Delta), 7-VII-1948, J.R.V. [all, CNC]. **Ontario:** 1 Missinaibi Riv[er], 23-28-VI-1920, F.J. [CNC]. **Quebec:** 1 G[rea]t Whale R[iver], 17-VI-1949, J.R.V.; 2 G[rea]t Whale R[iver], 18-VI-1949, J.R.V.; 1 G[rea]t Whale R[iver], 27-VI-1949, J.R.V.; 11 G[rea]t Whale R[iver], 31-VII-1949, J.R.V.; 2 G[rea]t Whale R[iver], 14-VIII-1949, J.R.V.; 2 G[rea]t Whale R[iver], 16-VIII-1949, J.R.V.; 1 G[rea]t Whale R[iver], 24-VIII-1949, J.R.V.; 1 G[rea]t Whale R[iver], 28-VIII-1949, J.R.V. [all, CNC]. **Yukon Territory:** 1 Firth River, 14-VII-1956, E.F.C. [CNC]; 1 Otter L[ake] (60°30' [N.], 130°28' [W.]), 20-VII-1960, J.E.H.M.; 2 Rampart House, 10-VII-1951, C.C.L. [all, CNC].

UNITED STATES

QUEENS

Alaska: 1 Cold Bay (163° W.), 25-VII-1952, W.R.M.; 1 Cold Bay (163° W.), 26-VII-1952, J.B.H.; 2 Cold Bay (163° W.), 27-VII-1952, J.B.H. [all, CNC]; 1 Naknek, 8-VII-1952, W.R.M.; 1 Richard[son] H[igh]w[a]y (Black Rapids, mile 223), 1-VI-1951, W.R.M.M. [both, CNC]; 1 Umiat, 8-VII-1959, J.E.H.M.; 1 Umiat, 12-VII-1959, J.E.H.M.; 1 Umiat, 17-VII-1959, J.E.H.M.; 2 Umiat, 23-VII-1959, J.E.H.M.; 1 Umiat, 12-VIII-1959, J.E.H.M.; 1 Umnak [Island] (Aleut[ians]), 21-VII-1958, Lindroth, visiting Vaccin[ium] [f]uliginosum [all, CNC]. **Colorado:** 1 Corona, VII-8-1916, F. Smith, 11,000' [INHS]; 1 Gothic, 7-1929, Mary J. Brown, 9600'; 1 Rocky M[ountain] [National] Park, Aug. 1, 1949, D.B., 11,750'; 1 Rocky M[ountain] [National] Park, Aug. 4, 1949, D.B., 12,300' [all, HEM]. **New Mexico:** 5 Taos (Wheeler Peak), June 15-25, 1960, Burks & Kinzer [USNM]; 1 Truchas Peak (NE.), Aug. 2, [yr.?], W.P.C., above timberline [HEM].



MAP 8.

CANADA

WORKERS

Alberta: 1 Cascade M[oun]t[ai]n, 25-VIII-16, Sanson; 1 Laggan, 4-8-07, J. Fletcher [all, CNC]. **British Columbia:** 1 Chilkat Pass (mi. 75, [Alaska Highway]), 14 July 1948, Mason & Hughes, 3500'; 1 Pete Lake (57°56' [N.], 131°56' [W.]), 16-VIII-1960, W.W.Ms.; 1 Pete Lake (57°56' [N.], 131°56' [W.]), 19-VIII-1960, W.W.Ms., *Arnica* meadow to 5500'; 1 Pete Lake (57°56' [N.], 131°56' [W.]), 20-VIII-1960, W.W.Ms., 4500', fleabane meadow; 1 Summit L[ake] (mi. 392, Alaska H[igh]w[ay]), 21-VI-1959, E.E.M. [all, CNC]. **Northwest Territories:** 1 Reindeer Depot (Mackenzie Delta), 9-VII-1948, J.R.V.; 2 Reindeer Depot (Mackenzie Delta), 2-VIII-1948, J.R.V. [all, CNC]. **Quebec:** 1 G[reat] Whale R[iver] (East Coast, James Bay), 4-5-VIII-1920, F.J.; V. 1 G[reat] Whale R[iver], 27-VII-1949, J.R.V.; 1 G[reat] Whale R[iver], 14-VIII-1949, J.R.V.; 1 G[reat] Whale R[iver], 16-VIII-1949, J.R.V.; 1 G[reat] Whale R[iver], 28-VIII-1949, J.R.V.; 1 James Bay (East Coast), Aug., 1920, F.J.V. [all, CNC]; 1 James Bay (East Coast), August 1920, F.J., (Theodore H. Frison Coll[ectio]n), [INHS]. **Yukon Territory:** 1 Firth River, 7-VIII-1956, E.F.C. [CNC]; 1 Old Crow, V-21-57, F.S.L.W. [MCZ]; 1 Rampart House, 10-VIII-1951, C.C.L. [CNC].

UNITED STATES

WORKERS

Alaska: 1 Atkasuk (Meade R[iver], SW. [of] P[oin]t Barrow), 8-VIII-1958, Lindroth, 407; 1 Cold Bay (163° [W.]), 26-VII-1952, J.B.H.; 1 Cold Bay (163° [W.]), 28-VII-1952, J.B.H. [all, CNC]; 1 Kodiak, July 20, '99, T. Kincaid, (Harriman Expedition, '99), [NRS]; 1 Moose Pass (Kenai Pen[insula]), 31-VII-1951, W.J.B. [CNC]; 3 M[oun]t McKinley Nat[ional] P[ar]k (Mile Post 69), July 13, 1950, D.B., 3000'; 2 M[oun]t McKinley Nat[ional] P[ar]k (M[ile] Po[s]t 72), July 19, 1950, D.B., 3500' [all, HEM]; 1 Nome, Aug. 24-25, '16, (Canadian Arctic Expedition, F.J., No. 66), [CNC]; 1 Umiat, 29-VI-47, C. Schultz [HEM]; 1 Umiat, 12-VII-1959, R. Madge; 2 Umiat, 12-VII-1959, J.E.H.M.; 1 Umiat, 15-VII-1959, R. Madge; 2 Umiat, 17-VII-1959, J.E.H.M.; 1

Umiat, 23-VII-1959, J.E.H.M.; 1 Umiat, 1-VIII-1959, J.E.H.M. [all, CNC]. **Colorado:** 1 Bear Creek [Baca County], Oslar, (Morrison), (Theodore H. Frison Coll[ectio]n), [INHS-mislabeled, wrong locality]; 1 Bullion Peak (Park Co[unty]), VII-27-29-1922, G.P. Englehardt, 12-14,000', (Theodore H. Frison Coll[ectio]n), [INHS]; 5 Horseshoe Cirque, Aug. 15, 1940, H.G. Rodeck [HEM]; 2 R[ocky] M[ountain] Nat[ional] Park (Trail Ridge R[oad]), 8-25-33, M. & H. James, 11,000' [INHS]; 2 (locality unknown), 2037 [MASS]. **New Mexico:** 2 Truchas Peak, 8-2-03, W.P.C., (Theodore H. Frison Coll[ectio]n) [INHS]. **Wyoming:** 1 Albany Co[unty], 1935; 1 Univ[ersity] Sum[mer] Camp (Albany Co[unty]), 8-16-35 [HEM].

CANADA

MALES

Northwest Territories: 2 Reindeer Depot (Mackenzie Delta), 2-VIII-1948, J.R.V. [CNC]. **Ontario:** 1 Moose Factory (James Bay), 28-IX-1919, Rev. W.E. Walton [CNC]. **Quebec:** 1 James Bay (East Coast), August 1920, F.J.; 1 James Bay (East Coast), 6-IX-1920, F.J. [all, CNC]; 1 Gr[eat] Whale R[iver] (East Coast, James Bay), 4-5-VIII-1920, F.J. [INHS]; 1 G[rea]t Whale River, 18-VIII-1949, J.R.V.; 4 G[rea]t Whale River, 28-VIII-1949, J.R.V. [all, CNC].

UNITED STATES

MALES

Alaska: 1 M[oun]t McKinley Nat[ional] Park (M[ile] Po[s]t 72), July 10, 1950, D.B., 3500' [HEM]; 1 Nome, July 9, 1913; 1 Nome (Anvil M[oun]t[ain]s), Aug. 13, 1913 [CM]; 1 Umiat, 29-VII-47, C. Schultz [HEM—compared by H.E.M. (1960) with type ♂ *tricolor* Zett., (*nec* Dahlb.)]; 1 Umiat, 22-VII-1959, J.E.H.M.; 1 Umiat, 29-VII-1959, J.E.H.M.; 1 Umiat, 29-VII-1959, J.E.H.M.; 1 Umiat, 31-VII-1959, J.E.H.M.; 1 Umiat, 1-VIII-1959, J.E.H.M.; 1 Umiat, 5-VIII-1959, J.E.H.M.; 1 Umiat, 7-VIII-1959, R. Madge; 1 Umiat, 9-VIII-1959, R. Madge [all, CNC]. **Colorado:** 1 Glenwood Sp[rin]gs, [Garfield County], Oslar [INHS—compared by H.E.M. (1960) with type ♂ *tricolor* Zett. (*nec* Dahlb.)]; 2 Lake Agnes (Cameron Pass), Aug. 21, 1940, H.E.M., 11,000' [HEM]; 1 Noharch Pass [?Monarch Pass, Gunnison County], VII-7-34, C.P. Alexander, 10,500'; 1 Ward, 8-30-99 [both, MASS]. **Montana:** 1 Glacier N[ational] Park, (Logan Pass), VIII-25-1937, F.W.P., at *Penstemon ellipticus*, (21294) [ANSP]. **Wyoming:** 5 Albany Co[unty], 1935 [HEM]. **Locality indeterminate** (United States?): 1, 2037 (no other data) [MASS]; 1, 2037 (no other data), (C.F. Baker Coll[ectio]n) [USNM]; 1, 2037 (no other data) (Baker) [ZMB]; 1 Snowy Range Class [?], 8-12-38 [HEM].

Megabombus (M.) polaris (Curt.)

Bombus polaris Curt., 1835a, Append., p. lxiii: *Alpinibombus [sic] arcticus arcticus*, Skor., 1937b, p. 53, (*nec Apis arctica* Acerbi, 1802, p. 353, pl. 1, fig. 7), [n. syn.]: *Alpinibombus [sic] balteatus*, Skor., 1937b, (p.p.), (*nec balteatus* Dahlb., 1832, p. 36; *nec ignitus* v. *balteatus* Skor., 1933b, p. 61), [n. syn.]: *Alpinibombus [sic!] arcticus* m. *groenlandicus*, Skor., 1937b, p. 53, (*nec Apis arctica* Acerbi, 1802, p. 353, pl. 1, fig. 7), [n. syn.]: *Alpinibombus [sic] arcticus kincaidi*, Skor., 1937b, p. 58, (*nec A. arctica* Acerbi, 1802, p. 353, pl. 1, fig. 7), [n. syn.]: *Alpinibombus [sic] arcticus* m. *natvigioides* Skor., 1937b, pp. 56, 57, (*nom. nud.*), (*nec A. arctica* Acerbi, 1802, p. 353, pl. 1, fig. 7): *Alpinibombus [sic!] arcticus* m. *nidulans*, Skor., 1937b, p. 56, (*nec A. arctica* Acerbi, 1802, p. 353, pl. 1, fig. 7; *nec A. nidulans* F. 1798, p. 274 vel 1793, p. 330), [n. syn.]: *Alpinibombus [sic!] arcticus* m. *polaris*, Skor., 1937b, p. 53, (*nec A. arctica* Acerbi, 1802, p. 353, pl. 1, fig. 7), [n. syn.]: *Alpinobombus kincaidi*, Skor., 1922a, p. 151, (list), [n. syn.]: *Alpinobombus kirbyellus appropinquans* Skor., 1914a, p. 123, (*nec kirbiellus* Curt., 1835a, Append., p. lxii), [n. syn.]: *Alpinobombus kirbyellus* v. *gmellini* Skor., 1914a, p. 124, (*nec kirbiellus* Curt., 1835a, Append., p. lxii), [n. syn.]: *Alpinobombus kirbyellus* v. *subcollaris* Skor., 1914a, p. 123, (*nec kirbiellus* Curt., 1835a, Append., p. lxii), [n. syn.]: *Alpinobombus polaris*, Skor., 1922a, p. 151, (p.p., list): *Bombus alpiniformis*, Pitt., 1938b, p. 254; Elfv., 1960a, p. 33, [n. syn.]: *Bombus arcticus* Kby., 1824, p. 216, (*nec Apis arctica* Acerbi, 1802, p. 253, pl. 1, fig. 7), [n. syn.]: *Bombus arcticus* v.

alpiniformis Rich., 1927b, p. 13, (*nec A. arctica* Acerbi, 1802, p. 353, pl. 1, fig. 7), [n. syn.]: *Bombus balteatus*, Strand, 1905, p. 6, (*et auctt.*), (*nec balteatus* Dahlb., 1832, p. 36; *nec ignitus* v. *balteatus* Skor., 1933b, p. 61), [n. syn.]: *Bombus derhamellus*, Fox, 1892, p. 134, (*nec Apis derhamella* Kby., 1802, p. 363), [n. syn.]: *Bombus groenlandicus* Sm., 1854, p. 393, [n. syn.]: [*Bombus hyperboreus* (fig. 2, Table III), (n. sp.), *Apis arctica* Acerbi syn., Schönh., 1809, p. 57]: *Bombus kincaidii* Ckll., 1898c, p. 324, [n. syn.]: *Bombus kirbyellus* v. *cinctellus* Fr., 1911a, p. 456, (*nec kirbiellus* Curt., 1835a, Append., p. lxii), [n. syn.]: *Bombus kirbyellus* v. *cinctus* Fr., 1911a, p. 456, (*nec kirbiellus* Curt., 1835a, Append., p. lxii; *nec robustus* v. *cinctus* Fr., 1904b, p. 188), [n. syn.]: *Bombus kirbyellus* v. *friesi* Skor., 1907, p. 111, (*nec kirbiellus* Curt., 1835a, Append., p. lxii), [n. syn.]: *Bombus kirbyellus* v. *groenlandicus*, Vogt, 1911, pp. 66, 67, (*nec kirbiellus* Curt., 1835a, Append., p. lxii), [n. syn.]: *Bombus kirbyellus* v. *pleuralis*, Fr., 1902, p. 486 (*et seq.*), (*nec kirbiellus* Curt., 1835a, Append., p. lxii; *nec pleuralis* Nyl., 1848, p. 231, *Adnot.*), [n. syn.]: *Bombus kirbyellus* v. *pyrrhopygus* Fr., 1902, p. 495, pl. 3, fig. 1 (*et seq.*), (*et pyrrhopygus*, *pyrrhopygus*, *seq.*), (*nec pyrrhopygoideus* Skor., 1914a, p. 124), [n. syn.]: *Bombus kirbyellus* v. *semljaensis* Fr., 1923c, p. 4, (*nec kirbiellus* Curt., 1835a, Append., p. lxii), [n. syn.]: *Bombus kirbyellus* v. *similis* Fr., 1911b, p. 684, (*nom. nov.*, *pro tristis* Sp.-Schn.), (*nec kirbiellus* Curt., 1835a, Append., p. lxii), [n. syn.]: *Bombus kirbyellus* v. *tristis* Sp.-Schn., *In* Friese, 1902, p. 495, pl. 3, fig. 1a, (*nec Bombus tristis* Seidl, 1837, p. 69), [n. syn.]: *Bombus nidulans*, *auctt.*, (*nec Apis nidulans* F., 1798, p. 274, *vel* F., 1793, p. 330), [n. syn.]: *Bombus nivalis* Dahlb., 1832, p. 40; Zett., 1838, p. 474, [n. syn.]: *Bombus* (*Alpinobombus*) *arcticus*, Rich., 1927b, p. 10, [n. syn.]: *Bombus* (*Alpinobombus*) *arcticus* f. *groenlandicus*, Yarr., 1955, p. 152, [n. syn.]: *Bombus* (*Alpinobombus*) *arcticus* f. *polaris*, Yarr., 1955, p. 152, [n. syn.]: *Bombus* (*Alpinobombus*) *kincaidii*, Brs., 1951, p. 1254, *In* Muesebeck *et al.*, [n. syn.]: *Bombus* (*B.*) *arcticus*, Fkln., 1912, p. 302, (p.p.), [n. syn.]: *Bombus* (*B.*) *polaris*, Fkln., 1912, p. 298; *Bombus* (*B.*) (*Kirbyellus* group) Fkln., 1912, p. 289, (p.p.): *Bremus polaris*, Fris., 1919b, p. 457; *Bremus* (*Alpinobombus*) *kincaidii*, Fris., 1927e, p. 66, [n. syn.]: *Bremus* (*Alpinobombus*) *polaris*, Fris., 1927e, p. 66; *Megabombus* (*M.*) *polaris*, Mlrn., 1961a, p. 57; *Megabombus* (*M.*) (*Alpinus* group) Mlrn., 1961a, p. 57, (p.p.): . . . *arcticus*, Mlrn., 1960a, p. 89, (♀ type): . . . *groenlandicus*, Mlrn., 1960a, p. 92, (Meade-Waldo ♀ type): . . . *nivalis* (Dahlb.), Mlrn., 1960a, p. 94, (♀, H.E.M. lectotype): . . . *polaris*, Mlrn., 1960a, p. 95, (♀ type).

DESCRIPTION. Queen. Length, 21.0 mm; width at wing bases, 9.0 mm; abdomen, 11.0 mm, width across T2, 9.5 mm; front wing length, 16.0 mm, width, 5.5 mm. **Head:** Frontal outline (excluding mouthparts) rounded trapezoidal, about as high as wide, vertical region nearly flat except slightly concave and smooth antieriad of lateral ocelli, ocular half of ocellular area irregularly weakly punctured; outline of compound eye slightly broader below than above, its inner margin nearly straight, 3 times higher than wide; ocelli of medium size, situated in a nearly straight line just below supraorbital line, interocellar line slightly greater than ocellular line; clypeus as wide as high, evenly convex above, covered with irregular well-separated punctures; labrum coarsely punctate, without prominent tubercles, 2½ times wider than thick, with strong sparse pubescence; malar space about as long as distance between (and including) mandibular articulations, weakly convex and microscopically punctate with fine pubescence posteriorly; flagellum slightly more than twice the length of scape, F1 1½ times longer than distal width, distinctly shorter than F2 and F3 combined, F2 about 1¼ times longer than wide. **Legs:** Mesobasitarsite elongate rectangular, distally obscurely emarginate, the distoposterior angle acute (but not spinate) and extended slightly beyond rounded arcuate distoanterior angle, outer surface shallowly concave longitudinally; outer hind tibial surface mid-longitudinally convex,

alutaceous throughout; metabasitarsite slightly less than twice as long as greatest width, the posterior margin arcuate at basal one-fourth, beyond to subtruncate distal end nearly straight, basally slightly wider than distally, its outer surface shallowly concave and covered with recumbent pubescence, posterior fringe arcuate and long over proximal two-thirds (longest hairs equal to widest dimension of segment) but short on distal one-third, subacute distoposterior angle only slightly extended beyond arcuate distoanterior angle. *Pubescence*: Rather long and loose throughout; corbicular fringe long, loose, the most prominent considerably longer than greatest corbicular width; metabasitarsal posterior fringe long and arcuate on proximal two-thirds, beyond short and sparse. *Color*: Head black with some pubescence at tips tinged with ochraceous yellow. Thorax above pale ochraceous yellow except for rather broad indefinitely defined black interalar band, the mesopleuron predominantly sienneous yellow with black intermixed, pleura otherwise and legs black. Abdominal T1–2 pale ochraceous yellow, T3 with burnt sienna and black intermixed, T4 mostly black on basal half but predominantly burnt sienna distally, T5–6 largely burnt sienna with some black intermixed, venter almost entirely black except some hairs pale tipped. Wings lightly and uniformly infusate.

Worker. Length, 14.0 mm; abdomen, 7.0 mm, width across T2, 6.5 mm; front wing length, 7.0 mm, width, 4.0 mm. Structural features relatively similar to those of the queen, except flagellum less than twice length of scape, F1 being about $1\frac{1}{4}$ times longer than distal width, much longer than quadrate F2, definitely shorter than F2 and F3 combined. Pubescence, color, and infumation of wings much as in the queen.

Male. Length, 16.0 mm; abdomen, 8.0 mm, width across T2, 6.5 mm; width at wing bases, 6.0 mm; front wing length, 14.0 ($\pm$) mm, width, 4.5 ($\pm$) mm. *Head*: Frontal outline rather narrowly rounded trapezoidal (excluding mouthparts), about as wide as high; compound eye twice as high as broad, more broadly arcuate below than above; ocelli situated as weak arc slightly below supraorbital line, nearly equidistant apart, interocellar line about equal to ocellular line, vertex behind ocelli finely irregularly punctate, the ocellar half of ocellular area smooth and polished, ocular half with coarser weak sculpture; labrum broad dorsoventrally, about 2 times wider than high, its ventral margin truncate except for evenly rounded lateral corners, its surface nearly flat and irregularly weakly punctate except for diminutive smooth callosities distolaterally, devoid of noticeable pubescence except rather strong hairs along ventral area; flagellum nearly twice as long as scape, F1 much longer than F2 and distinctly shorter than rectangular F3; malar space mostly convex and polished except posteriorly, about $1\frac{1}{4}$ times longer than distance between (and including mandibular) articulations. *Legs*: Mesobasitarsite elongate rectangular, less than 3 times longer than widest dimension, the subarcuately rounded distoposterior angle slightly in recess of arcuate distoanterior angle, outer surface mid-longitudinally weakly concave and covered with fine, long and short reclined pubescence; metabasitarsite rectangular, about $2\frac{1}{2}$ times longer than greatest dimension, the outer surface mid-longitudinally evenly concave and covered with short and long recumbent pubescence, distal angles similar to those of the mesobasitarsite, the posterior margin weakly arcuate basally to nearly straight distally, posterior fringe long (longest more than greatest width of segment) almost throughout. *Pubescence*: Longer, looser and more uneven throughout than in the female. Genitalia, seventh and eighth sterna (Pl. XII). *Color*: Head black except vertex mostly pale yellow, black hairs on clypeus with yellowish tinge. Thorax entirely drab yellow (except blackish mesopleuron) with intermixture of black hairs over interalar area (no discrete interalar black band); legs mostly with some intermixture of black but predominantly drab yellow, including fringes; abdominal T1–2 tawny (to light) yellow, T3–4 mostly black with conspicuous intermixture of burnt sienna posteriorly and postlaterally, T5–7 mostly with drab burnt (yellowish) sienna. Wings lightly infumated, more so than those of the queen and worker.

Redescribed from hypotypes. **Queen**, Cambridge Bay, [N.W.T.], Canada, 8-8-48, H.H. Stage (301, 48-14222), on flowers; **worker**, Southampton I[sland], N.W.T., Canada, July 30, 1947, C.W. Gottschalk; **male**, M[oun]t McKinley Nat[ional] Forest, Sable Pass, Aug. 12, 1950, D. Bolinger, elev. 4000' fall, HEMJ].

TYPE. Examined an original ♀ (labeled by Smith as type), Type Hym. 17B1054, in the British Museum (N.H.), London (Milliron 1960a: 95).

TYPE LOCALITY. Arctic North America (Canada). Number of specimens at hand: 1214. In flight: some time during the second half of May to early September, the males appearing during the first half of July. Distribution: (vertical), sea level to 8000 ft; (horizontal), Alaska, Yukon Territory, northern portions of British Columbia and Alberta, eastward through the Northwest Territories and northern

portions of Manitoba and Quebec, to Newfoundland (Labrador) and Greenland. Virtually a northern circumpolar species. Floral visitations: *Astragalus*, *Cassiope*, *Dryas*, *Epilobium*, *Papaver*, *Pedicularis*, *Salix*, *Saxifraga*, and *Silene*. Richards (1927b: 24) recorded [~~Bartisia~~] [= *Baptisia*] and *Ledum*. Undoubtedly there are numerous other generic records for this taxon.

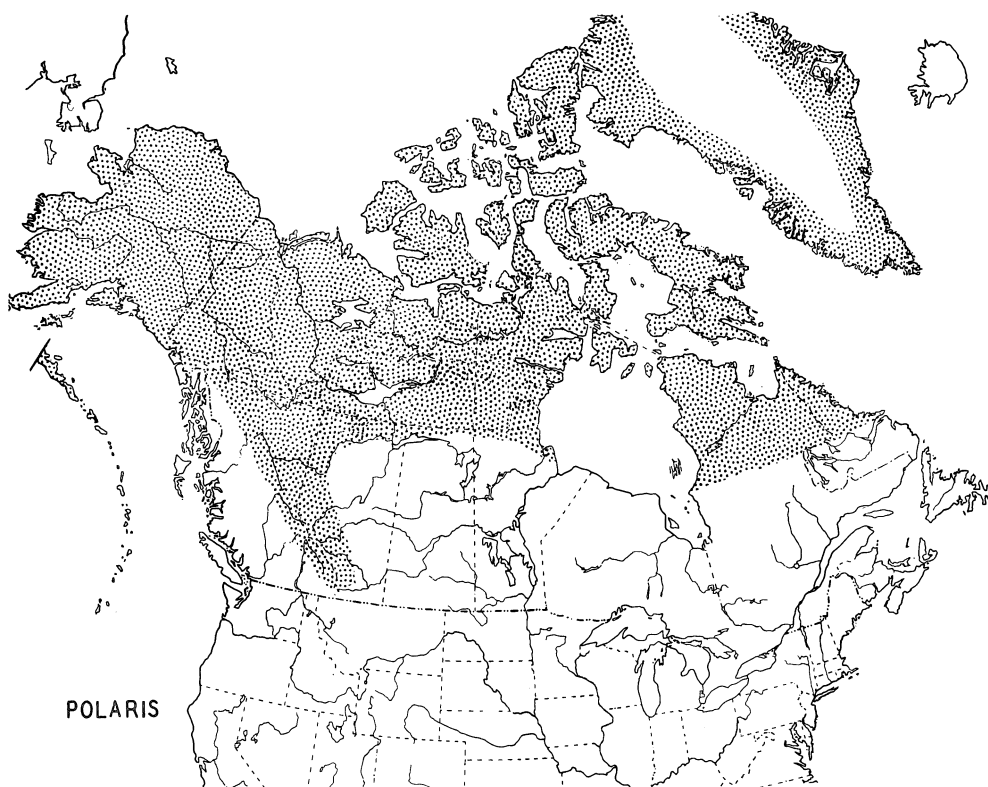
COMMENTS. Morphologically this species varies in several respects. Most noticeable is the length of the malar space, especially in the queens; this feature sometimes approximates that in *balteatus* (cf.) and also the shortest mandibular space of *kirbyellus* (cf.) but attention to other structures such as the relative comparative lengths of the flagellar segments, punctuation on the clypeus, comparative length of and posterior arcuation of the metabasitarsite will serve to distinguish this species from close relatives throughout its range. There is no problem in separating the males on the basis of structure from any of the related species. Chromatically, *polaris* is very variable with respect to the thorax and abdomen in queens and workers, especially so in the males. The lightest queens are pallid to pale ochraceous yellow on the thoracic dorsum with rather wide definitely defined interalar black band, the abdomen with T1-2 almost entirely ochraceous (or lighter) yellow, T3 predominantly ochraceous yellow intermixed with some black basally and basolaterally, T4-6 covered with rufescent tawny yellow except T6 ordinarily with short black hairs medially. Males often have the body dorsally almost entirely yellowish with only slight rufescent tinge to pubescence on the distal abdominal terga, though usually these terga in all castes are predominantly covered with rufescent yellow or ferruginous pile. The chromatic pattern of paler *polaris* often closely parallels that of *kirbyellus*, *balteatus*, and *strenuus*; and the darker specimens (♀, ♂, ♂), including melanics, by gross examination are easily confounded with any of the other four northern species. Often the thoracic dorsum of queens, workers, and males is predominantly black without any well-defined interalar band, and the abdominal dorsum might have pale conspicuous pubescence only on the basal and distal terga. Melanic specimens of workers and males before me, collected in the Northwest Territories (Canada), cannot in any way be differentiated from *Bombus arcticus* v. *alpiniformis* described by Richards (1927b: 13), and later elevated to "specific rank" by Pittioni (1938b: 254) and by Elfving (1960a: 7, figs. 9, 10, 16, 17, key p. 33). Comparable melanics (all castes) of all high and low arctic species of the Western Hemisphere species have been seen by me.

Often small workers, approximating 10-12.0 mm appear in the semblance of *frigidus* (Sm.), but such specimens can be distinguished as this species by the comparative lengths of the flagellar segments, posterior shape of the metabasitarsite, punctuation on the clypeus, etc.

CANADA

QUEENS

Alberta: 1 Banff, 24-VI-1924, Eric Hearle; 1 Cascade M[oun]t[ai]n, 25-VIII-16, Sanson [both, CNC]; 1 L[ake] Louise (Larch Valley), 15-VII-1931, E.R.T., 8000', (Theodore H. Frison Col[lectio]n) [INHS-(H.E.M. *arcticus* homotype)]. **British Columbia:** 2 Atlin, 2-VIII-1955, H.J.H., 5000'; 1 Summit L[ake] (Mi[le] 392, Alaska H[igh]w[ay]), 27-VI-1959, R.E.L. [all, CNC]. **Manitoba:** 6 Churchill, July 30, 1934, A.M. Heydweiller, (Cornell U[niversity], Lot 873, sub. 1) [CU]; 1 Churchill, 4-VIII-1937, W.J.B.; 3 F[or]t Churchill (H[udson] B[ay]), VII-1924, F.J.; 1 Fort Churchill, 20-VI-1952, C.D.B. (TD 18) [all, CNC]. **Newfoundland:** 3 Hebron, 13-VII-1954, J.F.M., (ex nest #1) [CNC]; Hebron, 13-VII-1954, J.F.M., (ex nest #1) [HEM]; 1 Hopedale (Labr[ador]), 4-VIII-1923; 1 Hopedale (Labr[ador]), 22-6-1924; 3 Hopedale (Labr[ador]), 6-VIII-1927, W.W.P.; 1 Hopedale (Labr[ador]), 3-VI-1928, W.W.P. [all, CNC]; 1 Labrador (no definite locality) (no data), [AMNH-(H.E.M. *polaris* homotype)]; 1 Labrador (no definite locality) [ZMB]. **Northwest Territories:** 1 Alert (Ellesmere Isl[and], 82°30' N., 62°18' W.),



MAP 9.

2-VII-1951, P.E.B.; 1 Alert (Ellesmere Isl[and], 82°30' N., 62°18' W.), 11-VII-1951, P.F.B.; 1 Alert (Ellesmere Isl[and], 82°30' N., 62°18' W.), 19-VII-1951, P.F.B.; 1 Baker Lake, 8-VIII-1947, T.N.F.; 2 Bathurst Inlet, 27-VI-1952 [1951], W.I.C.; 2 Bathurst Inlet, 29-VI-1951, W.I.C.; 1 Bathurst Inlet, 30-VI-1951, C.D.B.; 1 Bathurst Inlet, 16-VII-1951, W.I.C.; 1 Bathurst Inlet, 4-VIII-1951, C.D.B.; 1 Bathurst Inlet, 11-VIII-1951, W.I.C. [all, CNC]; 1 Bernard Harbour [Cornation Gulf, north of Coppermine], June 16, 1916 [1915?], (Canadian Arctic Expedition, F.J., 1916 [1915?], No. 1331); 1 Bernard Harbour Cornation Gulf, north of Coppermine, July 2, 1915, (Canadian Arctic Expedition, F.J., 1915, No. 1067) [both, CNC (paratypes of *neoboreus* Slad.)]; 1 Cambridge Bay, 8-8-48, H.H. Stage, (30148-142222) [HEM]; 1 Cambridge Bay, 28-VI-1950, G.K.S.; 2 Cambridge Bay, 1-VII-50, G.K.S.; 1 Cambridge Bay, 6-VII-1950, G.K.S.; 1 Cambridge Bay, 18-VII-50, E.H.N.S.; 1 Cambridge Bay, 19-VII-1950, E.H.N.S.; 2 Cambridge Bay, 20-VII-1950, E.H.N.S.; 1 Cambridge Bay, 20-VII-1950, G.K.S.; 1 Cambridge Bay, 26-VII-1950, E.H.N.S.; 3 Cambridge Bay, 26-VII-1950, G.K.S.; 2 Cambridge Bay, 6-VIII-1950, G.K.S.; 1 Cambridge Bay (Victoria Island), 12-VIII-1959, E.G. Munroe; 1 Cape Chudleigh (Hudson Straits), [all, CNC]; 1 Cape Digger (Hudson Bay), 21 June '85, (Theodore H. Frison Collection) [INHS]; 1 Cape Dorset (Baffin Land), 1-VI-1926, J.D.S.; 1 Cape Dorset (Baffin Land), 1-VI-1926, J.D.S., (No. 180); 1 Cape Dorset (Baffin Land), 9-VI-1926, J.D.S., (No. 179); 1 Cape Ross (Melville Island), June 21, 1916, Emiee (C.A.E.V. Stefansson); 1 Chesterfield, 2-VII-1950, J.R.V.; 1 Chesterfield, 4-VII-1950, J.G.C.; 1 Chesterfield, 13-VII-1950, J.R.V.; 1 Chesterfield, 14-VII-1950, J.R.V.; 1 Chesterfield, 15-VII-1950, J.R.V.; 1 Chesterfield, 17-VII-1950, J.R.V.; 1 Chesterfield, 18-VII-1950, J.R.V.; 1 Chesterfield, 28-VII-1950, J.R.V.; 1 Chesterfield, 30-VII-1950, J.R.V.; 1 Chesterfield, 2-VIII-1950, J.R.V.; 1 Chesterfield, 11-VIII-1950, J.G.C.; 3 Clyde (Baffin Is[land]), 2-VII-1958, J.E.H.M.; 1 Clyde (Baffin Is[land]), 4-VII-1958, J.E.H.M.; 2 Clyde (Baffin Is[land]), 5-VII-1958, J.E.H.M.; 1 Clyde (Baffin Is[land]), 6-VII-1958, G.E.S., (8:00-9:00 P.M., over *Cassiopa*); 2 Clyde (Baffin Is[land]), 14-VII-1958, J.E.H.M.; 1 Clyde (Baffin Is[land]), 16-VII-1958, J.E.H.M.; 3 Clyde (Baffin Is[land]), 19-VII-1958, J.E.H.M.; 2 Clyde (Baffin Is[land]), 21-VII-1958, J.E.H.M.; 1 Clyde (Baffin Is[land]), 25-VII-1958, J.E.H.M.; 1 Clyde Inlet (Head of, Baffin Is[land]), 7-VIII-1958, J.E.H.M.; 1 Coppermine, VI-5-

1951, S.D.H.; 1 Coppermine, VI-10-1951, S.D.H.; 5 Coppermine, VI-12-1951, S.D.H.; 2 Coppermine, VI-18-1951, S.D.H.; 1 Coppermine, VI-20-1951, S.D.H.; 1 Coppermine, VI-20-1951, S.D.H.; 1 Coppermine, VI-23-1951, S.D.H.; 1 Coppermine, VI-26, 1951, S.D.H.; 1 Coppermine, VIII-3-1951, S.D.H.; 2 Coral Harbour (Southampton Is[land]), 17-VI-1952, P.R.E.; 1 Coral Harbour (Southampton Is[land]), 19-VI-1952, P.R.E.; 1 Coral Harbour (Southampton Is[land]), 21-VI-1952, P.R.E.; 2 Coral Harbour (Southampton Is[land]), 22-VI-1952, P.R.E.; 2 Ellesmere Is[land], July 1928, G.W. Makinson; 1 Eskimo Point, 28-VI-1950, F. [not G.] G.D.; 1 Eskimo Point, 29-VI-1950, F. [not G.] G.D.; 1 Eskimo Point, 1-VII-1950, F. [not G.] G.D.; 1 Eskimo Point, 3-VII-1950, F. [not G.] G.D.; 3 Eskimo Point, 4-VII-1950, F. [not G.] G.D.; 1 Eskimo Point, 7-VII-1950, F. [not G.] G.D.; 2 Eskimo Point, 7-VII-1950, G.R. Roberts; 1 Eskimo Point, 9-VII-1950, F. [not G.] G.D.; 3 Eskimo Point, 11-VII-1950, F. [not G.] G.D.; 1 Eskimo Point, 12-VII-1950, F. [not G.] G.D.; 1 Eskimo Point, 21-VII-1950, G.R. Roberts; 1 Eureka (Ellesmere Island), 30-VI-1953, P.F.B.; 2 Eureka (Ellesmere Island), 28-VII-1953, P.F.B.; 3 Eureka (Ellesmere Island), 5-VII-1954, P.F.B.; 1 Eureka (Ellesmere Island), 6-VII-1954, P.F.B.; 2 Eureka (Ellesmere Island), 10-VII-1954, P.F.B. [all, CNC]; 1 Flaherty Is[and] (Belcher Islands), 29-VI-1939, J.K. Doutt [CM]—(H.E.M. *nivalis* homotype); 5 Flaherty Is[and] (Belcher Islands), 29-VI-1939, J.K. Doutt [CM]; 1 Frobisher Bay (Baffin Island), 16-VII-1948, F.G.D.; 1 Frobisher Bay (Baffin Island), 16-VII-1948, T.N.F.; 1 Fullerton [Harbour], July 14, 1904, A. Halkett; 1 Fullerton [Harbour], July 1904, A. Halkett; 1 Geillini L[ake] (60°18' N., 95°35' W.), 19-VIII-1952, C.D.B.; 2 Geillini L[ake] (60°18' N., 95°35' W.), 19-VIII-1952, A.B. Klots; 1 Holman (Victoria Is[land]), 12-VI-1952, B.A.G.; 2 Holman (Victoria Is[land]), 21-VI-1952, B.A.G.; 1 Holman (Victoria Is[land]), 24-VI-1952, B.A.G.; 1 Holman (Victoria Is[land]), 25-VI-1952, B.A.G. [all, CNC]; 1 Kendall Is[land] (Mackenzie Delta), July 6, 1942, A.T., (C[arnegie] M[useum], Acc. 13238), [CM]; 1 Kidluit Bay (Richard's Is[land]), 29-VII-1948, J.R.V.; 2 Kidluit Bay (Richard's Is[land]), 29-VII-1948, [J.R.V.?] [all, CNC]; 1 Kogaluk River (Mouth of, Hudson Bay Terr[itory]), July 5, 1945, (Carn[egie] Mus[eam], Acc. 13659) [CM]; 1 Mould Bay (Prince Patrick Is[land]), 26-VI-1952, P.F.B.; 1 Mould Bay (Prince Patrick Is[land]), 6-VII-1952, P.F.B.; 1 Nettilling Lake (Baffin Land), 11-VI-1925, J.D.S.; 2 Nettilling Lake (Baffin Land), 23-VI-1925, J.D.S.; 1 Nettilling Lake (Baffin Land), 25-VI-1925, J.D.S.; 1 Nettilling Lake (Baffin Land), 28-VI-1925, J.D.S.; 1 Nettilling Lake (Baffin Land), 29-VI-1925, J.D.S.; 1 Nettilling Lake (Baffin Land), 30-VI-1925, J.D.S.; 1 Nottingham Is[land] (Hudson Strait), 1886, J. McKenzie; 1 Nottingham Is[land] (Hudson Str[ait]), Aug., 1927, F.J.; 1 Padley, 2-VII-1950, R.A. Hennigar; 1 Padley, 4-VII-1950, R.A. Hennigar; 1 Padley, 13-VII-1950, R.A. Hennigar; 1 Padley, 15-VII-1950, R.A. Hennigar; 1 Padley, 19-VII-1950, R.A. Hennigar; 2 Padley, 25-VII-1950, R.E. Duckworth; 1 Pelly Bay (68°37' N., 89°55' W.), 6-VII-56, Van de Belde; 1 Repulse Bay, 21-VI-1950, J.E.H.M.; 1 Repulse Bay, 23-VI-1950, J.E.H.M.; 1 Repulse Bay, 25-VI-1950, J.E.H.M.; 1 Repulse Bay, 26-VI-1950, J.E.H.M.; 3 Repulse Bay, 29-VI-1950, J.E.H.M.; 3 Repulse Bay, 29-VI-1950, J.E.H.M.; 1 Repulse Bay, 5-VII-1950, J.E.H.M.; 1 Repulse Bay, 12-VII-1950, J.E.H.M. [all, CNC]; 1 Smith Island (Ellesmere Island, Jones Sound, off Craig Harbour), VIII-16-1934 [ANSP]; 1 Southampton Is[land], VII-1-1930, G.M. Stratton, (C[arnegie] M[useum], Acc. 8925); 4 Southampton Is[land], VII-12-1930, G.M. Stratton, (C[arnegie] M[useum], Acc. 8925) [all, CM]; 1 Southampton Is[land], VII-12-1930, G.M. Stratton, (C[arnegie] M[useum], Acc. 8925) [INHS]; 1 Southampton Is[land] (Native Point), VII-20-1954, M.B. Collins [USNM]; 1 Spence Bay, 28-VI-1951, J.G.C.; 1 Spence Bay, 30-VI-1951, J.G.C.; 1 Spence Bay, 1-VII-1951, J.G.C.; 1 Spence Bay, 2-VII-1951, J.G.C.; 1 Spence Bay, 10-VII-1951, J.G.C.; 1 Spence Bay, 14-VII-1951, J.G.C.; 1 Spence Bay, 21-VII-1951, A.E.R.D.; 2 Spence Bay, 7-VIII-1951, A.E.R.D.; 1 Taylor Island (69°16' N., 101°20' W.), 1918, J.F. Bernard; 1 Taylor Island, 1918, J.F. Bernard [all, CNC]; 5 Tukarak Is[and] (Belcher Islands, Hudson Bay), 20-VI-1938, J.K. Doutt; 2 Tukarak Is[and] (Hudson Bay), 9-VII-1938, R.C. Twomey [all, CM]; 1 Wakeham Bay (Hudson Str[ait]), August 1927, F.J.; 1 Winter H[arbour] (Melville I[land]), 20-7-1909, F.C. Hennesey [all, CNC]. **Quebec:** 1 Cape Wolstenholm (Hudson Strait, 62°25' N., 77°14' W.), 13-VII-41; 1 Cape Wolstenholm (Hudson Strait, 62°25' N., 77°44' W.), 19-VII-41, sea level [all, AMNH]; 1 F[or]t Chimo (not Labr[ador]), 7-31, L.M. Turner [MASS]; 1 G[rea]t Whale R[iver], 31-VII-1949, J.R.V.; 1 Knob Lake (54°47' N., 66°47' W.), 6-VII-1948, E.G. Munroe; 1 Knob Lake (54°47' N., 66°47' W.), 20-VII-1948, E.G. Munroe; 3 Payne Bay, 8-VII-1954, H.H.; 2 Payne Bay, 9-VII-1954, R. McCondochie; 1 Payne Bay, 10-VII-1954, R. McCondochie; 1 Payne Bay, 12-VII-1954, R. McCondochie; 1 Payne Bay, 13-VII-1954, R. McCondochie; 2 Payne Bay, 15-VII-1954, R. McCondochie; 7 Payne Bay, 25-VI-1958, E.E.M.; 3 Payne Bay, 31-VI-1958, E.E.M.; 2 Payne Bay, 2-VII-1958, W.R.M.M.; 1 Payne Bay, 6-VII-1958, W.R.M.M.; 2 Payne Bay, 7-VII-1958, W.R.M.M.; 1 Payne Bay, 10-VII-1958, W.R.M.M.; 1 Payne Bay, 15-VII-1958, W.R.M.M.; 1 Payne Bay, 21-VII-1958, E.E.M.; 1 Payne Bay, 25-VII-1958, E.E.M.; 3 Payne Bay, 25-VII-1958, W.R.M.M.; 1 Payne Bay, 31-VII-1958, E.E.M.; 7 Payne Bay, 11-VIII-1958, E.E.M.; 2 Payne Bay, 11-VIII-1958, W.R.M.M.; 3 Payne Bay, 18-VIII-1958, W.R.M.M.; 2 P[or]t Har-

rison, 1-VI-1949, D.P.W.; 4 P[or]t Harrison, 6-VI-1949, D.P.W.; 6 P[or]t Harrison, 14-VI-1949, D.P.W.; 2 P[or]t Harrison, 18-VI-1949, D.P.W.; 1 P[or]t Harrison, 27-VI-1949, D.P.W.; 3 P[or]t Harrison, 7-VII-1949, P.J. Lachaine; 2 P[or]t Harrison, 7-VII-1949, D.P.W.; 1 P[or]t Harrison, 20-VII-1949, D.P.W.; 1 P[or]t Harrison, 22-VII-1949, P.J. Lachaine; 5 P[or]t Harrison, 24-VII-1949, D.P.W.; 3 P[or]t Harrison, 30-VII-1949, D.P.W.; 2 P[or]t Harrison, 1-VIII-1949, D.P.W.; 1 P[or]t Harrison, 9-VIII-1949, D.P.W.; 2 Sugluk, 14-VII-1954, H. H.; 1 Sugluk, 20-VII-1954, H.H.; 1 Sugluk, 29-VII-1954, H.H.; 4 Sugluk, VIII-1954, H.H. [all reared near mid-August] [all, CNC]. **Yukon Territory:** 1 Aklavik, 20-VI-1953, J.S.W.; 1 Firth River, 17-VII-1956, E.F.C.; 1 Firth River, 18-VII-1956, R.E.L.; 1 Firth River, 13-VIII-1956, E.F.C.; 1 Herschel Is[land], 4-VII-1953, C.D.B.; 1 Herschel Is[land], 5-VII-1953, C.D.B.; 1 Herschel Is[land], 11-VII-1953, C.D.B.; 21 Herschel Is[land], 1-VIII-1953, J.S.W.; 1 Herschel Is[land], 1-VIII-1953, J.S.W. [all, CNC]; 1 Old Crow, June 18–20, 1912 J.M. Jessup, (Theodore H. Frison Coll[ectio]n), [INHS]; 2 Old Crow, V-18-57, F.S.L.W. [MCZ]; 1 Rampart House, 10-VII-1951, C.C.L. [CNC].

LOCALITY UNKNOWN (Canada or United States)

QUEEN

1 (no data) [ZMB].

GREENLAND (Denmark)

QUEENS

1 Clavering Is[land], Aug. 8, 1930; 2 Mester's Vig (Kong Oscar's Fjord, East Greenland), VI-24-1956, A. & T. Washburn; 1 Mester's Vig (Kong Oscar's Fjord, East Greenland), VI-29-30-1956, A. & T. Washburn; 1 Mester's Vig (Kong Oscar's Fjord, East Greenland), VII-1-1956, A. & T. Washburn; 1 Mester's Vig (Kong Oscar's Fjord, East Greenland), VII-14-1956, A. & T. Washburn; 1 Mester's Vig (Kong Oscar's Fjord, East Greenland), VII-15-1956, A. & T. Washburn; 1 Mester's Vig (Kong Oscar's Fjord, East Greenland), VII-18-1956, A. & T. Washburn; 1 Mester's Vig (Kong Oscar's Fjord, East Greenland), VIII-27-1956, A. & T. Washburn; 2 Mester's Vig (Kong Oscar's Fjord, East Greenland), VI-16-1957, A. & T. Washburn; 1 Mester's Vig (Kong Oscar's Fjord, East Greenland), VI-25-1957, A. & T. Washburn; 4 Mester's Vig (Kong Oscar's Fjord, East Greenland), VII-3-1957, A. & T. Washburn; 1 Mester's Vig (Kong Oscar's Fjord, East Greenland), VII-31-1957, A. & T. Washburn; 1 Shannon Is[land], July 13, 1930, 1 Shannon Is[land], 20-30-VII-1930; 3 West Coast (Greenland), 1916 [all, AMNH]; 1 West Coast (Greenland), 1916 [CU]; 2 West Coast (Greenland), 1916 [INHS—(one an *H.E.M. groenlandicus* homotype)] 1 W[est] Greenland (76°30' N.), VII-26-1914, (W.E.E.—M.C.T.) [AMNH]; 1 W[est] Greenland (76°30' N.), VII-26-1914, (W.E.E.—M.C.T.) [INHS—(*H.E.M. arcticus* homotype)].

UNITED STATES

QUEENS

Alaska: 1 Atkasuk (Meade R[iver], SW. [of] P[oin]t Barrow), 8-VIII-1958, Lindroth, (407); 1 Bartlett Bay (lat. 58°26', long. 135°33'), 1907, D.H. Nelles, at sea level; 1 Collinson P[oin]t (W[est] of), June 11, 1914, F.J., (Can[adian] Arctic Exped[ition]) [all, CNC]; 1 Dutch Harbor, VI-22-1913 [CM]; 1 Eagle Summit (mi. 110, St[ee]se H[ighway]), 21-VI-51, (W.M.) [CNC]; 1 Kotzebue, VI-24-1951, R.I. Sailer [HEM]; 3 Mekovuyuk, Aug. 25, 1959, R.H.W.; 10 Mekovuyuk, Aug. 26, 1959, R.H.W. [all, USNM]; 1 M[oun]t McKinley Nat[ional] Park (M[ile] Po[s]t 72), July 10, 1950, D.B., 3500'; 1 M[oun]t McKinley Nat[ional] Park (M[ile] Po[s]t 47), July 12, 1950, D.B. 3500' [both, HEM]; 1 Nome, 5-VI-1951, D.P.W.; 7 Nome, 6-VI-1951, D.P.W.; 2 Nome, 11-VI-1951, D.P.W.; 1 Nome, 6-VII-1951, D.P.W.; 3 Nunivak, Aug. 23, 1959, R.H.W.; 4 Nunivak, Aug. 29, 1959, R.H.W. [all, CNC]; 1 Popoff Island, July 9, '99, T. Kincaid, (Harriman Expedition, '99), [NRS]; 2 S[ain]t Paul Is[lan]d (Bering Sea), May 31, 1913, A.G. Whitney, (A.G.W. Lot No. 113); 1 S[ain]t Paul Is[lan]d (Bering Sea), June 5, 1913, A.G. Whitney, (A.G.W. Lot No. 36); 1 S[ain]t Paul Island (Pribilofs), Aug.–Sept. 1951, W.L. Jellison [all, USNM]; 1 Umiat, 13-VI-47, C. Schultz [HEM—(*H.E.M. nivalis* homotype)]; 2 Umiat, 2-VII-1959, J.E.H.M.; 2 Umiat, 3-VII-1959, J.E.H.M.; 1 Umiat, 1-VII-1959, J.E.H.M. [all, CNC]; 2 Unalakleet, May 31, 1921, S. Hadwen, (Theodore H. Frison Coll[ectio]n) [INHS].

CANADA

WORKERS

Alberta: 3 Jasper [National] Park, VIII-1915 [AMNH]. **British Columbia:** 1 Atlin, 15-VII-1955, H.H., 4800'; 1 Chilkat Pass (mi[le] 66), 14 July 1948, Mason & Hughes, 4000' [all, CNC]; 2 Upper Peace R[iver] Dist[ri]ct, VIII-8-1932, J. de N. Henry; 1 Upper Peace R[iver] Dist[ri]ct (Basins, n[orth] of] Besa, W[est] Redfern L[a]k[e]), 1932, J. de N. Henry [all, ANSP]. **Manitoba:**

2 Churchill, July 30, 1934, A.M. Heydweiller, (Cornell U[niversity], Lot 873, sub. 1) [CU]; 1 Churchill, July 19, 1936, H.E. McClure [INHS]; 1 Churchill, 26-VII-1952, J.G.C.; 2 F[lor]t Churchill (H[udson] B[ay]), VII-1929, F.J.; 1 Fort Churchill, 20-VI-1952, J.G.C. [all, CNC].

Newfoundland: 1 Cutthroat Harb[our] (Silutalik Is[land], Lab[rador]), 21-VII-1954, E.E.S.; 3 Hebron (Lab[rador]), 10-VII-1954, J.F.M., [n[ea]r entrance of nest #1?]; 6 Hebron (Lab[rador]), 13-VII-1954, J.F.M., (ex nest #1); 1 Hopedale (Lab[rador]), 4-VII-1923; 1 Hopedale (Lab[rador]), 7-VII-1923; 2 Hopedale (Lab[rador]), 4-VIII-1923; 1 Hopedale, 26-VII-1926, W.W.P.; 1 Hopedale (Lab[rador]), 21-VIII-1926, W.W.P.; 1 Hopedale (Lab[rador]), 21-VIII-1926, W.W.P.; 6 Hopedale (Lab[rador]), 6-VIII-1927, W.W.P.; 1 Hopedale (Lab[rador]), 29-VIII-1927, W.W.P.; 3 Nain (Lab[rador]), 27-VII-1927, W.W.P.; 4 Nutak (Lab[rador]), 23-VII-1954, J.F.M. [all, CNC]. Locality unknown (Labrador): 1 (Labrador) (no data) [NRS]; 2 (Nord Labrador) (no data) [ZMB].

Northwest Territories: 1 Alert (Ellesmere Is[land], 82°30' N., 62°18' W.), 21-VII-1953, P.F.B.; 1 Baker Lake, 1-VIII-1947, T.N.F.; 1 Baker L[ake], 8-VIII-49, R.G.; 1 Bathurst Inlet, 29-VII-1951, W.I.C.; 1 Cambridge Bay, 23-VII-50, E.H.N.S.; 1 Cambridge Bay, 25-VII-50, E.H.N.S.; 1 Cambridge Bay, 25-VII-50, G.K.S.; 1 Cambridge Bay, 28-VII-50, E.H.N.S.; 16 Cambridge Bay, 6-VIII-50, E.H.N.S.; 14 Cambridge Bay, 6-VIII-50, G.K.S.; 4 Cambridge Bay (Victoria Island), 12-VIII-1959, E.G. Munroe; 1 Chesterfield Bay, 28-VII-1950, J.G.C.; 1 Chesterfield Bay, 8-VIII-1950, J.R.V.; 1 Chesterfield Bay, 9-VIII-1950, J.R.V.; 2 Clyde (Baffin Is[land]), 14-VII-1958, J.E.H.M.; 1 Clyde (Baffin Is[land]), 14-VII-1958, G.E.S.; 1 Clyde (Baffin Is[land]), 16-VII-1958, J.E.H.M.; 6 Clyde (Baffin Is[land]), 17-VII-1958, J.E.H.M.; 3 Clyde (Baffin Is[land]), 19-VII-1958, J.E.H.M.; 7 Clyde (Baffin Is[land]), 21-VII-1958, J.E.H.M.; 2 Clyde (Baffin Is[land]), 21-VII-1958, G.E.S.; 1 Clyde (Baffin Is[land]), 22-VII-1958, J.E.H.M.; 1 Clyde (Baffin Is[land]), 23-VII-1958, J.E.H.M.; 1 Clyde (Baffin Is[land]), 24-VII-1958, J.E.H.M.; 3 Clyde (Baffin Is[land]), 25-VII-1958, J.E.H.M.; 1 Clyde (Baffin Is[land]), 26-VII-1958, G.E.S.; 4 Clyde (Baffin Is[land]), 27-VII-1958, J.E.H.M.; 1 Clyde (Baffin Is[land]), 2-VIII-1958, J.E.H.M.; 1 Clyde (Baffin Is[land]), 5-VIII-1958, J.E.H.M.; 1 Clyde Inlet (Head of, Baffin Is[land]), 7-VIII-1958, J.E.H.M.; 2 Coral Harbour (Southampton Is[land]), 11-VII-1948, G.E.S.; 1 Ellesmere Is[land], July 1928, G.W. Atkinson [all, CNC]; 1 Ennadai Lake, 29-VII-49, J.S. MacIsac [HEM]; 1 Eskimo Point, 29-VII-1950, G.R. Roberts; 1 Eskimo Point, 3-VIII-1950, G.R. Roberts; 1 Eskimo Point, 10-VIII-1950, F. [not G.] G.D.; 1 Eskimo Point, 20-VIII-1950, F. [not G.] G.D.; 1 Eureka (Ellesmere Island), 21-VII-1953, P.F.B.; 1 Eureka (Ellesmere Island), 5-VII-1954, P.F.B.; 1 Eureka (Ellesmere Island), 15-VII-1954, P.F.B.; 3 Eureka (Ellesmere Island), 18-VII-1954, P.F.B.; 6 Eureka (Ellesmere Island), 20-VII-1954, P.F.B.; 1 Eureka (Ellesmere Island), 22-VII-1954, P.F.B.; 1 Eureka (Ellesmere Island), 23-VII-1954, P.F.B.; 1 Eureka (Ellesmere Island), 2-VIII-1954, P.F.B.; 1 Eureka (Ellesmere Island), 12-VIII-1954, P.F.B.; 1 Frobisher Bay (Baffin Island), 6-VII-1948, T.N.F.; 1 Frobisher Bay (Baffin Island), 11-VII-1948, F.G.D.; 1 Frobisher Bay (Baffin Island), 13-VII-1948, T.N.F.; 5 Frobisher Bay (Baffin Island), 14-VII-1948, T.N.F.; 1 Frobisher Bay (Baffin Island), 16-VII-1948, T.N.F.; 1 Frobisher Bay (Baffin Island), 18-VII-1954, F.G.D.; 1 Frobisher Bay (Baffin Island), 18-VII-1954, T.N.F.; 1 Holman (Victoria Is[land]), 3-VII-1952, B.A.G.; 1 Holman (Victoria Is[land]), 8-VII-1952, B.A.G.; 1 Holman (Victoria Is[land]), 15-VII-1952, B.A.G.; 4 Kidluit Bay (Richard's Is[land]), 28-VII-1948, J.R.V.; 2 Kidluit Bay (Richard's Is[land]), 29-VII-1948, J.R.V.; 1 L[ake] Harbour (Baffin Is[land]), 24-VII-1931, J.D.S.; 1 Lake Harbour (Baffin Island), 7-VIII-1935, W.J.B.; 1 Mould Bay (Prince Patrick Is[land]), 4-VII-1952, P.F.B.; 3 Mould Bay (Prince Patrick Is[land]), 6-VII-1952, P.F.B.; 1 Mould Bay (Prince Patrick Is[land]), 27-VII-1952, P.F.B.; 1 Muskox L[ake] (64°45' N., 108°10' W.), 23-VII-1953, J.G.C.; 1 Muskox L[ake] (64°45' N., 108°10' W.), 3-VIII-1953, J.G.C.; 2 Muskox L[ake] (64°45' N., 108°10' W.), 4-VIII-1953, J.G.C.; 1 Muskox L[ake] (64°45' N., 108°10' W.), 5-VIII-1953, J.G.C.; 2 Muskox L[ake] (64°45' N., 108°10' W.), 6-VIII-1953, J.G.C.; 1 Muskox L[ake] (64°45' N., 108°10' W.), 13-VIII-1953, J.G.C.; 1 Nettilling Lake (Baffin Land), 9-VII-1925, J.D.S.; 5 Nottingham Is[land] (Hudson Str[ait]), August 1927, F.J. [all, CNC]; 2 Nottingham Is[land] (Hudson Str[ait]), August 1927, F.J., (Theodore H. Frison Coll[ection]) [INHS]; 1 Padley, 1-VIII-1950, R.E. Duckworth; 1 Reindeer Depot (Mackenzie Delta), 2-VIII-1948, J.R.V.; 1 Repulse Bay, 12-VII-1950, J.E.H.M.; 1 Repulse Bay, 29-VII-1950, J.E.H.M.; 2 Spence Bay, 10-VII-1951, A.E.R.D.; 1 Spence Bay, 11-VII-1951, A.E.R.D.; 1 Spence Bay, 14-VII-1951, A.E.R.D.; 1 Spence Bay, 18-VII-1951, J.G.C.; 1 Spence Bay, 22-VII-1951, A.E.R.D.; 2 Spence Bay, 23-VII-1951, J.G.C.; 1 Spence Bay, 6-VIII-1951, J.G.C.; 1 Spence Bay, 7-VIII-1951, A.E.R.D. [all, CNC]; 17 Tukarak Is[land] (Hudson Bay), 9-VII-1938, R.C. Twomey; 3 Tukarak Is[land] (Hudson Bay), 13-VII-1938, R.C. Twomey [all, CM]; 1 Young P[oin]t, July 21, 1916, (Canadian Arctic Expedition, F.J., 296) [CNC].

Quebec: 2 [Cape] Wolstenholm (62°N., 77°W.), VIII-24-36, A. Dutilly [USNM]; 1 F[lor]t Chimo, 9-VIII-1948, R.H. MacLeod; 1 Payne Bay, 8-VII-1954, H.H.; 1 Payne Bay, 11-VII-1954, R. McCondochie; 1 Payne Bay, 1-VIII-1954, R. McCondochie; 1 Payne Bay, 8-VII-1958, W.R.M.M.; 1 Payne Bay, 11-VII-1958, W.R.M.M.; 11 Payne Bay,

16-VII-1958, W.R.M.M.; 1 Payne Bay, 21-VII-1958, E.E.M.; 1 Payne Bay, 21-VII-1958, W.R.M.M.; 3 Payne Bay, 22-VII-1958, E.E.M.; 4 Payne Bay, 22-VII-1958, W.R.M.M.; 3 Payne Bay, 25-VII-1958, E.E.M.; 5 Payne Bay, 25-VII-1958, W.R.M.M.; 2 Payne Bay, 26-VII-1958, E.E.M.; 7 Payne Bay, 26-VII-1958, W.R.M.M.; 13 Payne Bay, 27-VII-1958, E.E.M.; 7 Payne Bay, 27-VII-1958, W.R.M.M.; 1 Payne Bay, 29-VII-1958, E.E.M.; 11 Payne Bay, 2-VIII-1958, W.R.M.M.; 3 Payne Bay, 3-VIII-1958, E.E.M.; 1 Payne Bay, 8-VIII-1958, W.R.M.M.; 2 Payne Bay, 9-VIII-1958, W.R.M.M.; 5 Payne Bay, 10-VIII-1958, E.E.M.; 1 Payne Bay, 10-VIII-1958, W.R.M.M.; 15 Payne Bay, 11-VIII-1958, E.E.M.; 3 Payne Bay, 11-VIII-1958, W.R.M.M.; 3 Payne Bay, 12-VIII-1958, W.R.M.M.; 3 Payne Bay, 18-VIII-1958, E.E.M.; 11 Payne Bay, 18-VIII-1958, W.R.M.M.; 2 Payne Bay, 19-VIII-1958, W.R.M.M.; 1 Payne Bay, 24-VIII-1958, W.R.M.M.; 2 P[or]t Harrison, 18-VI-1949, D.P.W.; 14 P[or]t Harrison, 30-VII-1949, D.P.W.; 4 P[or]t Harrison, 1-VIII-1949, D.P.W.; 1 P[or]t Harrison, 5-VIII-1949, D.P.W.; 1 Port Burwell, 25-VII-1935, W.J.B.; 1 Sugluk, 16-VII-54, H.H.; 1 Sugluk, 20-VII-1954, H.H.; 5 Sugluk, 22-VII-54, H.H.; 1 Sugluk, 24-VII-1954, H.H.; 1 Sugluk, 8-VIII-1954, H.H.; 1 Sugluk, VIII-1954, H.H. [presumably *ex nest* B8]; 8 Sugluk, 1954, H.H., (*ex [nest]* B5) [all, CNC]. **Yukon Territory:** 1 Aklavik, 16-VI-1956, E.F.C.; 1 Aklavik 22-VI-1956, R.E.L.; 3 Firth River, 17-VII-1956, E.F.C.; 1 Firth River, 27-VII-1956, E.F.C.; 1 Firth River, 30-VII-1956, E.F.C.; 1 Firth River, 7-VIII-1956, R.E.L.; 1 Herschel Is[land], July 21, 1916, (Canadian Arctic Expedition, F.J., 296); 1 Herschel Is[land], 16-VII-1953, C.D.B.; 12 Herschel Is[land], 1-VIII-1953, J.S.W.; 1 Kamakok (W[est] of Herschel Is[land]), Aug. 3, 1916, (Canadian Arctic Expedition, F.J., 857); 1 Snag, 24 July 1948, Mason & Hughes [all, CNC].

GREENLAND (Denmark)

WORKERS

9 Mester's Vig (Kong Oscar's Fjord, East Greenland), VIII-5-1956, A. & T. Washburn; 14 Mester's Vig (N[orth] E[ast] Greenland), VI-16-1957, A. & T. Washburn; 1 Mester's Vig (N[orth] E[ast] Greenland), VII-31-1957, A. & T. Washburn; 1 Mester's Vig (N[orth] E[ast] Greenland), VIII-16-1957, A. & T. Washburn; 1 Shannon Is[land], 20-30-VII-1930; 12 West Coast (Greenland), 1916 [all, AMNH]; 1 West Coast (Greenland), 1916 [CU]; 1 West Coast (Greenland), 1916; 1 West Greenland (76°30' N.), VII-26-1914 [or 1924?], (W.E.E.-M.C.T.), (Theodore H. Frison Coll[ection]) [both, INHS].

UNITED STATES

WORKERS

Alaska: 2 Barrow, Spring 1912, V. Stefanson, (A.M.N.H., No. 20791) [AMNH]; 1 Collinson P[oin]t, July 10, 1914, (Canadian Arctic Expedition, F.J., 859) [CNC]; 3 Katmai [National Monument], August '17, Jas. S. Hine, (A.M.N.H., Ac. 5494) [AMNH]; 8 Mekovyuk, Aug. 25, 1959, R.H.W.; 4 Mekovyuk, Aug. 26, 1959, R.H.W. [all, USNM]; 1 M[oun]t McKinley Nat[ional] Park (East Fork, Toklat Bridge), July 25, 1950, D.B. [HEM]; 3 Nome, 5-VI-1951, D.P.W.; 6 Nome, 13-VI-1951, D.P.W.; 1 Nome, 9-VII-1951, D.P.W. [all, CNC]; 1 Nunivak [Island], Aug. 23, 1959, R.H.W.; 8 Nunivak [Island], Aug. 29, 1959, R.H.W. [all, USNM]; 1 Popoff Island, July 4, '99, T. Kincaid, (Harriman Expedition, '99), [NRS]; 1 S[ain]t Matthew Is[land], 5-9-54, R. Rausch [CNC]; 1 S[ain]t Paul Is[lan]d (Pribilof Is[lands]), 8-97 [USNM-("allotype" *kincaidii*, No. 5179 U.S.N.M.)]; 1 S[ain]t Paul Is[lan]d (Bering Sea), June 5, 1913, A.G. Whitney, (A.G.W., Lot No. 36) [USNM]; 1 Umiat, 1950, N.A. Weber, (No. 2687) [ANSP]; 1 Umiat, 7-VII-1959, J.E.H.M.; 2 Umiat, 12-VII-1959, J.E.H.M.; 6 Umiat, 17-VII-1959, J.E.H.M.; 1 Umiat, 21-VII-1959, J.E.H.M.; 1 Umiat, 22-VII-1959, J.E.H.M.; 1 Umiat, 31-VII-1959, J.E.H.M. [all, CNC]; 1 Worthington Glacier (camp ground), August 1951, W.L. Jellison [USNM].

CANADA

MALES

British Columbia: 1 Atlin, 2-VIII-1955, H.J.H., 5500'; 1 Glacier, 30 July '50, F. Cameron [all, CNC]. **Manitoba:** 8 Churchill, Aug. 2, 1934, A.M. Heydweiller, (Cornell U[niversity], Lot 873, sub. 2) [CU]; 1 Churchill, 2-VIII-1937, W.J.B.; 3 Churchill, 4-VIII-1937, W.J.B.; 1 Churchill, 6-VIII-1952, J.G.C.; 2 Churchill, 8-VIII-1954, [H.J.H.]; 3 F[or]t Churchill (H[udson] B[ay]), VII-1929, F.J.; 1 F[or]t Churchill, VIII-1929, F.J. [all, CNC]. **Newfoundland:** 11 Hebron (Labr[ador]), 13-VII-1954, J.F.M., (*ex nest* 1); 1 Hebron (Labr[ador]), 3-VIII-1954, J.F.M.; 1 Hebron (Labr[ador]), 3-VIII-1954, E.E.S.; 1 Hopedale (Labr[ador]), 18-VIII-1925, W.W.P.; 1 Hopedale (Labr[ador]), 18-VIII-1925, W.W.P.; 1 Hopedale (Labr[ador]), 20-VIII-1925, W.W.P. [all, CNC]; 1 Hopedale (Labr[ador]), 1-IX-1925, W.W.P. [INHS]; 1 Hopedale (Labr[ador]), summer 1953, F.C.S. [MASS]; 2 Nukuak Bay (Labr[ador]), VIII-17-1951, F.C.S. [HEM]; 4 Nukuak Bay

(Lab[rador]), VIII-17-1951, F.C.S. [MASS]; 1 Ryan Bay (Lab[rador]), VIII-15-31, F.C.S. [HEM]; 1 Ryan Bay (Lab[rador]), VIII-15-31, F.C.S. [MASS]; 1 Tallik Bay (Nagvak Fjord, Lab[rador]), 15-VIII-1954, J.F.M.; 1 Tessiujak Bay (Nagvak Fjord, Lab[rador]), 15-VIII-1954, E.E.S. [all, CNC]; 1 Ungava B[ay] (Lab[rador]), 8-26, L.M. Turner [MASS]. **Northwest Territories:** 1 Bathurst Inlet, 4-VIII-1951, W.I. Campbell; 1 Bernard Harbour (Cornation Gulf, north of Coppermine), July 10, 1916, (Canadian Arctic Expedition, F.J., No. 200); 1 Bernard Harbour (Cornation Gulf, north of Coppermine), July 10, 1916, (Canadian Arctic Expedition, F.J., No. 200) [all, CNC]; 2 Cambridge Bay, 8-13-48, H.H. Stage, (30348-14222) [HEM]; 1 Chesterfield [Bay], 17-VIII-1950, J.G.C.; 4 Clyde (Baffin Is[land]), 25-VII-1958, J.E.H.M.; 1 Clyde (Baffin Is[land]), 27-VII-1958, J.E.H.M.; 6 Clyde (Baffin Is[land]), 2-VIII-1958, J.E.H.M.; 2 Clyde (Baffin Is[land]), 4-VIII-1958, J.E.H.M.; 1 Clyde (Baffin Is[land]), 12-VIII-1958, J.E.H.M.; 1 Eskimo Lakes, 20-26-VIII-1927, A.E. Porsild; 1 Eureka (Ellesmere Island), 2-VIII-1954, P.F.B.; 2 Kidluit Bay (Richard's Is[land]), 27-VII-1948, J.R.V.; 1 Kidluit Bay (Richard's Is[land]), 28-VII-1948, W.J.B.; 4 Kidluit (Richard's Is[land]), 28-VII-1948, J.R.V.; 1 Lake Harbour (Baffin Island), 7-VIII-1935, W.J.B.; 2 Mould Bay (Prince Patrick Is[land]), 25-VII-1952, P.F.B.; 5 Mould Bay (Prince Patrick Is[land]), 29-VII-1952, P.F.B.; 1 Muskox L[ake] (64°45' N., 108°10' W.), 2-VIII-1953, J.G.C.; 2 Muskox L[ake] (64°45' N., 108°10' W.), 2-VIII-1953, J.G.C.; 4 Muskox L[ake] (64°45' N., 108°10' W.), 3-VIII-1953, J.G.C.; 10 Muskox L[ake] (64°45' N., 108°10' W.), 4-VIII-1953, J.G.C.; 1 Muskox L[ake] (64°45' N., 108°10' W.), 5-VIII-1953, J.G.C.; 6 Muskox L[ake] (64°45' N., 108°10' W.), 6-VIII-1953, J.G.C.; 1 Muskox L[ake] (64°45' N., 108°10' W.), 8-VIII-1953, J.G.C.; 3 Muskox L[ake] (64°45' N., 108°10' W.), 13-VIII-1953, J.G.C.; 10 Muskox L[ake] (64°45' N., 108°10' W.), 14-VIII-1953, J.G.C. [all, CNC]; 1 Smith Island (Jones Sound, off Craig Harbour, Ellesmereland), VIII-16-1934 [ANSP]; 1 Southampton Is[land], July 30, 1947, C.W. Gottschalk [HEM]; 1 Spence Bay, 23-VII-1951, A.E.R.D.; 1 Spence Bay, 6-VIII-1951, J.G.C.; 3 Spence Bay, 7-VIII-1951, A.E.R.D.; 2 Spence Bay, 9-VIII-1951, A.E.R.D.; 2 Spence Bay, 10-VIII-1951, A.E.R.D. [all, CNC]; 1 Svakacham Bay (Hudson Str[ait]), August 1927, F.J. [INHS]; 1 Tukarak Is[land] (Hudson Bay), 9-VIII-1938, P.C. Twomey [CM]; 2 Wakeham Bay (Hudson Str[ait]), August 1927, F.J.; 1 Wood Creek (Ellesmere Is[land], 82°30' N., 63°25' W.), 11-VIII-1951, P.F.B. [all, CNC]. **Quebec:** 1 F[or]t Chimo, 9-VIII-1948, R.H. MacLeod; 3 Payne Bay, 1-VIII-1954, R. McCondochie; 2 Payne Bay, 6-VIII-1954, R. McCondochie; 1 Payne Bay, 9-VII-1958, E.E.M.; 1 Payne Bay, 17-VII-1958, E.E.M.; 5 Payne Bay, 27-VII-1958, E.E.M.; 4 Payne Bay, 3-VIII-1958, E.E.M.; 1 Payne Bay, 5-VIII-1958, E.E.M.; 4 Payne Bay, 7-VIII-1958, E.E.M.; 3 Payne Bay, 9-VIII-1958, W.R.M.M.; 3 Payne Bay, 10-VIII-1958, W.R.M.M.; 8 Payne Bay, 11-VIII-1958, E.E.M.; 7 Payne Bay, 11-VIII-1958, W.R.M.M.; 3 Payne Bay, 12-VIII-1958, W.R.M.M., ([ex] nest 3); 1 Payne Bay, 13-VIII-1958, E.E.M.; 3 Payne Bay, 15-VIII-1958, W.R.M.M.; 7 Payne Bay, 18-VIII-1958, W.R.M.M.; 6 Payne Bay, 24-VIII-1958, W.R.M.M.; 1 P[or]t Harrison, 9-VIII-1949, D.P.W.; 2 Sugluk, 29-VII-54, H.H.; 2 Sugluk, 1-VIII-1954, H.H.; 2 Sugluk, 2-VIII-1954, H.H.; 2 Sugluk, 4-VIII-1954, H.H.; 8 Sugluk, 5-VIII-1954, H.H., (*ex* nest); 1 Sugluk, 7-VIII-1954, H.H.; 1 Sugluk, 9-VIII-1954, H.H.; 7 Sugluk, 10-VIII-1954, H.H.; 2 Sugluk, 19-VIII-1954, H.H. [all, CNC].

GREENLAND (Denmark)

MALES

2 Mester's Vig (East Greenland), VIII-16-1957, A. & T. Washburn [AMNH]; 1 Sisko, Aug. 10, [yr.?]; 1 (locality unknown) [both, ANSP]; 3 (locality unknown) [INHS-2 *tricolor* Zett., *nec* Dahlb., H.E.M. homotypes].

UNITED STATES

MALES

Alaska: 1 Mekovuyuk, Aug. 26, 1959, R.H.W. [USNM]; 1 M[oun]t McKinley Nat[ional] Park (M[ile] Po[s]t 72), July 10, 1950, D.B., 3500'; 3 M[oun]t McKinley Nat[ional] Park (Sable Pass), Aug. 12, 1950, D.B., 4000'; 2 M[oun]t McKinley Nat[ional] Park (East Fork, Toklat Bridge), July 25, 1950, D.B. [all, HEM]; 2 Nome, July 9, 1913; 2 Nome (Anvil M[oun]t[ains]), Aug. 13, 1913 [CM]; 1 Nome, Aug. 24-25, '16, (Canadian Arctic Expedition, F.J., 1916, No. 65); 1 Nome, Aug. 24-25, '16, (Canadian Arctic Expedition, F.J., 1916, No. 50); 1 Nome, Aug. 24-25, '16, (Canadian Arctic Expedition, F.J., 1916, No. 69); 3 Nome, 9-VII-1951, D.P.W. [all, CNC]; 1 Nunivak, Aug. 23, 1959, R.H.W. [USNM]; 1 S[ain]t Matthew Is[land], 20-VIII-54, R. Rausch, (Nun. No. 25, Lot 54-815); 1 S[ain]t Matthew Is[land], 2-IX-54, R. Rausch, (vial No. 32, Lot 54-815) [both, CNC]; 1 S[ain]t Paul Island (Pribilofs), Aug.-Sept. 1951, W.L. Jellison [USNM]; 1 Teller, Aug. 1, 1913 [CM]; 2 Umiat, 22-VII-1959, R. Madge; 2 Umiat, 29-VII-1959, J.E.H.M. [CNC]; 1 Umiat, 7-VIII-47, C. Schultz [HEM]; 1 Umiat, 4-VIII-1959, J.E.H.M.; 1 Umiat, 7-VIII-1959, R. Madge; 1 Umiat, 8-VIII-1959, R. Madge [all, CNC].

Megabombus (M.) strenuus (Cr.)

Bombus strenuus Cr., 1863a, p. 102, (nec *Apis strenuus* Harr., 1776, p. 131, pl. 38, fig. 5): *Alpinibombus* [sic!] *neoboreus*, Skor., 1937b, p. 58 [n. syn.]: *Alpinibombus* [sic!] *strenuus*, Skor., 1937b, p. 57: *Alpinobombus strenuus*, Skor., 1922a, p. 151, (list): *Bombus kirbyellus* v. *frigidus*, F. & W., 1912, p. 182, pl. 5, fig. 12; Fr., 1923c, p. 6, (nec *kirbiellus* Curt., 1835a, Append., p. lxii; nec *frigidus* Sm., 1854, p. 399), [n. syn.]: *Bombus kirbyellus* v. *strenuus*, Fr., 1902, p. 487; F. & W., 1912, p. 182, pl. 5, fig. 11, (nec *kirbiellus* Curt., 1835a, Append., p. lxii), [n. syn.]: *Bombus neoboreus* Slad., 1919b, p. 28G, [n. syn.]: *Bombus (Alpinobombus) hyperboreus* ssp. *clydensis* Yarr., 1955, p. 151, (nec *hyperboreus* Schönh., 1809, p. 57), [n. syn.]: *Bombus (Alpinobombus) neoboreus*, Brs., 1951, p. 1254, In Muesebeck et al., [n. syn.]: *Bombus (Alpinobombus) strenuus*, Brs., 1951, p. 1254, In Muesebeck et al.: *Bombus (B.) strenuus*, Fkln., 1912, p. 297: *Bombus* (Kirbyellus group) Fkln., 1912, p. 289, (p.p.): *Bremus strenuus*, Fris., 1922, p. 216: *Bremus (Alpinobombus) neoboreus*, Fris., 1927e, p. 66, [n. syn.]: *Bremus (Alpinobombus) strenuus*, Fris., 1927e, p. 66: *Megabombus (M.)* (Alpinus group) Mltn., 1961a, p. 57, (p.p.): (Genus?) *neoboreus*, Skor., 1922a, p. 160, (list, "Incertae sedis"), [n. syn.].

DESCRIPTION. **Queen.** Length, 26 mm; width at wing bases, 10.5 mm; abdomen, 14.0 mm; width across T2, 11.0 mm; front wing length, 18.0 mm, width, 6.5 mm. **Head:** Frontal outline (excluding mouthparts) broadly trapezoidal, the upper corners broadly arcuate, perceptibly wider than high; vertical region weakly concave to nearly flat laterad of ocelli, the ocular two-thirds of ocellocular area covered with moderately deep rather coarse well-separated irregular punctures, the ocellar one-third smooth and polished; compound eye compared with other species rather smaller, its outline almost 3 times higher than greatest width, subacutely rounded above, more widely rounded below; ocelli moderate in size, about equidistant from one another, situated in nearly transverse position, the lateral ones touching supraorbital line; clypeus about as high as wide basally, rather strongly evenly convex medially, its disc nearly completely covered with medium to small separated irregular punctures; labrum about $2\frac{1}{2}$ times wider than thick, its ventral margin broadly arcuate, the outer surface covered with moderately long, stiff, irregular pubescence, each of the prominent tubercles concave medially, roughly sculptured, the tubercular depression deep, the strongly developed mesal tubercular prominences as far apart as length of F3; malar space only perceptibly longer than distance between (and including) mandibular articulations, its surface unevenly convex with microscopic pubescence medially and posteriorly, otherwise smooth and polished; flagellum slightly shorter than twice as long as scape, F1 little longer than distal width, longer than rectangular F2 which is much shorter than F3. **Legs:** Mesobasitarsite subrectangular, narrowed proximally, 3 times longer than widest dimension, its outer surface broadly concave especially mid-longitudinally, nearly truncate distally, covered with dense fine pilose pubescence on most of distal third; metabasitarsite subrectangular, little less than 3 times longer than widest dimension of segment, its posterior margin evenly weakly arcuate basally to nearly straight distally, the outer surface shallowly concave. **Pubescence:** Rather fine, dense and even except that on most of head, scutellum and abdominal T4-5 longer, coarser and looser; corbicular fringe long and loose throughout, nearly straight except arcuate distally, averaging distinctly longer than greatest width of segment; metabasitarsal posterior fringe long, arcuate, loose hairs intermixed with short weakly arcuate ones on proximal two-thirds of segment, beyond progressively shorter to absent distally. **Color:** Head black with only slight intermixture of brownish yellow on vertex; thorax above and upper half of mesopleuron ochraceous yellow except wide interalar black band extending over anterior one-third of scutellum, the thorax below (including metapleura) black; abdominal T1-3 ochraceous yellow, T4 black with some burnt sienna distally, T5 intermixed with black and burnt sienna, all prominent hairs on T6 with burnt sienna tinge. Wings moderately infumated throughout with pale reddish brown.

Worker. Length, 12.5 mm; width at wing bases, 6.5 mm; abdomen, 7.0 mm; width across abdominal T2, 6.5 mm; front wing length, 14.0 mm, width, 4.5 mm. Morphologically like that of the queen in all respects except in diminutive relation of corresponding features. **Color:** Like that of the queen except more often abdominal T5-6 predominantly covered with burnt sienna pile.

Male. Length, 12.5 mm; abdomen, 6.0 mm; width across abdominal T2, 5.5 mm; width at wing bases, 6.0 mm; front wing length, 15.5 mm, width, 4.8 mm. *Head:* Frontal outline (excluding mouthparts) broadly triangulate, about as high as greatest width, the upper angles rather broadly rounded; compound eye nearly $2\frac{1}{2}$ times higher than widest part, more acutely rounded above than below; vertical region nearly flat, the ocelli situated transversely on the supraorbital line, ocular area coarsely irregularly sculptured except smooth and polished about ocelli and on mesal half of ocellular area, the ocelli removed from one another by slightly more than their diameter, interocellar line about equal to ocellular line; malar space $1\frac{1}{2}$ times longer than distance between (and including) mandibular articulations, convex except area below compound eye, smooth and posteriorly covered with microscopic pubescence; labrum $2\frac{1}{2}$ times wider than thick, the ventral margin very shallowly emarginate medially, broadly arcuate at lateral corners, the transverse callosities weak and confluent mesially, the outer surface generally weakly irregularly sculptured, mostly pubescent; flagellum $1\frac{1}{2}$ times longer than scape, F1 in length about equal to F2, combined only slightly longer than F3. *Legs:* Mesobasitarsite subrectangularly elongate, nearly 4 times longer than greatest width of segment, its outer surface mid-longitudinally concave, the distal angles nearly equal; metabasitarsal outline subrectangular, distally truncate, little more than 3 times longer than greatest width of segment, its outer surface nearly flat, the posterior margin weakly arcuate throughout, posterior fringe long (about $1\frac{1}{2}$ times longer than widest dimension of segment) except progressively shorter distally, the external surface uniformly covered with microscopic recumbent hairs. *Pubescence:* Generally long and loose, that on head and thorax above more even, shaggy and uneven on thoracic pleura, legs and abdomen. *Color:* Pale yellow on clypeus, vertical region and thoracic dorsum (including upper pleura) except broad indefinite interalar black band (subdominantly intermixed with tawny yellowish hairs), the thoracic venter mostly tawny yellow; legs to tarsi predominantly tawny yellow, the tibial and metabasitarsal fringes rufescent tinged; abdominal T1-3 pale ochraceous yellow, T4 basally black the remainder burnt sienna distally intermixed with some black, T5-7 covered with vivid pale burnt sienna. Wings lightly uniformly infumated with pale reddish brown. Genitalia, seventh and eighth abdominal sterna (Pl. XII).

Redescribed from hypotypes. **Queen,** Umiat, Alaska, 13-VI-47, C. Schultz [USNM]; **worker,** Umiat, Alaska, 13-VII-47, C. Schultz; **male,** M[oun]t McKinley Nat[ional] Forest (Sable Pass), Aug. 12, 1950, elev. 4000 ft, D. Bolinger [both, HEM].

TYPE. Examined a Cresson (1916: 131) lectotype ♀ (No. 2172) in the collection of the Academy of Natural Sciences of Philadelphia. The genitalic structures of the allotype ♂, reported upon by Frison (1922: 216), have been so distorted, apparently by excessive caustic treatment prior to my examination, that they are now specifically unrecognizable, though I have attempted restoration by remounting all essential parts, still contained in the same collection.

TYPE LOCALITY. Arctic North America (Canada). Number of specimens at hand: 175. In flight: Some time during the first half of May to near mid-August, the males appearing in early July. Distribution: (vertical), sea level to 4000 ft (reported as high as 6700 ft on M[oun]t Edith Cavel in Alberta, Canada, by Neave (confirmation needed); (horizontal), Alaska, Yukon Territory and eastward through the Northwest Territories of Canada (all records south of this range are in need of confirmation. Floral visitations: No botanical records are available for this species.

COMMENTS. Morphologically there is evidently only slight variations within the castes (or sexes), usually these with respect to differences in body length and compactness; body size and other morphological features of the worker are relatively proportional to those of the queen. The male is rather constant in all critical characters, such as the appearance of the flagellum, distal abdominal sterna and the genitalia. Chromatic variability is in keeping with that of most species, melanism being encountered in populations of certain environmental areas. Certainly I have encountered melanism in all of the arctic and subarctic species of bumblebees in the Western Hemisphere. The more robust and compact melanic form of this species described as *neoboreus* by Sladen (1919b: 28G) belongs to this species. The proximal three female abdominal terga of *strenuus* are typically entirely covered with

ochraceous yellow, but sometimes T3 is black laterally and distally; abdominal T3 of the male is likewise suffused with black which is sometimes predominant. Usually the distal abdominal terga (T5–6 in female, T5–7 in male) are covered with varying amounts of burnt sienna to rufescent pubescence, but sometimes only the ultimate terga are so colored wholly or in part, otherwise occasionally these are mostly to entirely black (especially with regard to the form heretofore known as *neoboreus*).

CANADA

QUEENS

British Columbia: 1 Honeymoon Bay (Cowichan Lake, Vancouver Island), 6-VI-1955, G.E.S., (record in need of confirmation) [CNC]. **Northwest Territories:** 1 Aklavik (Mackenzie Delta), May 12, 1942, A.T., (Carnegie Museum, Acc. 13238) [CM]; 1 Bathurst Inlet, 9-VI-51, C.D.B.; 1 Bathurst Inlet, 11-VI-1951, W.I.C.; 1 Bathurst Inlet, 14-VII-51, W.I.C. [all, CNC]; 1 Bernard Harbour (across Coronation Gulf from Coppermine), June 6, 1915, (Canadian Arctic Expedition, F.J., 1915); 1 Bernard Harbour (across Coronation Gulf from Coppermine), June 21, 1915, (Canadian Arctic Expedition, F.J., 1915, 1329) [both, CNC-(*neoboreus* syntypes No. 2663)]; 1 Bernard Harbour (across Coronation Gulf from Coppermine), June 25, 1915, (Canadian Arctic Expedition, F.J., 1915, 1270) [CNC-(*neoboreus* type No. 2663, H.E.M. lectotype)]; 1 Bernard Harbour (across Coronation Gulf from Coppermine), July 9, 1915, (Canadian Arctic Expedition, F.J., 1915, 1232); 1 Bernard Harbour (across Coronation Gulf from Coppermine), Aug. 17-18, 1915, (Canadian Arctic Expedition, 1915, 413) [both, CNC-(*neoboreus* syntypes, No. 2663)]; 1 Cambridge Bay, 20-VII-50, E.H.N.S.; 1 Cambridge Bay 6-VIII-50, G.K.S.; 9 Coppermine, VII-10-1951, S.D.H. [both, CNC]; 15 Coppermine, VII-12-1951, S.D.H. [all, CNC-(one a H.E.M. homotype and four are melanics)]; 1 Coppermine, VII-18-1951, S.D.H.; 2 Coppermine, VII-20-1951, S.D.H.; 2 Coppermine, VII-23-1951, S.D.H.; 2 Coppermine, VII-25-1951, S.D.H. [all, CNC]; 1 Coronation Gulf, VI-10-11, R.M. Anderson, (American Museum of Natural History, Dept. Invert. Zool., No. 20742, Ac. 4238) [AMNH]; 1 Fort McPherson, 15-VII-57, R. Hurley; 1 Reindeer Depot (Mackenzie Delta), 26-VI-1948, W.J.B. [both, CNC]. **Yukon Territory:** 1 Kutlan Glacier, 1-VI-1913, Alf. Pattison, 9000'; 1 Kutlan Glacier, VI-1913, H.F.J. Lambert [both, CNC]; 3 Old Crow, V-18-57, F.S.L.W.; 1 Old Crow, V-21-57, F.S.L.W. [all, MCZ]; 1 Rampart House, 19-V-1951, C.C.L. [CNC].

UNITED STATES

QUEENS

Alaska: 1 Nome, 6-VI-1951, D.P.W. [CNC]; 1 Sainit Lawrence Island, 1935, (Acc. 33113) [AMNH]; 1 Umiat, 7-VI-47, C. Schultz [HEM]; 1 Umiat, 13-VI-47, C. Schultz [USNM]; 1 Umiat, 15-VII-1959, J.E.H.M. [CNC].

CANADA

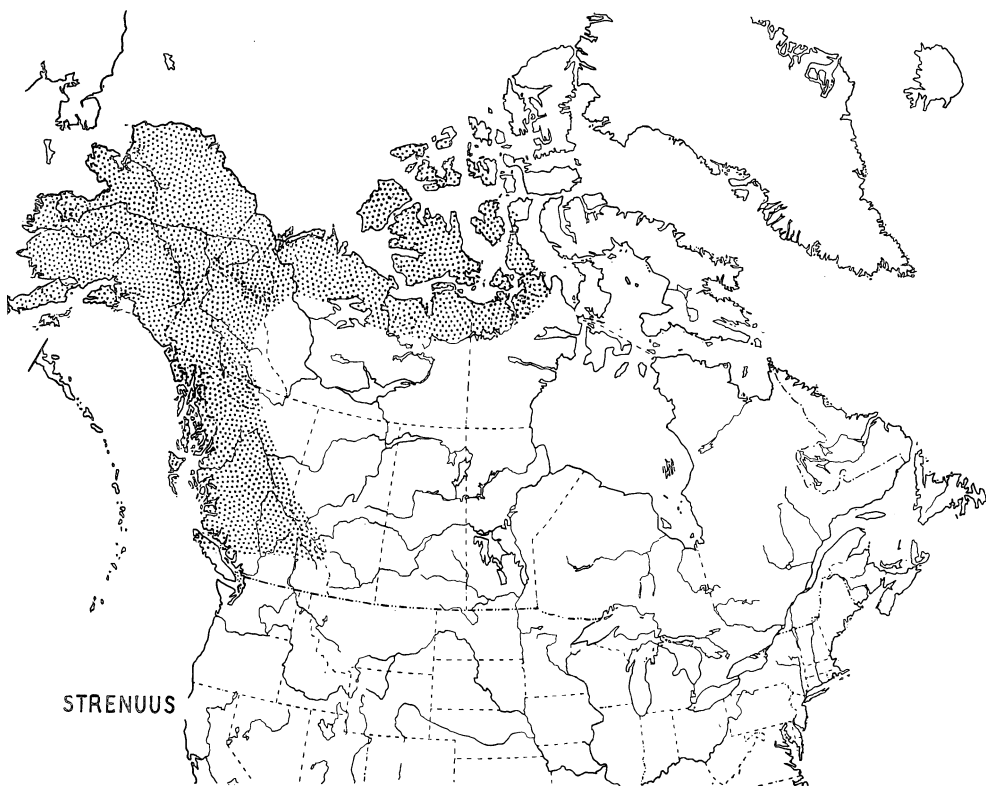
WORKERS

Northwest Territories: 1 Bernard Harbour (across Coronation Gulf from Coppermine), July 19, 1915, (Canadian Arctic Expedition, F.J., 1915, 1264); 1 Bernard Harbour (across Coronation Gulf from Coppermine), Aug. 14, 1915, (Canadian Arctic Expedition, F.J., 1915, 409) [both, CNC-(*neoboreus* syntypes No. 2663)]; 3 Cambridge Bay (Victoria Island), 12-VIII-1959, E.G. Munroe; 1 Fort McPherson, 27-VI-1957, S.D.H.; 1 Fort McPherson, 10-VII-1957, S.D.H.; 1 Fort McPherson, 16-VII-1957, R. Hurley; 2 Fort McPherson, 16-VII-1957, S.D.H.; 1 Holman (Victoria Island), 3-VII-1952, B.A.G.; 1 Holman (Victoria Island), 10-VII-52, B.A.G.; 1 Kidluit Bay (Richard's Island), 28-VII-1948, J.R.V.; 1 Mould Bay (Prince Patrick Island), 29-VII-1952, P.F.B.; 1 Reindeer Depot (Mackenzie Delta), 16-VII-1948, J.R.V.; 2 Reindeer Depot (Mackenzie Delta), 2-VIII-1948, J.R.V. [all, CNC]. **Yukon Territory:** 1 Herschel Island, July 1916, (Canadian Arctic Expedition, F.J., No. 853); 1 Herschel Island, 30-VII-1953, J.S.W.; 2 Herschel Island, 1-VIII-1953, J.S.W. [all, CNC].

UNITED STATES

WORKERS

Alaska: 1 McKinley National Forest (Sable Pass), Aug. 12, 1950, D.B., 4000'; 1 McKinley National Park (Toklat River Bridge), July 1, 1950, D.B., 3000'; 3 McKinley National Park (Mile Post 72), July 10, 1950, D.B., 3500'; 1 McKinley National Park (Mile Post 47), July 12, 1950, D.B., 3500' [all, HEM]; 2 Nome, 6-VI-1951,



MAP 10.

D.P.W.; 1 Richard[son] H[igh]way (Mile 213), 17-VI-1951, W.R.M.M.; 5 Richard[son] H[igh]w[a]y (Mile 199), 9-VII-1951, J.R.M. [all, CNC]; 3 S[ain]t Lawrence Is[land], 1933, (Acc. 83113) [AMNH]; 1 Umiat, 30-VI-47, C. Schultz; 1 Umiat, 9-VII-47, C. Schultz; 1 Umiat, 13-VII-47, C. Schultz; 1 Umiat, 9-VII-47, C. Schultz; 1 Umiat, 12-VII-1959 J.E.H.M. [all, HEM]; 1 Umiat, 18-VII-1959, R. Madge; 1 Umiat, 21-VII-1959, J.E.H.M.; 1 Umiat, 22-VII-1959, R. Madge [all, CNC]; locality unknown, 2 (no data) [MASS].

CANADA

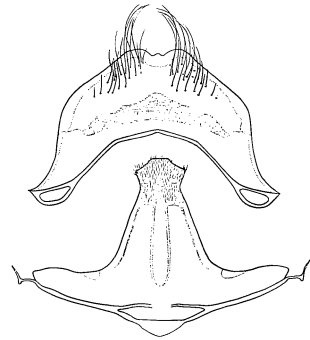
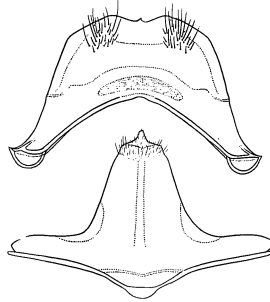
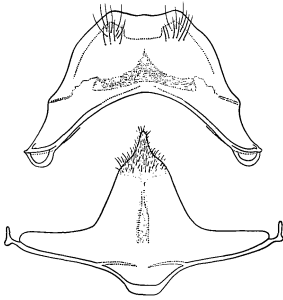
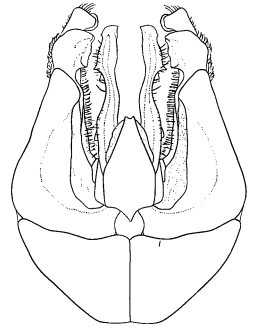
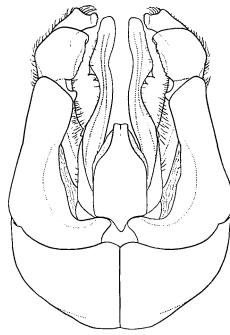
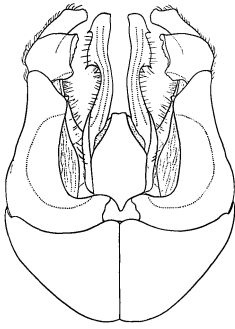
MALES

Northwest Territories: 1 Bernard Harbour (across Coronation Gulf from Coppermine), July 10, [1915?], (Canadian Arctic Expedition, F.J., 1916) [1915?], 201 [CNC *neoboreus* syntype, No. 2663]; 1 Bernard Harbour (across Coronation Gulf from Coppermine), Aug. 17-18, [1915], (Canadian Arctic Expedition, F.J., 1915), 411 [CNC *neoboreus* allotype, No. 2663]; 13 Reindeer Depot (Mackenzie Delta), 2-VIII-1948, J.R.V.; 6 Reindeer Depot (Mackenzie Delta), 10-VIII-1948, J.R.V.; 13 Reindeer Depot (Mackenzie Delta), 17-VIII-1948, J.R.V. [all, CNC].

UNITED STATES

MALES

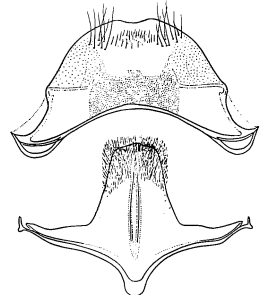
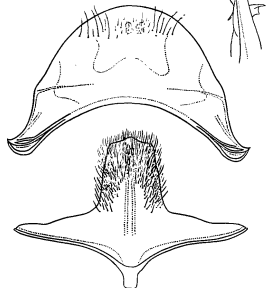
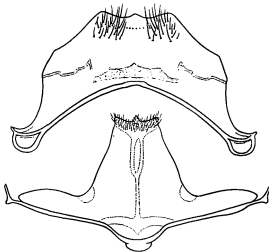
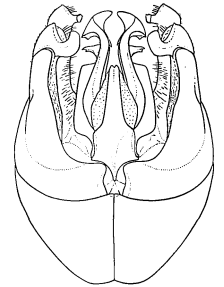
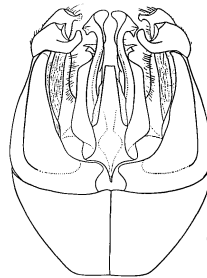
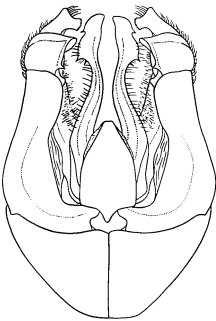
Alaska: 1 F[or]t Yukon, July 13, 1955, A. Becker [HEM]; 2 Gulkana (Paxson Lodge), 31-VII-1951, W.R.M.M. [CNC]; 3 M[oun]t McKinley Nat[ional] Forest (Sable Pass), Aug. 12, 1950, D.B., 4000' [HEM]; 1 Richard[son] H[igh]w[a]y (mi. 199), 9-VII-1951, J.R.M.; 1 Summit L[ake] (Isabella Pass), 30-VII-1951, W.R.M.M.; 1 Summit L[ake] (Isabella Pass), 31-VII-1951, W.R.M.M.; 20 Summit L[ake] (Isabella Pass), 1-VIII-1951, Mason & McGillis [all, CNC]; 1 Umiat, 7-VIII-47, C. Schultz [USNM]; locality unknown: 5 (no data) [MASS].



POLARIS

HYPERBOREUS
(ALPINUS GROUP)

STRENUUS

KIRBYELLUS
(ALPINUS GROUP)BOREALIS
(SUBTERRANEUS GROUP)

APPOSITUS

SUBTERRANEUS GROUP

KEY TO SPECIES

Females

- F1 shorter than F2 plus F3, F2 quadrate; first, second mandibular keels about equally wide, except latter noticeably constricted before attaining margin; ocellocular area usually irregularly, distinctly sculptured; thoracic dorsum gold to orange-yellow, somewhat paler anteriorly of rather wide interalar black band; abdominal T1-4 golden-yellow to luteous, T5-6 usually entirely black (occasionally with some tawny yellow especially along T5 distal margin) *borealis* (Kby.) (p. 117)
- F1 about equal to F2 plus F3, F2 short rectangular; first mandibular keel usually wider than second, which tapers gradually before attaining margin; sculpture on ocular one-third of ocellocular area weak, evident on only about one-half ocellocular area; thorax above pallid to whitish yellow anterior to rather wide interalar black band, scutellum luteous; abdominal T1-5 mostly luteous, T6 black (sides with few pale hairs) *appositus* (Cr.) (p. 113)

Males

- F1 more than $1\frac{1}{2}$ times as long as distal width, subequal to F3; hind tibia rounded distoposteriorly, outer surface not evenly strongly convex; metabasitarsal posterior fringe inconspicuous; thoracic dorsum yellow (often paler anteriorly), except moderately wide interalar black band, pleura usually pallid yellow; abdominal T1-5, sides of T6 luteous, remainder of abdomen black, except often few pale hairs at sides of T7; genitalia (Pl. XII) *appositus* (Cr.) (p. 113)
- F1 less than $1\frac{1}{2}$ times as long as distal width, distinctly shorter than F3; hind tibia angulate distoposteriorly, outer surface rather distinctly concave dorsolongitudinally beyond middle; metabasitarsal posterior fringe very short, even; thoracic dorsum golden-yellow to luteous, except rather wide interalar black band, pleura usually dark (brownish black); abdominal T1-4 golden-yellow (T2-4 usually more luteous), T5-7 black (each often with some golden-yellow along distal margin); genitalia (Pl. XII) *borealis* (Kby.) (p. 117)

Megabombus (M.) *appositus* (Cr.)

Bombus appositus Cr., 1878, p. 183, (*nec oppositus* Sm., 1878a, p. 9): *Bombus appositus*, Handl., 1888a, p. 234, (*nec distinguendus* Mor., 1869, p. 32, implied): *Bombus borealis*, auctt., (*nec borealis* Kby., 1837, p. 272): *Bombus* (B.) *appositus*, Fkln., 1912, p. 285: *Bombus* (B.) (Borealis group) Fkln., 1912, p. 281, (p.p.): *Bombus* ("Fervidus group") Rad., 1884, p. 77, (p.p.), (typ. sp. *nec Apis fervida* F., 1798, p. 274): *Bombus* (*Subterraneobombus*) *appositus*, Brs., 1951, p. 1249, *In Muesebeck et al.: Bremus appositus*, Fris., 1921b, p. 145: *Bremus* (*Subterraneobombus*) *appositus*, Fris., 1927e, p. 68: *Megabombus* (M.) (*Subterraneus* group) Mltn., 1961a, p. 57, (p.p.): *Subterraneobombus appositus*, Skor., 1922a, p. 154, (list).

DESCRIPTION. **Queen.** Length, 22.5 mm; width at wing bases, 9.0 mm; abdomen, 12.0 mm, width across T2, 9.5 mm; front wing length, 16.5 mm, width, 6.5 mm. **Head:** Frontal outline (excluding mouthparts) vertically elongate (as in *borealis*), slightly higher than wide, temporal area strongly arcuate; vertical region mostly flat, finely punctate and polished except concave area laterad of lateral ocelli; ocular two-thirds of ocellocular area irregularly weakly punctate, the ocellar one-third smooth and polished; compound eye more arcuately rounded above than below, about 3 times higher than wide; lateral ocelli moderate in size, the median larger, all located equidistant apart in a weak arc near the supraorbital line; clypeus trapezoidal, distinctly wider basally than high, moderately convex, medially smooth and polished; labrum $\frac{3}{4}$ wider than thick, the triangular rounded tubercles weakly punctate laterally to nearly smooth, the inner angles directed mesolaterally and separated by length of pedicel; malar space almost

twice higher than distance between (and including) mandibular articulations, sinuate sub-ocular surface weakly punctate, the convex extremity more or less reticulate; flagellum slightly less than twice as long as scape, F1 $2\frac{1}{2}$ times longer than distal width, about as long as lengths of quadrate F2-3 combined. *Legs*: Mesobasitarsite subrectangular, narrowed proximally, less so distally, nearly 3 times longer than widest dimension, its outer surface weakly broadly concave, completely covered with fine dense recumbent pubescence, the distoposterior angle moderately sharply acute, the posterior margin more strongly arcuate on proximal half, the margin nearly straight on distal half; metabasitarsite elongate rectangular, little more than 3 times longer than widest dimension, entirely covered with short strong recumbent pubescence on the outer surface, the posterior margin weakly arcuate basally, straight to spinose distoposterior angle, the outer surface nearly flat. *Pubescence*: Moderately fine throughout, dense and even except longer, looser and more uneven on face, vertex, scutellum posteriorly and on abdominal terga, especially on T5 and laterally on T4 and 3, T6 mostly with short stiff hairs and lacking coverage as on preceding terga; corbicular fringe long and loose, mostly weakly arcuate, the longest hairs about equal to greatest tibial width; metabasitarsal posterior fringe comparatively short, that along the greater median border longer, stouter and only weakly arcuate, the remaining fringe distally progressively shorter, straighter. *Color*: Head pallid yellow except brownish on gena; thorax above antieriad of tegulae and mesopleuron mostly ochraceous yellow, the moderately wide interalar black band intermixed with yellowish laterally, the scutellum yellow; abdominal T1-5 orange-yellow, T6 mostly blackish above, basolaterally with longish pubescence, more distally with dense short orange-yellow intermixed with irregularly longer darker hairs. Wings moderately infuscated throughout.

Worker. Length, 18.0 mm; width at wing bases, 6.5 mm; abdomen, 10.5 mm, width across T2, 6.5 mm; front wing length, 15.0 mm, width, 5.7 mm. Morphologically similar to the queen except comparatively smaller throughout. *Color*: Like that of the queen.

Male. Length, 17.5 mm; abdomen, 10.5 mm, width across T2, 6.2 mm; width at wing bases, 5.5 mm; front wing length, 13.5 mm, width, 5.0 mm. *Head*: Frontal outline (excluding mouthparts) more or less triangular, broadly arcuate above, little less than twice as high as widest dimension; compound eyes elongate, unevenly oval, slightly less than twice as high as greatest width; vertical region irregularly flat and variously punctate except smooth and polished laterad of ocelli which are located just below supraorbital line, the ocelli about as far apart as $\frac{3}{4}$ the widest diameter of the median one; mandibular space irregularly convex with weak depressions especially anteriorly, without noticeable pile except posteriorly, the ventrodistal width (including mandibular articulations) nearly equal to the length; labrum flat, without noticeable callosities, the ventral margin bilobed medially; flagellum little more than $3\frac{1}{2}$ times longer than scape, F1 nearly equal to F3, combined with F2 subequal to F3 plus F4. *Legs*: Mesobasitarsite subrectangularly elongate, $3\frac{1}{2}$ times longer than its widest dimension, the outer surface evenly concave, the distal angles more or less acute and subequal; metabasitarsite rectangular, $3\frac{1}{2}$ times longer than wide, exterior surface moderately concave mid-longitudinally, completely covered with short recumbent pile, the acute distoposterior angle and the more rounded distoanterior one equally extended, the posterior margin weakly evenly arcuate, with a short irregular fringe. *Pubescence*: Longer and more shaggy on most parts than that of either queen or worker. Genitalia, seventh and eighth abdominal sterna (Pl. XII). *Color*: Drab yellow on head intermixed with some black; thorax mostly yellow except paler on anterior thoracic dorsum, the interalar black band not well defined; distal parts of legs (chitinous) brownish ferruginous; pubescence mostly black on coxae and femora, otherwise on legs (tibiae and tarsi) yellow to ferruginous; abdominal T1-7 mostly ochraceous yellow, the corresponding sterna lighter. Wings lightly infumated, more so over the proximal two-thirds.

Redescribed from hypotypes. **Queen**, Friday Harbor, Wash., June 27, 1939; **worker**, Granny Camp, Wallowa Co., Ore., Aug. 4, 1941, M.R. Rieder; **male**, Waha, Idaho, VII-27, 1949, R.E. Rodock [all, HEM].

TYPE. Examined a ♀ (No. 2639) in the collection of the Academy of Natural Sciences of Philadelphia. This is a Cresson (1916: 111) lectotype.

TYPE LOCALITY. Colorado, U.S.A. Number of specimens at hand: 208. In flight: From late April to *ca.* mid-September, the males appearing near mid-July. Distribution: (vertical), from sea level to 14,000 ft; (horizontal), Colorado and Wyoming westward to California, northward to British Columbia and eastward to

Saskatchewan. Floral visitations: *Apocynum*, *Carduus*, *Chrysothamnus*, *Medicago*, *Pentstemon*, *Trifolium*, and *Vicia*. Cockerell and Porter (1899) recorded *Delphinium*, *Monarda*, and *Polemonium*, and Cockerell (1906c) *Scrophularia*.

COMMENTS. This species is very closely allied to *distinguendus* (Mor.) and might be only a junior synonym. Further study is warranted to determine the true taxonomic status of both taxa. As far as I have been able to distinguish between this species and *distinguendus* is a matter of the small differences in the lengths of corresponding proximal flagellar segments, especially in the male.

This species, like its close relative *borealis* (Kby.), exhibits only slight morphological variations that are within my species concept. However, the color of the pubescence on the head and thorax is especially variable in degree of paleness to the extent that any chromatic decision, let alone that based strictly on morphological differences, must await further study.

Over sympatric areas, captured (presumably) senile specimens of *borealis* that are encountered are often mistaken for this species, and *vice versa*; evidently, hybridization occurs in such sympatric distributional areas, ruling out senility as the logical explanation for specific convergence. The numerous questionable specimens seen from such locations are sufficient to indicate hybridization.

Most often in the male, frequently in the worker and less often in the queen, the dorsal thoracic pile anteriad of the interalar band varies from whitish yellow to a deeper shade, approaching the uniform typically golden-yellow of *borealis*.

CANADA

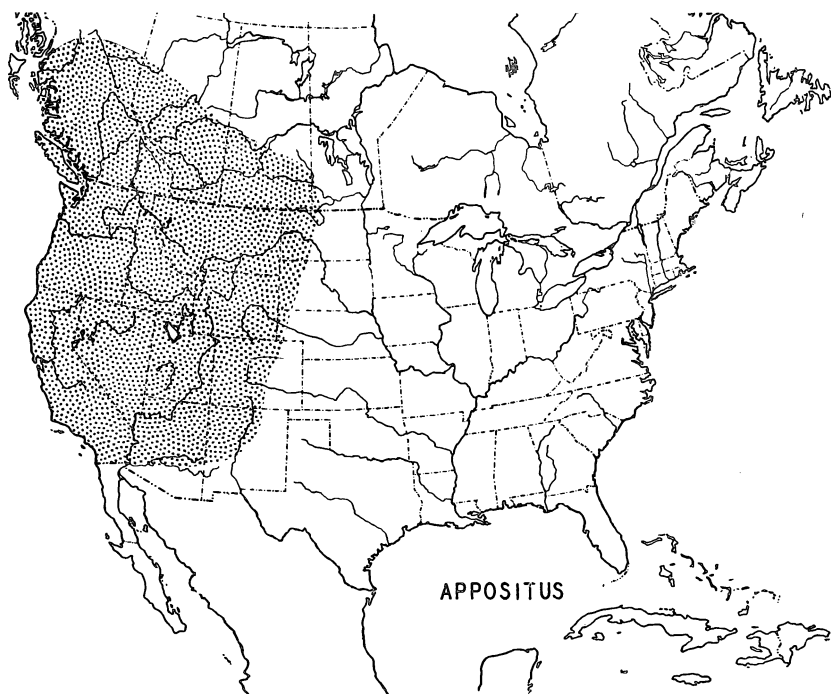
QUEENS

British Columbia: 3 Boitano Lake, July 8, 1955, J. Sanjean; 1 Chose, 24-V-1919, W.B. Anderson; 1 Hedley (17 mi. W. [of]), 31-V-1959, L.A.K.; 1 Kamloops, May 23, 1949, G.B.R.; 1 Kamloops, 5-VI-1949, G.B.R.; 2 Kaslo, 22-V-10, J.W. Cockle; 1 Lillooet, 9-VI-51, A.L. Turnbull; 1 Lytton, VII-1913, Tom Wilson; 1 Mile House (100), 4-VII-1938, G.S.W., red clover; 1 M[oun]t McLean, 22-8-20, A.W. Hanham; 1 M[oun]t Revelstoke, 15-VII-52, G.P.H., 6200'; 1 Nicola, 11-VI-1953, D.F.W., 2200'; 1 Okanagan Falls, 29-V-1953, J.R.M., 2000'; 1 Osoyoos, 1-VII-1953, D.F.H., 3500'; 1 Osoyoos, 6-VII-1953, J.R.M., 3500'; 1 Penticton, 15-V-1919, E.R.B.; 1 Penticton, 20-V-1919, E.R.B.; 1 Penticton, 5-VI-1919, E.R.B.; 1 Seton Lake, (Lillooet), 13-VI-1926, J. McDunnough; 2 Vernon, 1915; 1 Vernon, VIII-2-1923, D.G. Gillespie; 1 Vernon, IV-25-1925, E.A. Rendell [all, CNC].

UNITED STATES

QUEENS

California: 1 Sonora Pass, VII-16-51, P.D.A., 9-10,000' [USNM]; 1 Tahoe, (Lake Tahoe), El-dorado Co[unty], 11-VII-1952, D.F.H., 6300' [CNC]. **Colorado:** 1 Alder, Aug. 23, 1940, H.E.M.; 1 Gothic, 7-1929, Mary J. Brown, 9600' [both, HEM]; 1 Gothic (nr.), Gunnison Co[unty], VI-30-1938, S.L. Cresson, 9,000-10,000' [ANSP]; 1 Gothic, Gunnison Nat[ional] For[est], VI-27-1959, Marion E. Smith, 9500' [MASS]; 2 Hillside, Aug. 24, 1941, H.C.S. [SD]; 2 Pineywood Sp[rin]gs, Laramie Co[unty], VI-26-62, R.&K.D. [HEM]; 2 Pineywood Sp[rin]gs, Laramie Co[unty], VI-26-62, R.&K.D. [RRD]; 1 Science Lodge, Boulder Co[unty], June 28, 1937, Helen Rodeck [HEM]. **Nevada:** 1 Angel Lake, Elko Co[unty], VII-23-62, R.&K.D., 8200' [RRD]. **Oregon:** 1 Ashland M[oun]tain, Jackson Co[unty], July 14, 1943, H.A.S.; 1 Granny Camp, Wallowa Co[unty], Aug. 4, 1941, M.R. Rieder; 1 Ochoco Pass, July 13, 1936, H.A.S., 4800'; 1 Wood's Creek, Benton Co[unty], July 6, 1941, G.R. Ferguson [all, HEM]. **South Dakota:** 1 Deadwood, Sept. 9, 1925, H.C.S.; 1 Lead, June 8, 1934, H.C.S.; 1 Webster, June 26, 1934, H.C.S. [all, SD]. **Utah:** 1 Little Cottonwood Canyon, Lake Co[unty], VII-14-62, R.&K.D. [RRD]; 1 M[oun]t Timpanagos, Utah Co[unty], VII-15-62, R.&K.D. [HEM]; 4 M[oun]t Timpanagos, Utah Co[unty], VII-15-62, R.&K.D. [RRD]. **Washington:** 6 Friday Harbor, June 26, 1939, R.W.D.; 1 Friday Harbor, July 2, 1939, R.W.D. [all, HEM]; 3 Hurricane Ridge, Olympic M[oun]tain[s], 3-VIII-1955, J.F.G.C., 5500' [USNM]. **Wyoming:** 2 Meeteetse, Park Co[unty], July 13, 1948, Wallace-Bauer [CM]; 1 Middle Piney Creek, (Wyoming Range), Sublette Co[unty], Aug. 12-16, 1953, F.&P.R., 8400-8850' [AMNH]. **Locality unknown:** 1 (no data) [CNC].



MAP 11.

CANADA

WORKERS

Alberta: 1 High River 28-V-0[1900?], Bryant [MCZ]; 1 Spirit River, Aug. 20, 1918, E.H.S. [CNC]. **British Columbia:** 1 Agassiz, 8-VII-1914, F.W.L.S.; 1 Chilcotin, 23-VIII-1920, E.R.B.; 1 Edgewood, 24-7-1950, McM.-Craig, *Apocynum androssemifolium*; 2 Edgewood, 24-7-1950, McM.-Craig, *Trifolium pratense*; 1 Hedley, 24-VII-1923, C.B. Garret; 3 Invermere, 30-VI-1914, F.W.L.S.; 1 Kamloops, July 25, '95; 1 Kaslo, 3-VIII-16, Sn.; 1 Nakusp, 24-7-1950, McM.-Craig, *Trifolium pratense*; 1 Nelson, 5-VIII-16, Sladen; 2 Nicola, 10-VI-1953, J.R.M., 2200'; 1 Notch Hill, 27-7-1950, McM.-Craig, *Medicago media*; 1 Salmon Arm, 4-VII-1914, F.W.L.S.; 1 Salmon Arm, 26-7-50; 1 Shuswap, 29-VII-13, J.M. Swaine; 1 Sicamous, 11-VII-1914, F.W.L.S.; 1 Squilax, 27-7-1950, McM.-Craig, *Carduus lanceolatus*; 1 Vernon, 12-7-03, Sn.; 1 Vernon, 1915, Sn.; 1 Vernon 25-VII-17, Sn.; 2 Vernon, VIII-18-1923, D.G. Gillespie, [all, CNC]. **Saskatchewan:** 1 Stockholm, 22-VII-1954, Brooks-Wallis [CNC].

UNITED STATES

WORKERS

Colorado: 2 Boulder Canyon, 8-8-60, R.&K.D., 7800' [RRD]; 2 Buffalo Creek, Aug. 6, '39, V.A. Sandhouse [USNM]; 8 F[or]t Lewis, Aug. 8, 1948, R.W.D. [HEM]; 2 Hillside, Aug. 24, 1941, H.C.S. [SD]; 1 Roosevelt Forest, Fort Collins, VIII-5-1960, C.F. Smith [TBM]; 1 Science Lodge, Boulder Co[unty], July 30, 1936, Helen Rodeck [HEM]. **Idaho:** 2 Alturas Lake, Blaine Co[unty], VII-26-56, F.&P.R., 7000' [AMNH]; 1 Lewiston, 5-25-37, B. Buttrey [HEM]. **Montana:** 3 Gardiner, (nr.) Yellowstone N[ational] P[ark], VIII-16-1962, Phyl. & Paul Spangler [USNM]; 8 Hamilton, July 29, 1947, R.W.D. [HEM]. **Nevada:** 2 Angel Lake, Elko Co[unty], VII-23-62, R.&K.D., 8200' [RRD]; 2 Berry Creek, White Pine Co[unty], VII-14-1938, F.W.P., at *Penstemon watsoni* [ANSP]. **New Mexico:** 1 Wheeler Peak, (Taos), June 15-25, 1960, Burks & Kinzer, 12,500' [USNM]. **Oregon:** 1 Corvallis, June 18, 1948, H.A.S., on hairy vetch; 1 Hat Point, Wallowa Co[unty], July 3, 1941, M.R. Rieder; 2 Ochoco Pass, July 13, 1936, R.E. Rieder, 4800'; 1 Pine Cr[ee]k Canyon, Baker Co[unty], July 27, 1936, H.A.S., 4600-5300'; 1 Sunnyside School, 7-6-22, F.J. Spruijt; 1 Warrenton, 7-22, F.J. Spruijt [all, HEM]. **South Dakota:** 1 Custer,

Sept. 11, 1927, H.C.S.; 1 Deadwood, Sept. 9, 1925, H.C.S. [both, SD]. **Utah:** 3 M[oun]t Timpanagos, Utah Co[unty], VII-15-62, R.&K.D. [HEM]; 2 M[oun]t Timpanagos, Utah Co[unty], VII-15-62, R.&K.D. [RRD]. **Wyoming:** 1 Albany Co[unty], 1935 [HEM]; 13 Mammoth, Yellowstone N[at]ional P[ark], VIII-15-1962, Phyl. & Dick Spangler [USNM]; 1 Shoshone Nat[ional] Forest, Park Co[unty], July 14, 1948, Wallace-Bauer [CM]; 1 (locality unknown), (Monkhord, near track), July '21 [CNC].

CANADA

MALES

Alberta: 1 Banff (14 mi W. [of]), 4-VIII-1955, J.R.W.M. [CNC]. **British Columbia:** 1 Agassiz, 22-VII-1926, R.G.; 1 Celista, 27-7-1950, McM.-Craig, *Carduus lanceolatus*; 1 Cranbrook, 1-VIII-1927, A.A. Denny; 1 Kaslo, 30-VIII-06, J.W. Cockle; 1 Kalso, 9-VIII-16, S.; 2 Kelowna, July 25, '95; 2 Nelson, 5-VIII-16, Sn.; 3 Okanagan Falls, 21-VII-17, Sn.; 1 Okanagan Falls, 24-VII-17, Sn.; 1 Salmon Arm, 31-VII-1925, A.A. Denny; 1 Vernon, 26-VII-13, J.M. Swaine; 2 Yale (to Hope), 4.5-VII-13, Tom Wilson [all, CNC].

UNITED STATES

MALES

Colorado: 1 Boulder Canyon, 8-8-60, R.&K.D., 7800' [HEM]; 1 Boulder Canyon, 8-8-60, R.&K.D., 7800' [RRD]; 1 Hillside, Aug. 24, 1941, H.C.S. [SD]; 1 Lump Gulch (nr. Gilpin), July 24, 1934, H.G. Rodeck [HEM]; 1 Pingree Park, Aug. 16, 1926, M.D. Farrar [SD]. **Idaho:** 1 Lake Waha, Nex Perce Co[unty], VII-21-1937, F.W.P., at *Penstemon venustus* [ANSP]; 1 Sater M[ea]d[o]ws, Payette N[at]ional F[orest], 8-VIII-53, C.P. Alexander, 6000' [MASS]; 1 Waha, VIII-22-46, R.E. Rodock; 3 Waha, VII-27-1949, (R.E. Rodock Coll[ectio]n) [both, HEM]. **Montana:** 1 Lake Placid (Greenough), Aug. 5, 1946, H.C.S., 4500' [SD]. **Oregon:** 1 Rickreal, July 11, 1936, G.F.; 1 Summit Prairie, Aug. 9, 1939, Schuh & Gray; 1 Tolman Cr[ee]k (Ashland), July 21, 1943, H.A.S.; 1 Wallowa Lake, Wallowa Co[unty], Aug. 2, 1941, M.R. Rieder [all, HEM]. **South Dakota:** 3 Deadwood, Sept. 9, 1925, H.C.S. [SD]. **Washington:** 3 Blue M[oun]t[ain], Deer Park, 3-IX-1955, R. Coyles, 5000-6000'; 2 Deer Park, Olympic Nat[ional] P[ar]k, 1-IX-1955, R. Coyles, 5500'; 1 Deer P[ar]k, Olympic Nat[ional] P[ar]k, 3-IX-1955, J.R.M., 5500' [all, CNC]. **Wyoming:** 1 Jackson, Aug. 29, 1939, W.R.D. [HEM]; 1 Jenny Lake, Teton Co[unty], 30-VII-1948, Wallace-Bauer [CM]; 1 Mammoth, Yellowstone N[at]ional P[ar]k, VIII-15-1962, Phyl. & Dick Spangler [USNM].

Megabombus (M.) borealis (Kby.)

Bombus borealis Kby., 1837, p. 272, (*nec subterraneus* v. *borealis* Schmied., 1878, p. 375; *nec pratorum* v. *borealis* Alf., 1898, p. 158): *Bombus* (B.) *borealis*, Fkln., 1912, p. 282: *Bombus* (*Subterraneobombus*) *borealis*, Brs., 1951, p. 1249, *In* Muesebeck *et al.*: *Bombus fervidus*, Prov., 1882, p. 267, (p.p.), (*nec Apis fervida* F., 1798, p. 274): *Bombus* (B.) (*Borealis* group) Fkln., 1912, p. 281, (p.p.): *Bombus fervidus*, auctt., (*nec Apis fervida* F., 1798, p. 274): *Bombus fervidus*, Handl., 1888a, p. 237, (p.p.), pl. x, fig. 5: *Bombus* "Fervidus group") Rad., 1884, p. 77, (p.p.), (typ. sp. *nec A. fervida* F., 1798, p. 274): *Bremus borealis*, Fris., 1919a, p. 161 (*et seq.*): *Bremus* (*Subterraneobombus*) *borealis*, Fris., 1927e, p. 68: *Megabombus* (M.) *borealis*, Mlrm., 1961a, p. 57: *Megabombus* (M.) (*Subterraneus* group) Mlrm., 1961a, p. 57: *Subterraneobombus borealis*, Skor., 1922a, p. 154 (list).

DESCRIPTION. Queen. Length, 21.0 mm; width at wing bases, 8.5 mm; abdomen, 12.0 mm; width across T2, 9.5 mm; front wing length, 17.0 mm, width, 6.0. mm. **Head:** Frontal outline (excluding mouthparts) trapezoidal, about as wide as high, the temporal angles evenly arcuate; vertical region weakly convex except about ocelli, rather weakly coriaceous irregularly sculptured on ocular half of ocellular area, the ocellar one-half smooth and polished; ocelli in weak arc, the margins of lateral ones nearly touching supraorbital line; outline of compound eye little less than 2½ times higher than wide, only slightly more broadly and more evenly rounded below than above, the outer limits moderately arcuate, the inner margin almost straight; clypeus about 1½ times wider than high, irregularly convex, most of entire anterior surface impunctate, smooth, and polished; labrum nearly twice as wide as thick, its crescent-shaped moderately

punctate flattened tubercles mesially as far apart as length of F1, covered with rather stiff pubescence of irregular length; flagellum slightly less than twice as long as scape, F1 equal to F2-3 combined. *Legs*: Mesobasitarsite elongate rectangular, its outer surface nearly flat, its distoposterior angle sharp, extended beyond the acutely rounded distoanterior angle; metabasitarsite little more than twice as long as wide, its posterior margin only weakly arcuate basally, beyond nearly straight, the outer surface flat except inclined along posterior margin, its subacute distoposterior angle considerably extended beyond the round obtuse distoanterior angle, the posterior fringe moderately long and arcuate on proximal half, progressively shorter to absent distally. *Pubescence*: Dense, moderately even throughout except longer and irregular in length on face, vertex, scutellum, on abdomen laterally, and over T5 especially. *Color*: Face and occiput predominantly pallid yellow; thoracic dorsum and arcuate area on mesopleuron anterior of tegulae golden-yellow except rather indefinite median black interalar band of medium width, more broad medially, most of meso- and metapleuron black; legs black, tarsi with ferruginous tinge; abdominal T1-4 golden-yellow, T5 black though paler distally, T6 black except dense distal paler pile. Wings moderately infumated with sombre brown throughout.

Worker. Similar to the queen except smaller body dimensions (length, 14.5 mm; width at wing bases, 5.5 mm; abdomen, 6.5 mm; width across abdominal T2, 7.5 mm; front wing length, 12.5 mm; width, 4.5 mm).

Male. Length, 17.0 mm; abdomen, 9.5 mm, width across T2, 6.0 mm; width at wing bases, 6.5 mm; front wing length, 13.0 mm, width, 4.5 mm. *Head*: Frontal outline (excluding mouthparts) trapezoidal, slightly wider than high; compound eye about $2\frac{1}{2}$ times higher than wide, broadly rounded below, more narrowly rounded above, the inner margin dorsally only weakly concave inwardly; vertex nearly flat to weakly concave posteriorly, with well separated large shallow punctures; ocular half of ocellular area irregularly sculptured, the ocellar half nearly smooth; ocelli in nearly a straight line, situated slightly below supraorbital line, distinctly closer to one another than widest dimension of each; malar space nearly $1\frac{1}{4}$ times longer than distance between (and including) mandibular articulations, only weakly convex, microscopically granulose and bearing sparse diminutive hairs; labrum little more than twice as wide as thick, its ventral margin broadly rounded laterally and weakly emarginate medially, with long to short denser pubescence, the oval weak callosities mostly smooth and polished, between irregularly coarsely sculptured; flagellum 4 times longer than scape, F1 $1\frac{1}{2}$ times longer than F2 and slightly shorter than F3. *Legs*: Mesobasitarsite subrectangular, 4 times longer than greatest width, outwardly covered with short moderately dense pubescence, its outer surface weakly convex mid-longitudinally, the subtruncately rounded distoposterior angles about equal; metabasitarsite nearly $3\frac{1}{2}$ times longer than greatest width, the subtruncately rounded distoanterior angle slightly in recess of the acute distoposterior angle, the outer surface shallowly concave longitudinally, coriaceous with microscopic pubescence, the posterior margin nearly straight except weakly arcuate basally, the sparse posterior fringe short. *Pubescence*: Medium length, even, rather compact throughout. Genitalia, seventh and eighth abdominal sterna (Pl. XII). *Color*: Vertical region of head, thoracic dorsum anterior of tegulae, scutellum, abdominal T1-4 golden-yellow; face intermixed with longer black and dense whitish; lower pleura and abdominal T5 (distally and lateroventrally) with sienneous pubescence; otherwise head and body black; legs proper mostly black with some sienneous pubescence, that on tarsi largely ferruginous to stramineous. Wings somewhat more lightly infumated than those of female.

Redescribed from hypotypes. **Queen**, Itasca Park, Minn. (U.S.A.), June 24, 1945, R.W. Dawson; **worker**, Cass Lake, Minn. (U.S.A.), July 25, 1942, R.W. Dawson, [both, HEM]; **male**, Gatineau Park, Que., 30-VII-1961, 1100 ft, H.E.M. [CNC].

TYPE. Not examined. Kirby's ♀ type is lost.

TYPE LOCALITY. North America (Canada). Number of specimens at hand: 100. In flight: Late May to *ca.* mid-September, the males first appearing *ca.* mid-July. Distribution: (vertical), sea level to *ca.* 2000 ft; (horizontal), occurs in southern Canada from Nova Scotia to Alberta, and from Maine to New Jersey and New York westward to the Dakotas. Floral visitations: *Epilobium*, *Grindelia*, *Medicago*, *Melilotus*, *Rubus*, and *Trifolium*. Lutz and Cockerell (1920) recorded *Cornus*, *Pontederia*, and *Vicia*. Plath (1922c) listed *Diervilla* and *Rhododendron*. Graenicher (1935) recorded *Rosa*. Mitchell (1963) added *Pyrus* [*Malus*?].

COMMENTS. I detect no problematic morphological variability in this taxon except that often the female clypeus is punctate to polished over all its surface even so weakly punctured midventrally. Queens at hand range in length from 23.0 to 18.0 mm; worker, 15.0 to 13.0 mm or less, as encountered in subsequent determinations; male, 17.5 to 14.5 mm.

This species is very closely allied to *appositus* (Cr.) and to the Eurasian *distinguendus* Mor. Senile specimens of this taxon are often mistaken for *appositus*. Interbreeding between *borealis* and *appositus* undoubtedly occurs in the allopatric range; many specimens seen from the western North American allopatric areas indicate that this hybridization does actually occur.

CANADA

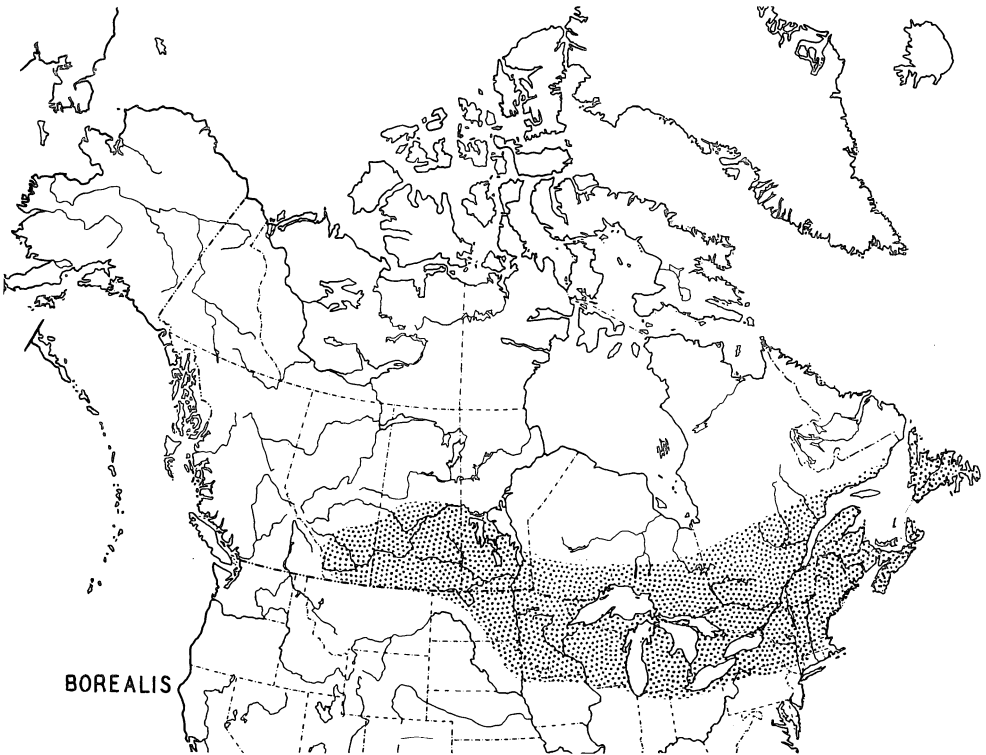
QUEENS

Alberta: 1 Laggan, IX-15-1884, (Bean Collection) [AMNH]. **Manitoba:** 1 Brandon (N. of), 26-VI-61, H.E.M., on sweetclover; 3 MacCreary (E. of), 26-VI-61, H.E.M., on sweetclover; 2 Oberon (E. of), 26-VI-61, H.E.M., on alfalfa; 1 Wanless, 29-VI-61, H.E.M., on *Rubus*; 1 Wanless, 30-VI-61, H.E.M., on *Rubus*; 1 Wanless 1-VII-61, H.E.M., on *Rubus*; 1 Wanless, 2-VII-61, H.E.M., on *Rubus*; 1 Wanless, 4-VII-61, H.E.M., on *Rubus* [all, CNC]. **Nova Scotia:** 1 Hectanooga, 6-VII-61, F.&L. [CNC]. **Ontario:** 1 Cedar Lake (10-40 mi N. [of]), 14-VII-1961, H.E.M.; 2 F[or]t Frances, 11-VII-1961, H.E.M. [both, CNC]; 2 Nipigon, (Nipigon T[o]wns[hi]p), July 14, 1955, F.&P. Rinde [AMNH]. **Quebec:** 1 Mistassini, 11-VII-44, A.R. [AR].

UNITED STATES

QUEENS

Michigan: 2 Alger Co[unty], Vi-6-59, R.&K.D.; 1 Charlevoix Co[unty], 5-31-60, R.&K.D.; 1 Chippewa Co[unty], 6-25-60, R.&K.D.; 1 Delta Co[unty], VI-11-60, R.&K.D.; 2 Dickinson Co[unty], 6-22-60, R.&K.D. [all, RRD]; 1 Douglas Lake, 7-19-1915, P.W.F. [HEM]; 1 Houghton



MAP 12.

Co[unty], 6-20-60, R.&K.D.; 2 Iron Co[unty], 6-13-60, R.&K.D. [all, RRD]. **Minnesota:** 1 Itasca Park, June 14, 1938, H.E.M.; 6 Itasca Park, July 2, 1945, R.W.D.; 7 Itasca Park 24, 1945, R.W.D.; 1 (locality unknown), June 30, '39, E.D. McDonald Jr. [all, HEM]. **North Dakota:** 1 Fargo, 21 May 1923, Wm. Baker [HEM]. **South Dakota:** 1 Brookings, Aug. 6, 1928, M. Fredricksen; 1 Watertown, Aug. 22, 1946, H.C.S.; 1 White (Warren's Woods), July 1, 1925, H.C.S. [all, SD].

CANADA

WORKERS

Alberta: 1 Laggan, IX-14-1884, (Bean Coll[ectio]n) [AMNH]. **Manitoba:** 1 Riding M[oun]t[ain] N[ational] P[ark], 26-VI-1961, H.E.M., 2000' [CNC]. **Newfoundland:** 1 Romaine Brook, Aug. [yr.?], G.K. Noble [MCZ]. **Ontario:** 1 Cedar Lake, (8 mi S. [of]), 13-VII-1961, H.E.M.; 2 Cedar Lake (10-40 mi N. [of]), 14-VII-1961, H.E.M. [all, CNC]; 1 F[or]t W[illia]m, July 23, 1942, R.W.D. [HEM]; 1 Silver Island (Sibley Pen[insula]), 18-VII-1961, H.E.M.; 3 Silver Island (Sibley Pen[insula]), 18-VII-61, H.E.M., on *Rubus*; 1 Vermilion Bay (3-5 mi N. [of]), 13-VII-1961, H.E.M., on *Epilobium* sp. [all, CNC]. **Saskatchewan:** 1 Regina, 30-VII-1943, (W.F.) [CNC].

UNITED STATES

WORKERS

Michigan: 1 Douglas Lake, Aug. 11, 1915, P.W.F. [HEM]; 2 Missaukee Co[unty], VII-11-59, R.&K.D. [RRD]. **Minnesota:** 2 Big Trout Lake (Pine River), Aug. 1, 1929, H.C.S. [SD]; 2 Cass Lake, July 25, 1942, R.W.D.; 4 Grand Marais, July 22, 1942, R.W.D.; 5 Grand Portage, July 23, 1942, R.W.D.; 1 Itasca Park, July 15, 1945, R.W.D. [all, HEM]. **North Dakota:** 1 (locality unknown, no data) [HEM]. **South Dakota:** 2 Mobridge, Aug. 15, 1924; 1 (locality unknown, no data) [all, SD].

CANADA

MALES

Nova Scotia: 1 Cheticamp (C[ape] B[reton] I[sland]), August 1917, F.J. [CNC (misabeled as to year)]; 1 Seabright, Halifax Co[unty], 7-16-49, K.D. Archibald [NSM]. **Quebec:** 1 Gatineau Park, 30-VII-1961, H.E.M., 1100' [CNC]; 1 La Sarre, 23-VIII-43, A.R.; 1 Makamik, 10-VIII-43, A.R.; 1 Métabetchouan, 9-VIII-44, A.R. [all, AR]. **Saskatchewan:** 1 Regina, 8-VIII-1943, P. Larkin [CNC].

UNITED STATES

MALES

Maine: 1 Fort Kent, 19-VIII-19 [MASS]. **Michigan:** 1 Keewenaw Co[unty], 8-22-59, R.&K.D.; 1 Schoolcraft Co[unty], VIII-5-59, R.&K.D. [both, RRD]. **Minnesota:** 1 Alex[ander] Lake, Aug. 18, '39, E.D. McDonald [HEM]; 2 Big Trout Lake (Pine River), Aug. 1, 1929, H.C.S. [SD]. **New York:** 1 Ithaca (Taghanio), Aug. 9, 1925, Babiý [CU]. **North Dakota:** 1 Fargo, Aug. 24, 1912, O.A. Stevens, on *Grindelia squarrosa* [MASS]; 1 Fargo, Aug. 22, 1916, O.A. Stevens, on *Trifolium laratense* [HEM].

DUMOUCHELI GROUP

KEY TO SPECIES

Females

1. Malar space very long, much longer than distance between and including mandibular articulations; clypeus about as high as basal width (except in *dahlbomii*, which has characteristic sharp mid-dorsal carina on T6 distally) 2
2. Malar space shorter; clypeus usually noticeably wider basally than high 4
2. F1 less than twice as long as distal width, *either* F1 not greatly exceeding F3 in length *or* ocular half of ocellocular area distinctly punctured 3
- F1 twice as long as distal width, much longer than F3; thorax black (sometimes cinereous above); abdominal T1 and T6 black, T2-5 ferruginous (orange-red); wings deeply infuscated with dark brown *excellens* (Sm.) (p. 169)

3. Ocelli situated in straight line; clypeus densely, evenly punctate; pubescence fine, moderately long, even, not compact; thoracic dorsum, pleura (lower half often dark) reddish orange to pale yellow; abdominal T1-5 reddish orange to pale yellow, T6 black; queen oval, robust, worker elongate-oval; wings moderately infuscated with reddish brown *dahlbomii* (Guér.) (p. 162)
- Ocelli situated arcuately; clypeus sparsely, finely punctate over median surface; entirely black; wings black with violaceous reflection in certain light *morio* (Swed.) (p. 177)
- Metabasitarsite not much longer than twice greatest width, or not much longer than succeeding segments combined, posterior margin not strongly or abruptly arched basally, outer surface never deeply concave mid-longitudinally (though often noticeably depressed, flat); F1 subequal to F2 plus F3; median clypeal area usually weakly punctate; thorax anterior to tegulae canary to deep yellow (rather narrow interalar black band present or not), pleura, scutellum yellow to black; abdominal T1-3 partly to all yellow, T4 yellow, T5-6 black (short fine distal pubescence on T6 often rufescent); very variable; wings deeply infuscated with brown-black *fervidus* (F.) (p. 147)
- Not as above; metabasitarsal outer surface strongly concave mid-longitudinally . . . 5
5. Malar space distinctly longer than distance between and including mandibular articulations (*pullatus* workers, with malar space only equal to distance between mandibular articulations, comparatively long black wings with deep steel-blue reflections, metabasitarsal distoposterior angle sharp, go here) 6
- Malar space at most only about equal to distance between and including mandibular articulations 8
6. F1 about twice as long as distal width, subequal to F2 plus F3; metabasitarsal posterior margin not strongly, suddenly arched basally; pubescence short, fine, rather dense, even, entirely black except that on abdominal T4-6 ferruginous *diligens* (Sm.) (p. 166)
- Not so 7
7. F1 less than twice as long as distal width, not greatly exceeding F3 in length; ocular one-fourth of ocellocular area sunken, entire ocellocular area devoid of strong punctuation, usually smooth; thorax canary to pale yellow except wide interalar black band (often narrower on worker); abdominal T1 (usually), T2 (basal middle), T3 yellow, remainder of abdomen above black; variable; wings dark (blackish) with some violaceous reflection in certain light *brasiliensis* (Lep.) (p. 143)
- Ocular one-fourth of ocellocular area not sunken, very finely punctate over ocular half of ocellocular area; ocellar area smooth, polished (except posteriorly), usually not more than one or two irregular lines of punctures laterad of median ocellus (or between median, lateral ocelli); metabasitarsal posterior margin strongly, suddenly arched basally, beyond nearly straight, distoposterior angle sharply acute, outer surface broadly concave; wings (front) relatively long with deep steel-blue reflection under certain light, vanal line weak or evanescent distally; entirely black *pullatus* (Fkln.) (p. 201)
8. Labral tubercles transverse, not distinctly conical mesially, often plainly convergent ventrally toward shelf; first, second mandibular keels rather narrow, not strongly arcuate, gradually attenuated toward margin; *either* three distal abdominal terga rufescent *or* only T2-4 red 9
- Not as above; first, second mandibular keels much constricted distally; wings always very dark (blackish) 10
9. Malar space slightly shorter than distance between and including mandibular articulations; metabasitarsal posterior margin abruptly arched at base; thoracic dorsum concolorous pale yellow (especially worker) to occasionally brunneus with darker interalar area, pleura dark; abdominal T1-3 black; wings deeply infuscated with brown, darker distally *bellicosus* (Sm.) (p. 138)

- Length of malar space similar to above; metabasitarsal posterior margin evenly, weakly arcuate throughout; thorax cinereous; abdominal T1, T5-6 mostly sooty black, T2-4 cupreous (red) *rubriventris* (Lep.)* (p. 137)
- Malar space longer than distance between and including mandibular articulations; thorax yellow, except for rather wide interalar black band; abdominal T1-3 yellow; wings rather deeply infuscated with brown *opifex* (Sm.) (p. 185)
10. Vertex coarsely punctate, ocellocular area smooth and polished only rather narrowly posterolaterally; clypeus coarsely, irregularly punctate, usually only narrow mid-vertical area impunctate; malar space about equal to distance between and including mandibular articulations; metabasitarsal posterior margin rather strongly arched basally (not abruptly so), outer surface broadly concave, without numerous short stiff hairs; thoracic dorsum usually canary to deep golden-yellow with well-defined moderately wide interalar black band, pleura largely black (though scutellum often partly to entirely black); abdominal T1 (mostly) - 3 canary to deep yellow, remainder of abdomen black (variable) *pennsylvanicus* (De G.) (p. 189)
- Not as above; area laterad of ocelli (ocellocular area) extensively smooth, polished 11
11. Punctuation on vertex very weak, sparse (behind ocellocular area); vertex (queen) declivous, rather sharply margined, arched posteriorly; temples wide, bulging, somewhat blocky, much exceeding width of compound eye; clypeus medially usually narrowly impunctate; mesobasitarsal distoposterior angle sharply spinose, directed posteriad; thoracic pleura black; thoracic dorsum often yellow or pallid yellow, except rather wide interalar black band (rectangular in queen, narrower in worker), often entirely black; usually abdominal T3 partly or entirely yellow, with remainder of abdomen black; often entire body black; wings black with deep steel-blue reflection in certain light; very variable *atratus* (Fkln.) (p. 125)
- Not as above 12
12. Metabasitarsal posterior margin abruptly arched basally, distoposterior angle rather sharply acute, usually extending noticeably beyond distoanterior angle; malar space about equal to distance between and including mandibular articulations; thoracic dorsum concolorous light yellow to fulvous, pleura (mostly) black; abdominal T3 yellow, remainder of abdomen black *steindachneri* (Handl.) (p. 205)
- Metabasitarsal posterior margin evenly arcuate at base, distoposterior angle broadly acute, not noticeably extended beyond distoanterior angle; malar space slightly shorter than distance between and including mandibular articulations; thoracic dorsum anterior to tegulae, scutellum yellow with rather wide (rectangular) interalar black band, pleura black; abdominal T3 yellow, remainder of abdomen black except fine short pubescence on T6 distally usually rufescent *medius* (Cr.) (p. 172)

Males

1. Malar space equal to at least $1\frac{1}{4}$ to $1\frac{1}{2}$ times the distance between and including mandibular articulations 2
- Malar space less than $1\frac{1}{4}$ times the distance between and including mandibular articulations 4
2. Outer surface of hind tibia weakly alutaceous, with short semi-erect stiff hairs, except on well-defined somewhat triangular area in center of distal half; entirely black; wings with violaceous reflections in certain light; genitalia (Pl. XIV) *morio* (Swed.) (p. 177)
- Not as above; most of hind tibial outer surface devoid of short stiff hairs; pubescence fine, long, loose (or shaggy) 3

* Known only from unique type queen.

3. F1 equal to F2, together exceeding F3 considerably; thorax black (sometimes cinereous above); abdominal T1 black, T2–5 entirely ferruginous, T6–7 black with ferruginous laterally; wings moderately infuscated with reddish brown, some violaceous reflection in certain light; genitalia (Pl. XIV) *excellens* (Sm.) (p. 169)
- F1 shorter than F2, together distinctly longer than F3; thoracic dorsum, pleura (except black below) ferruginous orange (often very pallid yellow on older specimens); all abdominal terga ferruginous orange (often pallid yellow on senile specimens) except T6–7 mid-distally black; wings moderately infuscated with brown, without much violaceous reflection in certain light; form robust, oblong-oval, genitalia (Pl. XIV) *dahlbomii* (Guér.) (p. 162)
4. Malar space distinctly shorter than distance between and including mandibular articulations, moderately convex, punctate; F1 at least 1½ times as long as distal width, considerably shorter than F2, F1 plus F2 noticeably longer than F3; hind tibial and metabasitarsal posterior fringes very short, even, only slightly distinguishable from other hairs; metabasitarsite long rectangular, distinctly longer than 3 times greatest width; thoracic dorsum pale yellow, pleura (mostly) black; abdominal T1–3 variably black and yellow, often predominantly yellow or black, T4 usually yellow and black, sometimes ferruginous distally, T5–7 ferruginous; variable; wings rather deeply infuscated with reddish brown; genitalia (Pl. XIV) *bellicosus* (Sm.) (p. 138)
- Not with above combination of characters; malar space only slightly shorter to distinctly longer than distance between and including mandibular articulations 5
5. F1 fully as long as or longer than F2 6
- F1 usually plainly shorter than F2 (if F1 equal to F2, *cf. brasiliensis*, then form small, partly yellow, outer surface of metabasitarsite strongly concave) 8
6. Hind tibial posterior fringe not dense, noticeably longer hairs mixed with short ones throughout, averaging longer than fringe on anterior margin; F1 distinctly longer than F2, together slightly longer than F3; metabasitarsite rectangular, about 3 times as long as greatest width, near length of succeeding segments combined; malar space about equal to distance between and including mandibular articulations; thoracic dorsum anterior to tegulae, citron to pale yellow, pleura, scutellum black to entirely yellow (then rather narrow interalar black band present); abdominal T1–5 black to entirely yellow, T6–7 black (sometimes T6 with yellow intermixed), T7 rarely rufescent; very variable; wings usually infuscated with brown, black; genitalia (Pl. XIII) *fervidus* (F.) (p. 147)
- Not as above 7
7. F1 almost twice as long as nearly quadrate F2; metabasitarsite not rectangular, arcuately narrowed at base; pubescence fine, moderately short, even; entirely black, except abdominal T4–7 light ferruginous; genitalia (Pl. XIII) *diligens* (Sm.) (p. 166)
- F1 about equal to F2; metabasitarsite rectangular; pubescence rather coarse, moderate in length; thoracic dorsum anterior to tegulae light to deep yellow, pleura, scutellum yellow to black (interalar black band present or absent); abdominal T1 (usually entirely) – 4 yellow, T5–7 commonly black (often T5 with mixture of yellow, and T6–7 rufescent); rarely abdomen above entirely yellow; variable; genitalia (Pl. XIII) *pennsylvanicus* (De G.) (p. 189)
8. Metabasitarsite rectangular, distal width only slightly wider than that at base; distal flagellar segment fully as long or longer than F1 plus F2; thorax yellow with wide interalar black band; abdominal T1–4 yellow to luteous, T5–7 light ferruginous; wings lightly infuscated with reddish brown; genitalia (Pl. XIV) *opifex* (Sm.) (p. 185)
- Not as above; metabasitarsal posterior margin evenly arched proximally, width of segment basally considerably less than that distally 9

9. F2 much longer than F1 (about $1\frac{1}{4}$ times longer), together distinctly exceeding F3; thoracic dorsum unicolorously light yellow to luteous, pleura black except yellow above; abdominal T1-2 black (often latter yellow at base), T3-4 yellow, T5-7 black; wings deeply infuscated with brown; genitalia (see redescription) *steindachneri* (Handl.) (p. 205)
- F2 exceeding F1 slightly to noticeably, together never distinctly longer than F3 (usually about as long); thoracic dorsum either entirely black, or with interalar black band 10
10. Vertical width of labrum greater than length of F2, only slightly less than F3, surface with weak polished irregular convexities, never transversely strongly depressed or concave; ocellocular area often impunctate or practically so, usually only single line of punctures between ocelli; entirely black; wings (front) relatively long, black with violaceous reflection in certain light, vanal line weak or evanescent distally; genitalia (Pl. XIII) *pullatus* (Fkln.) (p. 201)
- Not entirely as above; vertical width of labrum near equal to length of F2, distinctly shorter than F3, surface more or less transversely concave below weak callosities 11
11. F1 much shorter than F2, together distinctly longer than F3; labrum distinctly transversely concave, ventral margin weakly arcuate laterally, less than 3 times as thick as wide; malar space quadrate, slightly shorter than distance between and including mandibular articulations, convex; thoracic dorsum canary yellow to light fulvous except moderately wide well-defined interalar black band, pleura dark below; abdominal T1-2 usually black or predominantly so, T3 all yellow, T4 black or black and yellow, T5-7 sometimes entirely black though usually T6-7 rufescent; wings black, genitalia (Pl. XIII) *medius* (Cr.) (p. 172)
- F1 not greatly shorter than F2, together at most only slightly longer than F3
12. Clypeus mid-vertically fully $\frac{3}{4}$ as high as basal width; F1 distinctly longer than distal width, nearly equal to F2, combined distinctly longer than F3; labrum about $2\frac{1}{2}$ times wider than thick, callosities most prominent basolaterally, transverse concavity shallow, punctured or sculptured; ocular $\frac{1}{3}$ of ocellocular area noticeably sunken, practically impunctate; hind tibial posterior fringe moderately long, uneven; thoracic dorsum yellow except for interalar black band of variable width (usually wide), pleura often dark below; abdominal T1-3 usually partly or entirely yellow (sometimes T1-2 all black), T4-7 variable (T4 black though often yellow at sides, T5 usually black, T6-7 black though often rufescent); very variable; wings black with slight violaceous reflection in certain light; genitalia (Pl. XIV) *brasiliensis* (Lep.) (p. 143)
- Clypeus mid-vertically less than $\frac{3}{4}$ as high as basal width; F1 not much longer than distal width, slightly shorter than F2, combined about equal to F3; labrum about 3 times as thick as wide, obscurely transversely concave below weak callosities, lower margin strongly arcuate laterally; malar space about equal to distance between and including mandibular articulations, convex; ocular one-third of ocellocular area weakly punctate, not noticeably sunken, vertex moderately punctate in front of ocelli; thoracic dorsum often pale to deep yellow except rather narrow interalar black band, pleura dark below; abdominal T3 yellow (sometimes T1-2, T4 also yellow), T5 usually black, T6-7 black or rufescent (frequently entirely black, or black with cinereous *in lieu* of yellow); very variable; wings black; genitalia (Pl. XV) *atratus* (Fkln.) (p. 125)

Megabombus (M.) atratus (Fkln.)*

Bombus (B.) atratus Fkln., 1913, p. 118, (p.p.), (*nec mucidus* v. *atratus* Fr., 1911c, p. 572; F. & W., 1912, p. 185, pl. 6, fig. 19): *Bombus brasiliensis*, auctt., (p.p.), (*nec brasiliensis* Lep., 1836, p. 470): *Bombus caianensis* Hlbg., 1879, p. 160, (*nec Apis cajennensis* F., 1798, p. 273): *Bombus cayennensis*, auctt., (*nec A. cajennensis* F., 1798, p. 273): *Bombus cayennensis* v. *albidoanalis* Fr., 1931a, p. 302, (*nec A. cajennensis* F., 1798, p. 273): *Bombus cayennensis* v. *buchwaldi* Fr., 1931a, p. 302, (*nec A. cajennensis* F., 1798, p. 273): *Bombus cayennensis* v. *draenerti* Fr., 1931a, p. 302, (*nec A. cajennensis* F., 1798, p. 273): *Bombus cayennensis* v. *jundiahyensis* Fr., 1931a, p. 301, (*nec A. cajennensis* F., 1798, p. 273): *Bombus cayennensis* v. *nigriventris* Fr., 1913, p. 87; 1931a, p. 301, (*nec A. cajennensis* F., 1798, p. 273): *Bombus cayennensis* v. *pauper* Fr., 1931a, p. 301, (*nec A. cajennensis* F., 1798, p. 273): *Bombus cayennensis* v. *pauloensis* Fr., 1913, p. 87; 1931a, p. 302, (*nec A. cajennensis* F., 1798, p. 273): *Bombus cayennensis* v. *uberabensis* Fr., 1931a, p. 302, (*nec A. cajennensis* F., 1798, p. 273): *Bombus cayennensis velutinus*, vel *violaceus*, Handl., 1888a, p. 241, (*nec A. cajennensis* F., 1798, p. 273), [n. syn.]: *Bombus (B.) incarum* Fkln., 1913, p. 131, (p.p.), (*nec Apis transversalis* Oliv., 1789, p. 65, q.v.): *Bombus (B.) medius*, Fkln., 1913, p. 123, (p.p.), (*nec medius* Cr., 1863a, p. 97): *Bombus medius*, auctt., (*nec medius* Cr., 1863a, p. 97): Fkln., 1915, p. 415, (p.p.), (*nec medius* Cr., 1863a, p. 97): *Bombus (B.) niger* Fkln., 1913, p. 120, (p.p.): *Bombus niger*, auctt., (p.p.); Fkln., 1915, p. 415: *Bombus velutinus* Ill., 1806, p. 175, (p.p.): *Bombus velutinus*, auctt.: *Bombus violaceus* Lep., 1836, p. 473, (p.p.), [n. syn.]: *Bombus violaceus*, auctt.: *Bombus vogti* Fr., 1903, p. 254, (p.p.), [n. syn.]: *Bombus (Fervidobombus) medius*, Mich., 1954a, p. 163, (p.p.), (*nec medius* Cr., 1863a, p. 97), [n. syn.]: *Bremus atratus* v. *alternans* Fris., 1925a, p. 143: *Bremus atratus* v. *annulatus* Fris., 1925a, p. 142: *Bremus niger* v. *signatus* Fris., 1925a, p. 143: *Fervidobombus (F.) atratus*, Skor., 1922a, p. 153, (list): *Fervidobombus (F.) medius*, Skor., 1922a, p. 153, (list), (*nec medius* Cr., 1863a, p. 97): *Fervidobombus (F.) niger*, Skor., 1922a, p. 153, (p.p.): *Megabombus atratus*, Mlrm., 1962b, p. 730: *Megabombus* (Dumoucheli group), Mlrm., 1962b, p. 730, (p.p.): *Megabombus (M.)* (Dumoucheli group). Mlrm., 1961a, p. 57. (n.d.).

DESCRIPTION. Queen. Length, 23.0 mm; width at wing bases, 9.0 mm; abdomen, 12.0 mm, width across T2, 10.5 mm; front wing length, 19.0 mm, width, 7.5 mm. *Head:* Frontal outline (excluding mouthparts) subtrapezoidal, the dorsal outline bluntly rounded dorsolaterally, slightly wider than high, the vertical contour subconvex; ocellular area deeply concave near lateral ocellus, mostly smooth and polished except for weak, shallow, irregular punctations medially; outline of compound eye narrowly convex above, below more broadly evenly rounded, the inner margin nearly straight except above weakly concave, nearly twice as high as greatest width; ocelli situated in an arc slightly below supraorbital line, less than their diameters apart, the median one noticeably larger anteroposteriorly; vertical region behind irregularly weakly sculptured; clypeus rather evenly convex except laterally, nearly as high as greatest width, mostly roughly irregularly punctate but smoother mid-ventrally; labrum with broadly arcuate ventral margin, mostly covered with short stiff hairs, the broad tubercles nearly

*According to the 1963 International Code of Zoological Nomenclature (p. 57) this Franklin name falls as a junior homonym of the Friese trinomen, *Bombus mucidus* v. *atratus* (1911c: 572), which was used only once since its original proposal (cf. F. & W., 1912: 185, pl. 6, fig. 19). Even though Franklin's type series of *atratus* represented a composite (*atratus* Fkln., *pullatus* Fkln.), Franklin (1913: 118, pl. 19, figs. 61, 67) did adequately describe a good and recognizable species. It might be necessary to apply to the International Commission on Zoological Nomenclature for validation of *atratus* Franklin and the suppression of the Friese trinomen applied only to individual variants of an entirely different species which occurs in the highlands of south-central Eurasia.

confluent mesially, more or less subtriangular and irregularly sculptured; malar space about as long as width between (and including) mandibular articulations, its median surface mostly polished and with limited minute pubescence; flagellum slightly more than $1\frac{1}{2}$ times longer than scape, F1 $1\frac{1}{2}$ times longer than distal width, distinctly longer than subrectangular F2, perceptibly longer than rectangular F3, subequal to F2-3 combined. *Legs*: Mesobasitarsite subrectangular, nearly 3 times longer than greatest width, its outer mid-longitudinal surface weakly evenly concave, covered with short stiff pubescence except posterior fringe longer, the distoposterior angle acute; metabasitarsite $2\frac{1}{2}$ times longer than greatest width, its posterior margin strongly arcuate basally, beyond weakly so to nearly straight, the outer surface mid-longitudinally widely evenly concave, the distoposterior angle subacute and extending somewhat beyond the rounded distoanterior angle, the posterior fringe stiff, slightly arcuate, of moderate length and longest over the basal half of segment. *Pubescence*: Moderately long, dense and even except somewhat longer and looser on scutellum, sparse on head; corbicular fringe moderately dense, longer and more arcuate distally, the longest hairs subequal to widest dimension of tibia which is weakly unevenly convex and minutely aciculate over its mid-longitudinal outer surface. *Color*: Pronotum (including lobes to near tegulae), anterior one-third of mesoscutum, most of scutellum and abdominal T3 golden-yellow (sometimes lemon-yellow), otherwise entirely black except for (sometimes) few yellowish hairs mesolaterally on abdominal T2; interalar black band wide, not sharply defined, the black pubescence conspicuously infused with the yellow on the mesoprescutum and that on the scutellum. Wings deeply infumated throughout, violaceous.

Worker. Length, 15.0 mm; width at wing bases, 6.0 mm; abdomen, 6.0 mm, width across T2, 6.5 mm; front wing length, 13.0 mm, width, 5.0 mm. Overlooking diminutive differences in measurements, very much like the queen, except that the pubescence is somewhat longer, more uneven and shaggy throughout. *Color*: Like that of the queen, except lighter yellow on abdominal T2 medially, over most of T3 distally, and on all of T4.

Male. Length, 13.0 mm; width at wing bases, 5.5 mm; abdomen, 6.5 mm, width across T2, 6.0 mm; front wing length, 13.5 mm, width, 5.0 mm. *Head*: Frontal outline (excluding mouthparts) ovate trapezoidal, nearly as high as greatest width, the upper (temporal) angles rather weakly evenly arcuate; compound eye narrowly rounded above, more evenly and broadly arcuate below, the inner margin nearly straight, the posterior margin broadly evenly convex; vertical region nearly flat, mostly irregularly punctate except smooth and polished about ocelli; the latter positioned in a transverse arc, all about equidistant apart, the lateral ones about touching the supraorbital line; ocellocular area smooth and polished except for some irregular sculpture posteriorly, weak anteriorly; malar space about as long as distance between (and including) mandibular articulations, the surface convex and polished, with some irregular punctations, and some microscopic pile especially posteriorly; labrum subrectangular with nearly straight ventral margin arcuate only at lateral corners, irregularly punctate, evenly covered with short hairs, medially transversed concavely between weak indefinite callosities; flagellum nearly $2\frac{1}{2}$ times longer than scape, F1 slightly shorter than F2, both combined nearly equal to F3 or F4, the succeeding flagellar segments each progressively shorter and somewhat narrower. *Legs*: Mesobasitarsite elongate, subrectangular, and slightly more than 4 times longer than greatest width, outer surface mid-longitudinally moderately evenly concave, the distal angles subarcuately rounded, the posterior one sharper and more advanced; metabasitarsite subrectangular, about $3\frac{1}{2}$ times longer than wide, mid-longitudinally broadly evenly concave, the posterior margin evenly arcuate, distally nearly truncate except the subarcuate distoposterior angle sharper and somewhat extended beyond the rounded distoanterior angle, the posterior fringe rather short and uniform. *Pubescence*: Moderately long, mostly uniformly dense and compact, shaggier and longer on thoracic dorsum. Genitalia, seventh and eighth abdominal sterna (Pl. XV). *Color*: Head black with general admixture of yellowish-gray subpubescence; pronotum, mesoscutum anteriorad of tegulae, thoracic pleura above, scutellum, sparsely on abdominal T1 and mid-proximally on T2 as well as all of T3 lemon-yellow, the ill-defined (black) interalar band, thoracic venter, legs and remainder of abdomen black. Wings uniformly reddish brown throughout.

Redescribed from hypotypes. **Queen**, San Pedro, Argentina (Misiones), II-56; **worker**, Nova Teutonia, Santa Catherine, Brazil, I-68, Plaumann; **male**, San Pedro, Argentina (Misiones), II-56 [all, HEM].

TYPE. Examined a ♂ lectotype, designated by Frison (1925a: 162) belonging to the United States National Museum, Washington.

TYPE LOCALITY. San Bernardino, Paraguay. Number of specimens at hand: 4852. In flight: All castes occur throughout the year, *i.e.*, at least queens, or workers or males, or combinations thereof, are evident at any appropriate time and place in the species' range. Distribution: (vertical), near sea level to *ca.* 10,000 ft; (horizontal), Brazil, Uruguay, Paraguay, northern Argentina northward through Ecuador to Venezuela (and possibly the Guianas). Floral visitations: *Calliandra*, *Cassia*, *Crotalaria*, *Cucumis*, *Helianthus*, *Machaerium*, *Phaseolus*, *Rubus*, *Salvia*, *Senecio*, *Solanum*, *Vernonia*, *Zea*, and several unidentified Compositae.

COMMENTS. This species is not exceptionally variable structurally. Sometimes the labral tubercles are weak and completely convergent mesially. The relative lengths of the flagellar segments do not differ to any degree; but the depth of the vertical concavity (especially of the queen), its sculpture, and that of the female clypeus do vary somewhat. Chromatically, this is the most variable of all Neotropical species. Throughout the eastern range, extending into northern Argentina, the coloration as given is commonly encountered. Yet, queens taken in eastern South America have pubescence predominantly lemon-yellow on the thorax and abdomen, just as do many workers and males. Totally black specimens commonly occur throughout the species range. These constitute the major part of most collections of the species. On some specimens collected in the northwestern range (especially in Colombia) the abdominal areas normally covered with yellow might have this color replaced (at least in part) by coppery red, but such deviants are not regarded as representatives of subspecific rank because the gradation of replacement is from slight to extensive and seems to be an unstabilized and more or less erratic condition, suggesting no more than chromatic aberrations induced by climatic effects in these areas. Sometimes the males have ferruginous pile laterally on abdominal T6-7, but are otherwise entirely black.

ARGENTINA

QUEENS

Buenos Aires: 1 B[ueno]s Aires, II-1939, F. Yarela; 1 Buenos Aires, II-1950, M.S.; 1 Buenos Aires, (no data), J.F.; 1 Capital, 1940, Nayo [all, KU]; 2 Olivera, II-53; 1 Otamendi, 14-X-52; 25 Punta Lara, XII-52 [all, HEM]; 1 San Fernando, Jan. 26, 1956, (J.F.); 1 San Isidro, II-23-51, (J.F.); 1 Tigre, (no data); 1 Villa Ballester [nr. Buenos Aires], IV-1951, Foerster [all, KU]. **Entre Rios:** 1 Parque S[an]m Martin, 21-XI-1951 [MLF]; 5 Villaguay, XI-20-1951, (J.F.) [KU]. **Formosa:** 1 Clorinda, 23-V-1948, R.G. [MLF]; 6 Gran Guardia, X-21-52, (J.F.) [KU]; 1 Gran Guardia, 15-XI-52 [HEM]; 2 Laguna Larga, IV-48, F. Morel [MLF]. **Jujuy:** 2 Las Capillas, 12-VIII-1950, Peña; 1 Perico, I-1950, A.F.P.; 1 Zapla, IV-1948, A.F.P. [all, KU]. **Misiones:** 1 Campo Viero, XII-56; 1 Campo Viero, 3-XI-59; 1 Loreto, IX-55 [all, HEM]; 1 P[uer]to Bemberg, XI-[1]945, Prosen [KU]; 1 San Ignacio, 25-XI-1949, Picrott [MLF]; 24 San Ignacio, X-3-1950, M.S. [KU]; 1 San Ignacio, IV-56; 2 San Pedro, II-56 [all, HEM]. **Santa Fe:** 1 La Gallareta (Chaco Santafecino), III-46, Hd.&Wk. [MLF]. **Santiago del Estero:** 2 Villa Gomez, XI-46, Huidobra [MLF]; 1 Villa Union, V-1944, Castro [KU]. **Tucuman:** 1 Los Nogales, IV-47, As. [MLF]; 7 Marcos Paz, 8-X-55, H.E.M. [HEM]; 1 San Pedro de Colalao, ([Dpto.] Trancas), II-1950, (J.F.); 1 San Pedro de Colalao, ([Dpto.] Trancas), XII-1950, A. [both, KU]; 3 San Pedro de Colalao, ([Dpto.] Trancas), II-1951 [HEM]; 2 Siambon, ([Dpto.] Tafi), II-45, D.O.; 1 Siambon, ([Dpto.] Tafi), IV-45, D.O.; 1 Siambon, (no data) [all, MLF]; 1 Siambon, [Dpto. Tafi], 4-II-1946, D.O. [HEM]; 1 Tacanas, (Dpto. Trancas), II-51, J.M.A.; 1 Tucuman (Est[acion] Exp[er]imental), 10-X-1917; 1 Tucuman, 1945 [both, MLF]; 1 Tucuman, XI-1-1929, H.A. Jaynes; 2 Tucuman, (Dpto. Tafi), 27-IX-55, H.E.M.; 9 Tucuman (Hospital City), 9-X-55, Willink & Milliron [all, HEM]; 1 Villa Padre Monte, ([Dpto. Burruyacó]), 17-I [to] 7-II-48, R.Gh. [MLF].

BOLIVIA

QUEENS

Beni: 2 Magdalena, (Region Amazonica), VI-15-1950, (F.), 250 m; 2 Rurronabaque, 17 Oct. 1956, L.P., 175 m [all, KU]. **Santa Cruz:** 1 Buena Vista, (Dpto. Ichilo), V-15-50, L.E.P. [KU]; 1 Los Puntas, (Cordillera), II-47, Peredo [MLF]; 1 Santa Cruz, 5-19-53, J.A.M., 53-7800' [USNM].

BRAZIL

QUEENS

Espirito Santo: 1 (no specific data except, "Estat[ão], R. de S.") [SADZ]. **Goias:** Aragarcas, I-1955, F.M.O. [KU]; 1 Aragarcas, I-1955, F.M.O. [Seabra]. **Mato Grosso:** 1 Barranco ([Rio] Branco), 26-12-35, Soito Mairo [CL.ena]; 2 Chapada, (no data); 6 Chapada, April [yr.?]; 1 Chapada (nr. Cuiabá), April [yr.?] [all, CM]. **Minas Gerais:** 1 Varginha, II-1954, L.C.A. [Seabra]; 1 Ypiranga, (no data), Luderá; 1 (no data), P.J. Caldas, [both, SADZ]. **Paraná:** 1 Araucaria, 23-X-55, H.E.M.; 1 Araucaria, 27-X-55, H.E.M.; 9 Araucaria, 31-X-55, H.E.M.; 5 Araucaria, 31-X-55, H.E.M., on *Salvia*; 2 Araucaria, 3-XI-55, H.E.M. [all, HEM]; 1 Calusa, 4-X-55, M.&M.; 60 Cariubá, 1 Feb. 1956, M.&M. [all, KU]; 2 Curitiba, 23-X-55, C.D. Michener; 1 Curitiba, 25-X-55, H.E.M.; 5 Curitiba, 27-X-55, H.E.M.; 11 Curitiba, 29-X-55, H.E.M. [all, HEM]; 1 Curitiba, 4-XI-55, Michener & Lange [KU]; 4 Morretes (10 mi N. [of, nr. Parangaitá]), 5-XI-55, H.E.M. [HEM]; 2 Morretes, ([nr.] Para[na]gua), 3 Nov. 1955, M.&M. [Seabra]; 1 Praia de Leste, 5-XI-55, H.E.M. [HEM]; 1 Rio Paraná (below Rozario [Rosario]), XII-18 [CM]. **Rio de Janeiro:** 1 Itatiaia [Itatiaia], (Estação Biologica), 16-I-1930, 1900 m; 1 Itatiaia [Itatiaia], (Maromba), 8-9-1930, 1100 m [both, CL]; 1 Itatiaia [Itatiaia], 7-1-1954, C.A.C.S., L.C.&M. Alvarenga & W. Zikan, 2200 m; 2 Itatiaia (P[arque] N[acional]), VIII-1954, H.G., 850 m; 1 Maromba (Itatiaia), 4-V-1954, C.A.C.S. [all, Seabra]; 1 Mendes, 1930, Hildegardo de Carvallis [CL.ena]; 1 Mimas (Passo Quatro, Faz dos Campos), 1-IX-1914, J.F.Z.; 1 Passo Quat[ro], 1928, Zikan [both, CL]; 8 Pedro do Rio (Retiro), XII-1954, C.A.C.S. [Seabra]; 1 Pinheiro [Pinheiro], (no data) [CL.ena]; 1 Teresopolis (Parque nac[ional], Serra dos Orgaos), 15-VIII-1947, C.R. Hathaway [Seabra]. **Rio Grande do Sul:** 1 Pelotas, 2-IX-1954, Bo. [USNM]; 1 Pelotas, X-27-1954, CB.; 1 Pelotas, XI-1-1953, C.B. [both, AMNH]; 1 São Salvador, August [yr.?] [CM]. **São Paulo:** 1 Barueri [Barreiros, nr. Curitiba, also Curityba], 31-I-1955, K.L. [KL]; 2 Batatais, August 1943 [KU]; 1 Campodo (Caparaó Santo), 22-II-1915, J.F.Z. [CL]; 1 Cantareira, (no data) [SADZ]; 1 Jundiáhy, 28-VII-1897, Schrottky [CNC]; 1 Jundiáhy, LX-1900 [SADZ]; 1 São Carlos, 1 April 1956, C.D. Michener [KU]; 1 São Paulo, 14-X-55, H.E.M.; 1 São Paulo, 7-XI-55, H.E.M.; 26 São Paulo, 11-XI-55, H.E.M.; 1 São Paulo, 12-XI-55, H.E.M. [all, HEM]. **Santa Catarina:** 2 Corupa (Hansa Humboldt), October 1944, A.M.; 1 Corupa (Hansa Humboldt), XI-1946, A.M. [all, AMNH]; 1 Corupa, XI-1953, A.M.; 1 Corupa, III-1954, A.M.; 1 Corupa, IV-1954, A.M.; 1 Corupa, X-1954, A.M. [all, Seabra]; 1 Nova Teutonia (27°11'–52°23'), 5-X-1939, F.Pn., 300–500 m; 1 Nova Teutonia (27°11'–52°23'), 20-X-1939, F.Pn., 300–500 m; 1 Nova Teutonia (27°11'–52°23'), 24-X-1939, F.Pn., 300–500 m; 1 Nova Teutonia (27°11'–52°23'), 25-X-1939, F.Pn., 300–500 m; 1 Nova Teutonia (27°11'–52°23'), 25-XII-1939, F.Pn., 300–500 m; 1 Nova Teutonia (27°11'–52°23'), 28-XII-1939, F.Pn., 300–500 m; 1 Nova Teutonia, March 1942, F.Pn. [all, HEM]; 1 Nova Teutonia, IV-1942, F.Pn. [KU]; 1 Nova Teutonia, 4 April 1948, F.Pn.; 1 Nova Teutonia, 19 April 1948, F.Pn. [both, HEM]; 2 Nova Teutonia, VI-1951, L.E. Plaumann [KU]; 1 Nova Teutonia, 24-V-57, F.Pn.; 1 Rio Vermelho, January [yr.?] [both, HEM]; 1 Rio Vermelho, III-1946, A.M. [AMNH]; 1 (locality unknown), April 2, '49, Plaumann; 6 (locality unknown), Nov. 18, '49, Plaumann [all, HEM]. **Locality unknown:** 1, (no data), Sello [ZMB]; 1 (no data) [NMW].

COLOMBIA

QUEENS

Boyacá: 3 Bonza, 31-VII-59, G. Bravo, alverja [COL]. **Cauca:** 1 Cali, (no data except '08), Fassel. [AMNH]. **Cundinamarca:** 1 Chapinero (Lake [Lago] Bogotá), I-II-20, Forrest Clark [USNM]; 1 Funza, 27-VII-55, M. Revelo, maíz; 1 La Picota, 18-XI-36, H.O.; 1 La Picota, 20-XI-36, H.O. [all, COL]. **Magdalena:** 1 Manzanares, 20 July '40 [COL]. **Narino:** 1 Pasto, 25-XI-58, A. Unigarro, en malezas [COL]. **Locality unknown:** 3, 20 July '40 [COL]; 2, (no data), Q. Felipe Ovalle [AMNH].

ECUADOR

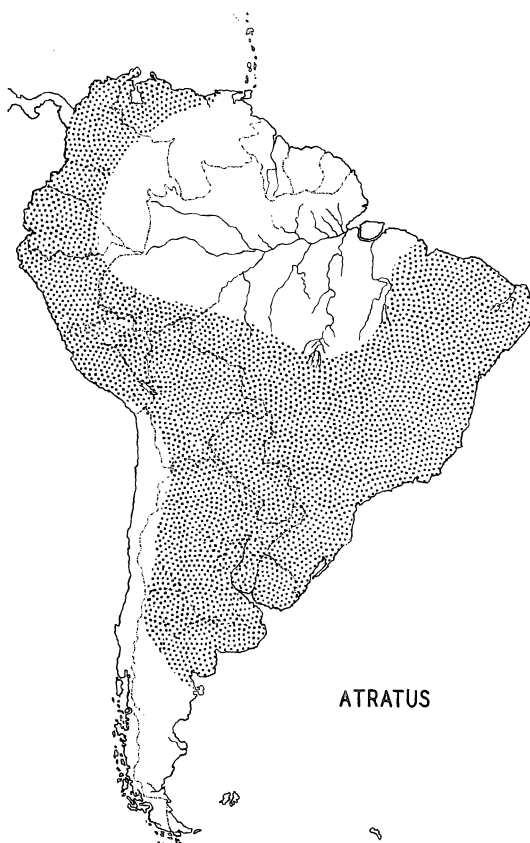
QUEEN

Guayas: 1 Guayagil [Guayaquil], (no data except 1901), Buchwald [ZMB].

PARAGUAY

QUEENS

Asuncion: 1 Asuncion, Oct. 9, 1949; 2 Col[onia] Independencia, II-21-51, (J.F.) [all, KU]; 1 Col[onia] Independ[encia] (C[am]po Melgarejo, Dpto. Guayra), 18-X-55, H.E.M.; 17 Col[onia] Sommerfeld (Dpto. Caa-Guazu), XII-58 [all, HEM]; 1 Contesa, III-1954, (F.H.W.); 1 Hohenau, 1V-1953, (Walz) [both, KU]; 1 Nueva Stalia, 7-XII-55, F.S., on *Cucumis melo*; 1 Villa Aurelia



MAP 13.

(nr. Asuncion), 22-X-55, H.E.M.; 2 Villa Aurelia (nr. Asuncion), 11-III-56, F.S., on Compositae; 1 Villa Aurelia (nr. Asuncion), 12-III-56, F.S., on Compositae; 1 Villa Aurelia (nr. Asuncion), 16-III-56, F.S., on Compositae [all, HEM].

URUGUAY

QUEENS

Canelones: 1 Carrasco (Paso de), 13-IX-53, P. San Martin, 2626'; 1 Montevideo, III-1943, P. Aliados [both, CSC]; 1 Montevideo, II-1951, A. Silveira; 1 Montevideo, XI-1951, A. Silveira [both, U-NMH]; 1 Montevideo, 23-XI-51, A. Silveira [SG]; 1 Montevideo, IV-1953, (L'Entomologia) [U-NMH]; 1 Montevideo, 29-IV-53, G. Soler [SG]; 1 Montevideo, 1-V-53, C. Rucks; 1 Montevideo, 1-V-1953, (L'Entomologia) [both, U-NMH]; 1 Montevideo, III-1954, A. Silveira [SG]; 1 Montevideo, X-1954, S. Pereira [U-NMH]; 1 Montevideo, May 1955, Olaizola; 1 Pando, 3-X-51, A. Silveira [both, SG]; 1 Penarol (Mont[e]video), III-1955, P. Briz [CSC]; 1 Prado (M[onte]video), XI-54, Furest [SG]; 1 Prado (Mont[e]video), 8-IV-55, C. Caudde; 1 Sayago, [Monte]video, 23-X-1942 [both, CSC]; 1 Sayago, [Monte]video, III-1951, A. Mesa [SG]; 1 Sayago (Monte]video), July '51, (dendro del laboratorio) [CSC]; 1 Sayago, [Monte]video, I-1952, A. Silveira; 1 Sayago, [Monte]video, X-1952, A. Costa; 1 Sayago, [Monte]video, 6-XI-53, A. Silveira; 1 Sayago, Se[p]tember 1954, Sarasua [all, SG]; 1 [Sayago, Monte]video, (F[acultad] Agronomia), 15-I-54, A. Silveira [SG]; 2 Sayago, [Monte]video, 10-1954, Tournon; 1 Sayago, [Monte]video, 10-10-1954, Pravia; 2 Sayago, [Monte]video, 11-10-54, Pravia; 1 Sayago, [Monte]video, 12-10-54, Pravia; 2 Sayago, [Monte]video, 14-10-54, Pravia [all, CSC]; 1 Sayago, [Monte]video, 24-X-54, Nin; 1 Sayago, [Monte]video, XII-54, C. Caudde; 1 Sayago, [Monte]video, March 1955, Sarasua [all, SG]. 1 Montevideo, (no data), [U-NMH]. **Colonia:** 1 Carmelo,

10-II-54, A. Silveira; 1 Carmelo, April 1955, G. Soler; 1 Carmelo, October 1955, H. May [all SG]; 1 La Estanzuela, 1-14-53, C.B. [AMNH]; 1 Puntas Arenal, March 1955, E. Sanguinet [SG]. **Durazo:** 1 San José, V-54, A. Silveira [U-NMH]. **Maldonado:** 1 Maldonado, IV-1953, A. Silveira; 1 Maldonado, IV-1953, (L'Entomologia) [both, U-NMH]. **Treinta y Tres:** 1 Cuchill. [La], (Negra Rivera Ples, Lunarejo), 16-XI-55, C.S. Carbonnel, on *Calliandra tweediei* [CSC]. **Locality indeterminate:** Las Tepas, April 15, 1955, Durán [SG]. **Locality unknown:** 1 (no data [U-NMH]; 1 (no data), A. Mesa [CSC].

VENEZUELA

QUEENS

Carache: 1 P[uer]to Cabello, II-6-1940, P.J.A. [CU]. **Federal District:** 1 Puerto la Cruz, Jan. 1 1929, E. Holt [CM]. **Mérida:** 1 Merida, 8-1883 [NMW]; 1 (M[oun]t[ain]s of Merida), (no data) [CM]. **Locality unknown:** 1 (no data) [USNM-syntype].

LOCALITY UNKNOWN (South America)

QUEENS

1 (no data), (Collection C.F. Baker); 1 (no data), O.M. Reuter, (Mus[eum] Hels[inki] Coll[ection], [both, USNM]; 1 (unlabeled) [KU].

ARGENTINA

WORKERS

Buenos Aires: 2 Boulogne, IV-6-53, M.M.S.; 1 B[ueno]s Aires, April 1940; 29 Buenos Aires, II-1950, M.S.; 5 Buenos Aires, XII-1950, L.E. Plaumann [all, KU]; 1 Buen[os] Ayr[es], [Buenos Aires], (no data), Kinb. [NRS]; 1 Capital [Buenos Aires], IV-9-1950, M.M.S.; 9 Capital [Buenos Aires], IV-1951, J.F.; 1 Martinez, April 16, 1926, Bi.; 1 Martinez, Nov. 13, 1926, Bi.; 1 Martinez, 8-11-28, J. Gomez; 18 Olavarría, April 3, 1952, (J.F.) [all, KU]; 14 Olivero, II-53 [HEM]; 2 Olivos, 3-1951, (F.) [KU]; 3 Pacheco, III-52 [MLF]; 66 Punta Chica, II-56; 155 Punta Chica, IV-56 [both, HEM]; 4 P[unta] Lara, Breyer; 1 Punta Lara, Feb. 9, 1951, (J.F.); 6 Punta Lara, II-20-1952, (J.F.); 8 Punta Lara, III-24-51, (J.F.) [all, KU]; 13 Punta Lara, XII-52; 1 Punta Lara, II-54 [all, HEM]; 3 Rio Lujan, I-1943, A.F.P.; 1 Rio Lujan, Oct. 27, 1952, M.S.; 18 Saavedra, II-25-1950, M.S.; 21 San Fernando, Jan. 26, 1951, (J.F.); 18 San Isidro, IV-25-50, M.M.S.; 27 San Isidro, II-1951, (F.); 23 San Isidro, II-23-51, (J.F.) [all, KU]; 242 San Isidro, XII-55 [HEM]; 2 San Nicolas, I-47, De La Sota [MLF]; 5 Tandil, II-1941, A.F.P. [KU]; 1 Tandil, January 1951, (J.F.) [Seabra]; 1 Tigre, II-1950, M.S.; 7 Tigre, III-1950, M.S.; 49 Tigre, VII-1951, (J.F.); 3 Villa Ballester, I-1951, Foerster [all, KU]; 33 (locality unknown), V-1951, L.E.P.; 2, 2-13-52, Senkute; 1 (no data), Breyer [all, KU]. **Catamarca:** 2 Valle Viejo, V-47, Morales, 1 (locality unknown), XII-46, Schäfer [all, MLF]. **Chaco:** 2 Colonia Benitez, 12-XII-48, R.R. [MLF]. **Cordoba:** 4 Calamuchita, 1945; 1 Cordoba, 23-X-47, P.L. [all, MLF]; 2 Cordoba, December 1956 [KU]; 1 Totorá, 18-II-48, P.L. [MLF]. **Corrientes:** 10 Manantiales, II-47, T. de Apostol [MLF]; 1 (locality unknown), (no data) [U-NMH]. **Entre Ríos:** 1 Colleordis, II-1930 [KU]; 1 Concordia, II-1930 [CL]; 1 Concordia, X-1942, A.F.P.; 1 (locality unknown), Breyer [both, KU]; 1 (locality unknown), (no data) [CU]. **Formosa:** 2 Clorinda, III-47, J. Morel; 1 Clorinda, XI-1947, J. Morel [all, MLF]; 3 Gran Guardia, II-52; 7 Gran Guardia, X-52 [all, HEM]; 2 Gran Guardia, X-21-52, (J.F.) [KU]; 2 Gran Guardia, XI-52; 3 Gran Guardia, 15-XI-52; 11 Gran Guardia, 1-XII-52; 58 Gran Guardia, II-53 [all, HEM]; 1 Laguna Larga, IV-48, F. Morel; 1 (locality indeterminate) (Rlacho [!] Negro), 20-XI-50, Ms.&Wk. [both, MLF]; 1 (locality unknown), II-1953, (J.F.) [Seabra]; 7 (locality unknown), February 1953, M.S. [KU]. **Jujuy:** 2 Calilegua, 13-II-50, Ms.&Wk. [MLF]; 1 Calilegua, 10-III-55 [HEM]; 1 Dique La Cienaga, 11-II-51, Wk.&Ms. [MLF]; 1 El Quemado, May '26, G.L. Harrington [USNM]; 1 Est[ado de] Yuto, II-56 [HEM]; 3 Estado de Yuto, November 1956 [KU]; 1 La Sela (Cerro del Carmen), 27-I-1948, Ms.&Wk.; 1 Ledesina, 8-II-50, Ms.&Wk.; 7 Los Perales, 4-II-50, Ms.&Wk. [all, MLF]; 4 Los Perales, XII-1950, A.F.P. [KU]; 2 Palpala, 24-I-1949, M.I. Aczél [MLF]; 2 Palpala, 27 Feb. '20 [CU]; 1 Reyes, II-1948, A.F.P. [KU]; 17 S[an] Juancito, 27 Feb. 1920 [CU]; 7 San Pedro, II-1948, A.F.P. [KU]; 5 Santa Barbara, 7-IV-57, (J.F.) [HEM]; 2 Zapla, IV-1948, A.F.P. [KU]; 16 (locality unknown), 10 Feb. 1920, R.G.H.; 6 (locality unknown), 11 Feb. 1920, R.G.H.; 1 (locality unknown), 20 Feb. 1920 [all, CU]; 1 (locality unknown), 24-I-48, Wk.&Ms. [MLF]; 10 (locality unknown), XII-1950, A.F.P. [KU]. **La Rioja:** 1 Dique Los Sauces, XII-1951, (F.H.W.) [KU]. **Misiones:** 2 Banto Pope, Oct. 20, 1951, (J.F.) [KU]; 2 Bemberg, 14 [to] 30-III-1945, H., W.&Gb. [MLF]; 2 Campo Viera, XII-55 [HEM]; 26 Campo Viera, December 1957; 1 Cerro Azul, (no data) [all, KU]; 5 Iguazu, 30-1 [to] 13-III-1945, Hd., Wk.&Gb. [MLF]; Iguazu Falls, 20 [to] 22 Jan. '20 [CU]; 15 Loreto; XII-55 [HEM]; 1 Panambi, (no data); 1 Pindapoy, January 1943, Bi. [both, KU];

1 Posados, 15 [to] 24 Jan. '20 [CU]; 1 P[uer]to Bemberg, XI-[1]945, Prosen [KU]; 7 Puerto Bemberg, 24-III-45; 1 Puerto Iguazu, 30-I [to] 13-III-1945, Hd., Wk.&Gb.; 13 Puerto Iguazu, II-1945, Hd., Wk.&Gb. [all, MLF]; 13 San Ignacio, X-3-1950, M.S. [KU]; 2 San Ignacio, 21-XI-51, Monros [MLF]; 6 San Ignacio, IV-56; 4 San Pedro, II-56 [all, HEM]; 1 Yabebiri [Yabebiri, arroyo], II-1954, (F.H.W.) [KU]. **Neuquén:** 1 Lake Lacar, I-15-53, M.M.S., 600 [KU]. **Rio Negro:** 1 Conesa, XI-1953, (F.H.W.) [KU]. **Salta:** 2 Cnl. [Coronel] Moldes, 14-II-48, Ms.&Wk. [MLF]; 1 Guemes, IV-1950, A.F.P.; 2 La Bomba, III-1946, A.F.P.; 9 Leser, I-1946, A.F.P.; 1 Pécetes, II-1954, (F.H.W.); 1 Pocitos, XI-1950, (F.H.W.); 1 Pocitos, III-1951; 3 Puerto Marquez (La Paz), III-1951, (F.) [all, KU]; 1 San Lorenzo, 31-I-48, Ms.&Wk.; 1 Tartagal, XI-46, T. Peredo [both, MLF]. **Santa Fe:** 10 La Gallareta, III-46, Hd.&Wk.; 12 La Gallareta (Santafecina), III-46, Hd.&Wk. [all, MLF]; 1 San Javier, 1947, A.F.P. [KU]; 29 Tartagal (Chaco Santafecina), 27-II-46, Hd.&Wk.; 9 Villa Ana (Chaco Santafecina), 4-II-1946, Wk.&Hd.; 2 Villa Ana, 4-II-1946, Hd.&Wk.; 6 V[illa] Guillermina, 21-II-46, Hd.&Wk. [all, MLF]. **Santiago del Estero:** 1 Termas d[el] Rio Rondo, 18 [to] 24-II-48 [MLF]. **Tucuman:** 2 Aconquija, 1-IV-47, As.; 2 Anta Muerto, II-I-48; 1 Burruyacu, 11-X-47, As.; 8 Cadillal, 10-I-48, Wk.&Gb.; 1 Cadillal, 10-II-48, Wk.&Gb.; 2 Cadillal, 16-V-48, Wk.; 1 El Infiernillo, 13-III-1948, F.M.; 2 Fronterita, 18-III-48, As.; 2 Horco Molle, 17-XII-1946, R.G.; 7 Los Nogales, III-47, A.A.; 4 Los Nogales, IV-47, A.A.; 4 Los Sarmientos, III-47, Fernandez; 1 Los Sarmientos, (Dpto. Rio Chico), 3-I-48, As.; 22 Monte Bello, (Dpto. Rio Chico), 18-IV-1946, A.Wk. [all MLF]; 4 Parque Aconquija, 24 Feb. '20 [CU]; 2 Piedras Coloradas Camino (Tafi del Valle), 26-XI-52, Wk.; 2 Rio Cochuna, 6-V-1948, A.Wk.; 1 Ruta Gentro, (Saladilla Tapia, Reserva Forestal), 10-I-48, Wk.&Gb.; 2 San Martin (D[e]p[artmen]to [de]), 3-I-48 [all, MLF]; 11 San Pedro de Colalao (Trancas), II-1950, A.; 1 San Pedro de Colalao (D[p]to. Trancas), II-1951 [all, KU]; 11 Siambon (Tafi), II-45, D.O.; 77 Siambon (Tafi), IV-45, D.O.; 7 Siambon (Tafi), XII-45, D.O.; 48 Siambon (Tafi), 4-II-46, D.O.; 13 Siambon (Tafi), V-46, D.O.; 2 Tacanas (Dpto. Trancas), XII-46, Gb.; 1 Tucuman (Est[acion] Exp[erimental]), III-29-1918; 3 Tucuman, 1945 [all, MLF]; 1 Tucuman, 2-26-46, P.A. Berry [USNM]; 1 Tucuman, III-46, Jolaner; 1 Tucuman, XII-46, O. Donell; 6 Tucuman, I-47, J. Cordoba; 6 Tucuman, 28-II-47, J. Cordoba; 1 Tucuman, 1-IV-47, As.; 252 V[illa] Padre Monte (Burruyacu), 17-I [to] 7-II-1948, R. Gh. [all, MLF].

BOLIVIA

WORKERS

Beni: 1 Magdalena (Region Amazonica), VI-15-50, F., 250 m; 13 Reyes, 20 Nov. 1956, L.P.; 35 Reyes, 10 Dec. 1956, L.P.; 12 Rurrenabeque, 17 Oct. 1956, L.P., 175 m [all, KU]. **Cochabamba:** 1 Crista (Mayu, Chapare), VIII-21-1949, L.E.P. [KU]. **La Paz:** 17 Ixiamas, December 1921-22, W.M.M.; 1 Tumupasa, December 1921-22, W.M.M. [all, USNM]. **Santa Cruz:** 11 Buena Vista (Depto. Ichilo), IV-1950, L.E.P.; 7 Buena Vista (Depto. Ichilo), IV-16-1950, L.E.P.; 2 Buena Vista (Depto. Ichilo), IV-20-1950, L.E.P.; 2 Buena Vista (Depto. Ichilo), IV-23-1950, L.E.P.; 2 Buena Vista (Depto. Ichilo), V-2-1950, L.E.P.; 1 Buena Vista (Depto. Ichilo), V-6-1950, L.E.P.; 1 Buena Vista, III-1951, A.F.P. [all, KU]; 4 Buena Vista, (no data), 450 m [CNC]; 2 Monteros, II-1951, A.F.P.; 3 S[an]ta Cruz, April 4, 19 50, L.E.P.; 2 S[an]ta Cruz, (no date), 400 m [all, KU]; 1 Santa Cruz (d[e] l[a] Sierras Andes, Hanez), XII-46, Peredo [MLF]; 1 Sara, November 1910, J.S., 450 m [CM]; 1 Tacauranda, ([nr.] Buena Vista), (no data), I.W. Rand [USNM]; 1 Tacu ([Department of] Ichilo), III-1951, A.F.P. [KU]; 1 (locality indeterminate, Piedra Blanco), (no data) [CM]; 1 (locality indeterminate, Oriental), 6 June 1955, Z. [KU]. **Locality unknown:** 1, XII-11-49, L.E.P. [KU].

BRAZIL

WORKERS

Amazonas: 1 Luna, (no data), (Mus. Western [sic.]) [UZM]; 2 Santarem, April 1919, S.M. Klagas [CM]; 3 Santarem, 1 [to] 10-VII-27, Zerny; 2 Santarem, 11 [to] 20-VII-27, Zerny; 2 Santarem, 21 [to] 31-VIII-27, Zerny; 1 Santarem, 9 [to] 10-IX-27, Zerny [all, NMW]; 4 Santarem, (no data) [CM]. **Bahia:** 5 Alagoinhas, I-31-'03, Penther [NMW]; 2 Benevides, October 1918, S.M. Klagas [CM]; 1 Porto Alegre, 29-I-1948, Cuezso of Palacio; 1 Porto Alegre, 31-I-1948, Cuezso & Palacio [both, MLF]. **Goiás:** 1 Sao Domingos, August 1950, G. Ferracioli [KU]. **Mato Grosso:** 1 Aquidauana, 11 [to] 13 Dec. 1919 [CU]; 1 Barranco Branco, 24-IV-35, Souto Maior [CL]; 1 Bello Horizonte, 1 [to] 6 Nov. '19, R.G.H. [CU]; 2 Cáceres, 9 Dec. 1954, M.A. [KU]; 16 Chapada [Cuiabá, ante Cuyabá], March '83, H.H.S.; 35 Chapada [Cuiabá], May '83, H.H.S.; 24 Chapada [Cuiabá], October 1884, H.H.S.; 13 Chapada [Cuiabá], October '15 [?]; 1 Chapada [Cuiabá], October '21 [?]; 3 Chapada [Cuiabá], January [yr.?]; 23 Chapada [Cuiabá], February [yr.?]; 136 Chapada [Cuiabá], March [yr.?]; 3 Chapada [Cuiabá], March 5 [?], [yr.?]; 16 Chapada [Cuiabá], April [yr.?]; 3 Chapada [Cuiabá], September [yr.?]; 5 Chapada

[Cuiabá], October [yr.?]; 3 Chapada [Cuiabá], October [yr.?], H.H.S.; 5 Chapada [Cuiabá], November [yr.?]; 5 Chapada [Cuiabá], December [yr.?] [all, CM]; 1 Miranda (to Cujabá [Cuiabá]), I [to] V-'95, Andeer [USNM]; 1 Salobra, Jan. 18, '41, J.R. Bailey [KU]; 1 Uacaryzal (no data), H.H.S. [CM]; 2 Urucum (Corumba), 23 [to] 29 Dec. '19 [CU]; 1 (locality indeterminate), (Nhecolandle, Corumba), 17-X-1953, C.R. Goncaives [Seabra]. **Minas Gerais:** 1 Jundiáhy, 11-1898, Schrottky [CNC]; 1 Jundiáhy, 1899 [ZMB]; 1 Ouro Preto, IV-1954, N.L.H.K. [KU]; 2 Pedro Leopoldo (Esc[ola] Nac[ional] Agr[ícola]), X-1950, Franco [CL]; 1 [Serra] da Caparaó, (no data), Lange & Larsson, 800-2000 m [NRS]; 1 Sete Lagoas, May 6, 1908 [CM]; 15 Varginha, II-1954, L.C.A.; 1 Varginha, II-1956, F.M.O. [both, Seabra]; 10 Varginha, January 1960, Alvarenga & Seabra [KU]; 1 Vicosá, 30-X-32, E.J. Hambleton [USNM]. **Paraná:** 4 Araucaria, 12 Jan. 1955, M.&M.; 1 Araucaria, 17 Jan. 1956, C.D. Michener; 3 Curitiba *ante* Curitiba, 4 Nov. 1943, Ralph Hertel; 1 Curitiba, III-1954, N.H.L.K. [all, KU]; 1 Curitiba, 29-X-1955, H.E.M. [HEM]; 1 Curitiba, February 1956, C.D. Michener [KU]; 8 Guaratuba, 5-XI-55, H.E.M.; 1 Morretes (10 mi S. [of]), 5-XI-55, C.D. Michener, on *Senecio*; 15 Paranaguá, 5-XI-55, H.E.M. [all, HEM]; 1 (locality indeterminate), (Caiubá), 4-XI-1955, Mr.&Me.; 40 (locality indeterminate), (Caiubá), 1 Feb. 1956, Me.&Mr. [all KU]. **Rio de Janeiro:** 1 Itatiaia [Itatiaia], (Estação Biológica), 5-2-1930, 1900 m; 1 Itatiaia [Itatiaia], 6-XI-1937, Bliitt-Strauch, (J.F.Z.), 700 m [both, CL]; 1 Itatiaia, 2-1-1954, C.A.C.S., I.C. & M. Alvarenga & W. Zikan; 8 Itatiaia, 7-1-1954, C.A.C.S., L.C. & M. Alvarenga & W. Zikan [all, Seabra]; 1 Itatiaia, VI-1954, H.G., 850 m [JSM]; 2 Itatiaia, VI-1954, H.G., 850 m [Seabra]; 1 Itatiaia, VI-1954 (not 19-54), H.G. (not H. Souveia), 850 m [KU]; 2 Itatiaia, VIII-1954, H.G., 850 m [HEM]; 4 Itatiaia, VIII-1954, H.G., 850 m [JSM]; 14 Itatiaia, VIII-1954, H.G., 850 m; 6 Itatiaia, November 1955, H.G., 400 m; 3 Pedro de Rio (Retiro), III-1954, C.A.C.S. [all, Seabra]; 1 Petropolis, 24 [to] 27 Oct. 1919, R.G.H. [CU]; 2 Rio Caxambu (12 mi E. [of]), 12-I-1954, C.A.C.S.; 1 Santa Cruz, XII-1953, P.A.T. [all, Seabra]. **Rio Grande do Sul:** 11 Aratiba, 7-I-57, F.P. [HEM]; 1 Encrucilhada, II-1948, Cuezco & Palacio; 1 Julio Castillos, 3-III-1948, Cuezco & Palacio [both, MLF]; 1 Pelotas, III-21-1953, C.B.; 2 Pelotas, III-1-1954, C.B.; 1 Pelotas, I-24-1955, C.B.; 1 Pelotas, IV-14-1955, C.B.; 1 Pelotas, XII-30-1955, C.B.; 1 Pelotas, Jan. 6, 1956, C.B.; 1 Pelotas, I-7-1956, C.B.; 1 Pelotas, Jan. 31, 1956, C.B. [all, AMNH]; 1 Pelotas, 7-II-1956, Bo. [USNM]; 1 Pelotas, III-20-1956, C.B.; 1 Pelotas, April 4, 1956, C.B. [both, AMNH]; 1 Pelotas, Jan. 8, 1957, C.B. [KU]; 1 Pelotas, III-14-1957, C.B. [AMNH]; 1 São Leopoldo, (no data), J.W. Stahl [NRS]. **Santa Catarina:** 1 Campo Alegre, III-1946, A.M.; 9 Cauna, XII-1945, A.M. [all, AMNH]; 3 Corupa, II-1954, A.M. [KU]; 2 Corupa, II-1954, A.M. [Seabra]; 3 Corupa, III-1954, A.M. [KU]; 1 Corupa (Hansa Humboldt), November 1944, A.M.; 1 Corupa (Hansa Humboldt), XI-1945, A.M.; 1 Corupa (Hansa Humboldt), XI-1946, A.M. [all, AMNH]; 2 Nova Teutonia (27°11'-52°23'), 30-V-39, F.Pn.; 1 Nova Teutonia (27°11'-52°23'), 27-XI-39, F.Pn.; 1 Nova Teutonia (27°11'-52°23'), 27-XI-39, F.Pn.; 1 Nova Teutonia (27°11'-52°23'), 30-XII-39, F.Pn.; 106 Nova Teutonia (27°11'-52°23'), March 1942, F.Pn.; 192 Nova Teutonia (27°11'-52°23'), January 1948, F.Pn. [all, HEM]; 5 Nova Teutonia, I-22-48, F.Pn. [KU]; 2 Nova Teutonia, 4 April 1948, F.Pn.; 3 Nova Teutonia, 5 April 1948, F.Pn.; 1 Nova Teutonia, 15 April 1948, F.Pn. 3 Nova Teutonia, 7 June 1948, F.Pn. [all, HEM]; 5 Nova Teutonia, I-2-50, F.Pn.; 1 Nova Teutonia, II-4-1950, F.Pn.; 2 Nova Teutonia, II-5-1950, F.Pn.; 1 Nova Teutonia, IV-17-1950, F.Pn. [all, KU]; 1 Nova Teutonia (27°11'-52°23'), 4-III-1951, F.Pn. [HEM]; 1 Nova Teutonia, III-23-51, F.Pn.; 2 Nova Teutonia, III-29-51, F.Pn. [all, KU]; 2 Nova Teutonia (27°11'-52°23'), 4-IV-51, F.Pn.; 2 Nova Teutonia (27°11'-52°23'), 5-IV-51, F.Pn.; 1 Nova Teutonia (27°11'-52°23'), 6-IV-51, F.Pn.; 1 Nova Teutonia (27°11'-52°23'), 7-IV-51, F.Pn.; 2 Nova Teutonia (27°11'-52°23'), 11-IV-51, F.Pn.; 1 Nova Teutonia (27°11'-52°23'), 12-IV-51, F.Pn.; 1 Nova Teutonia (27°11'-52°23'), 13-IV-51, F.Pn.; 8 Nova Teutonia (27°11'-52°23'), 14-IV-51, F.Pn.; 3 Nova Teutonia (27°11'-52°23'), 15-IV-51, F.Pn.; 2 Nova Teutonia (27°11'-52°23'), 16-IV-51, F.Pn.; 2 Nova Teutonia (27°11'-52°23'), 17-IV-51, F.Pn.; 5 Nova Teutonia (27°11'-52°23'), 18-IV-51, F.Pn.; 3 Nova Teutonia (27°11'-52°23'), 19-IV-51, F.Pn.; 5 Nova Teutonia (27°11'-52°23'), 20-IV-51, F.Pn.; 2 Nova Teutonia (27°11'-52°23'), 23-IV-51, F.Pn.; 1 Nova Teutonia (27°11'-52°23'), 24-IV-51, F.Pn.; 4 Nova Teutonia (27°11'-52°23'), 26-IV-51, F.Pn. [all, HEM]; 4 Nova Teutonia, XI-1951, L.E. Plaumann; 1 Nova Teutonia, II-1952, L.E. Plaumann [all, KU]; 15 Nova Teutonia, 23-I-57, F.Pn.; 7 Nova Teutonia, 24-I-57, F.Pn.; 1 Nova Teutonia, 5-II-57, F.Pn.; 2 Nova Teutonia, 16-II-57, F.Pn.; 15 Nova Teutonia, 15-II-57, F.Pn.; 2 Nova Teutonia, 18-II-57, F.Pn.; 7 Nova Teutonia, 20-II-57, F.Pn.; 7 Nova Teutonia, 22-II-57, F.Pn.; 1 Nova Teutonia, 23-II-57, F.Pn.; 4 Nova Teutonia, 25-II-57, F.Pn.; 1 Nova Teutonia, 16-III-57, F.Pn.; 2 Nova Teutonia, 22-III-57, F.Pn.; 4 Nova Teutonia, 13-IV-57, F.Pn.; 9 Nova Teutonia, 20-IV-57, F.Pn.; 2 Nova Teutonia, 21-IV-57, F.Pn.; 2 Nova Teutonia, 1-V-57, F.Pn.; 1 Nova Teutonia, 5-V-57, F.Pn.; 1 Nova Teutonia, 11-V-57, F.Pn.; 1 Nova Teutonia, 26-V-57, F.Pn.; 1 Nova Teutonia, 11-VI-57, F.Pn.; 2 Nova Teutonia, 12-VI-57, F.Pn.; 2 Nova Teutonia, 14-VI-57, F.Pn.; 1 Rio Vermelho, January [yr.?] [all, HEM]; 1 Rio Vermelho, I-1946, A.M.; 1 Rio Vermelho, II-1946, A.M. [both,

AMNH]; 2 San Carlo, 10-V-57, F.Pn.; 1 Santa Catarina, March 23, '49, Plaumann [all, HEM]. **São Paulo:** 1 Barretos, (no data) [SADZ]; 3 Barueri, 31-I-1955, K.L.; 2 Barueri, 18-II-1955, K. Lenko; 3 Barueri, 21-II-1955, K.L.; 2 Barueri, 11-III-1955, K.L.; 1 Barueri, 25-III-1955, K.L.; 1 Barueri, 26-III-1955, K.L. [all, KL]; 2 Batatais, August 1943, Stafuzza [KU]; 1 Bauru, 4 Dec. '19, Harris [CU]; 1 Campo de Jordao, (no data) [SADZ]; 2 Queluz, 2-I-1954, L.C.A.; 1 Queluz, 7-I-1954, L.C.A.; 2 Queluz, II-1954, L.C.A. [all, Seabra]; 2 São Carlos, 1 April 1956, C.D. Michener [KU]; 1 São Paulo, (no data), Hammer [CU]; 1 São Paulo, (no data), Lindburg [NRS]; 1 São Paulo, (no data except 1948); 11 São Paulo, 7-XI-55, H.E.M.; 131 São Paulo, 11-XI-55, H.E.M.; 131 São Paulo, 11-XI-55, H.E.M.; 9 São Paulo, 12-XI-55, H.E.M.; 33 São Paulo, 13-XI-55, [HEM]; 11 São Paulo, 14-XI-55, H.E.M. [all, HEM]. **Locality unknown:** 1 Cambinas, (no data except number 1682) [CU]; 1 E[spirito] Santo, June 19, '98, [CM]; 1 Iburra, (no data), (ex F.W.) [CNC]; 1 San Andre (Mon. San José do Goro), 24 Nov. 1955 [KU]; 3 (no data except 1848), Beske [NMW]; 1 (no data), Dreins [NRS]; 1 (no data except 1846) [NMW]; 1 (no data), Krieghoff [NRS]; 1 (no data), (Mus. Vindob.) [v.d.V.]; 2 (no data except 1833); 1 (no data) [both, NRS]; 2 (no data) [ZMB]; 4 (numbered resp. 96125, 96257, 96279, 96280) [SADZ].

COLOMBIA

WORKERS

Antioquia: 1 La Ceja, 8.I.35, E. Cardona, *Crotalaria*; 2 La Ceja, 20-IV-55, A. Saldarriaga, *Crotalaria* [all, COL]; 2 Manizales, October 1954, Rios C.; 1 Medellín (no data) [all, USNM]; 1 Rionegro, 2-VII-1959, M. Revelo, *Crotalaria* [COL]. **Bolívar:** 1 Bolívar [to] Carmen (m[oun]t-[ain] range betw.), March '31, W.A. Archer [USNM]; 1 Guayabetal, 12-VII-40; 1 La Represa, 3-X-40, H.O. [both, COL]; 21 M[on]t[e] Redondo, XII-56, J.F., 1400–2000 m; 16 M[on]t[e] Redondo, 4-XII-56, J.F., 1000 m; 2 M[on]t[e] Redondo, 24-XII-56, J.F.; 22 M[on]t[e] Redondo, 27-XII-56, J.F.; 40 M[on]t[e] Redondo, 29-XII-56, J.F.; 1 M[on]t[e] Redondo, 31-XII-56, J.F.; 4 M[on]t[e] Redondo, I-57, J.F., 1500 m; 3 M[on]t[e] Redondo, 21-II-57, J.F., 1000 m [all, HEM]. **Boyacá:** 2 Santa Elena (Colombia College), 1957 [USNM]. **Caqueta:** 2 Cali District (western Cordillera), Feb. 19, 1935, Severo Quintero, 5500'; 18 Cali District (western Cordillera), 19-11-1935, Herbert F. Schwartz, 5500' [all, AMNH]; 1 Cali Valle, 4-27-39, B. Losada S. [USNM]; 2 La Cumbre, V-23-14, H.S. Parish, 6600' [CU]. **Cauca:** 1 Dopayan (no data except 1900), Lehmann [ZMB]; 5 Popayan, II-14-1935, James Aranibar, 7000–7800' [AMNH]. **Cundinamarca:** 2 Anolaima, VII-21-49, C.M., 1800 m [COL]; 1 Bogotá, (no data), B.G. [USNM]; 1 Bogotá, (no data), Petersen [v.d.V.]; 3 El Colegio, 3-III-40, 1200 m; 1 El Penon, 2-XI-40; 20 Funza, XI-24-55, E. Caicedo, Malezas [?]; 1 Funza, XI-25-55, E. Caicedo, Maiz Zea; 1 La Picota, 16-XI-36, H.O.; 3 La Picota, 3-XII-36, H.O.; 3 La Picota, 26 May '49, Contreras, 2640 m; 1 La Picota, 26 May '49, H.O., 2640 m; 1 La Picota, (no data), H.O. [all, COL]; 5 Manjuy, 31-XII-58, J.F.G.C., 3300 m [USNM]; 4 Pacho, 26-IX-40, H.O.; 1 Prmo. Chiraque [Páramo de Chirugua?], 8-X-41, H.O., 2550 m; 1 Prmo. Chiraque [Páramo de Chirugua?], 25-XI-41, L. Richter, 3200 m [all, COL]; 1 Sabana (Bogotá), X-1939, Ossrao, 2640 m [JSM]; 1 Salento, 14-VII-39; 1 Suba, 15-X-39, Borrero; 1 Vocaima, 6-X-49, C.M., 1300 m [all, COL]. **Magdalena:** 1 Cacagualito, November [yr.?] [CM]; 1 Rio Frio, 31-III [yr.?], Darlington, 1500' [MCZ]. **Nariño:** 1 La Cruz, 19-X-43, F.R. Fosberg [HEM]; 1 La Cruz, 19-X-43, F.R. Fosberg [USNM]; 2 Union, 2-VI-39, E.O. [COL]. **Santander:** 1 Santander, 1-II-40 [COL]. **Locality indeterminate or unknown:** 1 Agustal, (no data) [ZMB]; 1 Tunjuelito, XII-49, C.M., 2660 m; 1 V-10-49, C.M.; 1 July 14, '49; 3 July 15, '49, Contreras; 5 July 15, '49, C.M.; 1 July 16, '49, C.M.; 1 VII-21-49, C.M.; 3 25-IX-49, Contreras; 5 25-IX-49, C.M.; 1 (no data), L. Richter [all, COL]; 1 (no data), Q. Felipe Ovalle [AMNH]; 1 (no data), (Collection C.F. Baker) [USNM]; 1 (no data) [v.d.V.].

ECUADOR

WORKERS

Azuay: 1 Jubones (Yunguilla), IX-8-46, Z.M., 900 m [AMNH]. **Guayas:** 2 Guayagil, 1901, Buchwald [ZMB]. **Loja:** 1 Saruma, February '16, F.W. Rohwer [USNM]. **Locality unknown:** 1 (no data) [ZMB].

PARAGUAY

WORKERS

Asuncion: 2 Asuncion, Oct. 9, 1949 [KU]; 2 Asuncion (Jardin Botanico), 8-III-56, F.S., on *Cassia* [HEM]; 2 Buena Vista [Dpto. San Ignacio], Feb. 1, [yr.?], Donald Wees; 1 Buena Vista [Dpto. San Ignacio], Feb. 3, [yr.?], Donald Wees [all, MCZ]; 1 Colonia Sommerfeld ([Dpto.] Caa-Guazu), December 1958; 2 Itapua, [Itapirú?], ([Dpto.] Cantera), November 1956; 13 [Colonial] Hohenau ([Dpto. Carmen del Parana]), IV-53, (F.H.W.) [all, KU]; 4 Nueva Stalia, 7-XII-55, F. S., on *Cucumis melo* [HEM]; 4 Paso Yobay [Dpto. Guaira], (no data) [MCZ]; 3

San Bernardino [Depto. Caraguatay], 16-X-55, H.E.M. [HEM]; 1 S[an] Bernardino [Depto. Caraguatay], Marz (anf.), [yr.?], Fiebrig [CU]; 2 San Lorenzo (Depto. Central), 27 Sept. 1949 [KU]; 2 San Luis [de La Sierra, Dpto. Concepción], (no data), Reimoser [NMW]; 17 S[an]t[a] Barbara, 18-IV-57, F.S., on *Vernonia* [HEM]; 1 Tacuara [Dpto. Tacuaras], (no data); 5 Tacuru-Pucu [Dpto. Tacuaras], 2 [to] 7 April [yr.?], Donald Wees [all, MCZ]; 1 Villa Aurelia, 28-X-55, H.E.M.; 39 Villa Aurelia, 10-III-56, F.S., on Compositae; 35 Villa Aurelia, 11-III-56, F.S., on Compositae; 36 Villa Aurelia, 12-III-56, F.S., on Compositae; 4 Villa Aurelia, 16-III-56, F.S., on Compositae; 9 Villarrica, March 1939, F.S.; 1 Villarrica, March 25, 1940, F.S.; 1 Villarrica, April 21, 1940, F.S. [all, HEM]; 1 Villarrica, IX-18-50, F.H.S. [KU]; 29 Villarrica, 10-IV-57, F.S., on *Solanum* sp.; 1 Villarrica, 16-IV-57, F.S., on *Vernonia*; 47 Villarrica, 17-IV-57, F. S., on *Solanum* sp. [all,HEM]; 1 Villar[r]ica, (no data) [MCZ].

PERU

WORKERS

Cajamarca: 6 Santa Ana, 3 Aug. '11, (Yale Peruv[ian] Exp[edition]), 3000' [USNM]. **Cusco:** 1 Machu Picchu, 5-II-1959, J.F.G.C., 2,385 M.; 1 Machu Picchu, 6-II-1959, J.F.G.C., 2385 [both, USNM]. **San Martin:** 1 Moyobamba, 18-I-53, C. Albriffio [HEM]; 1 San Martin, Dec. 10, 1946, J.C. Pallister, 1500'; 1 Tarapoto (Region [of]), I-10-26, (H. Bassler Coll[ectio]n) [both, AMNH].

URUGUAY

WORKERS

Artigas: 1 Arroyo Cuaró (Paso Campanianta), 27-II-55, F. Delt & Crencas; 3 Sepultures [Sepultura], 22-II-54, 3392', on *Solanum* [all, CSC]. **Canelones:** 1 Bella Vista [Montevideo], III-1955, G. Soler [CSC]; 1 Canelones, X-1951, A. Silveira, [SG]; 1 Capurro [Montevideo], 5-1955, Viscardi [CSC]; 1 Carrasco (not Cartasco), I-1951, A. Silveira; 1 Carrasco (not Cartasco), 15-VII-53, O. Nunez [both, SG]; 1 Las Brujas, III-1955, E. Sanguinetti; 1 Montevideo, III-1943, Facuerad; 1 Montevideo, (no data except 1940) [all, CSC]; 1 Montevideo, (no data), Kinb. [NRS]; 1 Montevideo, (no data) [SG]; 1 Montevideo, (no data) [U-NMH]; 1 Prado [Montevideo], 3-1955, Viscardi; 1 Sayago [Montevideo], (no data except 1941); 7 Sayago, (Montevideo), 29-I-42, C.S. Carbonnel, on *Helianthus annuus* [all, CSC]; 1 Sayago [Montevideo], 14-IV-53, (L'Entomologia) [SG]. **Colonia:** 2 Carmelo, (no data), [SG]; 1 Carras de San Juan [Cuchilla de San Juan], 9-III-42, C.S. Carbonnel, on *Helianthus annuus* [CSC]; 1 La Paz, (no data except 1951), (L'Entomologia) [SG]. **Durazno:** 1 S[an]t[a] Isabel, XI-12-1909 [CM]. **Florida:** 2 Puntas [de Maciel], (no data), Arenal; 1 Santa Lucia, 6-III-53, A. Silveira [all, SG]. **Maldonado:** 1 Laguna del Diario, 12-IV-42, on *Senecio platensis* [CSC]; 1 (locality unknown), (no data) [CU]. **Paysandu:** 1 Paysandu, 24-III-[yr.?], A. Silveira [SG]. **San José:** 1 (no data), [CL]. **Locality indeterminate:** 5 Isla del Pechon (Dentro del Monte), 30-I-44 [CSC]. **Locality unknown:** 3 R. O. del, (no data) [CU]; (no data), Boucard [NRS]; 1 (no data), J. Wyman [MCZ]; 1 (no data except 1955); 3 (no data), A. Mesa; 1 (without label) [all, CSC].

VENEZUELA

WORKERS

Mérida: 2 Apartaderos, IX-42, P.J.A., 3320 m [AMNH]; 4 Merida, 8-1883 [NMW]; 16 Tabay, IX-42, P.J.A., 1760 m [AMNH]; 3 (locality unknown), (no data except 1878) [NMW].

SOUTH AMERICA (locality unknown)

WORKERS

1 (no data), Sch. hr. [NRS]; 2 (no data) [MCZ]; 2 (without labels) [NMW].

MISLABELED SPECIMENS

WORKERS

1 Botuco (Costa Rica), July 190; 1 Honduras, (no data) [both, CM].

ARGENTINA

MALES

Buenos Aires: 24 Boulogne, IV-6-53, M.M.S.; 3 Buenos Aires, II-1950, M.S.; 1 Buenos Aires, III-1951, J.F.; 1 Buenos Aires, V-1951, (L.E.P.); 1 Buenos Aires, 2-13-52, Senkute [all, KU]; 2 Capital [Buenos Aires], IV-1951, J.F. [HEM]; 18 Capital [Buenos Aires], IV-1951, J.F.; 1 Escobar, II-1939 [all, KU]; 1 La Plata, 4-20-27, Max Kisliuk, in orchard [HEM]; 1 Martinez, April 13, 1927, R. Gomez; 6 Olavarria, April 3, 1952, (J.F.) [all, KU]; 1 Olivero, II-53 [HEM];

3 Olivos, 3-1951, (F.) [KU]; 1 Pacheco, III-1952 [HEM]; 1 Punta Chica, II-21-50, M.S. [KU]; 6 Punta Chica, II-58; 11 Punta Chica, IV-56 [all, HEM]; 2 Punta Lara, III-24-51, (J.F.) [KU]; 2 Punta Lara, XII-52 [HEM]; 1 San Isidro, III-18-50, M.S.; 9 San Isidro, IV-25-50, M.M.S.; 2 San Isidro, II-1951, (F.); 2 San Isidro, II-23-51, (J.F.); 1 Tandil, II-1941, A.F.P. [all, KU]; 1 Tandil, January 1951, (J.F.) [Seabra]; 8 Tigre, III-1950, M.S.; 5 Villa Ballester [nr. Buenos Aires], IV-1951, Foerster; 2 Vicente Lopez, IV-27-51, (J.F.) [all, KU]. **Catamarca:** 9 Puerto Marquez (La Paz), III-1951, (F.) [KU]. **Cordoba:** 1 Calamuchita, (no data except 1945), Sance [MLF]; 1 Carlos Paz, I-1943, A.F.P. [KU]. **Corrientes:** 2 Manantiales, II-1947, T. de Apostol [MLF]. **Entre Rios:** 1 Concordia, II-1930 [CL]; 1 Gualeguarchú, (no data except '45), A. Martinez [KU]. **Formosa:** 1 Espinillo, 29-XI-50, Ms.&Wk. [MLF]; 1 Gran Guardia, I-XII-52; 1 Gran Guardia, II-53 [both, HEM]. **Jujuy:** 1 Calilegua, 13-II-1950, Ms.&Wk.; 1 Calilegua, 10-III-55 [both, HEM]; 1 Jujuy, 10 Feb. 1920, R.G.H.; 1 Jujuy, 11 Feb. 1920, R.G.H. [both, CU]; 1 Jujuy, May 7, 1927, M. Kisliuk, in Citrus Grove [HEM]; 1 Lodesner, 3-II-50, Ms.&Wk.; 2 Los Perales, 6-II-1950, Ms.&Wk. [all, MLF]; 3 Monterrico, I-1948, A.F.P.; 1 Perico, I-1950, A.F.P. [all, KU]; 1 Reyes, II-1948, A.F.P. [HEM]; 1 Reyes, II-1948, A.F.P.; 2 Zapla, IV-1948, A.F.P. [all, KU]. **Misiones:** 4 Campo Viera, XII-55 [HEM]; 2 Cerro Azul, (no data); 1 Loreto, 10-1931 [all, KU]; 7 San Pedro, II-56; 7 Sao Ignacio, IV-56 [all, HEM]. **Salta:** 1 Guemes, IV-1950, A.F.P.; 1 La Bomba, III-1946, A.F.P.; 3 Lesser, I-1946, A.F.P. [all, KU]; 1 Tartagal, II-46, T. Peredo; 1 Tartagal, XI-46, T. Peredo [both, MLF]. **Santa Fe:** 1 La Gallareta, III-46, Hd.&Wk. [MLF]. **Tucuman:** 8 Aconguia, I-IV-47, As.; 2 Cadillal, 16-V-48, Wk.; 1 El Duraznito, V-47, As.; 6 Los Nogales, III-47, A.A.; 8 Los Nogales, IV-47, A.A.; 1 Los Sarmientos, III-47, Fernandez; 1 Monte Bello (Dpto. Rio Chico), 18-IV-1946, A.Wk.; 4 Parque Aconguia, I-IV-47, As.; 1 Puerto Vecino, (Est[ación] Experimental); 1 Saladilla [to] Tapia (Ruta 9, entre), 10-I-48, Wk.&Gb.; 1 San Javier, III-50, M. Acel [all, MLF]; 1 San Pedro de Colalao (Depto. Trancas), XII-1950, A. [KU]; 1 Tafi Viejo (Quebrado Cainzo), 8-IV-48, R.Gh.; 1 Tucuman (Est[ación] Experimental), IV-8-1917; 1 Tucuman (Est[ación] Experimental), IV-22-1917; 2 Tucuman (Est[ación] Experimental); 1 Tucuman (Est[ación] Experimental); 2 Tucuman, (no data except 1945); 1 Tucuman, III-46, Jolduer; 1 Tucuman, I-47, J. Cordoba; 2 Tucuman, 28-II-47, J. Cordoba; 4 Tucuman, 1-IV-1947, As.; 1 Siambon ([Dpto.] Tafi), II-45, D.O.; 1 Siambon ([Dpto.] Tafi), IV-45, D.O.; 2 Siambon, 4-II-46, D.O.; 2 Siambon ([Dpto.] Tafi), V-46, D.O.; 6 Villa Padre Monte (Burruyacu), 17-I [to] 7-II-48, R.G. [all, MLF]. **Locality unknown:** 1 Laguna Larga, IV-48, F. Morel [MLF]; 1C. Federal, III-1944; 4 (no data), (J.F.) [all, KU].

BOLIVIA

MALES

Beni: 1 Rurrenabague, 17 Oct. 1956, L.P., 175 m [KU]. **Santa Cruz:** 2 Buena Vista (Dpto. Ichilo), IV-1950, L.E.P.; 1 Buena Vista (Dpto. Ichilo), IV-8-1950, L.E.P.; 1 Buena Vista (Dpto. Ichilo), IV-20-1950, L.E.P.; 1 Buena Vista, III-2-51, A.F.P.; 1 Oriental, May 20, 1955, Z., 500 m [all, KU]. **Province unknown:** 3 Vesperdia, 20-IV-50, L.E.P. [KU].

BRAZIL

MALES

Mato Grosso: 1 Bello Horizonte, 1 [to] 6 Nov. '19, [CU]; 4 Chapada [Cuiabá], (no data); 1 Chapada [Cuiabá] March [yr. ?], H.H.S.; 1 Chapada [Cuiabá], 23 May [yr. ?], H.H.S. [all, CM]. **Minas Gerais:** 1 Campinas Goyaz, I-1936, Borgmeier & S. Lopes, [JSM]; 1 Passo Quatro (Faz dos Campos), 19-IX-1916, J.F.Z.; 1 Passo Quatro (Faz dos Campos), 1-I-1920, J.F.Z., 1600 m; 1 Passo Quatro (Faz dos Campos), 23-II-1920, J.F.Z.; 1 Passo Quatro (Faz dos Campos), 19-IV-1920, J.F.Z., 1600 m; 1 Passo Quatro (Serra dos Cachos), 15-I-1923, J.Z., 1460 m [all, CL]; 1 Varginha, II-1955, F.M.O. [Seabra]. **Paraná:** 25 Cariubá, 1 Feb. 1956, Me.&Mr.; 1 Curitiba (not Curitiba), (Morretes, Alto de Serra), 4 Feb. 1956, Me.&Mr. [all, KU]. **Rio de Janeiro:** 1 Itatiaia [Itatiaia], (Estação Biologica), 5-2-1930, 1900 m; 1 Itatiaia [Itatiaia], (Estação Biologica), 8-12-1930, 7-900 m [both, CL]; 1 Itatiaia [Itatiaia], 7-I-1954, C.A.C.S., L.C. & M. Alvarenga, & W. Zikan [Seabra]; 1 Itatiaia [Itatiaia], VI-1954, H.G., 850 m [KU]; 5 Itatiaia [Itatiaia], VI-1954, H.G., 850 m [Seabra]; 2 Itatiaia [Itatiaia], VIII-1954, H.G., 850 m [HEM]; 1 Itatiaia [Itatiaia], VIII-1954, H.G., 850 m [KU]; 3 Itatiaia [Itatiaia]; VIII-1954, H.G., 850 m [JSM]; 7 Itatiaia [Itatiaia], VIII-1954, H.G., 850 m; 3 Itatiaia [Itatiaia], November 1955, H.G., 400 m [all, Seabra]. **Santa Catarina:** 2 Campo Alegre, IV-1946, A.M.; 2 Corupa, III-1954, A.M.; 1 Corupa, IV-1954, A.M. [all, AMNH]; 1 Nova Teutonia, 27-VIII-34 [CL]; 1 Nova Teutonia, 7 June 1948, F.Pn.; 1 Nova Teutonia, 16-IV-1951, F.Pn., 3-500 m; 1 Nova Teutonia, 1-V-1951, F.Pn., 3-500 m; 1 Nova Teutonia, 24-I-57, F.Pn.; 1 Nova Teutonia, 20-II-57, F.Pn.; 5 Nova Teutonia, 20-IV-57, F.Pn.; 3 Nova Teutonia, 23-IV-57, F.Pn.; 2 Nova Teutonia, 27-IV-57, F.Pn.; 4 Nova Teutonia, 1-V-57, F.Pn.; 1 Nova Teutonia, 3-V-57, F.Pn.; 4 Nova Teutonia, 4-V-57, F.Pn.; 1 Nova Teutonia, 5-V-

57, F.Pn.; 2 Nova Teutonia, 26-V-57, F.Pn. [all, HEM]. **São Paulo:** 1 Barueri, 21-II-1955, K.L. KL; 1 Capitól [São Paulo], 23-8-37, C.I. Schwebel; 2 Capitól [São Paulo], X-1937, R. Aruazo; 1 Laranjal, I-1935, E. Sch[webel] [all, IBSA]; 1 Queluz, II-1954, L.C.A. [Seabra]; 1 São José (Campos), II-1935, O.B.&L.V.; 1 São José (Campos), X-1935, L.V.; 1 São Paulo, 3-28, Ada Serra [all, IBSA]; 1 São Paulo, 12-49, [Diringshoffer] (not Drings); 2 São Paulo, 7-XI-55, Paulo Nogueiro-Neto & H.E.M.; 163 São Paulo, 11-XI-55, H.E.M.; 3 São Paulo, 12-XI-55, H.E.M.; 14 São Paulo, 13-XI-55, H.E.M.; 8 São Paulo, 14-XI-55, H.E.M. [all, HEM]; 3 São Paulo (no data); 1, locality indeterminate (Butantan), 4-1938, B.L.R. [all, IBSA]; 1 (locality unknown), (no data), Hammar [CU]. **State or locality unknown:** 1 Cambinas, (no data) [CU]; 1 (no data), F. Sahlb[erg] [NRS]; 8 (Nos. 96127, 96128, 96183, 96184, 96186, 96200, 96216) [SADZ].

COLOMBIA

MALES

Antioquia: 3 La Ceja, 20-IV-55, A. Saldarriago, *Crotalaria* [COL]; 1 Manizales (en Casa Ago. [?]), (no data except 1953), C. Rios [USNM]. **Bolivar:** 4 M[on]t[e] Redondo, 27-XII-56, J.F.; 1 M[on]t[e] Redondo, 29-XII-56, J.F.; 3 M[on]t[e] Redondo, I-57, J.F., 1500 m (all, HEM). **Cundinamarca:** 1 Bogotá, (no data except "40, R"), [COL]; 1 Bogotá, (no data), Kruseman [ZMB]; 1 Bogotá, (no data), Petersen [v.d.V.]; 1 Bogotá (Sabana de), X-1939, H.E.O. & Mesa, 2640 m [Seabra]; 1 S[an] Antonio, 9-9-1908 [ZMB]. **Locality indeterminate or department unknown:** 1 Ciudad Naiver, 2-XII-48, Lopez; 14 (locality unknown), July 14, '49, Contreras; 1 (locality unknown), July 14, '49, C.M.; 1 (locality unknown), 25-IX-49, C.M. [all, COL].

PARAGUAY

MALES

Asuncion: 2 Col[onia] Independencia, [Dpto. Guayra], III-27-51, (J.F.) [KU]; 2 Paso Yobay [Dpto. Guaira, or Guayra], (no data) [MCZ]; 5 S[an]t[a] Barbara, 18-IV-51, F.S., on *Vernonia* [HEM]; 3 Tacuara [Dpto. Tacuaras], (no data); 2 Tacuru-Pucu [Dpto. Tacuaras], 2 [to] 7 April [yr.?], Donald Wees [all, MCZ]; 4 Villa Aurelia [nr. Asuncion], 10-III-56, F.S., on Compositae; 1 Villa Aurelia [nr. Asuncion], 11-III-56, F.S., on Compositae; 1 Villa Aurelia [nr. Asuncion], 12-III-56, F.S., on Compositae; 1 Villarrica, March 1939, F.S.; 2 Villarrica, March 26, 1940, F.S.; 1 Villarrica, 17 Jan. 1948, F.S.; 1 Villarrica, 10-IV-51, F.S., on *Solanum* sp.; 1 Villarrica, 16-IV-51, F.S., on *Vernonia* [all, HEM].

PERU

MALES

Cajamarca: 1 Santa Ana, 3 Aug. 1911, 3000', (Peruv[ian] Exp[edition]) [USNM]. **San Martin:** Tarapoto (Region of), I-10-26, (H. Bassler Coll[ectio]n) [AMNH].

URUGUAY

MALES

Artigas: 1 Morales (not Moraes) [Paso], [Arroyo de los Molles] (not Mello), 19-7-82; 1 Morales (not Morals) [Paso], [Arroyo de los Molles] (not Mello), 26-7-82 [both, CL]. **Camelones:** 1 Montevideo, 14-IV-53, A. Garcia; 1 Montevideo, X-54, A. Silveira, [both, SG]; 2 Montevideo, IV-1955, G. Soler; 1 Montevideo (La Teja), 22-10-55, E. Perez Alvarez [all, CSC]; 1 Montevideo, (no data) [CU]; 1 Sayago [Montevideo], 24-IV-53, A. Ibarra [SG]; 1 Sayago [Montevideo], October 1955, Olveyra [CSC]. **Colonia:** 1 Estanzuela, April '54, Melson Oudvi [CSC]. **Durazno:** 1 Alto II[lescasc?], 15-3-35 [CL]. **Maldonado:** 2 Sayago, 12-IV-42, on *Senecio platensis* [CSC]. **San José:** 1 San José, 20-I-53, A. Silveira [SG]; 1 (locality unknown), (no data), Buschental [CL]. **Tacaurembó:** 1 Tacaurembó, 15-IV-1954, P. Chapt [SG]. **Locality unknown:** 1 (10-3-25); 1 (5-25-27), (Mar.); 1 (22-2-28), (Mar. J. Cop.); 1 (5-XII-35), (Kinll.) [all, CL]; 2 (no data except 1955); 1 (no label) [all, CSC]; 1 R. O. del, (no data) [U-NMH].

VENEZUELA

MALES

Mérida: 1 Tabay, IX-42, P.J.A., 1760 m [AMNH]. **Locality unknown:** 1 (no data) [NRS].

SOUTH AMERICA (locality unknown)

MALES

2 (without labels) [KU].

MISLABELED SPECIMEN

MALE

1 Mexico, Sallé [NRS].

Megabombus (M.) rubriventris (Lep.) new comb.

Bombus rubriventris Lep., 1836, p. 472; (*Bombus rubriventris*, Ckll., 1921, p. 364): *Bombus carolinus*, Grne., 1860, (nec *Apis carolinus* L., 1767, p. 959; nec *A. carolina*, F., 1775, p. 379; nec *A. carolina*, F., 1781, p. 475; nec *A. carolina*, F., 1787, p. 299; nec *A. carolina*, F., 1793, p. 316), [n. syn.]: *Bombus (Bombus?) rubriventris*, Fkln., 1913, p. 181: . . . *rubriventris*, Mlrn., 1960a, p. 96, (♀ type).

DESCRIPTION. Queen. Length, 20 mm; abdomen, 12 mm; width at wing bases, 9 mm; width across T2, 10 mm; front wing length, 19 mm, width, 7 mm. Head: Frontal outline trapezoidal excluding mandibles, slightly higher than maximum width, temples broadly rounded; labral tubercles prominent, transverse oval, bluntly pointed, rather coarsely punctate, nearly contiguous mesally; labral shelf coarsely sculptured and moderately prominent, anterior (ventral) margin weakly arcuate extending from about middle each tubercle; tridentate mandible with broad mesal notch on anterior rim similar to that in *bellicosus*, basal furrow shallow, first and second keels not strongly arcuate, anterior discal area little narrower than median discal area, with distinct incisura lateralis and sulcus obliquus; malar space weakly imperfectly convex from front to rear, mostly smooth and polished, almost as long as distal width between and including mandibular articulations, slightly less than $\frac{1}{4}$ height of compound eye; clypeus about as high as basal width, evenly convex, moderately punctate over disc, with coarser more numerous punctures laterally and ventrolaterally above labral tubercles; upper parafacial area rather abruptly arcuately prominent along anterior vertex; temples dorsally, preocellar area and postvertex with median punctures; ocellocular area weakly punctate; ocelli situated very close to supraorbital line, each equal and of usual size, separated from one another by little less than their diameter, interocellar line equal to ocellocular line; flagellum about $1\frac{1}{2}$ times as long as scape, F1 about $1\frac{1}{2}$ times longer than apical width and length of F2, exceeding F4 only slightly, F3 subequal to F4. Thorax: Disc centrally smooth, polished, with well-separated moderate sized punctures laterally and beyond mid-scutel furrow; mesobasitarsite distoposteriorly pointed as in *bellicosus*; metabasitarsite nearly 3 times as long as width at basal third, distally about equal to width just beyond auricle, posterior margin weakly evenly arched, distoposteriorly terminated rather acutely as in *bellicosus*, bearing similar fringe; wing venation, infuscation as in *bellicosus*, and without pronounced violet reflections (violet reflections stated in original description in error). Abdomen: Dorsal punctation fine, dense, on venter stronger and sparser; epipygium without distinct sculpture, except weak incomplete median furrow. Pubescence: Rather fine on head and thorax, dense, uniformly short except longer and looser on face above, vertex and along posterior scutellar margin; that on abdominal terga more compact, longer, somewhat coarser, mostly recumbent, on venter finer and looser; that on legs, including corbicular fringe, as in *bellicosus*. Color: Head and pronotum black; meso- and metathorax (including pleura) cinereous (most hairs with basal one-third or two-thirds black or sooty, remainder white or silvery except those near wing bases and tegulae mostly black, along posterior scutellar margin mostly silvery); vestiture on legs black except fine, short pale pubescence on hind tarsus; abdominal T1 black, T2-4 bright coppery red, T5 mostly black with some pale (or pale-tipped pubescence) distally, T6 black with some short pale pubescence medially, short and longer hairs along distal margin predominantly pale; abdominal sterna mostly black with pale pubescence along distal margins.

TYPE. Examined a ♀ in the Westwood Collection, Hope Department of Entomology, University Museum, Oxford, England. This is the unique specimen representing the species.

TYPE LOCALITY. Brazil ("St. Dominique"), [São Domingos, Goiás].

COMMENT. The unique ♀ type has received critical study by me in 1960 and 1964. The numerous morphological features of *rubriventris* are very much like those of *bellicosus* (Sm.) and there is the likelihood that, in reality, *rubriventris* is

the progenitor of *bellicosus*. No morphological aberrancy in any part can be detected in the type above. Currently, this species is either very rare and localized in highland areas or it is entirely extinct; whichever is true could be ascertained by intensive collecting. The exact location of the type locality, "St. Domingue" is uncertain, and I am assuming that it refers to what is now São Domingos, in the Brazilian state of Goiás. Lepeletier (1836: 472) stated only that the species was from "Bresil". It is very unlikely that Lepeletier had before him more than this single specimen, which he indicated was from the Dejean Collection (intensive search did not, however, disclose any *rubriventris* (Lep.) among the few remaining recognizable specimens of the Dejean Collection). Westwood acquired this specimen from Lepeletier. Evidently, Cockerell (1921: 364) was in error when he implied that this unique specimen originally belonged to the Hope Collection (Oxford, England), "which had passed through the hands of Lepeletier". I have studied the same copy of Lepeletier's work used by Westwood, who noted on the margin of the page at the side of the original description of *rubriventris* that the locality "St. Domingue" on the separate label was written by Latreille, and that the determination label "*Bombus Rubriventris*" (on opposite side, "*carolinus*") was attached by Lepeletier. It is possible that Latreille originally obtained this specimen as early as 1800, after which it came into the possession of Dejean. Since that early date, man's activities in Brazil altering the environment could have also affected the existence of this species, so that currently this taxon is either very rare or non-existent, as stated above. The State of Goiás of the Brazilian Highlands is not far from the currently known northernmost distribution (State of Paraná) of *bellicosus*, which is typically a species of the high plateau, or of the lowlands (farther southward); whereas, *rubriventris* appears to represent a true highland form.

Megabombus (M.) bellicosus (Sm.)

Bombus bellicosus Sm., 1879, p. 131: *Bombus bellicosus*, Bing., 1897, p. 549, (foot-note): *Bombus bellicosus*, M-W., 1916, p. 469: *Bombus emiliae* D.T., 1890, p. 139: *Bombus emiliae*, Fkln., 1913, p. 102: *Bombus muscorum* v. *corsicus* D.T., 1882, p. 30: *Bombus thoracicus* Sich., 1862, p. 121, (*nec thoracicus* Spin., 1806, p. 30, pl. 2, fig. 11; *nec* Herrich-Schäffer, 1840, p. 89): *Bombus thoracicus* v. *fuliginosus* Fr., 1904b, p. 188, (*nec schneideri* v. *fuliginosus* Fr., 1903, p. 253; *nec hortorum* v. *fuliginosus* Fr., 1909a, p. 676; *nec humilis* v. *fuliginosa* F.&W., 1904, p. 557; *nec humilis* v. *fuliginosus* F.&W., 1910, pp. 39, 40, *vel hortorum* v. *fuliginosus* F.&W., *ibid.*, p. 62): *Bombus thoracicus* v. *umbrinus* Fr., 1913, p. 87: *Bremus bellicosus*, Fris., 1925a, p. 149: *Fervido-bombus* (F.) *emiliae*, Skor., 1922a, p. 153, (list): *Megabombus bellicosus*, Mlrn., 1962b, p. 729: *Megabombus* (Dumoucheli group), Mlrn., 1962b, p. 729, (p.p.): *Megabombus* (M.) (Dumoucheli group), Mlrn., 1961a, p. 57, (p.p.): (Genus?) *bellicosus*, Skor., 1922a, p. 159, (list, "*Incertae sedis*"): . . . *bellicosus*, Mlrn., 1960a, p. 89, (♀ type): . . . *thoracicus*, Mlrn., 1960a, p. 97, (♀ H.E.M. lectotype).

DESCRIPTION. **Queen.** Length, 25.0 mm; width at wing bases, 11.0 mm; abdomen, 13.0 mm, across T2, 11.5 mm; front wing length, 20.0 mm, width, 7.0 mm. **Head:** Frontal outline (excluding mouthparts) mostly round trapezoidal, greatest width through compound eyes subequal to height, rather evenly rounded above; vertical region with limited smooth concavities laterad of ocelli which are situated in weak arc just below supraorbital line, separated from one another by little less than widest diameter of median ocellus, the interocellar line somewhat greater than ocellular line; ocular half of ocellular area microscopically punctate with few deeper punctures behind; compound eyes with inner margins nearly parallel except above, each eye more broadly rounded below, about $2\frac{1}{2}$ times higher than greatest width; clypeus basally wider than median

height, disc evenly but not strongly convex, for the most part covered with medium punctures; ventral margin of labrum broadly arcuate, the tubercles irregularly rounded below and without strong mesal summits, coarsely irregularly punctate and not very widely separated; malar space somewhat shorter than distance between (and including) mandibular articulations, weakly convex, smooth and bearing some microscopic hairs; flagellum $1\frac{1}{2}$ times longer than scape, F1 subequal to F2 plus 3, F2 distinctly shorter than F3. *Legs*: Mesobasitarsite subrectangular, about 3 times longer than its greatest width, its outer surface rather strongly concave mid-longitudinally, the rounded distoanterior angle in recess of acute distoposterior angle and with distinct emargination between; outer hind tibial surface for the most part smooth and polished, mid-longitudinally convex to about distal one-quarter; metabasitarsite with outer surface broadly and strongly concave mid-longitudinally, covered with fine suberect pubescence, nearly 3 times longer than widest dimension, distal end (and angles) similar to that of mesobasitarsite, posterior margin strongly arcuate near base, progressively evenly and more weakly so to distal end. *Pubescence*: Rather short and even except somewhat longer on scutellum and antepenultimate abdominal tergum, dense; corbicular fringe moderately dense, hairs weakly arcuate except distal ones more strongly so, longest ones subequal to widest measurement of tibia; metabasitarsal posterior fringe rather short, longer arcuate hairs basally, gradually diminishing in length distally, sparser and inconspicuous on distal third. *Color*: Head black with few pale hairs intermixed on vertex, becoming burnt sienna on most of occiput; thoracic disc russet brown (often lighter approaching shades of yellow blending to brownish yellow on pronotum and most of scutellum), sides of thorax below wing bases black except for few intermixed pale hairs on metapleural region; legs black; abdominal T1-3 mostly black, with some pubescence covering anterolateral areas of T1 burnt sienna and some blackish with pale tips, a scant amount mid-basally on T2 tawny yellowish, elsewhere on T2-3 a few scattered rufescent hairs especially laterally and distally, T4-6 bright rufous, the abdominal venter rufescent with brownish tinge to pile on mid- and basal sterna. Wings deeply infumated, with some violaceous reflection under certain light, paler in the discal area.

Worker. Except for generally smaller size, taxonomic characters in this caste are relatively similar to those detailed for the queen. *Color*: Head black; thorax above (usually) more of a tawny yellow; abdominal T1-3 largely black, T4-6 (usually) paler rufescent. Wings little lighter and more uniformly infumated, (usually) with some violaceous reflection.

Male. Length, 16.0 mm; width at wing bases, 8.0 mm; abdomen, 8.0 mm, width across T2, 7.5 mm; front wing length, 14.0 mm, width, 4.5 mm. *Head*: Frontal outline (excluding mouthparts) suggestive of well rounded trapezoid, especially rounded behind eyes, less so on the vertical region, its widest dimension about equal to median height; vertical region only weakly concave laterad of ocelli; interocellar line about equal to ocellocular line; ocular half of ocellocular area with microscopic punctation, the ocellar half smooth and polished; labrum twice as broad as thick, its outer surface mostly punctate, the callosities weak; malar space slightly shorter than distance between (and including) mandibular articulations, weakly convex, mostly microscopically punctate; flagellum 4 times longer than scape, F1 and 2 about equal in length and together slightly longer than F3. *Legs*: Mesobasitarsite rectangular, about 4 times longer than widest dimension, its outer surface strongly concave longitudinally, the end emarginate between subacute distal angles; hind tibial outer surface longitudinally convex, well covered with rather short hairs, the posterior marginal fringe short and not markedly differentiated; metabasitarsite nearly $3\frac{1}{2}$ times longer than greatest width, subrectangular, its outer surface for the most part mid-longitudinally concave, covered with fine suberect hairs, the posterior fringe short, even and moderately dense, distal end distinctly emarginate between subacute distoposterior and more rounded distoanterior angles. *Pubescence*: In respect to length, density and evenness similar to that of the female. Genitalia, seventh and eighth abdominal sterna (Pl. XIV). *Color*: Head black intermixed with cinereous pile on face and lower genal region and burnt sienna hairs with paler tips on the occiput; thoracic dorsum pale brownish yellow (amber colored), pleura mostly blackish mixed with some pale (tawny) hairs above, becoming tawny below and on metapleura; legs mostly black intermixed with some pale hairs on femora, largely pallid on trochanters and coxae; abdominal T1 (largely), at least basal middle of T2, and some hairs along base of T3 tawny yellowish, otherwise T2-3 black, except distally on T3 (some) and T4 (except few blackish hairs intermixed basally) and all of T5-7 rufescent, the abdominal venter mostly pale rufescent. Wings as in the worker.

Redescribed from hypotypes. **Queen**, Tandil, Prov. B.A., Argentina, XI-54, 2 m; **workers**, 1 Sierra de la Ventana, Sur. Prov. B. Aires, Arg., III-1954, 600 m; 1 Araucaria, Paraná, Brasil, 12 Jan. 1955, Moure & Michener [all, HEM]; 1, Blanquillo, Dur. [Uruguay], 30-I-1948, Ruffinelli [SG]; **males**, Prov. Buenos Aires, Arg., III-1951, (Juan Foerster) [HEM]; 1, Maldonado, [Uruguay], IV-1953 [SG].

TYPE. Examined a ♀, no locality or date, Type Hym. 17B1049, British Museum (N.H.), London (Milliron 1960a: 89).

TYPE LOCALITY. "Sumatra or India" given by Smith (1879: 131) was guesswork; the type most probably came from Argentina. Number of specimens at hand: 731. In flight: All castes throughout the year; *i.e.*, queens or workers or males, or combinations thereof, might be taken at some appropriate time and place in the species' range. Distribution: (vertical), occurs from *ca.* 1000 to 2000 ft; (horizontal), southern Brazil (Paraná, Santa Catarina), Uruguay and northern Argentina. Likely to be found in the eastern part of Paraguay also. Floral visitations: *Helianthus*, *Salvia*, and *Senecio*.

COMMENTS. Except for overall size differences, little morphological variability is evident. Of the worker hypotypes above, two are of similar size but the third [SG] is considerably larger; in the material at hand some workers are much smaller than given here, and some almost attain the size of small queens which is not unusual. As far as coloration is concerned, the thoracic dorsum of the queen varies from a rich ferruginous brown to reddish or (even) tawny yellow, while the abdomen is much less variable except for the amount or extent of yellowish pile mid-basally on T2; this condition is usually less noticeable on the workers. The male is the most variable chromatically, especially on the abdomen; sometimes the thoracic dorsum (which is usually drab yellow) tends to be brownish yellow or pale yellowish brown. Except for male abdominal T4–7, the remaining terga might be predominantly tawny or drab yellowish, especially on T1 and T2.

ARGENTINA

QUEENS

Buenos Aires: 1 B[ueno]s Aires, XII-1944, P. Lara; 1 B[ueno]s Aires, 19-X-1945, S. Ventana [both, KU]; 1 Buenos Aires, (no data) [CU]; 1 Buenos Aires, (no data) [SG]; 1 B[ueno]s Aires (not Aries), (no data) [KU]; 1 La Plata, (no data), Spegezzini [MCZ]; 2 Lujan, XI-54 [HEM]; 1 D[e]p[artment] to de Puan, (Est[ancia] Felipe Sola), XII-1954, A. Martinez, [KU]; 1 San Isidro, I-56 [HEM]; 1 S[an] José, 15-III-55, Ponce de L. [CSC]; 1 Sierra de la Ventana, III-1954, 600 m; 1 Tandil, X-16-51 [both, KU]; 3 Tandil, XI-1951, (J.F.) [HEM]; 21 Tandil, XI-1951, (J.F.) [KU]; 1 Tandil, XII-53 [HEM]; 5 Tandil, II-1954, (F.H.W.), 250 m [KU]; 131 Tandil, X-54, 250 m; 36 Tandil, XI-54, 250 m [both, HEM]; 1 Villa Ballester [nr. Buenos Aires], IV-1951, Foerster [KU]; 1 (locality indeterminate), (Las Bruyar), III-1955, E. Lampinski; 1 (locality indeterminate), (Toodon), 10-1954, S. Lyagi [both, CSC]. **Cordoba:** 10 Capital [Cordoba], 19-XI-1948, P.L.; 1 Capital [Cordoba], 18-XII-48, P.L. [all, MLF]; 1 Cordoba (not Cordova), (no data), Davis [MCZ]. **Tucuman:** 1 San Pedro de Colalao, (Trancas), XII-1950, A., (J.F.) [KU]. **Locality unknown:** 1 (no specific data) [AMNH].

BRAZIL

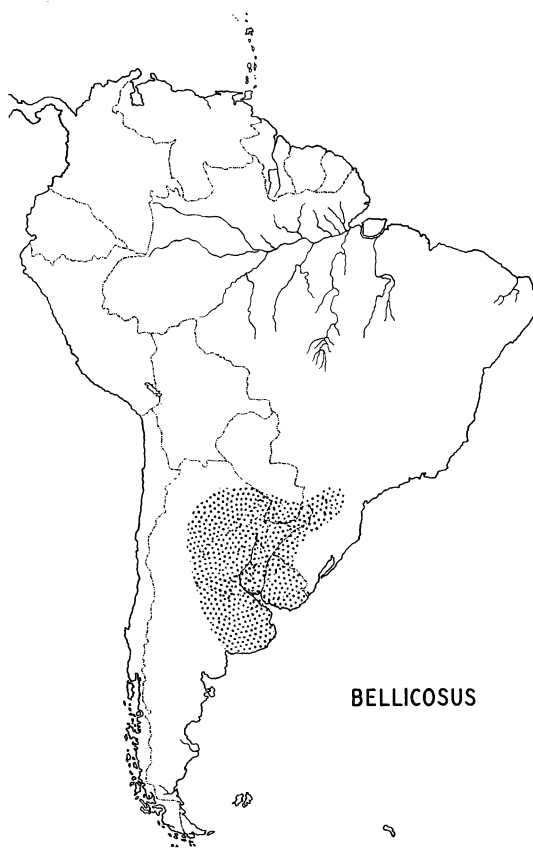
QUEENS

Paraná: 29 Araucaria, 27-X-55, H.E.M.; 30 Araucaria, 31-X-55, H.E.M.; 9 Araucaria, 31-X-55, H.E.M., on Labiatae (*Salvia*); 1 Araucaria, 3-XI-55, H.E.M. [all, HEM].

URUGUAY

QUEENS

Canelones: 1 Montevideo, X-1951, A. Silveira; 1 Montevideo, XI-1951, (L'Entomologia); 1 Montevideo, XI-1951, A. Silveira; 1 Montevideo, (no data except 1951); 1 Montevideo, 28-XI-55, A. Silveira [all, SG]; 1 Montevideo, (no data), R. Adel [U-NMH]; 2 Montevideo, (no data) [CU]; 1 Montevideo, (no data) [NRS]; 1 Mont[e]video, (no data) [SG]. **Colonia:** 1 Carmelo, 10-II-54, G. Kruger [SG]; 1 Rosario (not Rosereo), (no data), Davis [MCZ]. **Florida:** 1 Florida, (no data), R. de Leon [SG]. **Maldonado:** 1 Maldonado, (no data) [CU]. **San José:** 2 San José, 24-X-54, C.S. Carbonell, on volando [en volandas] [CSC]. **Locality unknown:** 1 (no data), R.O. del. [U-NMH].



MAP 14.

LOCALITY UNKNOWN (South America)

QUEEN

1 (no label) [KU].

ARGENTINA

WORKERS

Buenos Aires: 5 Abra d[e] l[a] Ventana, 6-II-47, Rossi [MLF]; 7 Buenos Aires, III-1951, J.F. [KU]; 4 Buenos Aires (not Buenos Ayres), (no data), Knib.; 1 Buenos Aires (not Buenos Ayres), (no data), Haglund; 9 Buenos Aires (not Buenos Ayres), (no data) [all, NRS]; 12 Cerro d[e] l[a] Ventana, 8-II-48, Rossi [MLF]; 1 Hurlingham, II-56; 1 Llavallol, III-20-52, M.S. [both, HEM]; 24 Llavallol, III-20-52, M.S.; 2 Sierra de la Ventana, February 1904 [all, KU]; 38 Sierra d[e] l[a] Ventana, 2-III-54; 1 Sierra de la Ventana, III-1954, 600 m [all, HEM]; 3 Sierra de la Ventana, III-1954, 600 m; 1 Tandil, II-1941, A.F.P.; 14 Tandil, I-1951, (F.), 200 m; 20 Tandil, V-1951, (F.); 1 Tandil, XI-1951, (J.F.) [all, KU]; 4 Tandil, I-52, 2 Tandil, XII-53 [all, HEM]; 11 Tandil, II-1954, (F.H.W.), 250 m [KU]; 1 Tornquist, 7-11-47, Rossi; 22 Tornquist (Pileta d[e] l[os] Tres Pico[s]), 25-I-47, Bachman & Rossi; 4 Tornquist, 7-II-47, Bachman & Rossi [all, MLF]; 1 Villa Ballester [nr. Buenos Aires], IV-1951, Foerster [KU]. **Cordoba:** 10 Avua de Oro, January 1940, F.S. [HEM]; 6 Carlos Paz, I-1943, A.F.P. [KU]; 2 Cordoba, 23-X-47, P.L. [MLF]; 8 Cordoba (not Cordova), Davis [MCZ]; 2 Cosquín, 1 [to] 9 March '20, R.G.H. [CU]; 1 Huerta Grande,

12-4-43 [HEM]; 2 Punilla, (no data), M. Villafane; 1 Punilla, II-47, Villafane (Villafarie[?]) [all, MLF]. **Corrientes**: 1 Mercedes, IX-54, Arcous [CSC]. **Santa Fe**: 4 Helvecia, XII-1944, A.F.P. [KU]. **Tucuman**: 1 [La] Colonia, 15-IV-1955, Hector Zamuz [CSC]; 11 San Pedro de Colalao (Trancas), II-1950, A., (J.F.) [KU]. **Locality indeterminate**: 1 (Las Bruyar), [Prov. B.A.?], XI-1955, E. Lampiniski; 1 (Melilla), 25-V-55, P. Varges [both, CSC]; 1 (Strinde), 24-3-98 [CNC]; 3 (Vesales), (no data) [CSC].

BRAZIL

WORKERS

Paraná: 1 Araucaria, 12 Jan. 1955, M.&M. [HEM]; 13 Araucaria, 12 Jan. 1955, M.&M. [KU]; 3 Araucaria, 18-I-55, R.S. Lange [JSM]; 2 Araucaria, 17 Jan. 1956, C.D. Michener [KU]; 1 Araucaria, 17 June 1956, C.D. Michener [HEM].

URUGUAY

WORKERS

Canelones: 2 Montevideo, (no data) [CU]; 3 Montevideo, (no data) [NRS]; 3 Montevideo, (no data), Knib. [NRS]; 1 Prado (Mont[e]video), II-1955, (L'Entomologia) [SG]; 4 Sayago (Montevideo), 28-I-42, C.S. Carbonnel, on *Helianthus annuus*; 8 Sayago (Montevideo), 29-I-42, C.S. Carbonnel, on *Helianthus annuus*; 5 Sayago (Montevideo), 30-I-42, on *Helianthus annuus*; 1 Sayago, [Montevideo], October '55, Hugomay; 1 Sayago, [Montevideo], XI-1955, E. Castro [all, CSC]; 1 Sayago, [Montevideo], (no data), Machado [SG]. **Durazno**: 1 Blanquillo, [Arroyo], 30-I-1948, Ruffinelli [SG]. **Florida**: 2 Florida, I-1952, (J.F.) [KU]; 1 Florida, II-1952, J.M.A. [MLF]. **Lavalleja**: 1 Min[as] (Arequila), 2-IV-53, J.F. Carbonnel [SG]. **Maldonado**: 1 Sayago, 12-IV-42, on *Senecio platensis* [CSC]. **Paysandu**: 2 Paysandu, 5-IV-54 [CSC]. **Soriano**: 1 Coquimb[o], Arroyo, I-1951, Thompson; 1 Soriano, I-IV-53, A. Silveira; 1 Soriano, 2-IV-53, C. Morixe [all, SG]. **Locality unknown**: 1 (no data), R.O. del [CU]; 1 (no data), A. Mesa, (26) [CSC]; 1 (no data) [U-NMH].

LOCALITY UNKNOWN (South America)

WORKER

1 (no data), Sek. hr. [NRS].

ARGENTINA

MALES

Buenos Aires: 2 Buenos Aires, III-1951, J.F. [HEM]; 18 Buenos Aires, III-1951, J.F. [KU]; 2 Buenos Aires (not Buenos Ayres), (no data), Knib.; 4 Buenos Aires (not Buenos Ayres), (no data) [all, NRS]; 1 Moreno (not Morano), III-22-50, (J.F.) [KU]; 1 Punta Chica, IV-56 [HEM]; 1 Punta Laro, IV-16-50, M.M.S.; 2 Sierra de la Ventana, February 1904 [all, KU]; 3 Sierra (not Cerra) de la Ventana, 8-II-1948, Rossi [MLF]; 14 Sierra de la Ventana, 2-III-54 [HEM]; 1 Sierra de la Ventana, 2-III-54, M.A. Fritz [JSM]; 1 Sierra de la Ventana, III-1954, 600 m [HEM]; 2 Sierra de la Ventana, III-1954, 600 m; 2 Tandil, II-1941, A.F.P.; 13 Tandil, II-1954, (F.H.W.), 250 m [all, KU]; 1 Tornquist (Pilata de l[os] Tres Picos), 24-I-47, Bachman & Rossi [MLF]. **Locality indeterminate**: 4 (Boulogne), IV-6-53, M.M.S.; 1 (Viaconte Lopez), III-27-51, (J.F.) [all, KU]. **Cordoba**: 1 [Cordoba?] (D[elp]artmen[to] Capital), 18-XII-48, P.L. [MLF]; 1 Cordoba (not Cordova), (no data) Davis; 1 Cordoba (not Cordova), (no data), W.M. Davis [both, MCZ]. **Corrientes**: 1 Mont[e] Prado, 16-IV-55, G. Cnudde [?] [CSC]. **Santa Fe**: 1 La Plata, April 20, 1927, M. Kisliuk, in orchard [USNM]. **Tucuman**: 2 San Pedro de Colalao (Trancas), II-1950, A., [KU]. **Locality unknown**: 1 (Oromano), 26-3-98, Thimk [?]; 1 (Oromano), 27-3-98; 2 (Strinde), 24-3-98 [all, CNC].

URUGUAY

MALE

Canelones: 1 Montevideo, XI-1954, A. Silveira [SG]; 1 Montevideo, (no data) [NRS]. **Flores**: 1 Flores, 17-V-53, A. Silveira [SG]. **Lavalleja**: 1 Minas, 15-X-54, (L'Entomologia) [SG]. **Maldonado**: 2 Maldonado, IV-1953, A. Silveira; 1 Maldonado, IV-1953, (L'Entomologia) [all, SG]. **Paysandu**: 2 Paysandu, 5-IV-54; 1 Santa Rita, 4-IV-54, hab[itation] pasto alto [all, CSC]. **Locality unknown**: 1 (no data), Howard [NRS]; 1 (no specific data) [CSC].

LOCALITY UNKNOWN (South America)

MALE

1 (without label) [U-NMH].

Megabombus (M.) brasiliensis (Lep.)

Bombus brasiliensis Lep., 1836, p. 470: *Bombus (B.) brasiliensis*, Fkln., 1913, p. 136: *Bombus brasiliensis* v. *palliventris* Fr., 1931a, p. 302: *Bombus steindachneri* Handl., 1888a, p. 239, (p.p.), [n. syn.]: *Bombus venustus* Sm., 1861, p. 154, (*nec venustus* Sm., 1876a, p. 201): *Bombus (B.)* (Dumoucheli group), Fkln., 1913, p. 95 (p.p.): *Bremus brasiliensis*, Fris., 1925a, p. 160: *Fervidobombus (F.) brasiliensis*, Skor., 1922a, p. 153, (list): *Megabombus brasiliensis*, Mlrm., 1962b, p. 729: *Megabombus* (Dumoucheli group), Mlrm., 1962b, p. 729: *Megabombus (M.)*, (Dumoucheli group), Mlrm., 1961a, p. 57, (p.p.): . . . *brasiliensis*, Mlrm., 1960a, p. 89, (♀ type): . . . *venustus*, Mlrm., 1960a, p. 97, (♀ type).

DESCRIPTION. **Queen.** Length, 23.0 mm; width at wing bases, 8.0 mm; abdomen, 12.0 mm, width across T2, 10.0 mm; front wing length, 16.0 mm, width, 6.0 mm. **Head:** Frontal outline (excluding mouthparts) trapezoidal, about as high as wide, dorsolaterally rather strongly rounded; vertical region weakly concave laterad of ocelli; ocelli positioned in a weak arc, removed from one another by less than their widest diameter, the interocellar line about equal to the ocellocular line, the lateral ones contiguous to supraorbital line; ocular half of ocellocular area with only microscopic punctures, the ocellar half mostly smooth and polished, the vertex laterad and behind with irregular medium punctures; outline of compound eye noticeably more rounded below than above, the inner margin straight except weakly incurved above, the eye about 3 times higher than greatest width; clypeus near base slightly wider than median height, rather evenly convex and mostly well covered with medium irregular punctures; labrum little more than twice as wide as thick, its ventral margin subtruncate, the sharp labral shelf arcuate, the labral tubercles transverse and somewhat flattened, with irregular medium punctures, separated from each other by about the length of F1; malar space nearly $1\frac{1}{2}$ times longer than distance between (and including) mandibular articulations, smooth, weakly convex with some microscopic hairs; flagellum little more than $1\frac{1}{2}$ times longer than scape, F1 nearly $1\frac{1}{2}$ times as long as F2, subequal to F2 and F3 combined, F3 distinctly longer than F2. **Legs:** Subrectangular mesobasitarsite about 4 times longer than its greatest width, the outer surface moderately concave mid-longitudinally, the acutely rounded distoanterior angle in recess of the spinate distoposterior angle; outer hind tibial surface evenly convex to near distal end, microscopically alutaceous; metabasitarsite about 3 times longer than widest dimension, with outer surface broadly concave mid-longitudinally, finely alutaceous, bearing some recumbent microscopic hairs, the blunt distoanterior angle in recess of the acute distoposterior angle, distal margin broadly emarginate, the posterior margin arcuate basally becoming nearly straight over distal half. **Pubescence:** Compact, moderately fine, of rather even length throughout except longer on head, posteriorly on scutellum and parts of legs, densest on thorax; corbicular fringe rather dense, hairs weakly arcuate except those distally, the longest about equal to widest corbicular dimension; hairs comprising metabasitarsal posterior fringe longest and more arcuate basally, beyond gradually becoming short toward distal end. **Color:** Head black, thorax yellow (sometimes ochraceous yellow) except for black interalar band of medium width (sometimes broader); legs black; abdominal T1, T2 basally (especially medially) and distally (especially distolaterally) and T3 yellow, the remainder of abdomen black (for variability cf. under Comments). Wings strongly, evenly infumated.

Worker. Length, 15.0 mm; width at wing bases, 6.0 mm; abdomen, 7.0 mm, width across T2, 7.0 mm; front wing length, 13.0 mm, width, 5.5 mm. Morphological features, including character of pubescence, of this caste are relatively like those given for the queen. Coloration of typical specimens is also very similar to that described for the queen (atypical specimens with more extensive yellow patterns are more frequently encountered in this caste; cf. under Comments).

Male. Length, 15.0 mm; width at wing bases, 5.0 mm; abdomen, 8.0 mm, width across T2, 7.0 mm; front wing length, 14.0 mm, width, 4.5 mm. **Head:** Frontal outline (excluding mouthparts) narrowly trapezoidal, about as high as widest dimension; compound eye little more than twice as high as greatest width, its outline only slightly more broadly rounded below than above, the inner eye margins almost parallel; vertex weakly concave laterad of ocelli; ocellocular area largely smooth and polished with only few microscopic punctures; ocelli situated in very weak arc near supraorbital line, removed from one another by somewhat less than their diameter, the interocellar line equal to the ocellocular line; malar space about $1\frac{1}{2}$ times as long as distance

between (and including) mandibular articulations, weakly convex, polished, with microscopic punctations; labrum nearly $2\frac{1}{2}$ times wider than median thickness, mostly well covered with pubescence except the weak polished callosities; flagellum about $3\frac{1}{2}$ times longer than scape, F1 nearly equal to F2, together about equal to F3. *Legs*: Mesobasitarsite subrectangular, nearly $4\frac{1}{2}$ times longer than greatest width, distal end emarginate with equally produced angles the posterior one more sharply rounded, the outer surface weakly concave mid-longitudinally; metabasitarsite subrectangular, about 4 times longer than greatest width, the outer surface broadly concave mid-longitudinally, its distal end shallowly emarginate, the posterior margin weakly arcuate. *Pubescence*: Similar in character to that described for the queen. Genitalia, seventh and eighth abdominal sterna figured (Pl. XIV). *Color*: Very much like that detailed for the queen (for variability cf. under Comments). Wings (usually) somewhat paler.

Redescribed from hypotypes. **Queens**, 1 Nova Teutonia (27°11' B., 52°23' L.), Brasilien, 20-X-1939, Fritz Plaumann; 1 Santa Catarina, Brasil, Nov. 14, '49, Plaumann; 1 Santa Catarina, Brasil, Nov. 20, '49, Plaumann; **workers**, 1 Nova Teutonia (27°11' B., 52°23' L.), Brasilien, 14-III-1951, 300-500 m, Fritz Plaumann; 2 Nova Teutonia (27°11' B., 52°23' L.), Brasilien, 23-XII-1939, Fritz Plaumann; 1 Santa Catarina, Feb. 22, '49, Plaumann; 1 Villarrica, Paraguay, March 1939, F. Schade [all, HEM]; **males**, 1 Itatiaya, E. do Rio, [Brazil], 26-IV-938, 1100 m, W. Zikan; 1 [Brazil?], 5-5-29 [both Instituto Oswaldo Cruz]; 1 Eldorado, São Paulo, [Brazil], 4-941, Aravio [Institute of Biological Science, São Paulo].

TYPE. Examined a ♀ in the Westwood Collection, Hope Department, University Museum, Oxford, England, (Milliron 1960a: 89). This is the only recognizable Lepeletier type for the species.

TYPE LOCALITY. Brazil. Number of specimens at hand: 173. In flight: Throughout the year; i.e., queens or workers or males, or combinations thereof might be captured at any appropriate date any place in the species' range. Distribution: (vertical), specimens have been taken from 900 to 6600 ft; (horizontal), northeastern Brazil through Uruguay and northeastern Argentina (Misiones) to Paraguay. Floral visitations: While *Datura* and *Solanum* are the only plant genera with which I can associate this species, I have captured specimens on other unrecognizable plants, and I suspect the species to be polylectic, as is true for most species of bumblebees.

COMMENTS. Except for differences in size, especially in the worker caste, I have not detected any significant morphological variation in this species, which is, chromatically, one of the most variable in South America. On light colored specimens the interalar black band varies considerably in width and to some degree in definiteness. The abdominal yellow usually is evident on at least terga 1 and 3; sometimes it is nearly or completely replaced by black on terga 1 and 2, while other specimens might have terga 1-3 all yellow, particularly in the workers. Melanism has been encountered in the male. Such specimens of this sex at hand indicate a condition whereby the color is totally black or one that shows only traces of yellow on the anterior part of the thoracic dorsum and on abdominal T3. I have not found this degree of melanism in the female though possibly it does occur; if so, such individuals might easily be confused with *M. (M.) atratus* (Fkln.), a species in which similar coloration is common.

BRAZIL

QUEENS

Espírito Santo: 1 Santa Theresa, XI-15-1928, O. Conde, (Theodore H. Frison Coll[ectio]n); 1 Santa Theresa, XI-20-1928, O. Conde, (Theodore H. Frison Coll[ectio]n) [both, INHS]; 1 (locality unknown), (no data), Fruhstorfer [CU]. **Minas Gerais**: 1 Mar d'Hespanha (not de Hespanha), 22-XI-1910, J.F.Z. [CL]. **Paraná**: 1 Blumenau, 1897, Virgil; 1 Curiuva (not Caviuna), X-1946, A.M., (Frank Johnson, donor) [both, AMNH]. **Rio de Janeiro**: 1 Alto da Boa Vista (Tijuca, [nr. Rio de Janeiro], D[istrito] F[ederal]), XII-1950, C.A.C.S.; 1 Alto da Boa Vista (Tijuca, [nr. Rio de Janeiro], D[istrito] F[ederal]), I-16-(yr.?), C.A.C.S. [both, KU]; 1 Bon Retiro (nr. Alto da Boa Vista), 16-XI-55, H.E.M. [HEM-(H.E.M. *venustus* Sm. homotype)]; 1 Corcovado [Rio de Janeiro], (D[istrito] F[ederal]), 9-X-1958, Alvarenga & Seabra [KU]; 3 Itatiaya (Itatiaia), (P[arque] N[acional]), VIII-[1]954, H. G. [Seabra]; 1 Serra da Itatiaya (Itatiaia), 16 [to] 26-X-27, Südablig, Waldreg & Zerny [NMW]. **Santa Catarina**: 1 Corupa (Hansa Humboldt), November

1940, A.M., (Frank Johnson, donor); 1 Corupa (Hansa Humboldt), Nov., 1944, A. M., (Frank Johnson, donor), 1 Corupa (Hansa Humboldt), I-1946, A.M., (Frank Johnson, donor) [all, AMNH]; 1 Nova Teutonia (27°11'–52°23'), 20-X-1939, F.Pn.; 1 (locality unknown), Oct. 31, '49, Plaumann; 1 (locality unknown), Nov. 14, '49, Plaumann; 1 (locality unknown), Nov. 20, '49, Plaumann [all,HEM]. **São Paulo:** 1 Boraceo (São Paulo), 10-X-58, Werner [HEM]; 1 Serra da Contareira, (no data), E. Dente [SADZ]. **Locality and state unknown:** 1 (no data), Lund, (Mus[eum] Westerm[an]) [UZM]; 1 (no data), Nett. [NMW]; 1 (no data) [MCZ].

LOCALITY UNKNOWN (South America: ?Brazil)

QUEENS

1 (22-2-28); 1 (17-XI-32) [both, CL].

PARAGUAY

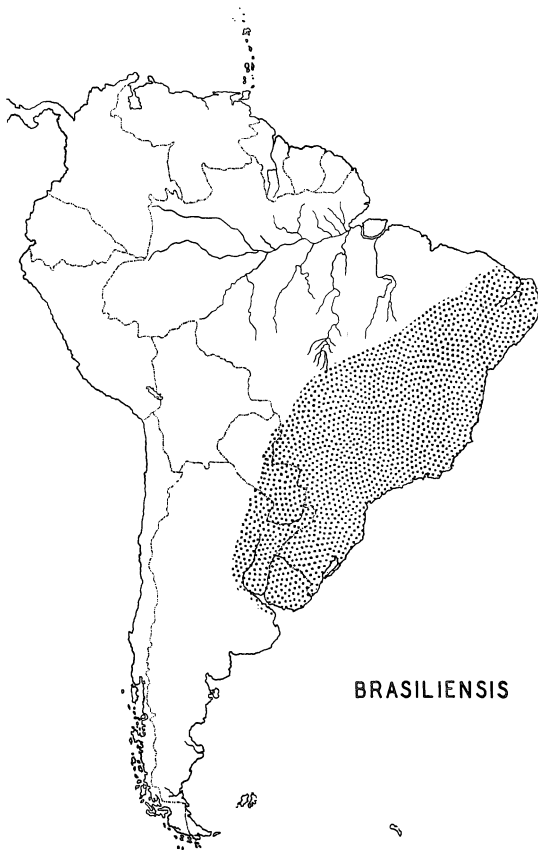
QUEENS

Asuncion: 1 Col[onia] Independ[encia], (Dept. Guayra [Guaira]), 17-X-55, H.E.M., (H.E.M. *venustus* Sm. homotype); 1 Col[onia] Independ[encia], (Dept. Guayra [Guaira]), 18-X-55, H.E.M., (H.E.M. *venustus* Sm. homotype); 10 Col[onia] Sommerfeld, (Dept. Caa-Guazu), XII-1958; 1 Paso Yobay, (Dept. Caa-Guazu), XII-1950, (F.), 280 m [all, HEM].

ARGENTINA

WORKERS

Misiones: 3 Puerto Iguazu, II-45, Hd., Wk., & Gb. [MLF]; 1 Iguazu, X-10-1950, M.S. [KU]; 4 Iguazu Falls, 20 [to] 22 Jan. '20, (Cornell U[niversity] Exp[edition]) [CU]; 3 Iguazu [Sierras], 30-I [to] 13-III-1945, Hd., Wk., & Gb. [MLF]; 1 Obera, X-15-1950, M.S.; 1 P[uer]to Bemberg, XI-[1]945, Prosen [both, KU].



MAP 15.

BRAZIL**WORKERS**

Espírito Santo: 2 Faz Jerusalem, 11-II-1914, J.F.Z. [CL]; 1 Linhares, III-1954, P.A.T.; 3 Parque Sooretama (nr. Linhares), III-1953, P.A.T. [all, Seabra]. **Mato Grosso:** 1 Dourados, (no data), G.B.F., (Theodore H. Frison [Collection]) [INHS]; 3 Rio Caraguata, II-1953, F.Pn.; 2 Rio Caraguata, III-1953, F.Pn. [all, KU]. **Paraná:** 3 Alto de Serra ([betw.] Curitiba, not Curitiba and Morrestes), 4 Feb. 1956, M.&Mr.; 1 Araucaria, 17 Jan. 1956, C.D. Michener; 1 Cariura (not cariubá), 1 Feb. 1956, M.&Mr. [all, KU]; 2 Rio Paraná, 1904, Garbe [AMNH]. **Rio de Janeiro:** 1 Alto da Boa Vista (Tijuca, D[istrito] F[ederal]), 17-I-1951, C.A.C.S.; 1 F[loresta da] Tijuca, (Distrito Federal, Ae. Solidos), 24-II-1953, C.A.C.S.; 1 Floresta da Tijuca (D[istrito] Federal), I-1954, C.A.C.S. [all, Seabra]; 1 Floresta da Tijuca (D[istrito] Federal), II-1954, C.A.C.S. [KU]; 1 Floresta da Tijuca (D[istrito] Federal), VII-1954, C.A.C.S. [Seabra]; 22 Floresta [da] Tijuca (D[istrito] Federal), 1-II-1955, C.A.C.S. [HEM-(2 H.E.M. *brasiliensis* v. *palliventris* Fr., homotypes)]; 1 Gavea Pequena (Distrito Federal), 27-II-1953, C.A.C.S. [KU]; 1 Gavea Pequena (Distrito Federal), II- [1]954, C.A.C.S. [Seabra]; 1 Itatiaia (Itatiaia), (Est[ação] Biologica), 25-3-37, W.Z.; 2 Itatiaia (Itatiaia), 26-IV- 1938, W.Z., 1100 m [all, CL]; 2 Itatiaia (Itatiaia), 7-I-1954, L.C. & M. Alvareta, M. Zikan & C.A.C.S., 2200 m; 3 Maromba (Itatiaia, or Itatiaia), 2-I-1954, L.C. & M. Alvarenga, C.A.C.S. & M. Zikan [all, Seabra]; 1 Terra [Passo] Quatro, 1897 [AMNH]. **Santa Catarina:** 1 Corupa, III-1954, A.M. [Seabra]; 1 Mafra, December 1941, A.M., (Frank Johnson, donor) [AMNH]; 4 Nova Teutonia, I-23-48, F.Pn. [KU]; 15 Nova Teutonia, January 1948, F.Pn. [HEM]; 3 Nova Teutonia, 1-II-1950, F.Pn.; 1 Nova Teutonia, II-1952, F.Pn.; 1 Nova Teutonia, II-1952, L.E. Plaumann; 1 Nova Teutonia, 26-III-52, F.Pn. [all, KU]; 1 Nova Teutonia (27°11'–52°23'), 27-XI-1939, F.Pn.; 2 Nova Teutonia (27°11'–52°23'), 23-XII-1939, F.Pn.; 1 Nova Teutonia (27°11'–52°23'), 28-XII-1939, F.Pn.; 2 Nova Teutonia (27°11'–52°23'), 14-III-1951, F.Pn., 300–500 m; 1 (locality unknown), Feb. 22, '49, Plaumann [all, HEM]. **São Paulo:** 1 Barueri, 24-II-1955, K.L. [KU]. **Locality unknown or indeterminate:** 1 (Monat), IV-1935, P. Sandig [USNM]; 1 (no data), Gyllenkrok[?] [NRS]; 2 (no data), (Mus[eum] Drews[on]) [UZM]; 2 (no data), [MCZ]; 1 (no data), Lund, (Mus[eum] Westerm[an]) [UZM].

LOCALITY UNKNOWN (South America: ?Brazil)

WORKERS

1 (1-2-19) [Seabra]; 2 (15-5-29); 2 (16-3-35) [both, CL].

PARAGUAY**WORKERS**

Asuncion: 1 Frente a Puerto Mineral [Argentina, Misiones], 20-XI-[1]951, A.Wk. [MLF]; 1 S[an] Bernardino, March (end of), [yr.?], Fiebrig [CU]; 1 San Estanislao (not Estansilao), Jan. 15, 1947, Williner [KU]; 1 Villarrica (sometimes Villa Rica or Villarica), March 1939, F.S. [HEM]; 1 (locality indeterminate), (Carlos Pflarme [?Pfannl]), (no data), (Sternitzky Coll[ectio]n) [MCZ].

ARGENTINA**MALE**

Misiones: 1 Puerto Bemberg, 14 [to] 30-III-1945, Hd., Wk.&Gb. [MLF].

BRAZIL**MALE**

Espírito Santo: 1 Parque Sooretama (nr. Linhares), III-1953, P.A.T. [Seabra]. **Goías:** 1 Annapolis, VII-7-36, G.B.F., (Theodore H. Frison Coll[ectio]n) [INHS]. **Mato Grosso:** 1 Chapada [Cuiabá], March [yr.?], (Theodore H. Frison Coll[ectio]n, Acc. 2966) [INHS]; 2 Maracopa, (no data), G.B.F., (Theodore H. Frison Coll[ectio]n) [INHS]; 5 Rio Caraguata, III-53, F.Pn. [KU]. **Paraná:** 2 Alto de Serra ([betw.] Curitiba, (not Curitiba) & Morrestes), 4 Feb. 1956, M.&Mr. [KU]. **Rio de Janeiro:** 1 Itatiaia (Itatiaia), (Estação Biologica), 14-3-1930, 2200 m [CL]; 1 Therezopolis, III-1914, Bresslau [ZMB]; 1 Alto Itatiaia (Itatiaia), 16-3-35; 1 E. do Rio, Itatiaia (Itatiaia), 1-26-[1]938, 1100 m, W.Z. [both, CL]. **Santa Catarina:** 1 Corupa (Hansa Humboldt), II-1946, A.M., (Frank Johnson, donor) [AMNH]; 1 Nova Teutonia, III-42, F.Pn. [KU]; 1 R[io] Vermelho, 7-49 [HEM]. **São Paulo:** 1 Capital (São Paulo), 3-10-32, Schwebel; 1 Capital (São Paulo), 4-1 [936], G. Sch[webel]; 1 El Dorado (São Paulo), 11-1 [941], Aravio [all, IBSA]. **Locality unknown:** 1 15-5-29 [CL].

PARAGUAY

MALE

Asuncion: 1 Contesa, III-1954, (F.H.W.) [KU].

URUGUAY

MALE

Maldonado: 1 San Carlos, (no data), (Cornell U[niversity] Lot 631, sub. 113) [CU].

Megabombus (M.) fervidus (F.)

KEY TO SUBSPECIES

Females

- Thoracic pleura (usually), scutellum, abdominal T1–4 canary-yellow *f. fervidus* (F.) (p. 147)
 Thoracic pleura mostly (about two-thirds) black; scutellum, abdominal T1–4 golden-yellow *f. sonomae* (How.) (p. 160)
 Thoracic pleura below, scutellum (mostly), abdominal T1–3 (at least in varying degree) black; extremely variable toward subspecies *fervidus* in sympatric locations *f. californicus* (Sm.) (p. 155)

Males

- Thorax (except usually rather definite narrow interalar black band), abdomen lemon to ochraceous yellow, except abdominal T6–7 always black *f. fervidus* (F.) (p. 147)
 As above, except thoracic pleura largely black *f. sonomae* (How.) (p. 160)
 Thorax pale to drab yellow (usually considerable black on pleura below wing bases), scutellum yellow or intermixed with black; abdominal T1 pale to drab yellow, T2–3 with varying amounts of black and yellow, T6–7 normally black though often with at least some ferruginous *f. californicus* (Sm.) (p. 155)

Megabombus (M.) fervidus fervidus (F.) new status

Apis fervida F., 1798, p. 274 (re: nominate ssp. only): *Apathus elatus*, Cov., 1889, p. 295: *Apis alata* F., 1798, p. 274, (cf. *Bombus elatus* F., 1805, p. 352); *A. alata*, Mltn., 1960a, p. 98; [n. syn.]: *Bombus elatus* F., 1805, p. 352, (emend., *A. alata* F., *supra*), [n. syn.]: *Bombus fervidus*, Handl., 1888a, p. 237, (p.p.): *Bombus fervidus* v. *dorsalis* Cr., 1879a, p. 230: *Bombus fervidus* v. *umbraticollis* Fr., 1931a, p. 301, [n. syn.]: *Bombus nevadensis aztecus* Ckll., (C.&P.), 1899a, p. 389, (*nec nevadensis* Cr., 1874, p. 102): *Bombus pennsylvanicus*, auctt., (*nec Apis pensylvanica* De G., 1773, p. 575): *Bombus* (*B.*) *fervidus*, Fkln., 1912, p. 388: *Bombus* (*B.*) *fervidus* ssp. *dorsalis*, Fkln., 1912, p. 392 (♀, ♂, ♂): *Bombus* (*Fervidobombus*) *fervidus*, Brs., 1951, p. 1249, *In* Muesebeck *et al.*: *Bombus* (*Fervidobombus*) *fervidus* v. *dorsalis*, Brs., 1951, p. 1249, *In* Muesebeck *et al.*: *Bremus fervidus*, Fris., 1919a, p. 161 (*et seq.*): *Bremus fervidus* ssp. *fervidus*, Fris., 1919a, p. 161 (*et seq.*): *Bremus fervidus* v. *dorsalis*, Fris., 1926a, p. 136: *Bremus* (*Fervidobombus*) *fervidus*, Fris., 1927e, p. 68: *Bremus* (*Fervidobombus*) *fervidus* v. *dorsalis*, Fris., 1927e, p. 68: *Fervidobombus* (*F.*) *fervidus*, Skor., 1922a, p. 153, (list): *Megabombus* (*M.*) (*Dumoucheli* group), Mltn., 1961a, p. 57, (p.p.): *Megabombus* (*M.*) *fervidus*, Mltn., 1961a, p. 57: . . . *fervida*, Mltn., 1960a, p. 91, (♀ type).

DESCRIPTION. Queen. Length, 22.0 mm; width at wing bases, 8.5 mm; abdomen, 11.0 mm, width across T2, 9.5 mm; front wing length, 17.0 mm, width, 6.0 mm. *Head:* Frontal outline (excluding mouthparts) trapezoidal, weakly evenly arcuate over occiput, the temples rather strongly rounded, the median height somewhat greater than widest dimension, the inclined vertical region irregularly and closely punctate for the most part except most of ocellar half of ocellular area impunctate; ocelli nearly equal in size and shape, about as far from each other as their diameter, situated in a weakly curved line, the lateral ones nearly touching supraorbital line; compound eyes considerably more broadly rounded below than above, their inner margins for the most part subparallel; malar space about $1\frac{1}{2}$ times as long as distance between (and including) mandibular articulations, for the most part weakly convex and with only few microscopic punctures; labrum subrectangular, about twice as wide as its greatest thickness, the ventral margin evenly arcuate, the blunt conical tubercles not strongly produced but rather coarsely punctate, the intertubercular depression distinct but not especially deep; flagellum nearly twice as long as scape, F1 nearly twice as long as quadrate F2 and equal to F2 and 3 combined; clypeus rather strongly and evenly convex, somewhat wider below than its median height, well covered with irregular medium punctures except less so medially below. *Legs:* Mesobasitarsite nearly 4 times longer than widest dimension, widely concave mid-longitudinally, the spinate distoposterior angle extended noticeably beyond blunt distoanterior angle; outer surface of hind tibia rather sharply convex mid-longitudinally from base to near distal third, nearly entirely smooth, the widest part not exceeding the length of longest hairs of corbicular fringe; metabasitarsite subrectangular, the outer surface shallowly concave mid-longitudinally, the widest part about equal to longest hairs of posterior fringe (longest on proximal two-thirds of margin), the posterior margin nearly straight except arcuate at very base, the distal angles similar to those of mesobasitarsite but distoposterior angle more rounded and not spinate. *Pubescence:* Compact, medium in length, even except somewhat longer on scutellum posteriorly, laterally on abdominal T1 and on T5; corbicular fringe of medium length, rather dense and even throughout, the few distal hairs the most strongly arcuate; metabasitarsal posterior fringe longest proximally to medium in length distally. *Color:* Head (except for trace of some pale pile above antennal bases), approximate lower third (sometimes most) of thoracic pleura above leg bases (and most of metapleura), legs, band of medium width between wing bases, abdominal T5-6 and the venter black; remainder of body canary yellow. Wings uniformly deeply infuscated to blackish with slight violaceous reflection.

Worker. Length, 12.5 mm; width at wing bases, 5.5 mm; abdomen, 6.0 mm, width across T2, 6.0 mm; front wing length, 12.5 mm, width, 4.0 mm. Usually, except for size difference, the structural features of this caste are proportionately similar to or like those given for the queen. The color is also the same except the thoracic pleural yellow is (usually) more extensive below so as to cover all or nearly all that region. The wings are noticeably less infuscated and lack the violaceous reflection often noted in the queen.

Male. Length, 17.0 mm; width at wing bases, 7.0 mm; abdomen, 9.0 mm, width across T2, 6.0 mm; front wing length, 14.0 mm, width, 5.0 mm. *Head:* Frontal outline (excluding mouthparts) trapezoidal, the median height about equal to widest dimension; vertical region weakly convex and largely covered with irregular small to medium punctures; ocellar half of ocellular area mostly smooth, the ocular half (typically) with few small punctures; ocelli removed from one another by little less than their diameter, situated in a weak arc just below supraorbital line; compound eyes little more broadly rounded below than above, their inner margins subparallel; malar space about $1\frac{1}{2}$ times as long as distance between (and including) mandibular articulations, weakly convex, noticeably punctate over upper half; labrum near twice as wide as thickest part, the ventral margin straight except arcuate at lateral corners, the callosities weak; clypeus rather evenly convex, not densely pubescent, almost entirely covered with small to medium punctures except less so medially below; flagellum about 3 times longer than scape, with none of its segments any more than only slightly crenulate, F1 subequal to F3 but nearly $1\frac{1}{2}$ times longer than quadrate F2 and combined with latter only little longer than F3. *Legs:* Mesobasitarsite nearly rectangular, slightly less than 4 times longer than greatest width, the outer surface broadly concave mid-longitudinally, the distal end not deeply emarginate and with both angles nearly equally extended, neither sharply pointed; outer surface of hind tibia somewhat minutely alutaceous and for the most part rather evenly convex throughout; metabasitarsite much broader than mesobasitarsite (also much broader than longest hairs of posterior fringe), otherwise similar except posterior margin weakly evenly arched from base to near distal end. *Pubescence:* Except for being somewhat looser, that on the body is very similar to that given for the queen; posterior fringe of mesobasitarsite short and rather even; posterior fringe of hind tibia rather dense, comprised of short and some intermixed longer (about twice as long) hairs; metabasitarsal posterior fringe short and even throughout, or nearly so (*cf.* this sex with that of *M. (M.) pennsylvanicus*). *Genitalia*, seventh and eighth abdominal sterna (Pl. XIII). *Color:* Very much like that given

for the queen except (usually) the black interalar band is narrower and less definitive, the pile on coxae, trochanters, femora and on the abdominal venter is largely pallid yellow instead of being black, and at least the distal half of abdominal T6 and all of T7 is black with the preceding terga being yellow. Wings (often) paler than those of the worker and rarely approaching the degree of infuscation normally apparent in the queen.

Redescribed from hypotypes. **Queen**, Hectanooga, N. S., 4-VII-1961, Freeman and Lewis; **worker**, Hectanooga, N. S., 7-VII-1961, Freeman and Lewis [both, CNC]; **male**, Boardman, Ore., July 13, 1938, collrs. K. Gray, J. Schuh [HEM].

TYPE. Examined a ♂, *Apis fervida* F. (1798: 274), in the Kiel Collection (Fabrician), now on extended loan to the Universitetets Zoologiske Museum, (København) Copenhagen, Denmark (Milliron 1960a: 91).

TYPE LOCALITY. "America", (probably eastern United States of America). Number of specimens at hand: 1345. In flight: late April to late October, the males first appearing in early June. Distribution: (vertical), sea level to slightly more than 9000 ft; (horizontal), transcontinental in southern Canada and in all the continental United States except Alaska, Alabama, Florida, Louisiana, Mississippi, and the extreme eastern part of Virginia; in Mexico to the southwestern portion of the State of Chihuahua. Floral visitations: *Aster*, *Astragalus*, *Brassica*, *Calchortus*, *Chrysothamnus*, *Cirsium*, *Cleome*, *Dahlia*, *Delphinium*, *Echium*, *Eriogonum*, *Geranium*, *Glycyrrhiza*, *Helianthus*, *Lotus*, *Malus*, *Medicago*, *Melilotus*, *Monarda*, *Onopordum*, *Oxytropis*, *Pontederia*, *Prunus*, *Ribes*, *Rosa*, *Solidago*, *Taraxacum*, *Thermopsis*, *Trifolium*, *Vaccinium*, and *Veronica*. Cockerell and Porter (1899a) gave *Lupinus*, *Petalostemum*, *Verbascum*, and *Verbena* that had been overlooked in subsequent compilations. Cockerell (1913b) reported this subspecies on *Phaseolus*, and Lutz and Cockerell (1920) added *Aesculus*, *Allium*, *Capnoides*, *Carduus*, *Lobelia*, *Mentha*, and *Rhodora*. Graenicher (1935) recorded *Lithospermum*. From LaBerge and Webb (1962) we can add: *Amorpha*, *Argemone*, *Liatris*, *Oenothera*, *Symphoricarpos*, and *Vicia*.

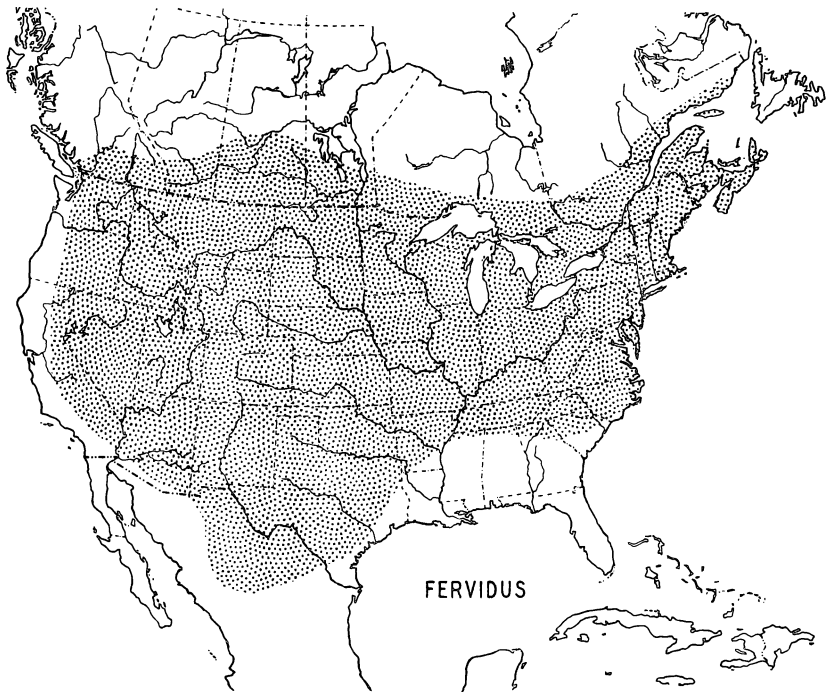
COMMENTS. There seems to be little structural variation except for size; workers sometimes are relatively small, but often attain a size that is indistinguishable from that of small queens, in which case they cannot be assigned with certainty as being one or the other. With color, however, there are some notable variations. The yellow is often pale instead of a vivid canary. The thoracic pleural yellow extension downward is variable in the queen, sometimes reaching the leg bases, or nearly so, as is usually the case in workers and males. The interalar black band is very variable in both width and definiteness; usually it is of moderate width being somewhat wider in the middle, but it might be very narrow, or represented by sparse remnants of black hairs in the middle, or the band might be absent altogether. This latter condition occurs erratically throughout most of the range of this subspecies but is most commonly encountered in the southwestern United States and northern Mexico; it is a variable form in all castes and has been described as *fervidus* variety *dorsalis* by Cresson (1879a, 230), later treated as *fervidus* subspecies *dorsalis* by Franklin (1912: 392) and others, and even as a race *aztecus* of *nevadensis* (!) by Cockerell (in Cockerell and Porter, 1899a: 389).

In certain areas in the West where this subspecies is sympatric with the subspecies *f. californicus* hybridization between the two might occur; numerous specimens examined in this study could be assigned to one or the other.

CANADA

QUEENS

Alberta: 1 Bow Island, 1-VII-1949, G.A.H.; 1 Burdett, 10-V-24, R.W.S.; 1 Calgary, 20-V-1923, G. Salt, at *Ribes lacustre*; 1 Calgary, 2-VI-1924, G. Salt, at flowers of loco weed; 1 Lethbridge,



MAP 16.

28-VI-1914, F.W.L.S.; 1 L[eth]bridge, July 31, 1914, E.H.S.; 1 Lethbridge, 24-V-1915, F.W.L.S.; 1 Lethbridge, May 26, 1923, Walter Carter, alfalfa soil; 1 Lethbridge, May 19, 1937, R.W.S.; 2 Lethbridge, 4-VII-1956, E.E.S.; 1 Lethbridge, 7-VII-1956, E.E.S.; 1 Manyberries, Dom[inion] Range Sta[tion], 9-VII-1951, D.F.H.; 2 Medicine Hat, 30-V-04, T.N. Willing; 1 Medicine Hat, 15-VII-56, O.P.; 1 Scandia, 9-VII-1956, E.E.S.; 1 Vet[erinary] Res[earch] Sta[tion], 10-V-1951, G.A.H.; 1 Vet[erinary] Res[earch] Sta[tion], 15-V-1951, G.A.H.; 2 Vet[erinary] Res[earch] Sta[tion], 16-V-1951, G.A.H.; 9 Vet[erinary] Res[earch] Sta[tion], 21-V-1951, C.E.L.; 1 Vet[erinary] Res[earch] Sta[tion], 21-V-1951, C.E.L., *Thermopsis rhombifolia* (P.); 1 Vet[erinary] Res[earch] Sta[tion], 25-V-1951, G.A.H., B.H., *Thermopsis rhombifolia*; 1 Vet[erinary] Res[earch] Sta[tion], 8-VI-1951, G.A.H.; 2 Vet[erinary] Res[earch] Sta[tion], 8-VI-1951, C.E.L.; 1 Vet[erinary] Res[earch] Sta[tion], 15-VI-1951, G.A.H. [all, CNC]. **British Columbia:** 2 Kamloops, May 23, 1949, G.B.R.; 1 Nicola, 2200', 10-VI-1953, J.R.M.; 2 Okanagan Falls, 2000', 20-V-1953, J.R.M.; 1 Okanagan Valley; 1 Oliver, 1000', 9-V-1953, D.F.H.; 1 Oliver, 1000', 12-V-1953, J.R.M.; 1 Oliver, 1000'; 3-VI-1953, J.R.M.; 1 Oliver, White Lake, 10-VI-1959, L.A.K.; 1 Osoyoos, 1200', 21-V-1953, D.F.H.; 1 Penticton, 30-IV-1919, E.R.B.; 1 Walhachin, 3-VII-1918, E.R.B. [all, CNC]. **Manitoba:** 1 Brandon, June 11, 1948, T.V. Cole [CNC]. **New Brunswick:** 1 Fredericton, 12-VII-1915, A.B. Baird; 1 Fredericton, 1920, (McN.); 1 Fredericton, 192[?] [all, CNC]. **Nova Scotia:** 1 Hectanooga, 4-VII-1961, F.&L.; 1 Kentville, 24 May 1932, *Ribes*; 1 Kentville, 24 May 1932, apple; 1 Kings Co[unty], June 12, 1932, C.E. Atwood, apple; 1 Kings Co[unty], June 13, 1932, C.E. Atwood; 2 Kings Co[unty], June 16, 1932, C.E. Atwood; 6 Kings Co[unty], June 16, 1932, C.E. Atwood, apple; 1 Kings Co[unty], Aug. 1, 1932, C.E. Atwood, *Solidago*; 1 N[ear] Middle River, Pictou County, (Min Grant) [all, CNC]. **Ontario:** 1 Bell's Corners, June 23, 1932, R.L.; 1 Britannia, 30-V-1948, S.D.H.; 1 Cayuga, 3-IX-1954, R.L., on Scotch thistle; 1 Chatham, 23-VIII-1913, F.W.L.S.; 1 Chatham, 15-VI-29, A.B. Baird; 1 Coldstream, V-15-22, A.A. Wood; 3 Goderich, 25-V-53, J.B.H.; 1 Marmora, 10-V-1952, J.R.V.; 1 Marmora, 26-V-1952, J.R.M.; 1 Marmora, 30-V-1952, J.R.V.; 2 Marmora, 4-VI-1952, J.R.V.; 1 Marmora, 7-VI-1952, J.R.V.; 1 Marmora, 11-VI-1952, J.R.V.; 1 Marmora, Aug. 4, 1952, J.R.V.; 1 Marmora, Aug. 4, 1952, J.R.V., *ex nest*; 1 Marmora, 11-VIII-1952, C. Boyle; 4 Marmora, Aug. 19, 1952, J.R.V., *ex colony* in mouse nest; 1 Marmora, Aug. 21, 1952, J.R.V., *ex nest*; 1 Merivale, Aug. 19, 1954, R.L. (Cage #5); 1 Ottawa, 1.600, J. Fletcher; 1 Ottawa, 8-VI-1904, A. Gibson; 1 Ottawa, 30-VI-1912, (J.I.B.); 2 Ottawa, 12-VI-1913, F.W.L.S.; 1 Ottawa,

20-VI-1913, F.W.L.S.; 1 Ottawa, 8-VII-1913, F.W.L.S.; 2 Ottawa, Sept. 28, 1954, R.L., cage 5; 1 Ottawa, 27-V-1955, R.L.; 1 Ottawa, 1-VI-1955, G.G. Lewis; 2 Ottawa, 2-VI-1955, R.L.; 1 Ottawa, 1-VIII-55, R.L., reared more than 2 mos. in cage; 7 Ottawa, 28-IX-1955, R.L., nest under porch stone; 1 Parkhill, 6-IX-54, R.L., alfalfa; 1 Pelee Isl[and], 4-VI-1937, G.S.W.; 3 P[oin]t Pelee, 30-V-1929, G.S.W.; 1 Quarries, 24-V-1946, O.P., dandelion; 1 S[ain]t John's West, 1-VIII-1954, C.D.M.; 1 S[ain]t John's West, 1-IX-1954, R.L., on Scotch thistle; 1 Selkirk, Sept. 3, 1954, R.L.; 1 Sellente, 2-V-1947, John C. Martin; 1 Strathroy, 12-VI-1926, H.F. Hudson; 1 Strathroy, 13-VI-1926, H.F. Hudson; 1 Vineland Sta[tion], 11-6-28, W. Putman [all, CNC]. **Quebec:** 1 Beech Grove, 7-VI-1955, C.D.M. [CNC]; 1 Cap Rouge, 20-VIII-41, N.M. Comeau [TBM]; 1 Cap Rouge, 7-VII-1953, R.L.; 3 Cap Rouge, 8-VII-1953, R.L.; 1 Cap Rouge, 10-VII-1953, R.L. [all, CNC]; 1 Hemmingford, VI-27-1922, A.D. Baker; 1 Hemmingford, 30-V-1927, A.D. Baker; 1 Hemmingford, 28-VI-1928, G.H. Hammond; 1 Hull, 31-V-1955, R.L.; 3 Kingsmere, June 12, 1953, R.L.; 1 Mistassini Post, 13-VII-1956, J.R. Lonsway; 1 Quebec, 16 June 1950, R.L.; 1 S[ain]t Anne's, May 19, 1932; 1 S[ain]t Foy, 7-VII-53, R.L.; 2 S[ain]t Isidore, 26-7-1933, B. Champagne; 1 S[ain]t Isidore, July 17, 1934, R. Mougeot; 2 S[ain]te Anne des Monts, 18-VI-1954, G.P.H.; 1 Yarms, 23-VII-1950, L.A. Kelton [all, CNC]. **Saskatchewan:** 1 Indian Head, 27-V-1925, J.J. de Gryse; 1 Katapwa, June 25, 1925, J.J. de Gryse; 1 Scott, 15-VII-1916, F.W.L.S. [all, CNC]. **Locality unknown:** 1 (no data), (Max H. Ruhmann Coll[ection]); 1 E 26-11; 1 3-1; 1 3-3; 1 3-4; 1 3-5; 1 5-1; 1 9-3, 1 17-1; 1 17-3; 1 22; 3 (no data) [all, CNC].

UNITED STATES

QUEENS

Arizona: 1 Flagstaff, 10 mi S. [of], May 27, 1954, G.D.B., *Thermopsis pinetorum*; 1 Prescott, July 23, 1948, H.A.S.; 2 Superior, June 1936, D.K.D. [all, HEM]. **Colorado:** 1 Cache la Poudre Canyon, Watrous Park, 8-14-60, R.&K.D. [RRD]; 1 (locality unknown), Morrison [NRS]. **Connecticut:** 1 Colebrook, VII-9-21, W.M. Wheeler [TBM]. **Delaware:** 2 Newark, 14-V-1952, H.E.M. [HEM & Elfving]. **Iowa:** 1 Ledges St[ate] P[ar]k, 20-IV-1954, L.A.K. [CNC]. **Indiana:** 1 Tippecanoe Co[unty], V-1951, (Purdue Student Collection) [CNC]. **Maine:** 2 Orono, (Coll[ectio]n of Frederick Allen Eddy), [MCZ]. **Maryland:** 1 Baltimore Co[unty], 19-V-1940 [CNC]. **Massachusetts:** 1 Amherst, VI-5-1917; 2 Amherst, VI-6-1917 [all, TBM]; 1 Amherst, 6-3-1927; 1 Amherst, V-18-1938, L. Kenny; 1 Nantucket, 4-VIII-22 [all, MASS]; 1 Needham, V-30-28, T.B.M., *Vaccinium*; 1 Needham, VI-7-28, T.B.M. [both, HEM]; 1 Needham, VI-7-28, T.B.M. [TBM]; 1 Topsfield, 4-VI-22 [MASS]. **Michigan:** 1 Alger Co[unty], VI-6-59, R.&K.D.; 2 Allegan Co[unty], IV-18-59, R.&K.D. [all, RRD]; 1 Douglas Lake, July 10, 1915, P.W.F. [HEM]; 1 Hillsdale Co[unty], 5-21-60, R.&K.D. [RRD]; 1 Mackinac Co[unty], 6-7-57, R.&K.D. [HEM]; 1 Schoolcraft Co[unty], VI-5-59, R.&K.D. [RRD]. **Minnesota:** 2 Mound Spring St[ate] P[ar]k, Rock Co[unty], Sept. 15, 1948, H.E.M. [HEM]. **New York:** 1 Ithaca, VI-25-1936, S. Bettini [ANSP]; 1 Ithaca (Campus), July 1, 1925, Babi [NRS]; 1 Minetto, 9-22-1941, L.D. Newsom [TBM]; 1 Tompkins Co[unty], 26-VIII-60, J.R., on *Solidago* [CNC]; 1 Tompkins Co[unty], 25-VI-60, J.R., *Rosa carolina*; 1 Tompkins Co[unty], 26-VIII-60, J.R., *Solidago* sp. [both, RAM]; 1 Wyandanch, L[ong] I[sland], 9-13-1914, F.M. Schott [CNC]; 1 (locality unknown) [NRS]. **Ohio:** 1 Delaware, 5-12-03 [MASS]; 1 Oxford, V-22-1948, D.M. Weisman [TBM]; 1 Plain City, 6-VI-1947, H.E.M. [Elfving]; 1 Put-in-Bay, June 23, 1947, H.E.M. [HEM]. **Oregon:** 1 Cayuse, July 13, 1938, K. Gray & J. Schuh; 1 Powell Butte, Crook Co[unty], July 5, 1941, H.A.S., Alsike clover; 1 Redmond, April 28, 1939, Schuh & Gray; 1 Redmond, June 27, 1939, Schuh & Gray [all, HEM]. **Pennsylvania:** 1 Benton, Columbia Co[unty], 20-VIII-1920, H.K. [CM]; 1 Secane, 4-VI-1951 [ANSP]; 1 Rector, 4 mi S. [of], W[est]m[ore]land Co[unty], (Powdermill Nature Res[erve]), 3-VII-1960 [CM]. **Rhode Island:** 1 Newport, 5-VI-14 [MASS]. **South Dakota:** 1 Brookings, Aug. 17, 1928, M. Fredricksen; 1 Brookings, Oct. 6, 1958, H.C.S.; 1 Brookings, Sept. 30, '61, H.C.S.; 1 Cottonwood, July 26, 1948, H.C.S.; 1 Elk Point, June 3, 1953, H.C.S.; 1 L[ake] Hendricks, June 21, 1923, H.C.S.; 1 Mitchell, June 4, 1953, H.C.S.; 1 Newell, 8-31-22, H.C.S.; 1 Newell, June 28, 1923, H.C.S.; 1 Pringle, July 15, 1924; 1 Redig, June 24, 1954, H.C.S.; 1 Vermillion, June 3, 1953, H.C.S. [all, SD]. **Utah:** 1 Duchesne, VII-14-62, R.&K.D. (form *dorsalis*) [HEM]. **Vermont:** 1 Shoreham, 13-VI-36, Richard Dow [MCZ]. **Virginia:** 1 Burkes Garden, June 4, 1940, 3500', J.E. Graf [USNM]. **Washington:** 1 Pullman, May 20, '09, (W.M. Mann Coll[ectio]n, 1954) [HEM]. **West Virginia:** 3 Glen Dale, April 1959 [HEM]. **Wisconsin:** 1 Madison, 7-13; 1 Madison, 5-18-28; 1 Madison, V-1933; 2 Madison, VI-1940; 1 Madison, 30-V-1952 [all, CNC]. **Wyoming:** 1 Beach Springs (Lake area), Yellowstone Nat[ional] P[ar]k, July 17, 1955, 7800', F. Hartig [AMNH]; 3 Torrington, VII-30, G.B.F. [MCZ]. **Locality unknown:** 1 Brooklyn Lake, 6-14-25, (C.L.C.) [HEM]; 7 (no data) [MASS].

CANADA

WORKERS

Alberta: 1 Calgary, 5-IX-1923, G. Salt; 1 Calgary, 10-VII-1924, Geo. Salt; 1 Calgary, 5-VIII-1924, G. Salt, at large head thistle; 1 Calgary, 5-VIII-1924, G. Salt; 2 Calgary, 28-VIII-1924, Geo. Salt, at large head thistle; 1 Countess, July 25, 1927, H.E. Gray; 3 Hays, 14-VIII-1952, C.E.L., red clover brackens; 1 Hays (Bracken's), 10-VII-1953, G.A.H., red clover; 1 Hays, (10-VII-1953, C.E.L., red clover; 2 Irvine, 1-VIII-1952, G.A.H., alfalfa; 1 Irvine, 1-VIII-1952, G.A.H., *Cleome*; 1 Lethbridge, Sep[t.], 30, 1913, E.H.S.; 1 L[eth]bridge, July 28, 1914, E.H.S.; 1 L[eth]bridge, Aug. 28, 1914, E.H.S.; 1 L[eth]bridge, Aug. 12, 1924, T.H. Owens; 1 L[eth]bridge, Sept. 6, 1924, H.E. Gray; 1 L[eth]bridge, July 6, 1925, H.E. Gray; 1 L[eth]bridge, July 6, 1925, H.L. Seamans; 1 L[eth]bridge, Aug. 26, 1927, H.E. Gray; 1 L[eth]bridge, 19-VIII-1948, G.A.H.; 2 L[eth]bridge, 19-VIII-1948, G.A.H., red clover; 2 L[eth]bridge, 2-IX-1948, G.A.H., red clover; 3 L[eth]bridge, 26-VII-1949, G.A.H., *Helianthus*; 2 (L[eth]bridge), Vet[erinary] Res[earch] Sta[tion], 13-VII-50, *Astragalus*; 1 Lethbridge, Vet[erinary] Res[earch] Sta[tion], 13-VII-50, *Astragalus*; 6 Lethbridge, An[imal] Ins[pection] Lab[oratory], 15-IX-1951, G.A.H., red clover; 1 Lethbridge, Vet[erinary] Res[earch] Sta[tion], 17-VIII-1951, B.H., *Monarda* sp.; 1 Lethbridge, 4-VII-1956, E.E.S.; 1 MacLeod, 21-VII-1950, G.A.H., on red clover; 1 Magrath, 14-IX-1951, C.E.L., *Helianthus*; 1 Manyberries (Dom[inion] Range St[ation]), 15-VIII-1951, D.F.H.; 2 Manyberries, 22-VIII-1954, L.A. Konotopetz; 1 Medicine Hat, 13-VII-25, F.S. Carr; 1 Milk R[iver], 12-IX-1951, G.A.H., sweet-clover; 1 Scandia (Swanson), 29-VII-1952, G.A.H., red clover; 1 Seven Persons, 8-VII-1952, T.H.B. Haig, *Glycyrrhiza*; 1 Seven Persons, 27-VII-1952, G.A.H., on sweetclover; 1 Seven Persons, 27-VII-1953, G.A.H., on mustard (S. alt.) near alfalfa; 1 Wild Horse (Heydlauff), 4-VIII-1952, G.A.H., alfalfa; 1 Wil[d] Horse, 4-VIII-1952, C.E.L., alfalfa; 1 (locality unknown), 1-4, 17-VIII-1952, A.R.B. [all, CNC]. **British Columbia:** 1 Osoyoos, 10-VI-1919, E.R.B.; 1 Salmon Arm, 2-V-1918, E.R.B. [both, CNC]. **Manitoba:** 1 Oberon, 2-IX-54, T.V. Cole, on sunflower [CNC]. **New Brunswick:** 1 Bridgetown, 20-IX-1913, G.E. Saunders; 2 Chamcook, 7-VIII-1957, G.E.S.; 1 S[ain]t Andrews, IX-1917, F.J.; 1 S[ain]t John (W.H.H.) [all, CNC]; 1 S[ain]t John (Red Head), 1 Sept. 1907, A.G. Leavitt [HEM]. **Nova Scotia:** 1 Greenwich, May 17, '34, (M.E.M.); 1 Hectanooga, 4-VII-1961, F.&L.; 2 Hectanooga, 7-VII-1961, F.&L.; 1 Kings Co[unty], 20 June '16; 1 Kings Co[unty], Aug. 1, 1932, C.E. Atwood, *Solidago*; 1 Smith's Cove, 15-VII-1914, Arthur Gibson [all, CNC]. **Ontario:** 1 Belleville, 26-VII-42, M. Thompson; 3 Bell's Corners, Sept. 9, 1952, R. de Ruette; 7 Bobcaygeon, 30-VIII-1954, R.L., Viper's bugloss; 10 Cayuga, 3-VIII-1954, C.D.M.; 23 Cayuga, 3-IX-1954, R.L., on Scotch thistle; 1 Chatterton, 25 Aug. 1949, John C. Martin; 1 Chatterton, 9-IX-54, John C. Martin; 2 Clear Cr[ee]k, 5-IX-1954, R.L., thistle; 1 Clear Cr[ee]k, 5-IX-1954, R.L., *Solidago*; 1 Frankford, 13-7-47, John C. Martin; 1 Grand Bend, 6-IX-1954, R.L.; 6 Hillcrest, 28-VIII-1954, R.L., on Viper's bugloss; 4 Hillcrest, 28-VIII-1954, C.D.M.; 1 Kingsville, 17-VII-1955, L.A.K.; 1 Lobo, Aug. 3, 1912, A.A. Wood; 1 London, July 20, 1953, B. Hartley; 2 London, 23-VII-53, J.B.H.; 1 London, Aug. 11, 1953, B. Hartley; 1 London, Aug. 17, 1953, B. Hartley; 1 Markham, 21-VIII-1913, F.W.L.S.; 38 Marmora, Aug. 4, 1952, J.B.V., *ex nest*; 1 Marmora, 14-VIII-1952, C.Boyle; 1 Marmora, 7-IX-1952, R.L. (Malaise trap); 26 Marmora, 11-IX-1952, R.L., on Viper's bugloss; 2 Marmora, 12-IX-1952, R.L., on goldenrod; 1 Marmora, 12-IX-1952, E.H.N.S.; 1 Marmora, 14-IX-1952, R.L., *Aster*; 1 Merivale, 6-VIII-1930, J.J. de Gryse; 1 Merivale, 19-VIII-1930, J.J. de Gryse; 12 Merivale, Aug. 19, 1954, R.L.; 3 M[oun]t Pleasant, Brant County, 19-IX-52, J.B.H.; 1 Niagara Glen, 24-X-1954, R.L., on garden flowers; 6 Osgoode, 30-IX-52, C.D.M.; 1 Ottawa, 3-X-1912, Sn.; 1 Ottawa, 23-V-1913, F.W.L.S.; 1 Ottawa, Aug. 6, 1952, R.L.; 1 Ottawa, Sept. 1, 1952, R.L.; 1 Ottawa, Sept. 10, 1952, R.L.; 1 Ottawa, Aug. 15, 1954, R.L.; 1 Ottawa, 15-VII-1957, J.E.H.M. [all, CNC]; 2 Ottawa, 4-VII-60, H.E.M. [HEM]; 4 Ottawa, 16-VII-1960, O.P., *ex nest*; 1 Ottawa, 22-9-[yr. ?]; 1 Parkhill, 7-IX-1954, C.D.M., on *Solidago*; 8 Peacock P[oin]t, 3-IX-1954, R.L., thistle; 20 Port Ryerse, 4-IX-1954, C.D.M.; 1 Quarries, 18-VII-1946, O. Peck; 24 S[ain]t John's West, 1-VIII-1954, C.D.M.; 60 S[ain]t John's West, 1-IX-1954, R.L., on Scotch thistle; 2 Selkirk, Sept. 3, 1954, R.L.; 1 Toronto, G. 32; 53 Wellington, 28-VIII-1954, R.L., on Viper's bugloss [all, CNC]. **Prince Edward Island:** 1 Charlottetown, 3-VIII-1914, F.W.L.S. [CNC]. **Quebec:** 1 Abbotsford, May 29, 1934, C.E. Bourgault; 3 Beech Grove, 18-VIII-52, B.A.G.; 1 Cap Rouge, 4-VII-1953, R.L.; 2 Duchesnay, 1-IX-48, R.L.; 1 Getineau Park, 30-VII-1961, H.E.M., 1100'; 1 Hemmingford, VIII-26-1922, A.D. Baker; 1 Herdman, 21-VIII-1952, G.S.W.; 1 Lac du Bois, 20 July '50, K. Bourns; 1 Mont Joli, 6-VIII-1954, J.R.M.; 1 Montreal, 27-VI-06, Beaulieu; 1 Wooton [Wotton] 100 [all, CNC]. **Saskatchewan:** 1 Minton, 12-VIII-55, C.D.M.; 4 Perdue, 11-VIII-1914; 1 Regina, 8-VIII-1886, J. Fetcher; 1 Rock Glen, 2-VIII-55, C.D.M.; 1 S[ain]t Victor, 28-6-1955, A.R.B.; 1 Saskatoon, 21-VIII-1914; 1 Sask[atoon] Landing, 23-VII-56, E.E.S.; 1 S[wift] Current, 19-IX-1951, G.A.H.; 1 S[wift] Current, 19-IX-1951, C.E.L., bull thistle; 2 Tompkins, 18-IX-1951, C.E.L., on sweetclover; 1 Val Marie, 10-VIII-55, C.D.M. [all, CNC].

UNITED STATES

WORKERS

Arizona: 1 Flagstaff, 7 mi S. [of], Sept. 12-16, 1955, G.B.B., *Geranium*; 1 Flagstaff, 4 mi N. [of], Sept. 15, '55, G.D.B., *Aster*; 1 Flagstaff, (Canyon, R[oute] 180), VIII-12-12-62, R.&K.D., 7600'; 1 Flagstaff, (M[oun]t Elden), VIII-11-62, R.R.D., 9000' [all, HEM] 3 Flagstaff, (Canyon, R[oute] 180), VIII-12-14-62, R.R.D., 7600'; 2 Flagstaff, (Canyon, R[oute] 180), VIII-12-14-62, R.&K.D., 7600'; 2 Flagstaff, (M[oun]t Elden), VIII-11-62, R.R.D., 9000' [all, RRD]; 2 Natames Plateau (n[e]a[r] Chrysotile), NW. Gila Co[un]ty, VII-22-1937, Rehn, Pate, & Rehn, 5,100 ft. [ANSP]; 1 Snowflake, Navajo Co[un]ty, VIII-16-62, R.&K.D. [RRD]; 1 Strawberry, Gila Co[un]ty, VII-24-1937, Rehn, Pate & Rehn, 5900' [ANSP]; 1 Williams, Sept. 8, 1938, R.W.D. [HEM]. **California:** 1 Hallelujah J[un]ct[ion], Lassen County, VII-13-49, J.W.M. [TBM]. **Colorado:** 1 Alder, Aug. 2], 1940, H.E.M. [HEM]; 1 Boulder Canyon, 8-8-59, R.R.D., 7800' [RRD]; 44 F[or]t Lewis, Aug. 8, 1948, R.W.D.; 3 Great Sand Dunes Nat[ional] Mon[ument], Aug. 23, 1940, H.E.M. [HEM]; 1 Lay, Moffat Co[un]ty, VII-2-62, R.&K.D. [RRD]; 1 (locality unknown), Morrison [NRS]. **Illinois:** 1 (locality unknown), Belfrage [NRS]. **Indiana:** 1 Cromwell, 20-VII-32, H. Brown [CNC]. **Maine:** 1 Biddeford Pool, 23-VIII-54, G.S.W. [CNC]; 1 Harold, (Coll[ectio]n of Frederick Allen Eddy) [MCZ]; 1 Pemaguid P[oin]t, VIII-23-1936, J.W. Cadbury [ANSP]. **Massachusetts:** 1 Boston, 1837 [NRS]; 2 Cohasset, 1-IX-07 [MASS]; 1 Forest Hills [TBM]; 1 Martha's V[ir]n[e]y[ar]d, 9-19-56, C.W. Sabrosky [USNM]; 1 Nantucket, VIII-29-1911; 1 Nantucket, VIII-14-1922 [both, MASS]; 2 Needham, IX-3-1927, T.B.M. [HEM]; 2 Needham, IX-3-1927, T.B.M. [TMB]; 1 Waltham, 25-VI-57, R.A.M. [CNC]; 1 Waltham, 25-VI-57, R.A.M. [RAM]; 1 Wood's Hole, E. Cattell [CNC]. **Michigan:** 1 Douglas Lake, Aug. 7, 1915, P.W.F. [HEM]; 1 Douglas Lake, Aug. 11, 1915, P.W.F. [HEM-(Homotype, H.E.M.)]; 1 Missaukee Co[un]ty, VIII-11-59, R.&K.D. [RRD]. **Minnesota:** 1 Brainerd, Oct. 2, 1938, R.W.D.; 2 Mound Spring St[ate] P[ar]k, Rock Co[un]ty, Sept. 15, 1948, H.E.M.; 2 Pine Co[un]ty, Sept. 25, 1938, R.W.D.; 1 S[ain]t Paul, Aug. 2, 1938, R.W.D.; 4 S[ain]t Paul, Aug. 4, '38, R.W.D. [HEM]; 1 S[ain]t Paul, Aug. 17, '38, R.W.D. [HEM-(Homotype, H.E.M.)]. **Montana:** 1 Hamilton, July 29, 1947, R.W.D. [HEM]. **Nebraska:** 1 Thedford, 8-31-60, R.&K.D. [RRD]. **New Jersey:** 1 Oradell, Oct. 7, '28 [HEM]; 1 (Locality unknown), Belfrage [NRS]. **New Mexico:** 1 Lake Burford, VI-5-1918, A. Wetmore [NRS]; 2 McCaffrey, Aug. 25, 1940, H.E.M. [HEM]; 1 Raton, W.P.C.; 1 Sapello Cañon, Aug. 31, 1899, W. Porter [both, CNC]. **New York:** 2 Essex Co[un]ty, 2-VIII-60, J.R., on *Lotus corniculatus* [CNC]; 2 Essex Co[un]ty, 2-VIII-60, J.R., on *Lotus corniculatus* [RAM]; 1 Ithaca, Aug. 22, 1955, Babiý [NRS]; 1 Minnetto, July 24, 1951, F.P. Sivik [HEM]; 7 Minnetto, July 24, 1951, F.P. Sivik [TBM]; 1 Minnetto, July 31, 1951, F.P. Sivik [HEM]; 4 Minnetto, July 31, 1951, F.P. Sivik [TBM]; 1 New York City, Van Cortt Park, Aug. 1, 1936, S. Bettini [ANSP]; 1 Orient, VII-12-20-18; 1 Tompkins Co[un]ty, 25-VI-60, J.R., *Rosa carolinä*; 1 Tompkins Co[un]ty, 15-IX-60, J.R., on *Solidago* [all, CNC]; 1 Tompkins Co[un]ty, 15-IX-60, J.R., on *Solidago* [RAM]; 1 Wyandanch, L[ong] I[sland], 9-13-1914, F.M. Schott [CNC]. **North Dakota:** 1 Fargo [HEM]. **Oregon:** 1 Frenchglen, Harney Co[un]ty, July 29, 1935, Stanley Jewett, Jr. [CNC]; 2 Granny Camp, Wallowa Co[un]ty, Aug. 4, 1941, M.R. Rieder; 1 Juntura, Drinkwater Pass (1 mi W. [of] co[un]ty line), July 14, 1940, H.A.S., 4212 ft [all, HEM]. **Pennsylvania:** 1 Benton Columbia Co[un]ty, 19-VIII-1920, H.K.; 1 Columbia Co[un]ty, 20-VIII-1930, H.K.; 1 Pittsburgh, All[eghen]y Co[un]ty, IX-1921, H.K. [all, CM]; 1 Pittsburgh, 30-VIII-60, M. O'Shea, on *Dahlia* [HEM]; 1 Rector, Powdermill Nature Res[erve], W[est]-moreland Co[un]ty, 3-VIII-196[0] [CM]. **South Dakota:** 3 Brookings, Aug. 6, 1928, M. Fredricksen; 17 Brookings, Sept. 22, '52, H.C.S.; 1 Brookings, 15 June 1956, H.C.S., light trap; 2 Brookings, Sept. 10, '58, H.C.S.; 2 Brookings, Sept. 11, '58, H.C.S.; 1 Brookings, Sept. 6, '61, H.C.S.; Brookings, Sept. 9, '61, H.C.S.; 2 Brookings, Sept. 15, '61, H.C.S.; 1 Brookings, Sept. 17, '61, H.C.S.; 1 Buffalo, Jump Off, July 22, 1928, H.C.S.; 6 Buffalo, Antelope, Aug. 28, 1952, H.C.S.; 6 Cottonwood, June 2, 1948, H.C.S.; 27 Cottonwood, July 27, 1948, H.C.S.; 1 Deadwood, Sept. 9, 1925, H.C.S.; 1 Grass Rope, Aug. 23, 1929, H.C.S.; 1 Highmore, June 14, 1948, H.C.S.; 1 Martin, June 16, 1925, H.C.S.; 1 Sioux Falls, 9-II-61, H.C.S.; 2 Sioux Falls, 9-18-61, H.C.S.; 6 Slim Buttes, n[e]a[r] Reva, Aug. 4, 1953, H.C.S.; 1 Slim Buttes, n[e]a[r] Reva, Aug. 5, 1953, H.C.S.; 2 Spearfish, June 28, 1947, H.C.S. [all, SD]; 5 St[ate] Game Lodge, Aug. 24, 1938, R.W.D. [HEM]; 1 Webster, June 26, 1935, H.C.S. [SD]. **Utah:** 1 Duchesne, VII-14-62, R.&K.D.; 2 Vernal, VII-11-62, R.&K.D. [all, HEM]; 4 Vernal, VII-11-62, R.&K.D. [RRD]. **West Virginia:** 1 Durbin, n[e]a[r] Gaudineer, (not Gardiner), Tower, 6-VIII-60, H.E.M.; 1 Spruce Knob, 5-VIII-60, H.E.M., on *Cirsium* sp., 4000'; 1 Spruce Knob, 5-VIII-60, H.E.M., 4860'; 2 Spruce Knob, 6-VIII-60, H.E.M. [all, HEM]. **Wisconsin:** 1 Bayfield Co[un]ty, Aug. 22, 1952, R.E. Fye, alsike clover [CNC]; 1 (locality unknown), Kumlien [NRS]. **Wyoming:** 1 Manville, Aug. 12, 1947, D.G. Denning [HEM]; 2 Mommoth, Yellowstone N[ational] P[ar]k, VIII-15-1962, Phyl. & Dick Spangler [USNM]; 2 Moran, Teton Co[un]ty, 27-VII-1948, Wallace-Bauer, (C[arnegie] M[useum], Acc. 14503) [CM]; 3 Torrington, VII-30, G.B.F. [MCZ].

CANADA

MALES

Alberta: 3 Hays, 14-VIII-1953, C.E.L., red clover; 2 Lethbridge, Sept. 20, 1913, E.H.S.; 1 Lethbridge, Sept. 6, 1924, H.E. Gray; 1 Lethbridge, Aug. 20, 1927, H.E. Gray; 3 Lethbridge, Aug. 26, 1927, H.E. Gray; 1 Lethbridge, 20-IX-30, R.W.S.; 1 Lethbridge, Aug. 10, 1940, R.W.S.; 1 Lethbridge, Aug. 21, 1940, R.W.S.; 1 Lethbridge, 19-VIII-1948, G.A.H.; 1 Manyberries, 25-VII-1952, A.R.B.; 1 Mild River, 12-IX-1951, G.A.H., sweetclover; 1 Steeveville, 21-VIII-1957, A.R.&J.E.B. [all, CNC]. **British Columbia:** 1 Kamloops, 24 July '51, K. Bourns; 1 Oliver, 10-VII-1957, L.A.K.; 1 Peachland, 24-VII-09, J.B. Wallis; 2 Penticton, 7-VIII-16, Sn.; 1 Summerland, 14-IX-31, A.N. Gartrell; 1 Trout Creek, 8-22-14, Tom Wilson; 1 Walhachin, 11-IX-1917, E.R.B. [all, CNC]. **Manitoba:** 1 Aweme, VIII-7-13, N. Criddle; 1 Aweme, IX-26-1914, N. Criddle, 1 Aweme, 5-IX-1925, R.D. Bird; 1 Stony Mountain, 25-IX-09, J.B. Wallis [all, CNC]. **New Brunswick:** 1 Fredericton, 16-VII-1915, A.B. Baird [CNC]. **Ontario:** 1 Bancroft, 13-IX-1952, R.L., on goldenrod; 1 Bell's Corners, 21-IX-1951, J.F.M.; 1 Bobcaygeon, 30-VI-1954, C.D.M.; 8 Bobcaygeon, 30-VIII-1954, R.L., on Viper's bugloss; 1 Bobcaygeon, 30-VIII-1954, R.L.; 2 Cayuga, 3-VII-1954, C.D.M.; 10 Cayuga, 3-IX-1954, R.L., on Scotch thistle; 2 Clear Creek, 5-IX-1954, R.L., thistle; 1 Goderich, Sept. 7, 1953, J.B.H.; 4 Grand Bend, 6-IX-1954, R.L., thistle; 1 Grimsby, 29-VIII-1913, F.W.L.S.; 1 Guelph, 27-VIII-1913, F.W.L.S.; 1 Hillcrest, 28-VIII-1954, R.L., on Scotch thistle; 8 Hillcrest, 28-VIII-1954, R.L., on Viper's bugloss; 4 Hillcrest, 28-VIII-1954, C.D.M.; 3 London, Sept. 20, 1953, B. Hartley; 1 Lower Rideau [River], 3-9-1947, John C. Martin; 1 Marmora, 12-VIII-1912, E.H.N.S.; 1 Marmora, Aug. 19, 1952, J.R.V., *ex* nest; 2 Marmora, 7-IX-1952, R.L., Malaise trap; 3 Marmora, 10-IX-1952, R.L., on goldenrod; 10 Marmora, 11-IX-1952, R.L., on Viper's bugloss; 18 Marmora, 14-IX-1952, R.L., *Aster*; 2 Marmora, 14-IX-1952, R.L., on Viper's bugloss; 1 Merivale, Aug. 19, 1954, R.L.; 1 Mounjt Pleasant, Brant County, 19-IX-52, J.H.B. Hartley; 1 Normandale, 4-IX-1954, C.D.M., on *solidago*; 1 Osgoode, 30-IX-1952, R.S.B.; 9 Osgoode, 30-IX-1952, C.D.M.; 1 [Ottawa], Canal, 28-8-84; 1 Ottawa, 24-IX-1908, Arthur Gibson; 1 Ottawa, 2-10-1912, Sn.; 2 Ottawa, 3-X-1912, Sn.; 2 Ottawa, 4-X-1912, J.L. Beaulne; 14 Ottawa, Sept. 8, 1952, R.L.; 9 Ottawa, Sept. 10, 1952, R.L.; 10 Ottawa, Sept. 20, 1952, R.L.; 2 Ottawa, 25-VIII-1954, W.R.M.M.; 1 Ottawa, 26-VIII-1954, R.L.; 2 Ottawa, Sept. 18, 1954, R.L., on *Aster*; 9 Ottawa, 28-IX-1955, R.L., [*ex*] nest under porch stone; 1 Parkhill, 6-IX-54, R.L., *Aster*; 1 Parkhill, 7-IX-1954, C.D.M.; 4 Peacock P[oin]t, 3-IX-1954, R.L., thistle; 1 Point Pelee, 8-IX-1954, R.L., on goldenrod; 1 Point Pelee, 8-IX-1954, W.R.M.; 20 Port Ryerse, 4 -IX-1954; 2 P[or]t Dover, 4-IX-1954, R.L.; 7 S[ain]t John's West, 1-VIII-1954, C.D.M.; 3 S[ain]t John's West, 1-IX-1954, R.L., on Scotch thistle; 1 Stratford, 21-IX-52, J.B.H.; 2 Wellington, 28-VIII-1954, R.L., on Viper's bugloss [all, CNC]. **Quebec:** 2 Chelsea, 12-IX-1952, R. de Ruette; 1 Fort Coulonge, 1-VIII-1919, J.I. [L.] Beaulne; 1 Hull, 12-IX-1952, R. de Ruette; 1 Ile de Montreal, 2-IX-06, Beaulne; 1 Kazabazua, 9-IX-1913, F.W.L.S.; 1 Parke Reserve, Kam[ourshka] Co[unty], 24 Aug. 1957, E.M. [all, CNC]. **Saskatchewan:** 1 Minton, 11-VIII-1955, A.R.B.; 1 Minton, 12-VIII-1955, C.D.M.; 1 Regina, 10 Sept. '05, T.N. Willing; 1 Tunstall, 27-VIII-1957, A.R.&J.E.B. [all, CNC]. **Locality unknown:** 1 (no data) [CNC].

MEXICO

MALE

Chihuahua: 1 Meadow V[alle]y, Townsend [USNM].

UNITED STATES

MALES

Arizona: 1 Flagstaff, 15 mi N. [of] ("Divide"), Oct. 2, 1938, E.R.T., 7225'; 1 Flagstaff, 4 mi N. [of], Sept. 15, '55, G.D.B., *Aster*; 1 Flagstaff, 8 mi N. [of], Sept. 15, '55, G.D.B. [all, HEM]; 1 Flagstaff, (Canyon, R[oute] 180), VIII-12-14-62, R.&K.D., 7600' [RRD]; 1 Mounjt Lemon, Sain[t] Catalina Mounjt[ains], VII-27-17, 9150' [CNC]. **California:** 1 Hallelujah J[un]ct[ion], Lassen County, VII-13-49, J.W.M. [HEM]; 1 Hallelujah J[un]ct[ion], Lassen County, VII-13-49, J.W.M. [TBM]; 2 Topaz Lake, Mono Co[unty], VII-17-51, P.D.A. [USNM]. **Colorado:** 2 Boulder, Sept. 12, 1929, E.D. Bueker [HEM]; 1 Boulder, VIII-6-60, R.K.D. [RRD]; 1 Crook (Jumbo Res[ervoir]), Aug. 12, 1921, G.A. Sandhouse; 1 Denver, Sept. 11, 1914, E.C. Jackson [both, USNM]. **Indiana:** 1 Tippecanoe Co[unty], IX-7-1951, (Purdue Student [Collection]) [CNC]. **Maine:** 1 Saco, Sept. 3, '26, T.B.M., thistle [TBM]. **Massachusetts:** 1 Needham, IX-3-1927, T.B.M. [TBM]. **Michigan:** 1 Mecosta Co[unty], 9-9-59, R.&K.D.; 1 Menominee Co[unty], 8-29-59, R.&K.D. [both, RRD]. **Minnesota:** 1 Pine Co[unty], Sept. 25, 1938, R.W.D. [HEM]. **Montana:** 1 Bozeman, 15 Sept. 1950, R.S. Filmer [HEM]. **New Hampshire:** 2 Meredith, 28-VIII-60, R.A.M.,

on *Pontederia cordata* [CNC]; 2 Meredith, 28-VIII-60, R.A.M., on *Pontederia cordata* [RAM]; 1 Belknap Co[unty], 26-VIII-60, R.A.M., on *Aster macrophyllus* [CNC]; 1 Belknap Co[unty], 26-VIII-60, R.A.M., on *Aster macrophyllus* [RAM]. **New Mexico:** 1 Closson, Aug. 25, 1940, H.E.M. 1 Hauley Lake, Navajo Co[unty], VIII-17-62, R.&K.D., 8000' [RRD]. **New York:** 2 Covert, Seneca Co[unty]; 1 Ithaca (campus), 24 Sept. 1925, P.P. Babiy [all, NRS]; 1 Minnetto, 9-22-1941, L.D. Newsom [HEM]; 1 Minnetto, July 24, 1951, F.P. Sivik [TBM]; 1 Richm[ond County], Staten Island, Sept. 2, 1936, S. Bettini [ANSP]; 1 Tompkins Co[unty], 22-VII-60, J.R., on *Veronica* sp. [CNC]; 1 Tompkins Co[unty], 22-VII-60, J.R., on *Veronica* sp. [RAM]; 1 Wyandanch, L[ong] I[sland], 9-13-1914, F.M. Schott [CNC]. **North Carolina:** 1 Linville, Sept. 21, 1945, T.B.M. [TBM]. **North Dakota:** 2 Fargo [HEM]. **Ohio:** 1 Columbus, Franklin Co[unty] [HEM]. **Oregon:** 1 Blitzen Valley, VII-17-36, S. Jewett Jr.; 1 Boardman, July 13, 1938, K. Gray & J. Schuh; 1 Hemond, 9-5-39, K. Gray, & J. Schuh [all, HEM]. **Pennsylvania:** 11 Pittsburgh, 30-VIII-60, M. O'Shea, on *Dahlia*; 1 Pittsburgh, 30-VIII-60, M. O'Shea [all, HEM]; 8 Rector, Powdermill Nature Res[erve], W[est]moreland Co[unty], 8-IX-1960; 4 Rector, Powdermill Nature Res[erve], W[est]moreland Co[unty], 14-IX-1960 [all, CM]. **South Dakota:** 1 Brookings, Sept. 1, 1948, H.C.S.; 2 Brookings, Oct. 6, 1958, H.C.S.; 4 Brookings, Sept. 6, '61, H.C.S.; 2 Brookings, Sept. 9, '61, H.C.S.; 3 Brookings, Sept. 15, '61, H.C.S.; 2 Brookings, Sept. 17, '61, H.C.S.; 2 Brookings, Sept. 22, '61, H.C.S.; 1 Buffalo, Sept. 9, 1927, H.C.S.; 3 Buffalo, Antelope Range, Aug. 28, 1952, H.C.S.; 2 Cottonwood, June 2, 1948, H.C.S.; 3 Cottonwood, July 26, 1948, H.C.S.; 5 Elk Point, Aug. 29, 1954, H.C.S.; 1 Lake Campbell, Aug. 30, 1929, H.C.S.; 1 Martin (Sand Hills) Aug. 25, 1929, H.C.S. [all, SD]; 2 St[ate] Game Lodge, Aug. 24, 1938, R.W.D. [HEM]; 3 Waubay, Sept. 13, 1929, H.C.S.; 1 White (Warren's Woods), Sept. 25, 1925, H.C.S. [all, SD]. **Utah:** 1 Morcan, 6-IX-56, G.F. Knowlton [CNC]. **Virginia:** 1 Farmville, 9-25-21, P.W.F. [HEM]. **West Virginia:** 1 Cranberry Gl[ade], Aug. 11, 1957, T.B.M. [TBM]; 2 Spruce Knob, 5-VIII-60, H.E.M., 4000'; 3 Spruce Knob, 6-VIII-60, H.E.M., 4000'; 1 Spruce Knob, 7-VIII-60, H.E.M., 4000'; 5 Spruce Knob (r[oad] to), Pendleton Co[unty], 14-VIII-60, H.E.M., 4000' [all, HEM]. **Wisconsin:** 1 Madison, 10-2-6 [CNC]; 1 (locality unknown) [NRS]. **Wyoming:** 4 Casper, Aug. 25, 1938, R.W.D.; 1 Lander, Aug. 2, 1925 [all, HEM]; 2 Mommoth, Yellowstone N[ational] P[ark], VIII-16-62, Phyl. & Paul Spangler [USNM].

Megabombus (M.) fervidus californicus (Sm.) new status

Apis fervida F., 1798, p. 274, (p.p.), (re: nominate ssp. only): *Bombus californicus* Sm., 1854, p. 400 (♀, paranominate ssp. only): *Apathus ? californica* Cr., 1887, p. 307: *Apathus ? californicus* Cr., 1879c, p. 214 (♂): *Bombus californicus*, auctt., (nec *californicus* Sm., 1854, p. 307, ♀): *Bombus californicus*, Handl., 1888a, p. 243, (p.p.): *Bombus californicus* ssp. *californicus*, Steph., 1957, pp. 33, 34: *Bombus consanguineus* Handl., 1888a, p. 239: *Bombus californicus* ssp. *consanguineus*, Steph., 1957, pp. 33, 38: *Bombus (B.) californicus*, Fkln., 1912, p. 393: *Bombus dubius* Cr., 1863a, p. 97: *Bombus neglectulus* Ashm., 1902b, p. 124: *Bombus (Fervidobombus) californicus*, Brs., 1951, p. 1249, *In Muesebeck et al.*: *Bombus (Fervidobombus) californicus* v. *consanguineus*, Brs., 1951, p. 1249, *In Muesebeck et al.*: *Bombus (Fervidobombus) californicus* v. *dubius*, Brs., 1951, p. 1249, *In Muesebeck et al.*: *Bombus (B.) (Dumoucheli group)*, Fkln., 1912, p. 387, (p.p.): *Bremus californicus*, Fris., 1921b, p. 146 (wrong locality): *Bremus californicus* v. *dubius*, Fris., 1927c, p. 373: *Bremus (Fervidobombus) californicus*, Fris., 1927e, p. 68: *Bremus (Fervidobombus) californicus* v. *consanguineus*, Fris., 1927e, p. 68: *Bremus (Fervidobombus) californicus* v. *dubius*, Fris., 1927e, p. 68: *Fervidobombus (F.) californicus*, Skor., 1922a, p. 153, (list): *Megabombus (M.) (Dumoucheli group)*, Mlrn., 1961a, p. 57, (p.p.): *Psithyrus californicus*, auctt., (nec *Psithyrus* Lep., 1832, p. 374): . . . *californicus*, Mlrn., 1960a, p. 90, (♀ type).

DESCRIPTION. This taxon does not differ morphologically from the nominate subspecies, either in specific characters or in the physical condition of the pubescence.

Queen, Worker. *Color:* Typical specimens have the thoracic dorsum antierad of wing bases and extending noticeably ventrad of tegulae, and abdominal T4 yellow; head, remainder of body and legs black (often yellow in varying degree is evident laterally on the scutellum); wings deeply infuscated much as in *f. fervidus*. Usually very variable (*cf.* under Comments).

Male. *Color:* Typical specimens have the thoracic dorsum anterior to wing bases, thoracic pleura in front (often extending downward to or near leg bases), abdominal T4 at least for the most part yellow (although often some yellowish pile might also occur distally or distolaterally on T1 and 3); head, remainder of body for the most part, and legs black; wings distinctly paler than those of queen and worker. Genitalia, seventh and eighth abdominal sterna as in *f. fervidus* (Pl. XIII).

Redescribed from hypotypes. **Queen**, Friday Harbor, Wash., June 21, 1939, R.W. Dawson; **worker**, same locality, July 25, 1939, R.W. Dawson [both, HEM]; **male**, Elkwater Park, Alta., 30-VII-1952, A.R. Brooks [CNC].

TYPE. Examined a ♀ (Type Hym. 17B 1223) in the British Museum (N.H.), London (Milliron 1960a: 90). A Cresson (1916: 114) lectotype ♂ *Apathus? californicus* (No. 2685, or 2685.1) is in the collection of the Academy of Natural Sciences of Philadelphia.

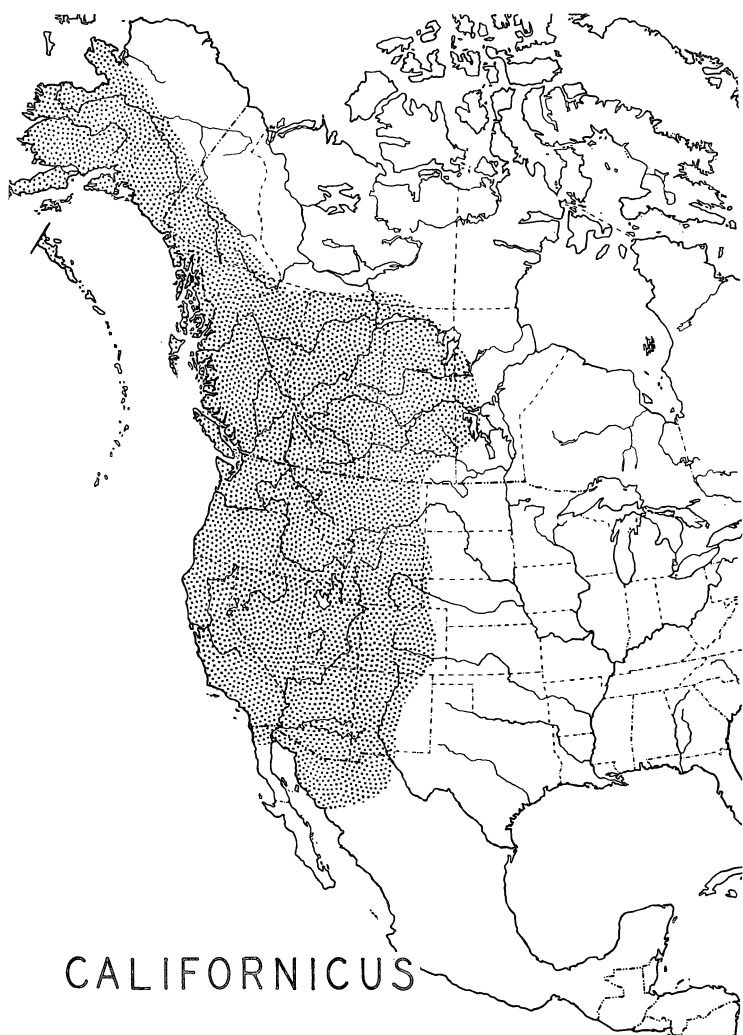
TYPE LOCALITY. California, U.S.A. Number of specimens at hand: 423. In flight: From mid-March to *ca.* mid-October, the males first appearing in late May. Distribution: (vertical), sea level to *ca.* 8850 ft; (horizontal), Alaska southward to northern Mexico, and eastward into the western Canadian Provinces to Manitoba. Floral visitations: *Castilleja*, *Lotus*, *Medicago*, *Mimulus*, *Penstemon*, *Trifolium*, and *Zinnia*. Lutz and Cockerell (1920) recorded *Carduus* and *Iris*.

COMMENTS. In all its castes, chromatically this taxon is one of the most variable of all recognized subspecies in North America. Deviating from the form described above I have seen almost every conceivable degree of replacement of black by yellow on the body, except for the usual retention of it on abdominal T5–6 even in the lightest females and most often on T5–7 in the males. In some areas specimens grading toward *f. fervidus* is striking, as for example the form named *consanguineus* by Handlirsch (1888a: 239) and its allies. As stated before, in regions where hybridization with *f. fervidus* evidently occurs, specimens which cannot be reliably placed in either subspecies might be taken. The amount of yellow on the scutellum varies from a mere trace to conditions where it is predominant (then being medially divided by some black) or completely covers the scutellum. On light specimens there is usually a distinct interalar black band, but sometimes this is vague or absent.

CANADA

QUEENS

Alberta: 1 Bennet Ranch (Waterton), 21-VIII-1951, G.A.H.; 1 Bennet Ranch (Waterton), 19-V-1956, E.E.S.; 1 Calgary, (no data) [both, CNC]; 1 Edmonton, 28-VI-1919, F.S. Carr [HEM]; 1 Edmonton, 29-V-1924, G. Salt; 1 Edmonton, 2-VI-1924, G. Salt; 1 Elkwater, 8-VI-1952, A.R.B.; 1 Elkwater, 20-VI-1956, E.E.S.; 1 Elkwater Park, 1-V-1952, L.A. Konotopetz; 1 Elkwater Park, 8-V-1952, L.A. Konotopetz; 1 Lethbridge, 20-VII-1930, R.W.S.; 1 Lethbridge, 4-VII-1956, E.E.S. [all, CNC]. **British Columbia:** 1 Abbotsford, 16 June, 1953, G.J.S.; 1 Agassiz, June, 1913, R.C. Treherne; 1 Agassiz, 8-VII-1914, F.W.L.S.; 1 Agassiz, 11-V-1915, F.W.L.S.; 1 Agassiz, 11-V-1926, R.Gg.; 1 Agassiz, 4-VI-1927, R.Gg.; 1 Boitana Lake, July 8, 1955, J. Sanjean; 1 Chilcotin, 16-VI-1920, E.R.B.; 2 Cowichan Bay (Vancouver Island), 2-VI-1959, E.E.M.; 1 Fitzgerald, Aug. 22, '21, W.R. Carter; 1 Keremeos, 18-VI-1923, C.B. Garret; 1 MacGillivray Creek Game Reserve (nr. Chilliwack), 15-VI-1953, G.J.S.; 1 Mission City, 2-VI-1953, E.M.; 1 Mission City, 2-VI-1953, W.R.M.M.; 2 Mission City, 6-VI-1953, E.M.; 1 Mission City, 9-VI-1953, W.R.M.M.; 3 Mission City, 14-VI-1953, E.M.; 1 Mission City, 15-VI-1953, E.M.; 1 Mission City, 16-VI-1953, E.M.; 1 Mission City, 20-VI-1953, E.M.; 2 Mission City, 26-VI-1953, W.R.M.M.; 1 Mission City, 1-VII-1953, G.J.S.; 1 Mission City, 4-VII-1953, W.R.M.M.; 1 Mission City, 9-VII-1953, G.J.S.; 2 Mission City, 18-VII-1953, G.J.S.; 1 M[oun]t Cheam, 10-VIII-13, Jack Wilson, 7000'; 1 New Westminster (Forestry Station), V-19-1939, R.H. Longmore; 5 Okanagan Falls, 29-V-1953,



MAP 17.

J.R.M., 2000'; 2 Penticton, 15-V-1919, E.R.B.; 1 Royal Oak, V-13-1917, R.C. Treherne; 2 Royal Oak, V-16-1917, R.C. Treherne; 1 Ruskin, 26-VI-1953, W.R.M.M.; 1 Saanich, 19-VIII-13, Tom Wilson; 1 Saanich, 22-V-1929, W.H.A. Preece; 1 Saanich Dist[ri]ct, 25-VII-17, W.D.; 2 Salmon Arm, 4-VII-1914, F.W.[L.]S.; 1 Sidney, 6-VII-1914, F.W.L.S.; 9 Sidney, 8-V-1915, F.W.L.S.; 1 Sidney, 15-VIII-16, Sn.; 1 Spring Creek (30 mi N. [of] Terrace), 11-VI-1960, W.W.Ms.; 1 Taylor, 3-VII-1948, Mason & Hughes; 1 Terrace, 31-V-1960, C.H.M.; 1 Terrace, 2-VI-1960, B.S. Heming; 1 Terrace, 7-VI-1960, B.S. Heming; 3 Terrace, 8-VI-1960, B.S. Heming; 1 Terrace, 16-VI-1960, W.W.Ms.; 1 Terrace, 9-VII-1960, W.R. Richards; 1 Vancouver, 3-IV-1906, Rev. G.W. Taylor; 1 Vernon, 12 Aug. 1917, Max H. Rühmann; 1 Vernon, 7-VI-1929, I. Ward; 1 Vernon, 29-V-1953, D.F.H., 1200'; 1 Victoria, V-[o]1, G.W. Taylor; 1 Victoria, 5-V-1919, W.D.; 2 Victoria, May 24, '21, W.R. Carter; 1 Victoria, May 30, '22, W.R. Carter; 1 Victoria, 31-5-1923, W.R. Carter; 1 Victoria (Douglas M[oun]t[ain]), 3-VI-1959, R.E.L.; 1 Walhachin, 3-IX-1917, E.R.B.; 2 Wellington, 3-VI-08; 1 Wellington, 3-VI-08, Rev. G.W. Taylor; 1 White T[rail], (Oliver), 17-V-1959, R.E.L. [all, CNC]; 1 (locality unknown), (C.D.), 23-5-97 [CNC] **Manitoba**: 2 Roblin (30 mi N. [of]), 13-7-1954, Brooks & Wallis [CNC]. **Saskatchewan**: 1 Cypress Hills, 28-V-1952, A.R.B.; 1 Humboldt, (no data), T.N. Willing; 1 Snowden, 17-VII-1950, L.A. Konotopetz; 1 White Fox, 6-VI-1954, Brooks & Wallis; 2 (locality unknown), (Hudson Bay [?]), 25-8-1954, Brooks & Wallis [all, CNC].

UNITED STATES

QUEENS

California: 1 Corte Madera, Marin Co[unty], III-24-1953, H.L. Mathis; 1 Jacumba, San Diego Co[unty], 12-VII-17; 1 Lucerne, Lake Co[unty], IV-10-1953, A.A. Grigarick; 1 Putah C[anyo]n, Yolo Co[unty], III-15-1953, D.E. Barcus; 1 Samuel Spr[ings], Napa Co[unty], V-28-1953, K. Tucker; 1 San Miguel, July 28, '37 [all, CNC]; 1 Strawberry, Tuolumne Co[unty], VI-19-51, P.D.A. [USNM]; 1 Strawberry, Tuolumne Co[unty], VI-30-51, D.P. Lawfer [CNC]; 1 Strawberry, Tuolumne Co[unty], VII-7-51, E.L. Silver [HEM]; 1 (locality indeterminate), (Slauson Hills), III-17-1934, C.A. Schroeder [HEM]; 1 (locality unknown), 23-VII; 1 (locality unknown), (no data) [both, CNC]. **Colorado:** 1 R[oute] 14 & 40 (10 mi N. [of] j[un]c[tion]), VII-2-62, R.&K.D. [HEM]; 2 R[oute] 14 & 40 (10 mi N. [of] j[un]c[tion]), VII-2-62, R.&K.D. [RRD]; 1 Science Lodge, Boulder Co[unty], July 4, 1936, Helen Rodeck [HEM]. **Oregon:** 1 Corvallis, May 18, 1925, H.A.S.; 1 Corvallis, May 24, 1925, H.A.S. [both, SD]; 1 Corvallis, April 1, 1930, Loring G. Hudson; 1 Corvallis, Apr. 29, 1930, H.A.S.; 1 Corvallis, VIII-24-1935, G.F. [all, CNC]; 1 Corvallis, 5-15-1947, D.A. Lindquist [HEM]; 1 Corvallis, IV-20-49, on apple [CNC]; 1 Forest Grove, May 8, 1938; 1 Hat Point, Wallowa County, VIII-4-41, M.&R.E. Rieder, 7000' [both, HEM]; 1 Newport, V-11-30, J. Wilcox [CNC]; 1 Roaring River (Fish Hatchery), Linn Co[unty], May 25, 1929, H.A.S.; 1 Salem, 9-28-25, H.A.S. [both, SD]. **South Dakota:** 1 Webster, June 26, 1934, H.C.S. [SD]. **Washington:** 1 Chuckanut Bay, Whatcom Co[unty], 24-VI-1955, J.F.G.C.; 30 Friday Harbor, June 27, 1939, R.W.D.; 2 Friday Harbor, July 2, 1939, R.W.D. [all, HEM]; 1 Illahee, Kitsap Co[unty], Nov. 7, 1955, D.F.; 10 Illahee, Kitsap Co[unty], May 1956, D.F.; 3 Illahee, Kitsap Co[unty], 15-V [to] 8-VI-1956, D.F.; 7 Illahee, Kitsap Co[unty], June 1956, D.F. [all, CNC]; 1 Signal Peak Guard Station, 23-VII-1955, J.F.G.C., 4100' [HEM].

CANADA

WORKERS

Alberta: 1 Aspen Beach, Aug. 25, 1944, O.P.; 6 Bennets Ranch (Waterton), 21-VIII-1951, G.A.H.; 2 Bennets Ranch (Waterton), 21-VIII-1951, C.E.L.; 1 Bilby, 29-VI-1924, G. Salt; 1 Calgary, July 7, 1904, J. Fletcher [all, CNC]; 1 Edmonton, 4-VIII-1919, F.S. Carr [HEM]; 1 Fallis, Aug. 25, 1939, R.W.S., alfalfa; 1 Glenevis, Aug. 25, 1939, R.W.S., alfalfa; 1 Highwood Summit (Kananaskis-Coleman H[igh]w[a]y), 13-VIII-1955, J.R.M., 4500'; 2 Millarville, 2 Aug. 1904; 1 Olds (N. [of]), 15-IX-1902, T.N. Willing; 1 Waterton, 4-7-1927, E.R.T. [all, CNC]. **British Columbia:** 1 Agassiz, 17-VII-1922, R.Gg.; 1 Agassiz, 20-VIII-1926, R.Gg.; 1 Agassiz, 11-IX-1926, R.Gg.; 1 Alberni, 26-VIII-1913, J.M. Swaine; 1 Comox, 2-8-01; 3 Eberts, VIII-1913, J.M. Swaine; 2 Fitzgerald, Aug. 7, '21, W.R. Carter; 1 Fitzgerald, Aug. 21, '21, W.R. Carter; 1 Invermere, 30-VI-1914, F.W.L.S.; 1 Mission City, 28-VII-1953, E.M.; 1 Okanagan, (no data); 1 Okanagan Falls, 21-VII-17, Sn.; 1 Okanagan Falls, 16-VI-1953, J.R.M., 2000'; 1 Peachland, 21-VII-09, J.B. Wallis; 4 Rolla, 21-VIII-1927, P.N. Vroom; 1 Rolla, 23-VIII-1927, P.N. Vroom; 4 Saanich Dist[ri]ct, 2-VII-1918, W.D.; 1 Saanichton, 20-VIII-1913, J.M. Swaine; 1 Salmon Arm, 4-VII-1914, F.W.L.S.; 4 Salmon Arm, 26-7-1950, McM. & Craig; 2 Shawnigan (V[ancouver] I[sland]), 7-VII-1914, F.W.L.S.; 1 Sidney, 6-VII-1914, F.W.L.S.; 1 Sidney, 7-VII-1914, F.W.L.S.; 1 Sidney, 8-VII-1914, F.W.L.S.; 2 Sidney, 9-VII-1925, W.D.; 1 Skulamaheen, 25-VII-13, Tom Wilson; 1 Vernon, 12 Aug. 1917, Max H. Rühmann; 1 Victoria, 14-VII-16, Sn.; 1 Victoria (Oak Bay), 2-VI-1959, L.A.K.; 1 Victoria (Oak Bay), 2-VI-1959, R.E.L. [all, CNC]. **Saskatchewan:** 1 Mal, 15-VII-1959, A.R.B.; 2 Melfort, 20-VII-16, Sn.; 1 Snowden, 28-VII-1944, O.P.; 9 (locality unknown), (Hudson Bay [?]), 25-8-1954, Brooks & Wallis [all, CNC].

MEXICO

WORKER

Chihuahua: 1 Tacubaya (not Jacubaya), (no data except 1900) [AMNH].

UNITED STATES

WORKERS

Alaska: 1 Nulato, VII-25-1916 [AMNH]. **California:** 1 Bridgeville, (no data), L.A.K.; 2 Descanso, San Diego Co[unty], 14-VIII-17; 2 Green Valley, Solano Co[unty], VI-19-1953, E.I. Sohlinger [all, CNC]; 1 Riverside, Riverside Co[unty], 4-20-40, [HEM]; 1 San Antonio Canyon (N. of Ontario), June 14, 1931, H.A.S., 2100'; 1 Trinity Center, Trinity Co[unty], VII-18-1953, A.T. McClay; 2 Winters, V-16-1953, A.A. Grigarick [all, CNC]. **Colorado:** 1 Cascade Lodge, Rocky M[oun]t[ain] Nat[ional] Park, Aug. 2, 1931, H.C.S. [SD]; 1 Pingree Park, August 1924, Beamer & Lawson [KU]; 1 Spring Gulch (nr. Gilpin), Aug. 3, 1934, N. Dondelinger [HEM]. **Montana:** 1 Glacier Nat[ional] P[ar]k, VIII-26-1937, F.W.P., at *Castilleja* [ANSP]; 1 Lake Placid (Green-

ough), Aug. 5, 1946, H.C.S., 4500' [SD]. **Nevada:** 1 Berry Creek, White Pine Co[unty], VII-14-1938, F.W.P., at *Penstemon watsoni* [ANSP]; 1 Fernley, Lyons Co[unty], VII-28-62, R.&K.D. [RRD]; 1 Lehman Creek (W. of Baker), White Pine Co[unty], VII-7-1938, F.W.P., at *Penstemon watsoni*; 1 Lehman Creek (W. of Baker), White Pine Co[unty], VII-7-1938, F.W.P., at *Mimulus guttatus* [both, ANSP]. **Oregon:** 2 Corvallis, June 7, '28, H.A.S. [SD]; 1 Corvallis, July 26, 1948, H.A.S., on red clover; 1 Fall M[oun]t[ain] Lookout Tr[ail], Grant Co[unty], July 14, 1936, H.A.S., 5200-6000'; 1 Imnaha (16 mi E. of), Wallowa Co[unty], Aug. 4, 1941, E.R. Rieder; 1 Medford (5 mi NE. of), July 1, 1948, H.A.S., *Lotus corniculatus* [all, HEM]; 1 Medford, VI-16-1952, M.F. McClay; 1 Medford, VII-24-1953, M.F. McClay [both, CNC]; 2 M[oun]t Hood, VII-29-1922, F.J. Spruijt; 1 Portland, VI-16-1935, Stanley Jewett Jr. [both, HEM]; 2 Salem, 14-VI-28, H.A.S. [SD]. **South Dakota:** 1 Lead, VII-27-1913, H.E. Cott [CNC]. **Washington:** 1 Chuckanut Bay, Whatcom Co[unty], 24-VI-1955, J.F.G.C.; 1 Friday Harbor, June 25, 1939, R.W.D.; 2 Friday Harbor, June 27, 1939, R.W.D.; 3 Friday Harbor, July 2, 1939, R.W.D.; 1 Friday Harbor, July 4, 1939, R.W.D.; 3 Friday Harbor, July 9, 1939, R.W.D.; 1 Friday Harbor, July 11, 1939, R.W.D.; 4 Friday Harbor, July 25, 1939, R.W.D.; 1 Friday Harbor, July 27, 1939, R.W.D.; 1 Friday Harbor, Aug. 1, 1939, R.W.D. [all, HEM]; 3 Unumclaw, IX-5-1955, J. Sanjean, on *Zinnia* [HEM]. **Wyoming:** 7 Mammoth, Yellowstone N[ational] P[ark], VIII-15-1962, Phyl. & Dick Spangler [USNM]; 1 Summit, Aug. 16, 1940, H.E.M., 8835' [HEM]; 1 Yellowstone N[ational] P[ark] (nr. Gardiner), VIII-16-1962, Phyl. & Paul Spangler [USNM].

LOCALITY UNKNOWN OR INDETERMINATE (Canada or the United States)

WORKERS

1 (no locality), Aug. 17, '17; 1 New Lunuore, 22-7-04 [both, CNC].

CANADA

MALES

Alberta: 1 Elkwater Park, 30-VII-1952, A.R.B. [CNC]; 1 High River, 28-V-[0]0, Bryant [MCZ]; 1 Highwood Summit (Kananaskis-Coleman H[igh]w[ay]), 13-VIII-1955, J.R.M., 4500'; 1 Kananaskis Forest Reserve, 9-VIII-1955, R. Coyles, 4200'; 1 Millarville, August 1904 [all, CNC]. **British Columbia:** 1 Agassiz, 5-IX-1922, R.G.; 1 Agassiz, 17-X-1922, R.Gg.; 1 Agassiz, 20-VII-1926, H.H. Ross; 1 Agassiz, 23-VIII-1926, H.H. Ross; 1 Agassiz, 11-IX-1926, R.Gg.; 1 Agassiz, 15-VIII-1927, R.Gg.; 2 Crescent, 14-VIII-16, Sn.; 5 Eberts, VIII-13, J.M. Swaine; 1 Fitzgerald, Aug. 14, '21, W.R. Carter; 1 Fitzgerald, Aug. 28, '21, W.R. Carter; 1 Kelowna, July 25, '95; 1 Newgate, 26-VIII-1927, A.A. Denny; 1 Okanagan Falls, 21-VII-17, Sn.; 1 Okanagan Falls, 24-VII-17, Sn.; 2 Saanich, 19-VIII-13, Tom Wilson; 1 Terrace, 1-VIII-1960, B.S. Heming; 2 Terrace, 1-VIII-1960, W.R. Richards; 1 Terrace, 6-VIII-1960, B.S. Heming; 2 Vancouver, 15-VII-16, Sn.; 3 Vancouver, 12-VIII-16, Sn.; 1 Vernon, 19-VIII-04; 1 Vernon, Aug. 10, 1926, D.G. Gillespie; 1 Vernon, 2-VIII-1927, I.J. Ward; 1 (locality unknown), 5-9-00 [all, CNC]. **Saskatchewan:** 1 Torch River, 30-8-1954, Brooks & Wallis; 1 (locality unknown), (Hudson Bay [??]), Aug. 13, 1950, C.H. Craig, *Medicago media* [both, CNC].

UNITED STATES

MALES

Alaska: 1 Cordova, VIII-15-1916 [AMNH]. **California:** 1 Camp Baldy, S[an] Bernardino Co[unty], VII-17-1952, D.S. Thompson [CNC]; 1 Cedar Pass, Modoc Co[unty], VIII-15-52 [HEM]; 1 Eleanor Lake, Tuolumne Co[unty], VII-2-51, P.D.A. [USNM]; 1 Giant Forest, 9 [to] 13 Aug. 1927, J.C.B., 6400-7000' [HEM]; 2 Green Valley, Solano Co[unty], VI-19-1953, E.I. Sholinger [CNC]; 1 Miles, July 11, 1936, A.E. Pritchard [HEM]; 2 Strawberry, Tuolumne Co[unty], 6-18-51, P.D.A.; 3 Strawberry, Tuolumne Co[unty], VI-23-51, P.D.A. [all, USNM]; 1 Strawberry, Tuolumne Co[unty], VI-23-51, D.P. Lawfer; 1 Strawberry, Tuolumne Co[unty], VI-29-51, D.P. Lawfer [both, CNC]; 1 Strawberry, Tuolumne Co[unty], VI-30-51, P.D.A. [USNM]; 1 Strawberry, Tuolumne Co[unty], VI-30-51, D.P. Lawfer; 1 Strawberry, Tuolumne Co[unty], VII-1951, B. Puttler [both, CNC]; 1 Strawberry, Tuolumne Co[unty], VII-9-1951, P.D.A. [USNM]; 1 Strawberry, Tuolumne Co[unty], VII-15-51, D.P. Lawfer [CNC]; 1 Strawberry, Tuolumne Co[unty], VII-14-52, E.L. Silver [HEM]. **Colorado:** 1 Poudre Canyon (W. of F[or]t Collins), August 1934, N. Dondelinger; 1 Rand, Aug. 22, 1940, H.E.M. [both, HEM]. **Idaho:** 1 (locality indeterminate), Black Pine Camp, (no data except 1950), (R.E. Rodock Coll[ectio]n) [HEM]. **Oregon:** 1 Blooming, July 26, 1938, Schuh & Gray; 1 Clackamas County, 9-1946, J.F. Bock; 1 Grant's Pass, July 29, 1948, H.A.S., on red clover [all, HEM]; 1 Joseph Viewpoint, Wallowa Co[unty], VII-25-1937, F.W.P., at *Penstemon variabilis* [ANSP]; 1 Mary's Peak, Benton Co[unty], July 17, 1941, G.E.F. [HEM]. **Washington:** 3 Friday Harbor, July 25, 1939, R.W.D.; 1 Friday Harbor, Aug. 1, 1939,

R.W.D.; 1 Friday Harbor, Aug. 6, 1939, R.W.D.; 2 Friday Harbor, Aug. 7, 1939, R.W.D.; 1 Friday Harbor, Aug. 8, 1939, R.W.D. [all, HEM]; 1 Illahee, Kitsap Co[unty], June 1956, D.F. [CNC]; 3 Seattle, 18 Sept. 1993, R.A. Flock [HEM]. **Wyoming:** 1 Laramie (Sherman Hill), 9-37, Pfadt; 1 Summit, Aug. 16, 1940, H.E.M. [both, HEM].

LOCALITY UNKNOWN (Canada or the United States)

MALES

1 (no locality label), 9 Sept. 14 [?], '49 [CNC]; 1 (no label) [HEM].

Megabombus (M.) fervidus sonomae (How.) new status

Apis fervida F., 1798, p. 274, (re: nominate ssp. only): *Bombus sonomae* How., 1901, pl. 2, fig. 7, (re: paranominate ssp. only): *Bombus (B.) sonomae*, Fkln., 1913, p. 133: *Bombus (B.)* (Dumoucheli group), Fkln., 1913, p. 95, (p.p.): *Bremus sonomae*, Fris., 1925a, p. 160: *Fervidobombus (F.) sonomae*, Skor., 1922a, p. 154, (list): *Megabombus (M.)* (Dumoucheli group), Mln., 1961a, p. 57, (p.p.).

DESCRIPTION. This taxon does not differ from the nominate subspecies in any of its morphological features.

Queen, Worker. *Color:* Head, most of thoracic pleura, rather broad interalar band, abdominal T5-6, venter and legs black, remainder of thorax and abdomen rather deep (golden) yellow; extent of yellow pattern on the thoracic dorsum anterior of wing bases like that of *f. californicus* except sometimes extended a little farther downward especially on the worker; interalar band normally noticeably wider (front to rear) especially medially than that of *f. fervidus*; sometimes sparse black hairs intermixed with the yellow anterior of interalar band and on the scutellum. Wings rather dark brownish black throughout.

Male. *Color:* Head black except for some fine intermixed pale pubescence; thorax similar to that of *f. californicus* except for somewhat deeper yellow that extends a little farther downward on the anterior part of thoracic pleura and covers the scutellum, and a small patch of yellowish pile occurs beneath bases of hind wings; some black hairs intermixed with the yellow on thoracic dorsum anterior to wing bases and with that on scutellum, a rather wide interalar black band present; mid- and hind coxae, trochanters and femora with predominantly pale pubescence, otherwise legs black; abdomen covered with rather deep yellow above except, paler on T1, at extreme sides of all abdominal terga and on venter; abdominal T7 predominantly black with some intermixed pale hairs. Wings somewhat paler than those of the queen or worker. Genitalia, seventh and eighth abdominal sterna as in *f. fervidus* (Pl. XIII).

Redescribed from hypotypes. **Queens**, 1 Altacomulco, Mexico, 18-VIII-1954, 8500', J.G. Chillcott [CNC]; 1 Mexico, D. F., 8 July 1928, 2300 m, G. Lassmann [CU]; **worker**, Teotihuacan, Mex., 10-29-57, R. & K. Dreisbach [RRD]; **males**, 1 Dist. Fedrl., Mex., 1605, L. Conradt, (Theodore H. Frison Collection) [INHS]; 1 Erradura, 20 mi E. Libres, Puebla, Mex., Aug. 20, 1958, H.F. Howden [CNC].

TYPE. Examined a ♀ (No. 24114) in the collection of the United States National Museum, Washington. This subspecies (Howard 1901: pl. 2, fig. 7) was without description until that by Franklin (1913: 133). Franklin's types of all castes have been examined.

TYPE LOCALITY. Meadow Valley, Chihuahua, Mexico. Number of specimens at hand: 49. In flight: Taken from early July to late October; male records (August only) are not indicative of the complete flight activity of that sex. Distribution: (vertical), from near sea level (Delaware)* to 9600 ft; (horizontal), known from the eastern United States (northern Delaware)* to southern Mexico (Puebla). Floral visitations: No botanical records accompany any of the available specimens.

*Cf. Illinois record of *Megabombus (M.) pennsylvanicus sonorus* v. *flavodorsalis* (Fkln.) by Frison (1924: 294).

COMMENTS. Very little color variation has been noted, except for the downward extent of yellow on the thoracic pleura where often in the worker it might faintly extend fully one-half the distance to the leg bases.

There is some question in my mind about the retention of this form as a distinct subspecific taxon, which is often encountered in Mexico. However, evidently it might occur erratically at several widely separated locations in the range of the species (*fervidus*); in Delaware the writer captured a queen which cannot be distinguished from those taken in Mexico. Some specimens chromatically closely resemble light individuals of *f. californicus*.

MEXICO

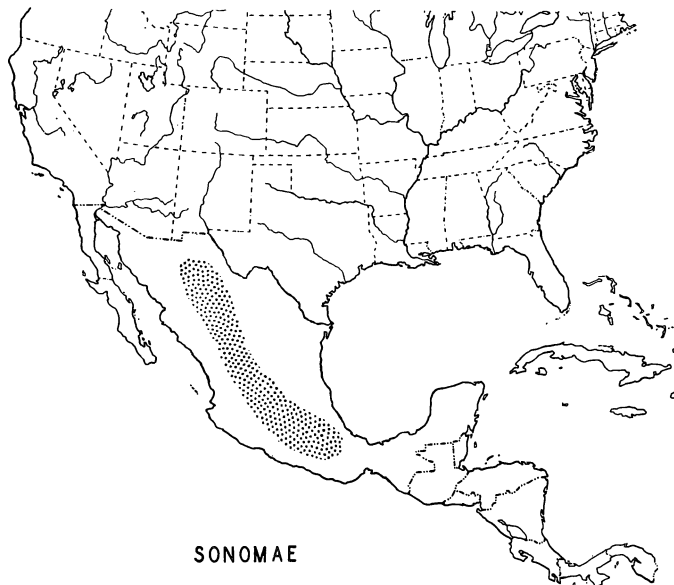
QUEENS

Chihuahua: 3 Madera, VII-6-47, Mr., 7200', (D. Rockefeller Exp[edition]); 1 Santa Clara, 7-2-47, Gh., (D. Rockefeller Exp[edition]); 2 San José [de] Babicora [Baviácroa?], July 5, 1947, Schramel, (D. Rockefeller Exp[edition]); 1 San José [de] Babicora [Baviácroa?], July 5, 1947 [all, AMNH]. **Durango:** Coyotes (Durango Dist[ri]ct), Aug. 8, '47, Mr., 8300', (D. Rockefeller Exp[edition]); 1 El Salto (6 mi NE. [of], D[urango] Dist[ri]ct), Aug. 10, 1947, Schramel, 8500'; 1 Palos Colorados, VIII-5-47, Gh., 8000', (D. Rockefeller Exp[edition]) [all, AMNH]. **Federal District:** 1 Xochimilco, 18-VIII-62, H.E.M., 8000' [CNC]. **Locality indeterminate:** 18 July 1928, G.L., 2300 m; 1 (Tepetzte[!]), 29 July 1928, G.L., 2700 m [both, CU]. **Mexico:** 1 Atlacomulco, 18-VIII-1954, J.G.C., 8500' [CNC]; 1 Atlacomulco, VIII-18-54, 8800', (Univ[ersity of] Kans[as] Mex[ican Expedition]); 1 Ixtlahuacan (4 mi N. [of]), VII-30-54, 7500', (Univ[ersity of] Kans[as] Mex[ican Expedition] [both, KU]); 1 Toluca (22 mi N. [of]), 17-VIII-1954, J.G.C., 8800' [CNC].

UNITED STATES

QUEEN

Delaware: 1 Newark, 14-V-1952, H.E.M. [HEM].



MAP 18.

MEXICO

WORKERS

Chihuahua: 2 Pedernales (2 mi W. [of]), Aug. 17, 1950, R.F.S. [AMNH]. **Durango:** 1 Otinapa, Aug. 7, 1947, Gh., 7500' (D. Rockefeller Exp[edition]); 1 Otinapa, Aug. 11, 1947, Mr., 8200' (D. Rockefeller Exp[edition]) [all, AMNH]. **Hidalgo:** 2 Ozumbilla, 10-30-57, R.&K.D. [RRD]. **Mexico:** 9 Atlacomulco, 18-VIII-1954, J.G.C., 8500' [CNC]; 3 Atlacomulco, 8800' (Univ[ersity of] Kans[as] Mex[ican] Expedition) [KU]; 2 Teotihuacán, 10-29-57, R.&K.D. [RRD]; 7 Toluca (4 mi E. [of]), VIII-17-51, 8400' (Univ[ersity of] Kans[as] Mex[ican] Expedition) [KU]; 2 Toluca (22 mi N. [of]), 17-VIII-1954, 8800', J.G.C. [CNC].

MEXICO

MALES

Federal District: 1 (no data), L. Conradt, (Theodore H. Frison Coll[ectio]n) [INHS]. **Puebla:** 1 Erradura (20 mi E. [of] Libres), Aug. 20, 1958, H.F.H. [CNC].

Megabombus (M.) dahlbomii (Guér.)

Bombus dahlbomii Guér., 1835, pl. 75, fig. 3; 1844, p. 459 (description): *Bombus chilensis* Spin., 1851, p. 165, In Gay: *Bombus grandis* Westw., 1840, p. 256, pl. 17, fig. 2: *Bombus nigripes* Hal., 1836, p. 341: *Bombus (B.) dahlbomii*, Fkln., 1913, p. 114: *Bombus (B.)* (Dumoucheli group), Fkln., 1913, p. 95, (p.p.): *Bremus dahlbomii*, Fris., 1925a, p. 162: *Fervidobombus (F.) dahlbomii*, Skor., 1922a, p. 130 (text), p. 153, (list): *Megabombus dahlbomii*, Mlrn., 1962b, p. 729: *Megabombus* (Dumoucheli group), Mlrn., 1962b, p. 729: *Megabombus (M.)* (Dumoucheli group), Mlrn., 1961a, p. 57, (p.p.): . . . *chilensis*, Mlrn., 1960a, p. 90, (♂, H.E.M. lectotype): . . . *dahlbomii*, Mlrn., 1960a, p. 91, (♀ "type", H.E.M. lectotype): . . . *grandis*, Mlrn., 1960a, p. 92, (♀ type): . . . *nigripes*, Mlrn., 1960a, p. 94, (♀ type).

DESCRIPTION. **Queen.** Length, 32.0 mm; width at wing bases, 10.0 mm; abdomen, 16.0 mm, width across T2, 14.0 mm; front wing length, 22.0 mm, width, 8.0 mm. **Head:** Frontal outline (excluding mouthparts) elongate trapezoidal, about $1\frac{1}{2}$ times higher than greatest width through compound eyes; vertical region weakly concave laterad of ocelli, behind rather strongly inclined to occipital area; ocelli located in nearly straight line, the lateral ones almost touching supraorbital line, somewhat closer together than their diameter, the interocellar and ocellocular lines about equal; ocular half of ocellocular area with microscopic punctation, the ocellar half mostly smooth and polished, the vertex laterad and behind well covered with microscopic punctures; compound eye little less than twice as high as its greatest width, more broadly rounded below than above, the inner margin for the most part subparallel with its counterpart to weakly convergent dorsally; clypeus about as high as its basal width, rather evenly convex and well covered with fine punctures; labrum about twice as wide as thick, its ventral margin and prominent shelf both broadly arcuate, the tubercles flattened and irregularly sculptured, their pointed summits nearly as far apart as length of F1; malar space nearly $1\frac{1}{2}$ times longer than distance between (and including) mandibular articulations, weakly and irregularly convex, shining and with weak sculpture and some microscopic hairs; flagellum near $1\frac{1}{2}$ times longer than scape, F1 about $1\frac{1}{2}$ times longer than F2 and $\frac{2}{3}$ the combined length of F2 plus F3. **Legs:** Mesobasitarsite subrectangular, little more than 3 times longer than greatest width, its outer surface broadly and shallowly concave longitudinally, the bluntly rounded distoanterior angle considerable in recess of the spinate distoposterior angle; most of outer hind tibial surface microscopically punctate, longitudinally convex just anterior of middle then nearly flat behind; metabasitarsite with outer surface evenly but not deeply concave mid-longitudinally, well covered with fine recurved pubescence, about 3 times as long as the widest dimension, its posterior margin not strongly but for the most part evenly arcuate, noticeably emarginate between the nearly equally extended broader distoanterior angle and the acute distoposterior angle; epipygium (abdominal T6) with prominent median carina on distal half. **Pubescence:** Fine, dense, longer and looser on scutellum and on most of abdomen; corbicular fringe rather dense, the longest hairs nearly equal in length to the widest tibial dimension, none strongly arched except distal ones, those comprising the proximal fourth (or third) finer, shorter, straighter and more dispersed; mesobasitarsal posterior fringe similar, but more loosely arranged; metabasitarsal posterior fringe rather dense, short and even throughout comprised mostly of weakly arcuate hairs. **Color:** Vertex mostly,

occiput, all of thorax to just above coxae and abdominal T1-5 orange ferruginous; remainder of head, all the venter, legs and abdominal T6 black. Wings rather deeply infumated throughout.

Worker. Length, 19.0 mm; width at wing bases, 8.0 mm; abdomen, 10.0 mm, width across T2, 9.0 mm; front wing length, 15.0 mm, width, 5.0 mm. The morphology of this caste is similar to that of the queen though usually the labral tubercles and carina on the epipygium are noticeably reduced. The coloration is like that of the queen.

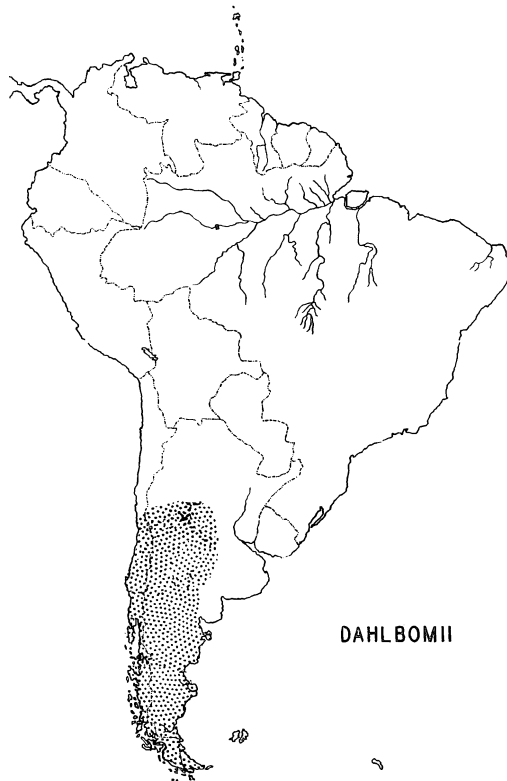
Male. Length, 22.0 mm; width at wing bases, 8.0 mm; abdomen, 12.0 mm, width across T2, 9.0 mm; front wing length, 17.0 mm, width, 5.0 mm. **Head:** Frontal outline (excluding mouth-parts) narrowly trapezoidal, about as high as its greatest width; compound eye nearly 3 times higher than widest dimension, below noticeably more broadly rounded than above, the inner margin weakly concave, the outer margin evenly arcuate; vertex nearly flat, rather strongly inclined toward occiput, covered with medium punctures; ocular half of ocellular area with small punctures, these much sparser on ocellar half; ocelli positioned in a nearly straight line adjacent to supraorbital line, slightly closer together than their diameter, the interocellar line nearly equal to the ocellular line; malar space about $1\frac{1}{4}$ times longer than distance between (and including) mandibular articulations, weakly convex, with some microscopic punctures (those anteriorly noticeably larger) and minute recurved hairs; labrum nearly 3 times wider than median thickness, its ventral margin widely arcuate, covered with prominent pubescence below its weak callosities; flagellum 4 times longer than scape, F1 about $\frac{2}{3}$ as long as F2 which is about $\frac{2}{3}$ the length of F3, F1 and F2 combined only noticeably longer than F3. **Legs:** Mesobasitarsite subrectangular, 4 times longer than wide, its outer surface weakly concave mid-longitudinally, the rounded disto-posterior angle little extended beyond the less evenly rounded distoanterior angle, with only a shallow emargination between; outer surface of hind tibia finely alutaceous, unevenly and weakly concave, both anterior and posterior fringes rather long and relatively dense; metabasitarsite subrectangular, nearly $3\frac{1}{2}$ times longer than widest dimension, the outer surface rather shallowly concave mid-longitudinally, the distal angles about equally extended with weak emargination between, the posterior margin only weakly arched basally to nearly straight beyond, the fringe thereon relatively short (shortest at very base), not dense, mostly composed of straight hairs the longest not exceeding $\frac{1}{2}$ widest part of segment. **Pubescence:** In character similar to that of queen except somewhat more even in length save for longer scutellar pile. **Genitalia,** seventh and eighth abdominal sternite (Pl. XIV). **Color:** Like that of queen except that the abdominal dorsum is concolorous orange ferruginous with only few inconspicuous intermixed dark hairs at or near middle of T6-7.

Redescribed from hypotypes. **Queen,** Mulchen, Fundo "El Cisne", Andes, Chile, March 23-26, 1951, D. S. Bullock; **worker,** Rio Bueno, Chile, 2-III-1951, R. Daniel; **male,** Mulchen, Fundo "El Cisne", Andes, Chile, March 23-26, 1951, D. S. Bullock [all, HEM].

TYPE. Examined my (1960a: 91) lectotype ♀ in the collection of the Ryksmuseum von Natuurlijke Historie, Leiden.

TYPE LOCALITY. Chile. Number of specimens at hand: 686. In flight: Early December to late January, the males occurring during the second half of January. Distribution: (vertical), from sea level to ca. 5000 ft; (horizontal), southern and western Argentina, and approximately the southern half of Chile. Floral visitations: *Thrygilanthus* is the only record available from the numerous specimens of this species seen by me. Etcheverry and Valenzuela (1960) reported *Eucriphia* and *Myrthus*.

COMMENTS. Many queens of this species, though variable in length to some extent, under 32.0 mm, are the largest and bulkiest bumblebees found in the Western Hemisphere. Workers range in length from about 10 to 20 mm. Morphologically there seems to be little variation except for degree and coarseness of punctation, and prominence of the median epipygial carina referred to in the queen; often this is very weak especially on workers. The color pattern of younger specimens (not callows) is stable, but senile individuals of each caste often have the orange ferruginous faded to very pale or whitish yellow.



MAP 19.

ARGENTINA

QUEENS

Neuquén: 1 Bariloche, 26-XI-1950, Wygadzinsky; 3 Hua Hum (Lago Locar), 11-IX-1946, Hd.&Wk.; 16 Hua Hum (Lago Locar), 11-XII-1946, Hd.&Wk. [all, MLF]; 2 Pucara (L[ago] Locar), 7-XII-54, J.A. Pastrana; 1 Pucara (L[ago] Locar), 9-XII-54, J.A. Pastrana [all, HEM]; 13 San Martín de Los Andes, 7-XII-1946, Hd.&Wk. [MLF]; 1 S[an] M[artin] d[e] L[os] Andes, II-52 [HEM]. **Rio Negro:** 1 Córdoba (Fundo Maicho), January 1956, L.P. [HEM]; 2 Isla Victoria, 2-13-30, Pablo Gross [USNM]; 2 Isla Victoria (Puerto Radal), 6-II-1949, F.M. [MLF]. **Locality unknown:** 1 (no data), Ljungner [NRS]. **Locality indeterminate** (Argentina?): 2 Lago Nahuel (Huapi, Patagonien), February 1933, Ljungner, 770 m; 1 Lago Nahuel (Huapi, Patagonien), January 1934, Ljungner, 770 m; 4 Lago Nahuel (Huapi, Patagonien), 1-3-1934, Ljungner, 770 m [all, NRS].

CHILE

QUEENS

Aconcagua: 2 Limache, Oct. 20, [yr.?] [AMNH]. **Aysen** (or Aisen): 1 Ultima Esperanza, (no data), Skottsberg [NRS]. **Angol:** 1 Angol, 24 Oct. 1926 [AMNH]; 1 Angol, June 1, 1946, H. Munvaca; 1 Angol, 29 Sept. 1946, C. Castillo; 1 Angol, 6 Oct. 1946, C. Castillo; 1 Angol, 27 Oct. 1950, R. Gomez; 1 Angol, 17 March 1951, D.S.B.; 1 Angol, 1 Nov. 1956, D. Catalda [all, HEM]. **Bio Bio:** 1 Mulchen (Fundo "El Cisne" Andes), March 23-26, 1951, D.S.B. [HEM]. **Cautín:** 1 Temuco, II-55 [HEM]. **Chiloe:** 2 Butaleura, 4 [to] 5 April '20 [CU]. **Concepción:** 1 Concepción, 10-1903, Herbst [CU]; 1 Concepción, 8-9-1908, P. Herbst [AMNH]. **Llanquihue:** 6 Peulla, 8-III-1959, J.F.G.C. [USNM]. **Magallanes:** 1 Maldonado, (no data) [U-NMH]. **Osorno:** 1 (locality unknown), (no data except 1900), Ehrhardt [NRS]; 2 (locality unknown), (no data) [CNC]. **Santiago:** 1 Santiago, (no data), Varas [MCZ]. **Valdivia:** 2 Valdivia, (no data except 1897), Lossberg [CNC]; 1 Valdivia, (no data) [MCZ]. **Valparaíso:** 13 (locality unknown), (no data), A. Faz [CU]. **Locality unknown or indeterminate:** 1 (Conal), (no data), R. Thaxter; 2 (Tatonhana), (no data), (Hassler

Exped[ition]) [all, MCZ]; 1 (no data), A. Faz [AMNH]; 1 (no data), C. Porter; 3 (no data), C.S. Reed [all, CU]; 2 (no data), Varas [MCZ]; 1 (no data), (M[useum] Berl[in]) [NRS]; 1 (no data) [AMNH]; 1 (no data) [U-NMH].

LOCALITY UNKNOWN (South America)

QUEEN

1 (no data) [CM].

MISLABELED SPECIMEN

QUEEN

1 (Barro Colorado, C[erro] Z[unil], Panama), A.T. [CM].

ARGENTINA

WORKERS

Chubut: 5 Futalafguen, 15-VII-1949, F.M.; 4 Futalafguen, 17-II-1949, F.M.; 21 Futalafguen, 18-II-49, F.M.; 27 Haya de Epuyen, 14-II-1949, F.M.; 3 Lago Meneudez (Alerzai), 17-II-1949, F.M.; 1 (locality unknown), II-1945, Castellanus [all, MLF]. **Neuquén:** 3 Hua Hum, 17 [to] 31-I-49, F.M.; 1 Lago Lacar (Piccan), 26-I-1949, F.M. [MLF]; 5 L[ago] Lacar (Pucara), III-1955, A. Oglobin [HEM]; 12 Lago Villarino (Cerea de Pichi Trafal), 4-II-1949, F.M.; 2 Parque Nac[ional] Lamin, 1-II-1950, S. Shajovscol [all, MLF]; 1 Pucara, I-55 [HEM]; 2 San Martin de Los Andes, 7-XII-1946, Hd.&Wk.; 3 San Martin de Los Andes, 30-I-1949, F.M. [all, MLF]; 3 S[an] M[artin] d[e] L[os] Andes, XII-51; 1 San Martin de Los Andes, XII-51, (J.F.); 38 S[an] M[artin] d[e] L[os] Andes, II-52 [all, HEM]. **Rio Negro:** 42 El Bolson, II-55 [HEM]; 4 Isla Victoria (Puerto Radal), 6-II-1949, F.M.; 3 Isla Victoria, 1-III-53, F.M. [all, MLF]. **Locality indeterminate** (Argentina?): 2 Lago Nahuel (Huapi, Patagonien), January 1934, Ljungner, 770 m; 1 Lago Nahuel (Huapi, Patagonien), February 1934, Ljungner, 770 m; 2 Lago Nahuel (Huapi, Patagonien), 1-3-1934, Ljungner, 770 m; 3 Lago Nahuel (Huapi, Patagonien), 3-III-1934, Ljungner, 770 m; 1 Rio Condor, (no data), Ohlin; 2 (no labels) [all, NRS].

CHILE

WORKERS

Aconcagua: 1 Limache, 1922 [CM]. **Aysen** (or Aisen): 1 Ultima Esperanza (Patagonia[?]), (no data), O. Nordenskiöld; 2 Ultima Esperanza (Patagonia[?]), (no data), Ohlin; 1 (locality indeterminate, Patagonia[?]), (no data), Kinb. [all, NRS]; 1 (locality unknown), 1870, Philip [NMW]. **Concepción:** 2 Concepc[ión], I-7-1903, P. Herbst [NRS]; 1 Concepción, 12-1903, Herbst [AMNH]; 1 Concepc[ión], 26-I-1906, P. Herbst; 1 Concepc[ión], 2-1908, P. Herbst [both, CU]. **Bio Bio:** 13 Mulchen (Fundo "El Cisne" Andes), March 23-26, 1951, D.S.B. [HEM]. **Cautin:** 10 Temuco, II-55 [HEM]. **Chiloe:** 7 Butalcura, 4 [to] 5 April '20 [CU]; 16 Rio Bueno, 2-III-1951, R. Daniel; 14 Rio Bueno, 3-III-1951, R. Daniel; 1 Rio Bueno, 25-III-1951, R. Daniel [all, HEM]. **Llanquihue:** 1 Puerto Montt, III-20-39, A.T. [CM]; 1 Puerto Varas, 8 [to] 9 April '20 [CU]; 5 Puerto Varas, 3-III-1959, J.F.G.C.; 18 Puerto Varas, 5-III-1959, J.F.G.C., [USNM]. **Magallanes:** 1 English Narrows, III-15-36 [CM]; 1 Magellan St[raits], (no data), (Hassler Exp[edition]); 1 Punta Arenas, February 1906, R. Thaxter [both, MCZ]. **Angol:** 1 Angol, 1 Feb. 1927; 1 Angol, 1-4-1930 [both, AMNH]; 1 Angol, 2 May 1946, 1 Angol, Oct. 14, 1946, R. Uandaca; 1 Angol, Oct. 15, 1946, R. Uandaca; 2 Angol, 2 Dec. 1946, H. Zarges; 1 Angol, 10 March 1951, D.S.B.; 3 Angol, 17 March 1951, D.S.B.; 3 Angol, 23 March 1951, D.S.B.; 1 Contulmo, 21 March 1951; 7 Contulmo, 23 March 1951; 8 Contulmo, 24 March 1951; 19 Contulmo, 25 March 1951 [all, HEM]. **Osorno:** 1 (locality unknown), 1 April '20, R.G.H. [CU]; 1 (locality unknown), (no data) [CNC]. **Santiago:** 1 Olmue, 15-III-1920, P. Herbst, *Thrygilanthus* [AMNH]; 2 Santiago, (no data), Varas [MCZ]; 1 Santiago, 1890, Phillippi [AMNH]; 1 Santiago, 1890, Phillippi [CNC]; 9 Santiago, I-54 [HEM]. **Valparaiso:** 1 Valparaiso, (no data), C. Porter [CU]; 1 Valparaiso, 16 Feb. 1951, D. Catalda [HEM]. **Locality indeterminate or unknown:** 6 (Juneal), (no data), Reimoser [CU]; 1 (Sanli), 4 Jan. 1951, Quintem [HEM]; 2 (Tatonhana), (no data), (Hassler Exp[edition]) [MCZ]; 1 (no data); 1 (no data), A. Faz; 1, III-1921, T. Aug. [all, AMNH]; 2, (no data), C.S. Reed [CU]; 1, (no data), M. Berl.; 1, (no data), P. Dusen [both, NRS]. **Locality indeterminate** (Chile?): 1 Rio Aysen, (no data), P. Busen [NRS].

MISLABELED SPECIMENS

WORKERS

2 (Barro Colorado), C[erro] Z[unil], Panama, A.T. [CM].

ARGENTINA

MALES

Chubut: 6 Futalafguen, 15-II-49, F.M.; 1 Futalafguen, 17-11-49, F.M.; 3 Futalafguen, 18-II-49, F.M.; 4 Haya d[e] Epuyen, 14-II-49, F.M.; 1 Lago Menendez (Alerzai), F.M.; 1 (locality unknown), II-1945, Cenlillenos [all, MLF]. **Neuquén:** 1 Hua Hum (Lago Lacar), 11-XII-1946, Hd. & Wk.; 1 Hua Hum, 17 [to] 31-I-49, F.M. [both, MLF]; 1 Pucara (Lago Lacar), III-55, A. Ogloblin; 1 San Martin de Los Andes, XII-51, (JF.); 17 S[an] M[artin] d[e] L[os] Andes, II-52 [all, HEM]. **Rio Negro:** 1 El Bolson, II-55 [HEM]. **Locality indeterminate** (Argentina?): 3 Lago Nahuel (Huapi, Patagonien), 1-3-1934, Ljungner, 770 m [NRS].

CHILE

MALES

Angol: 1 Angol, 15 Feb. 1930 [AMNH]; 16 Angol, 17 March 1951, D.S.B.; 15 Angol, 23 March 1951, D.S.B.; 1 Contulmo, 22 March 1951; 4 Contulmo, 23 March 1951; 4 Contulmo, 25 March 1951; 9 Los Angeles, 23 March 1951 [all, HEM]. **Aysen (or Aisen):** 1 Otway (Water) [Bahia], (Patagonia[?]), (no data), Skottsberg; 1 Ultima Esperanza (Patagonia[?]), (no data), O. Norden-skiold; 4 Ultima Esperanza (Patagonia[?]), (no data), Ohlin [all, NRS]. **Bio Bio:** 51 Mulchen (Fundo "El Cisne" Andes), March 23-26, 1951, D.S.B. [HEM]. **Cautín:** 17 Temuco, II-55 [HEM]. **Chiloe:** 1 Rio Bueno, 3-III-1951, R. Daniel [HEM]. **Concepción:** 1 Concepción, 1903, Herbst [AMNH]; 1 Concepción, 1903, Herbst; 1 Concepción, 1904 [both, CU]. **Llanquihue:** 2 Puerto Varas, 5-III-1959, J.F.G.C. [USNM]. **Santiago:** 1 Santiago, (no data), Varas [MCZ]; 1 Santiago, I-54 [HEM]. **Valdivia:** 1 Montealegre R[io], 1920 [CU]. **Valparaíso:** 1 Valparaíso, (no data), Kinb. [NRS]. **Locality indeterminate or unknown:** 1 El Lalto, Feb. 2, '22; 1 Termas Tolhuaca, 2-II-1907, P. Herbst; 2 (no data), A. Faz [all, AMNH]; 1, V-95 [MASS]; 3 (no data), A. Faz [CU].

LOCALITY UNKNOWN (South America)

MALE

1 (no data) [CU]; 1 (no data) [HEM].

Megabombus (M.) diligens (Sm.)

Bombus diligens Sm., 1861, p. 154, (p.p.): *Bombus dolicocephalus* Handl., 1888a, p. 244: *Bombus* (B.) *dolicocephalus*, Fkln., 1913, p. 108: *Bombus* (B.) (Dumoucheli group), Fkln., 1913, p. 95, (p.p.): *Bremus dolicocephalus*, Fris., 1925a, p. 159: *Fervidobombus* (F.) *dolicocephalus*, Skor., 1922a, p. 130, (text), p. 153, (list): *Megabombus diligens*, Mlrn., 1962b, p. 728: *Megabombus* (M.) (Dumoucheli group), Mlrn., 1961a, p. 57, (p.p.): *Megabombus* (Dumoucheli group), Mlrn., 1962b, p. 729: . . . *diligens*, Mlrn., 1960a, p. 91, (♀ "type", H.E.M. lectotype): . . . *dolichocephalus*, Mlrn., 1960a, p. 91, (♀ H.E.M. lectotype).

DESCRIPTION. **Queen.** Length, 22.0 mm; width at wing bases, 8.0 mm; abdomen, 11.0 mm, width across T2, 9.0 mm; front wing length, 18.5 mm, width, 7.5 mm. **Head:** Frontal outline (excluding mouthparts) narrowly trapezoidal, slightly higher than widest dimension; vertical region weakly irregularly concave, rather strongly inclined toward occiput; ocelli situated in weak arc somewhat below supraorbital line, closer together than their diameter, the interocellar line slightly greater than the ocellocular line; ocular half of ocellocular area with microscopic punctation, the ocellar half mostly smooth and polished; compound eyes each little more than twice as high as widest measurement, the upper outline somewhat more narrowly rounded than that below, the inner margins for the most part subparallel and only weakly convergent above; clypeus rather evenly convex, little broader basally than median height, its disc mostly smooth with some weak punctures, laterally and above with small irregular punctures; labrum well covered with strong hairs below, little more than twice as wide as median thickness, its ventral margin broadly arcuate, the shelf depressed, the tubercles not very prominent, with coarse punctures above and only limited smooth area below, their mesal summits separated a distance about equal to length of F2; malar space only perceptibly longer than distance between (and including) mandibular articulations, its surface only weakly convex and for the most part smooth; flagellum nearly twice as long as scape, F1 subequal to combined lengths of F2 and 3, F2 subequal to F3. **Legs:** Mesobasitarsite slightly more than 3½ times longer than greatest width, its outer surface shallowly concave mid-longitudinally, the abruptly rounded distoanterior angle considerably in recess of the spinate

distoposterior angle; outer surface of hind tibia microscopically granulate, weakly convex mid-longitudinally from base to about $\frac{3}{4}$ its length, its widest part little less than longest hairs of corbicular fringe; metabasitarsite with finely pubescent and mostly microscopically granulose outer surface broadly concave mid-longitudinally, its posterior margin noticeably arcuate near base and beyond nearly straight, the acutely rounded distoposterior angle extended beyond bluntly rounded distoanterior angle. *Pubescence*: Rather short on head and thorax, even, fine and dense, longer on most of abdomen; corbicular fringe moderately long and dense comprised of mostly straight hairs or nearly so; metabasitarsal posterior fringe not dense with weakly arcuate to nearly straight hairs, longest on basal half becoming gradually shorter beyond. *Color*: Head, thorax, legs and abdominal T1-3 black (as well as their corresponding sterna); last 3 abdominal segments ferruginous orange. Wings very dark with some violaceous reflection under certain light.

Worker. Length, 17.0 mm; width at wing bases, 7.0 mm; abdomen, 9.0 mm, width across T2, 8.0 mm; front wing length, 16.0 mm, width, 6.0 mm. Except for size, morphologically very similar to the queen. Character of pubescence and coloration like those of the queen.

Male. Length, 18.0 mm; width at wing bases, 7.0 mm; abdomen, 9.0 mm, width across T2, 7.5 mm; front wing length, 16.0 mm, width, 5.5 mm. *Head*: Frontal outline (excluding mouth-parts) rather narrowly trapezoidal, above broadly arcuate, slightly wider than median height; compound eye somewhat bulging, twice as high as broad, nearly equally rounded above and below, the inner margin for the most part parallel with its counterpart; vertex weakly convex, evenly sloped toward occiput, to large extent covered with irregular punctures behind ocelli; ocellular area mostly smooth to microscopically granulose, the ocular half with only few small punctures; ocelli located noticeably below supraorbital line in the form of an arc, slightly closer together than their diameter, the interocellar and ocellular lines equal; malar space about $1\frac{1}{2}$ times longer than distance between (and including) mandibular articulations, very weakly unevenly convex, shiny but with minute shallow punctures and microscopic hairs; labrum little more than twice as wide as its median thickness, the ventral margin nearly straight except lateral corners are arcuate, the lower half covered with somewhat coarse sculpture and rather strong hairs, the weak callosities largely smooth and with only few punctures; flagellum little more than 4 times longer than scape, F1 perceptibly longer than F2, together only slightly longer than F3. *Legs*: Mesobasitarsite subrectangular, about 4 times longer than its greatest width, the outer surface broadly and shallowly concave mid-longitudinally, the distoposterior angle acute, the distoanterior one broadly rounded with only slight emargination between these angles; metabasitarsite also subrectangular but slightly less than 4 times longer than widest part, the microscopically alutaceous outer surface shallowly convex mid-longitudinally, with fine reclining pubescence, the distal angles about equally extended with slight emargination between, the distoposterior angle sharper than the distoanterior one, the posterior margin only weakly arched with rather dense and even short fringe most of which is not longer than $\frac{1}{4}$ of widest part of segment. *Pubescence*: Character like that of female except on thorax somewhat longer, looser and a little uneven in length. *Genitalia*, seventh and eighth abdominal sterna (Pl. XV). *Color*: Like that of female except base of abdominal T4 narrowly clothed with black pile, the remainder of its pubescence and all on T5-7 ferruginous. Wing color very much the same as that of the female.

Redescribed from hypotypes. **Queen**, Jocotepec, Jal., Mex., VII-11-59, H.E. Evans; **worker**, Morelia, Michoacan, Mexico, 9-22-57, R. & K. Dreisbach; **male**, Rio Blanco, V.C., Mex., 11-13-57, R. & K. Dreisbach [all, HEM].

TYPE. Examined my (1960a: 91) lectotype ♀ in the British Museum (N.H.), London.

TYPE LOCALITY. Oaxaca, Mexico. Number of specimens at hand: 139. In flight: Late April to mid-November, the males evident during the first half of November. Distribution: (vertical), 3000 to nearly 8000 ft; (horizontal), Guatemala and the southern half of Mexico. Floral visitations: *Asclepias* and *Lobelia* are known at present.

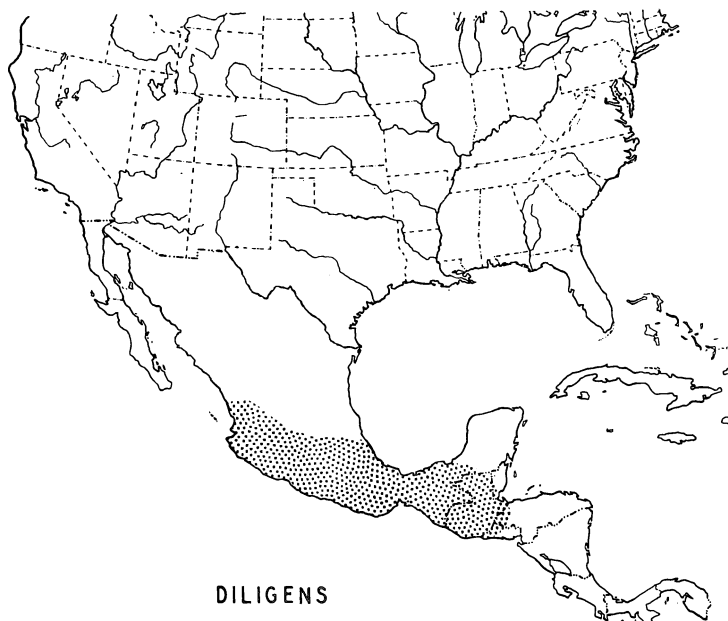
COMMENTS. Except for differences in body length, especially of the worker, which range from ca. 8.0 mm to near the size of small queens, I cannot detect any significant morphological variations in the castes of this species. Its coloration likewise is notably constant throughout its range.

The color pattern of this taxon is very much like that of *Pyrobombus* (C.) *brachycephalus* (Handl.), a species to which it bears no close relationship.

MEXICO

QUEENS

Federal District: 1 Tacubaya (not Jacobaya), 1900 [AMNH]. **Guerrero:** 1 Chilpancingo, 30 June 1951, H.E.E., on *Asclepias* [KU]; 3 Taxco (29 mi N. of), 8-VIII-1954, J.G.C., 4900' [CNC]; 8 Taxco (4 mi S. [of]), VIII-8-1954, (Univ[ersity of] Kans[as] Mex[ican] Exped[ition]), 4900'; 7 Taxco (8 mi NE. [of]), VIII-8-1954, (Univ[ersity of] Kans[as] Mex[ican] Exped[ition]), 5450'; 1 Taxco (23 mi N. [of]), VIII-8-54, (Univ[ersity of] Kans[as] Mex[ican] Exped[ition]), 4700'; 3 Taxco (29 mi N. [of]), VIII-8-54, (Univ[ersity of] Kans[as] Mex[ican] Exped[ition]), 4900' [all, KU]; 1 Teloloapan, 30-X-1957, Dale Douglas [INIA]. **Jalisco:** 1 Ajijie, July 28, 1954, M. Cazier, W. Gertsch & Bradts [AMNH]; 1 El Molino, 7-10-56, R.&K.D. [RRD]; 1 Guadalajara, 7-13-59, H.E.E., 5000'; 3 Jocotepec, VII-11-59, H.E.E., 5000' [all, CU]; 1 Mazamitla (4 mi W. [of]), Oct. 16, 1950, R.F.S., 6800' [AMNH]; 1 Mazamitla (15 km S [of]), July 29, 1952, F.W.&F.G. Werner, 5500' [HEM]. **Mexico:** 6 Ixtapan de La Sall, VIII-9-54, (Univ[ersity of] Kans[as] Mex[ican] Exped[ition]), 5500' [KU]. **Michoacan:** 1 C[ui]da[d] H[i]d[al]go (4 mi W. [of]), VI-16-58, (Univ[ersity of] Kans[as] Mex[ican] Exped[ition]), 6400' [KU]; 1 Jacona (3 mi W. [of]), VII-18-53, (Univ[ersity of] Kans[as] Mex[ican] Expedition), 5300' [HEM]; 1 Jacona (3 mi W. [of]), VII-18-53, (Univ[ersity of] Kans[as] Mex[ican] Exped[ition]), 5300' [KU]; 1 Morelia, 9-22-57, R.&K.D. [RRD]; 1 Tuxpan, 11 July 1951, H.E.E. [HEM]; 1 Tuxpan, 11 July 1951, H.E.E. [KU]; 1 Zitacuaro (10 km W. [of]), 11 July 1951, P.D.H. [CIS]; 1 Zitacuaro [to] Tuxpan, VIII-14-1940, H.R. Roberts, 5-6000' [ANSP]. **Morelos:** 2 Cuautla, July-August '03, (W.L. Tower Coll[ectio]n) [AMNH]; 1 Cuautla [not Cautela], 7-28-1938, L.J. Lipovsky [HEM]; 1 Cuautla [not Cautela], 7-28-1938, L.J. Lipovsky [KU]; 2 Cuernavaca (10 mi N. [of]), VII-15-1954, (Univ[ersity of] Kans[as] Mex[ican] Exped[ition]), 7700'; 2 Cuernavaca, VIII-14-1954, (Univ[ersity of] Kans[as] Mex[ican] Exped[ition]), 5000' [all, KU]; 1 Cuernavaca (3 mi NW. [of]), VI-26-59, H.E.E., 6500' [CU]; 1 Cuernavaca, 7-29-61, R.&K.D., 7000' [RRD]; 1 Cuernavaca, (no data), Barnett [MCZ]; 1 Matamoros, Aug. 11, '03, (W.L. Tower Coll[ectio]n) [AMNH]; 1 Tepotzlan, 9-26-57, R.&K.D.; 1 Tepotzlan, VII-11-61, R.&K.D. [both, RRD]; 1 (locality indefinite), (6 mi N. [of the State of] Guerrero), VII-15-54, (Univ[ersity of] Kans[as] Mex[ican] Exped[ition]), 7100' [KU]. **Nayarit:** 1 Bella Vista, 7-5-56, R.&K.D. [RRD]. **Oaxaca:** 1 Mitla, 22-VII-62, H.E.M., 6000'; 1 Mitla, 25-VII-62, H.E.M., 5500'; 1 Mitla, 26-VII-62, H.E.M., 5500'; 4 Mitla, 27-VII-62, H.E.M., 5500'; 4 Mitla, 28-VII-62, H.E.M., 5500-6000' [all, CNC]; 1 Oaxaca (25 mi SE. [of]), VII-11-53, (Univ[ersity of] Kans[as] Mex[ican] Expedition) [KU]. **Puebla:** 1 Atlixco (7 mi. S. [of]), VII-18-53,



MAP 20.

(Univ[ersity of] Kan[as] Mex[ican] Expedition) [KU]; 1 Atlixco, 7-23-56, R.&K.D. [RRD]; 1 Chila (5 mi S. [of]), VII-4-53, (Univ[ersity of] Kans[as] Mex[ican] Exped[ition]), 5700'; 3 Huauchinango (5 mi E. [of]), VI-25-53, (Univ[ersity of] Kans[as] Mex[ican] Exped[ition]), 4100' [all, KU]. **San Luis Potosi:** 1 Necaxa, Aug. 12-13, 1921 [CU]; 1 Xilitla (17 mi W. [of]), VII-22-54, (Univ[ersity of] Kans[as] Mex[ican] Exped[ition]), 4700' [KU]. **Veracruz:** 1 Ciudad Mendoza, 15-VIII-62, H.E.M., 6000' [CNC]; 1 El Fortin, VII-8-41, Henry S. Dybas [CNHM]; 7 Jalapa, VIII-1 [to] 6-61, R.&K.D.; 2 Orizaba, 8-12 [to] 22-61, R.&K.D.; 1 Rio Blanco, 7-26-56, R.&K.D.; 1 Rio Blanco, 11-13-57, R.&K.D. [all, RRD]. **Locality unknown:** 1 (no data except 1905), P.N. Goldsmith [MCZ]; 2 (no data), (Cornell U[niversity], Lot 546, sub. 1194, Baker Coll[ectio]n) [CU].

WORKERS

Hidalgo: 1 Paloma, 8-28-56, R.&K.D. [RRD]. **Jalisco:** 1 Cojumatlan, IX-9-38, L.J. Lipovsky [KU]; 5 Mazamitla (4 mi W. [of]), Oct. 16, 1950, R.F.S., 6800' [AMNH]. **Michoacan:** 5 Morelia, 9-22-57, R.&K.D. [RRD]. **Morelos:** 1 Cuernavaca, 14 Oct. '34, G.L. [CU]; 2 Cuernavaca, 10-29-57, R.&K.D.; 2 Tepotzlan, 9-26-57, R.&K.D.; 1 Tepotzlan, X-20-57, R.&K.D. [all, RRD]; 1 Xochicalco, (no data), W.M. Mann [MCZ]; 1 Yautepec, X-29-56, R.&K.D. [RRD]; 1 (locality unknown), (no data), Crawford [CU]. **Mexico:** 3 Ixtapan de La Sall, VIII-9-54, (Univ[ersity of] Kan[as] Mex[ican] Exped[ition]), 5500' [KU]. **Puebla:** 1 Atlixco, 7-23-56, R.&K.D. [RRD]; 1 Puebla (6 mi SW. [of]), (Univ[ersity of] Kans[as] Mex[ican] Exped[ition]), 6600', on *Lobelia fenestralis* [KU]. **Veracruz:** 2 C[udad] Mendoza (4 mi SW. [of]), 16-VIII-62, H.E.M., 3-4000' [CNC]; 1 Jalapa, 9-28 to 10-3-61, R.&K.D.; 2 Rio Blanco, 7-26-56, R.&K.D.; 4 Rio Blanco, 11-13-57, R.&K.D. [all, RRD].

MALES

Veracruz: 2 Rio Blanco, 11-13-57, R.&K.D. [RRD].

Megabombus (M.) excellens (Sm.)

Bombus excellens Sm., 1879, p. 133: *Apis carolina*, auctt., (*nec A. carolina* L., 1767, p. 959): *Bombus carolinus* F., 1805, p. 342, (*nec A. carolina* L., 1767, p. 959), [n. syn.]: *Bombus semivetulus* Spin., *In Osculati*, 1850, p. 201, (*nom. nud.*): *Bombus (B.) carolinus*, Fkln., 1913, p. 112, (*nec A. carolina* L., 1767, p. 959; *nec A. carolina*, F., 1775, p. 379; 1781, p. 475; 1787, p. 299; 1793, p. 316), [n. syn.]: *Bombus (B.)* (Dumoucheli group), Fkln., 1913, p. 95, (p.p.): *Bremus carolinus*, Fris., 1925a, p. 154 (*sensu B. carolinus* F., 1805, p. 342; Fkln., 1913, p. 112), [n. syn.]: *Fervidobombus (F.) carolinus*, Skor., 1922a, p. 153, (list), [n. syn.]: *Megabombus excellens*, Mlrm., 1962b, p. 729: *Megabombus* (Dumoucheli group), Mlrm., 1962b, p. 729: *Megabombus (M.)* (Dumoucheli group), Mlrm., 1961a, p. 57, (p.p.): . . . *excellens*, Mlrm., 1960a, p. 91, (♀ type).

DESCRIPTION. **Queen.** Length, 21.0 mm; width at wing bases, 9.0 mm; abdomen, 11.0 mm, width across T2, 10.0 mm; front wing length, 20.0 mm, width, 7.0 mm. **Head:** Frontal outline (excluding mouthparts) narrowly trapezoidal, about $1\frac{1}{2}$ times higher than greatest width; vertical region strongly sloped toward occiput; ocelli rather small, located in weak arc just below supra-orbital line, distinctly closer together than their diameter, the interocellar line slightly less than ocellular line; ocular half of ocellular area with small punctures, the ocellar half mostly smooth; compound eye twice as high as widest dimension, somewhat more narrowly rounded above than below, the inner margin weakly curved to nearly straight and subparallel to its counterpart; clypeus only slightly higher medially than its width at base, its disc not strongly but rather evenly convex and covered with small to medium irregular punctures; labrum slightly less than twice as wide as its median thickness, the ventral margin rather evenly arcuate, the labral shelf weak, tubercles not strongly produced, with their ventral surfaces irregularly punctate and their mesal summits slightly less far apart than length of F1 and separated by a rather shallow depression; nearly smooth malar space only weakly convex over its ventral half, nearly twice as long as distance between (and including) mandibular articulations; flagellum nearly $2\frac{1}{2}$ times longer than scape, F1 almost twice as long as F2 and subequal to combined lengths of F2-3. **Legs:** Mesobasitarsite subrectangular, about 4 times longer than widest part, its outer surface

rather deeply concave mid-longitudinally, the distoposterior angle sharply acute and extended somewhat beyond the bluntly rounded distoanterior angle, with subarcuate emargination between; most of hind tibial outer surface faintly granulose to nearly smooth, with mid-longitudinal convexity from near base to about distal third; metabasitarsite with outer surface broadly concave longitudinally, microscopically granulose, for the most part covered with fine recumbent pubescence intermixed with some stronger inclined hairs, the posterior margin weakly arcuate at basal third, beyond nearly straight, the acute distoposterior angle extended slightly beyond bluntly rounded distoanterior angle with an angulate emargination between. *Pubescence*: Moderately long, fine, dense, longest on face, vertex, scutellum, and abdomen; corbicular fringe rather dense with most hairs only weakly arcuate to nearly straight except arcuate distal ones, the longest somewhat longer than widest part of corbicula; metabasitarsal posterior fringe longest basally, gradually declining in length distally and becoming sparser. *Color*: Head, thorax, legs, abdominal T1 and T6, and venter black or blackish; abdominal T2-5 ferruginous (or light coppery red). Wings uniformly stained with brown.

Worker. Length, 18.0 mm; width at wing bases, 8.0 mm; abdomen, 9.0 mm, width across T2, 8.0 mm; front wing length, 16.0 mm, width, 5.5 mm. Morphologically like the queen except the characteristic features are more diminutive. Pubescence and coloration like those of the queen.

Male. Length, 17.0 mm; width at wing bases, 7.0 mm; abdomen, 9.0 mm, width across T2, 7.5 mm; front wing length, 14.0 mm, width, 5.0 mm. *Head*: Frontal outline (excluding mouthparts) narrowly trapezoidal, about $1\frac{1}{4}$ times higher than greatest width, the upper angles rather strongly arched; compound eyes little more narrowly curved above than below, the inner margins nearly parallel, the outer margins broadly and rather weakly convex; vertical region nearly flat, strongly inclined toward occiput, mostly smooth and polished about ocelli to finely punctate elsewhere; ocelli about equal in size, distinctly closer together than their greatest diameter, positioned in a weak arc, the lateral ones definitely touching supraorbital line; ocellular area mostly smooth with small irregular punctures present on scarcely more than the ocular third; malar space fully $1\frac{1}{2}$ times as long as distance between (and including) mandibular articulations, its surface at most only weakly convex, smooth and bearing some microscopic hairs posteriorly; labrum subrectangular, its ventral margin nearly straight, about twice as wide as its greatest thickness, with weak callosities at basolateral corners and only moderately pubescent; flagellum slightly less than 4 times longer than scape, F1 and F2 about equal, each nearly twice as long as thick, combined distinctly longer than F3; clypeus perceptibly higher than basal width, its surface rather evenly though not strongly convex, for the most part covered with medium punctures. *Legs*: Mesobasitarsite subrectangular, about 5 times longer than greatest width, most of outer surface mid-longitudinally concave, the bluntly acute distoposterior angle not extended beyond distoanterior angle; metabasitarsite nearly 4 times longer than greatest width, its outer surface moderately concave longitudinally, the distoanterior angle only slightly in recess of acute distoposterior angle, posterior margin weakly but rather evenly arcuate for the most part. *Pubescence*: That on clypeus not dense and fine, similar to that on remainder of head, that on thoracic dorsum somewhat longer and less compact than on the queen but otherwise similar throughout; metabasitarsal posterior fringe short, straight or nearly so with longest hairs on basal third about equal to $\frac{1}{2}$ widest dimension of segment. Genitalia, seventh and eighth abdominal sterna (Pl. XIV). *Color*: Like that of the queen except few blackish hairs distally on abdominal T6 and all of T7 black. Wings only slightly paler than those of the queen.

Redescribed from hypotypes: **Queen**, Pico de Naiquata, D. F. [Venezuela], 18-IV-37, G. Vivas-Berthier, 2765 Mts.; **worker**, Tambo Eneñas, Cam. del Pichis, Peru, 4 July '20, Cornell Univ. Expedition, Lot 569 [both, CU]; **male**, Limon, E. Ecuador, II-1948, Z. Muller, 900 m [AMNH].

TYPE. Examined a ♀, Type Hym. 17B1048, in the British Museum (N.H.), London (Milliron 1960a: 91).

TYPE LOCALITY. Venezuela. Number of specimens at hand: 31. In flight: The few records available indicate that the flight activity extends from the second half of April to January, the males appearing as early as (probably late) May. Distribution: (vertical), from ca. 3000 to ca. 8300 ft; (horizontal), Bolivia, northward at the higher altitudes, to Venezuela. Floral visitations: Recorded on *Begonia* and *Citrus*.

COMMENTS. Except for some variation in size of workers, little structural variation has been detected in the limited material of this taxon available for study.

However, with respect to color most, if not all, of the normally black coloration of the queen (possibly worker and male also) might appear as dark or blackish cinereous pubescence, especially that on the thorax.

BOLIVIA

QUEEN

La Paz: 1 El Palmar (Chapare), 15 Sept. 1956, L.P., 900 m [KU].

PERU

QUEEN

1 (locality unknown), 31-8-22, S.G. Tessmann [ZMB].

VENEZUELA

QUEENS

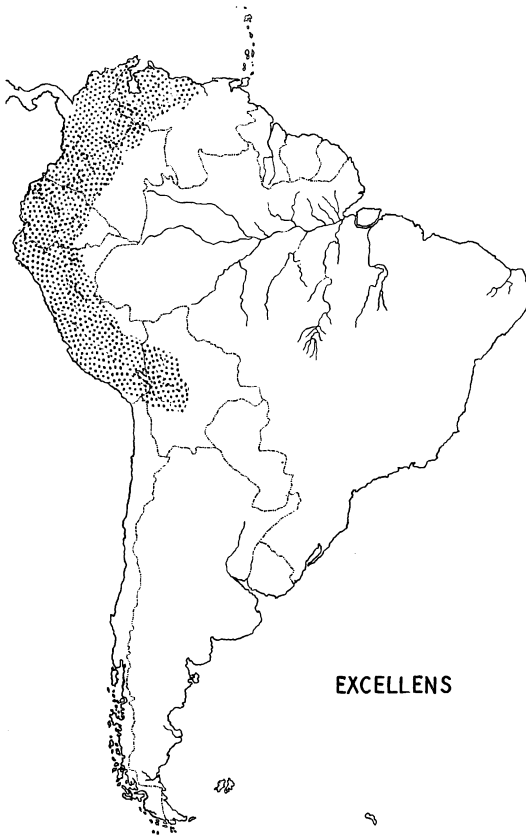
Mérida: 2 Merida, (no data), [UZM]. **Distrito Federal:** 1 Pico de Naiguata, 18-IV-37, G. Vivas & Berthier, 2765 m [CU].

BOLIVIA

WORKERS

Cochabamba: 5 Cochabamba (Lacotal, Chapare [not Chaparo]), II-1952, (F.H.W.), 1200 m [KU].

La Paz: 1 Yungas del Palmar, 15 March 1951, Z., 2000 m [KU].



MAP 21.

COLOMBIA

WORKERS

Caquetá: 1 La Cumbré (San Lorenzo M[on]t[es]), Dec. 29, 1922 [INHS]. **Cauca:** 1 Popayan, 12-4-1908 [AMNH]; 1 Popayan, 17-5-1908, Tasse [NRS]. **Magdalena:** 1 Vista Nieve (San Lorenzo M[on]t[es]), 12-20-1922, H.L. Viereck, Begonia [ANSP]; 1 Vista Nieve (Santa Marta), 21-XII-22, 5000' [INHS].

ECUADOR

WORKERS

Province unknown: 3 Limón, II-1948, Z.M., 900 m [AMNH].

PERU

WORKERS

Piura: 1 Tambo (Eneñas, Cam[bino] del Pichis), 3 July '20; 3 Tambo (Enenas, Cam[bino] del Pichis), 4 July '20 [all, CU]; 1 Tambo (Eneñas, Cam[bino] del Pichis), 4 July '20 [INHS]. **Puno:** 1 Vallé Chanchamayo, 1-4-1939, W.W., 1600 m, on orange [HEM].

BOLIVIA

MALE

Cauca: 1 Popayan, 13-4-1908, Tasse [NRS].

ECUADOR

MALE

Province unknown: 1 Limón, II-1948, Z.M., 900 m [AMNH].

VENEZUELA

MALES

Falcon (Bolivar): 1 La Vega [La Vela], V-05 [AMNH]. **Distrito Federal:** 1 Uguas Negras, 4-I-38, G. Vivas & Berthier [CU].

Megabombus (M.) medius (Cr.)

Bombus medius Cr., 1863a, p. 97: *Bombus cayennensis*, auctt., (*nec Apis cajennensis* F., 1798, p. 273), [n. syn.]: *Bombus medius*, Fkln., 1915, p. 415, (p.p.): *Bombus (B.) medius*, Fkln., 1913, p. 123, (p.p.): *Bombus (Fervidobombus) medius*, Mich., 1954a, p. 163, (p.p.): *Bombus (B.)* (Dumoucheli group), Fkln., 1913, p. 95, (p.p.): *Bremus medius*, Fris., 1925a, p. 160 (*et seq.*): *Fervidobombus (F.) medius*, Skor., 1922a, p. 153, (p.p., list): *Megabombus (M.)* (Dumoucheli group), Mln., 1961a, p. 57, (p.p.).

DESCRIPTION. **Queen.** Length, 23.0 mm; width at wing bases, 8.5 mm; abdomen, 12.0 mm, width across T2, 9.5 mm; front wing length, 18.0 mm, width, 6.5 mm. **Head:** Frontal outline (excluding mouthparts) trapezoidal, above rather evenly arcuate, only slightly higher than greatest width, the vertical region inclined toward occiput, irregularly punctate; ocellar half of ocellular area smooth and polished, the ocular half with only microscopic punctation; ocelli situated in very weak arc just below supraorbital line, closer to one another than shorter diameter of a lateral ocellus; compound eyes little more broadly rounded below than above, their inner margins nearly subparallel; malar space about equal to distance between (and including) mandibular articulations, the surface weakly convex and at most only microscopically punctate; labrum subrectangular, little more than twice as wide as greatest thickness, its ventral margin rather evenly arcuate, the tubercles well separated, not strongly conical mesally and for the most part rather coarsely punctate; flagellum nearly twice as long as scape, F1 nearly 1½ times longer than almost quadrate F2, distinctly longer than F3 and subequal to F2 and F3 combined; clypeus moderately and rather evenly convex, for the most part irregularly punctate except less so medially below, little wider below than its median height. **Legs:** Mesobasitarsite subrectangular, nearly 4 times longer than widest dimension, its outer surface shallowly concave mid-longitudinally, the blunt distoanterior angle noticeably in recess of the spinate distoposterior angle; outer surface of hind tibia for the most part rather evenly convex and nearly smooth mid-

longitudinally, its widest part little less than longest hairs of corbicular fringe; metabasitarsite with outer surface microscopically alutaceous, broadly concave from near base to distal end, posterior margin arched basally but nearly straight beyond, the acute distoposterior angle produced very little if any beyond blunt distoanterior angle. *Pubescence*: Rather short, even and dense except slightly longer on face, vertical region, scutellum and on abdominal T4–5; corbicular fringe of medium length, shortest basally, most hairs only slightly curved; metabasitarsal posterior fringe rather short, longest basally, beyond gradually diminishing in length to distal end. *Color*: Black, except golden-yellow on thoracic dorsum anterior of tegulae, scutellum behind wide interalar (black) band and on distal two-thirds of abdominal T3. Wings deeply infuscated to blackish, not iridescent or with violaceous reflection.

Worker. Length, 16.0 mm; width at wing bases, 7.0 mm; abdomen, 8.0 mm, width across T2, 7.5 mm; front wing length, 14.0 mm, width, 5.0 mm. Except for smaller size, this caste is structurally similar to the queen but the relative features are more diminutive. Chromatically the yellow pattern (usually) is a more pallid yellow, and the interalar (black) band somewhat narrower.

Male. Length, 17.0 mm; width at wing bases, 7.0 mm; abdomen, 9.0 mm, width across T2, 8.0 mm; front wing length, 16.0 mm, width, 5.0 mm. *Head*: Frontal outline (excluding mouth-parts) rather narrowly trapezoidal, only little higher than widest dimension, the vertical region only weakly convex, mostly covered with medium punctures; ocellular area largely smooth; ocelli positioned closer together than their diameters and in a weak arc, the lateral ones touching supraorbital line; compound eyes somewhat more broadly rounded below than above, their inner margins about subparallel to slightly divergent below; malar space little longer than distance between (and including) mandibular articulations, evenly and weakly convex, smooth except for few small punctures; labrum subrectangular with broadly arcuate ventral margin, mostly pubescent and with very weak callosities; flagellum 4 times longer than scape, most of its segments weakly crenulate, F1 subequal to F2 and considerably shorter than F3 being little more than $\frac{1}{2}$ the combined lengths of F2 and F3. *Legs*: Mesobasitarsite subrectangular, little more than 4 times longer than widest part, the acute distoposterior angle somewhat extended beyond the more or less rounded distoanterior angle, the outer surface mid-longitudinally concave; metabasitarsite narrowest at base, 4 times longer than widest dimension, the outer microscopically alutaceous surface mid-longitudinally concave, evenly weakly arcuate from base to distal end, the distal angles similar to those of mesobasitarsite but posterior one somewhat less acute. *Pubescence*: On head, thorax, and abdomen similar to that of the queen but slightly looser; posterior mesobasitarsal fringe longest along proximal half to short at distal end of segment; metabasitarsal posterior fringe only long on proximal third and gradually becoming short at distal end of segment. Genitalia, seventh and eighth abdominal sterna (Pl. XV). *Color*: Similar to that of queen except for the following: Trace of intermixed fine pallid pile on the face; black on vertex intermixed with noticeable amount of yellow; little more downward extension of yellow mixed with the black anteroventrad of tegulae; small amount of yellow near base and laterally on abdominal T4; some burnt sienna distally on abdominal T7 and S7. Wing color similar to that of the queen.

Redescribed from hypotypes. **Queen**, Valles, S. Luis Potosi, Mex., 3-27-40, S.S. Easter; **worker**, Santa Maria de Ostuma, Nicaragua, November 1959, W.L.H. Krauss; **male**, Agua Amarilla, Honduras, Nov. 30, 3800 ft, L.W. Williams, (15) [all, HEM].

TYPE. Not examined. A ♀, mislabeled as having been taken in Utah (by Dr. Suckley), appears to be lost.

TYPE LOCALITY. Most probably Mexico. "Utah" [U.S.A.], given by Cresson (1863a: 97) is incorrect (*cf.* Cockerell 1905e: 90; Cresson 1916: 123; Lutz and Cockerell 1920: 523). Number of specimens at hand: 490. In flight: Throughout the year, *i.e.*, queens, workers or males, or combinations thereof, might be taken any time of year at the appropriate place in the species' range. Distribution: (vertical), sea level to 7000 ft; (horizontal), from the southern half of Mexico to Panama. Floral visitations: *Bidens*, *Cirsium*, *Haplopappus*, *Lippia*, and *Salvia*. The writer has taken it at flowers of some unidentified additional plant genera.

COMMENTS. Other than for size and small differences in punctuation, especially on the clypeus, and differences in size of the queen epipygial convexity, little morphological variation was detected in this taxon. Queens are somewhat larger or smaller than the length given for the hypotype. Workers vary from being considerably larger

than given, and I have seen some no larger than $\frac{1}{3}$ the given length of the hypotype. As for the male no notable size variation has been detected by me, though it might occur. Some color variation has been encountered in all castes, especially with respect to the width of the black interalar band; on most specimens it is quite broad, while on others it is of medium width. Sometimes the black encroaches considerably onto the scutellum in both queens and workers, and occasionally in the male the interalar band is not very sharply defined. The yellow of the worker and often of the male is lighter than that normal for the queen (golden-yellow), but sometimes the latter might have rather brownish yellow. Some males have very little or no yellow on abdominal T4 and/or extensive burnt sienna on both T6-7.

This species has been much confounded with *M. (M.) atratus* (Fkln.) since South American specimens of the latter have been identified as *medius* which is not known to occur on that continent (see Map 22). Although Cresson gave Utah as the type locality of *medius*, this taxon does not occur anywhere in the United States.

GUATEMALA

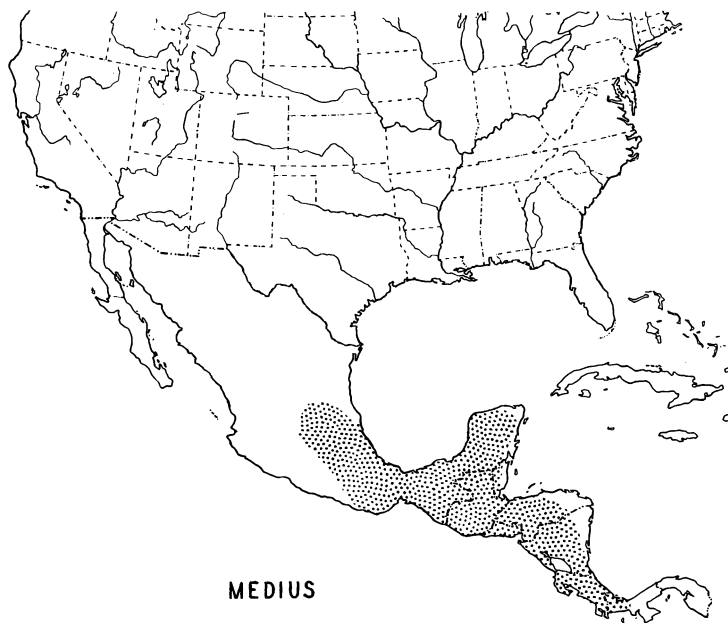
QUEENS

San Marcos: 2 San Cristóbal, January [yr.?], (Ac. 4875) [AMNH]. **Locality unknown:** 1 (no data), (Acc. No. 11025, ex Geo. P. Engelhardt Coll[ection]), Brooklyn Museum Coll[ectio]n, 1929 [USNM].

HONDURAS

QUEENS

Tegucigalpa: 1 Orica (Montana de la Flor), Dec. 30, 1937, V.W.V. Hagen [AMNH]; 1 Veneralka [to] Zemonno [?Zamorana], Dec. 14 [yr.?], T.D.A.C., 6000' [MCZ]. **Yoro:** 1 Subirana, 21-XII-32, Stadelmann; 2 Subirana, 2-II-[?1933], Stadelmann, 1 Subirana, 8-III-[?1933], Stadelmann [all, MCZ].



MAP 22.

MEXICO

QUEENS

Federal District: 1, J.R. Inda [USNM]. **Hidalgo:** 2 Chapulhuacan, VI-24-41, Henry S. Dybas [CNHM]; 1 Chapulhuacan, V-20-1952, M. Cazier–W. Gertsch–R. Schrammel [AMNH]. **Oaxaca:** 1 Palomares, IX-5-21-61, R.&K.D. [RRD]. **Puebla:** 1 Huauchinango (5 mi E. [of]), VI-25-53, 4100', (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion) [KU]. **San Luis Potosi:** 1 Pujal (15 mi S. [of]), VI-21-58, (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion) [KU]; 1 Tmazunchalo [Tamazunchale], III-31-51, W.P. Stephen, on thistle [HEM]; 5 Tmazunchalo [Tamazunchale], III-31-51, W.P. Stephen, on thistle [KU]; 1 Valles, 3-27-40, S.S. Easter [HEM]; 2 Xilitla (17 mi W. [of]), VII-22-54, 4700' (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion) [KU]. **Vera Cruz:** 1 Cordoba, (Ac. 30223); 1 Huatusco (Finca El Mirador), VIII-28-47, H. Wegener [both, AMNH]; 2 Jalapa, VIII-1-6-61, R.&K.D. [RRD]; 1 Orizaba, 9-53, E.G. Smyth, (Chittenden No. 13320) [USNM]; 1 Orizaba, 11-13-54, R.R.D., 2500'; 1 Rio Blanco, 11-13-57, R.&K.D. [both, RRD]. **Yucatan:** 3 Chichén–Itza, E. Thompson [CNHM].

NICARAGUA

QUEEN

Nueva Segovia: 1 Santa Maria (de Ostuma), November 1959, N.L.H.K. [HEM].

GUATEMALA

WORKER

San Marcos: 1 San Cristóbal, January [yr.?], (Ac. 4875) [AMNH].

HONDURAS

WORKERS

Morazán: 1 Agua Amarilla, Oct. 21, [1946], O. Williams, 3500' [HEM]; 1 Agua Amarilla, T.D.A.C. [MCZ]. **Tegucigalpa:** 1 Portilla Grande, 3-IX-[yr.?], R.E. Stadelmann; 1 Portillo Grande, 5-IX-[yr.?], R.E. Stadelmann [both, MCZ]; 1 Zamorano, Jan. 12, [1947], Castellanos [HEM]. **Yoro:** 1 Subirana, 20-XII-32, Stadelmann; 1 Subirana, January 1933?, Stadelmann; 1 Subirana, 16-II-[1933?], Stadelmann; 1 Subirana, 19-II-[1933?], Stadelmann; 1 Subirana, 3-III-[1933?], Stadelmann [all, MCZ].

MEXICO

WORKERS

Campeche: 3 San Dimas, December 1944, M. Guerra, (Frank Johnson, donor) [AMNH]. **Chiapas:** 1 Comitán (5 mi S. [of]), 6-VIII-62, H.E.M., 6000'; 1 Comitán (20 mi S. [of]), 6-VIII-62, H.E.M., 6-7000'; 4 Ocozocautla (30 km S. [of]), 2-VIII-62, H.E.M., 3000' [all, CNC]. **Durango:** 1 El Salto [not S.L.P.], VI-14-53, on *Haplopappus venetus*, (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion); 14 El Salto [not S.L.P.], VIII-24-54, 1600', (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion) [all, KU]. **Hidalgo:** 1 Chapulhuacan, VI-19-41, Henry S. Dybas; 2 Chapulhuacan, VI-24-41, Henry S. Dybas [all, CNHM]; 4 Chapulhuacan (n[e]ar), Sept. 8, 1948, K.W. Marx [HEM]; 11 Chapulhuacan, V-20-1952, M. Cazier, W. Gertsch, R. Schammel [AMNH]. **Mexico:** 1 Coatepec, VII-[yr.?] [USNM]. **Oaxaca:** 5 Oaxaca, Crawford, (Cornell U[niversity]), Lot 546, sub. 1112, Baker Coll[ectio]n, [CU]; 2 Palomares, IX-5-21-61, R.&K.D. [RRD]; 1 Tehuantepec (S[ain]t Lucrecia), April, W.M. Mann [USNM]; 1 Tolosa, Aug. 26, 1947, B.M.; 4 Tolosa, Sept. 1-4, 1947, B.M. [all, AMNH]. **Puebla:** 1 Villa Juarez (13 mi E. [of]), VI-25-53, 1300', (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion) [HEM]; 3 Villa Juarez (13 mi E. [of]), VI-25-53, 1300', (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion) [KU]. **San Luis Potosi:** 1 Huichihuayan, VI-18-1941, C.H. Seevers [CNHM]; 2 [El] Pugal [Pujal], 17-21-VIII-1939, Ralph Haag [MCZ]; 9 Pujal, VI-20-53, (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion) [KU]; 4 Pujal (15 mi S. [of]), VI-21-53, (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion) [HEM]; 114 Pujal (15 mi S. [of]), VI-23-53, (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion) [KU]; 1 Tamazunchale, VI-23-41, C.H. Seevers [CNHM]; 1 Tamazunchale, IX-9-47, P.&C.V., (F. Johnson, donor) [AMNH]; 3 Tamazunchale, VI-21-1953, Slesnick (No. 11), 600', (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion) [KU]; 5 Xilitla (5 mi N. [of]), 23-VII-1954, J.G.C., 1600' [CNC]; 1 Xilitla, 23-VII-54, 1450', (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion) [HEM]; 24 Xilitla, VII-23-54, 1450', (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion), [KU]; 1 Xilitla, 24-VIII-1954, J.G.C., 1800' [CNC]; 1 Xilitla (10 mi E. [of]), VII-25-54, 300' (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion) [KU]. **Tamaulipas:** 1 Allamira [Altamira], VI-26-03, M.R. Haag [ANSP]; 2 Antigua Morelos, VII-20-54, (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion); 4 Llera, VII-19-54, (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion); 1 Neuvo Morelos (2 mi NW. [of]), VI-19-53, (Univ[ersity of]

Kans[as] Mex[ican] Exped[ition]) [all, KU]. **Vera Cruz:** 3 Acayucan, 10-23-57, R.&K.D. [RRD]; 2 Catamaco (Lake) Lago[de], July 23, 1955, P.&C.V., 1000'; 12 Coatepec, July 28, 1955, P.&C.V., 4019'; 9 Coatzacoalcas, September 1944, M. Guerra, 10 m, (Frank Johnson, donor) [all, AMNH]; 1 Cordoba, VII-8-41, C.H. Seevers; 2 Cordoba, VII-22-41, Henry S. Dybas [all, CNHM]; 1 Cordoba (9 mi N.E. [of]), VII-1-53, 1300', (Univ[ersity of] Kans[as] Mex[ican] Exped[ition]) [KU]; 1 Cordoba, 15-VIII-62, H.E.M., 5000' [CNC]; 1 El Fortin, VII-8-41, Henry S. Dybas; 1 El Fortin, VII-9-41, Henry S. Dybas [both, CNHM]; 1 El Juile, June 1944, M. Guerra, 27 m, (Frank Johnson, donor) [AMNH]; 10 Fortin ($\frac{1}{2}$ mi W. of), Sept. 15, 1948, K.W. Marx. (tropical upland) [HEM]; 14 Fortin, July 22, 1955, P.&C.V., 3000' [AMNH]; 1 Fortin de las Flores, VI-10-59, H.E.E., 3000' [CU]; 2 Huatusco, II-12-54, R.R.D., 2400' [RRD]; 1 Jalapa, VII-2-41, Henry S. Dybas [CNHM]; 2 Jalapa, May 1947, H.M. Wegner; 2 Jalapa, IX-4-47; 1 Jalapa, IX-13-47 [all, AMNH]; 1 Jalapa, (10 mi SE. [of]), VI-29-53, 3000', (Univ[ersity of] Kans[as] Mex[ican] Exped[ition]) [KU]; 1 Jalapa, 3-IX-58, J.L. Carrillo INIA; 4 Jalapa, VIII-1-6-61, R.&K.D. [RRD]; 1 Jalapa, IX-22-61, F.P. [INIA]; 2 Jesus Carranza, June 1944, M. Guerra, 26 m, (Frank Johnson, donor); 7 Jesus Carranza, June 1944, M. Guerra, (Frank Johnson, donor); 1 Macaya, June 1944, M. Guerra, 37 m, (Frank Johnson, donor); 1 Minatitlan, July 1944, M. Guerra, 66 m (Frank Johnson donor) [all, AMNH]; 1 Minatitlan, 8-26-IX-61, R.&K.D. [RRD]; 2 Orizaba (3 mi E. [of]), VII-1-53, 1900', (Univ[ersity of] Kans[as] Mex[ican] Exped[ition]) [KU]; 1 Orizaba, 7-25-56, R.&K.D.; 2 Orizaba, 8-12-22-61, R.&K.D. [all, RRD]; 1 Pajaritos, July 1944, M. Guerra, 8 m, (Frank Johnson, donor); 1 Papantla, Aug. 1, 1955, P.&C.V. [both, AMNH]; 1 Potero Viejo, VI-6-49, 1700', W.W. Dalquest [KU]; 2 Poza Rico, Aug. 2, 1955, P.&C.V. [AMNH]; 1 Rio Blanco, 11-13-57, R.&K.D. [RRD]; 1 Rio Nautla, 4-8, Townsend; 3 Súcil, June 1944, M. Guerra, 27 m, (Frank Johnson, donor); 20 Sureste (25 km R.R. from), August 1944, M. Guerra, (Frank Johnson, donor) [all, AMNH]; 4 Tecolutla, VI-19-51, H.E.E. [KU]; 4 Tecolutla, VI-19-51, P.D.H. [CIS]; 2 Tuxtla (S[an] Andres), 10-25-57, R.&K.D. [RRD]; 1 Zamora (3 mi W. Gutiarra [Gutierrez]), VI-25-53, 200 ft, (Univ[ersity of] Kans[as] Mex[ican] Exped[ition]) [HEM]; 3 Zamora (3 mi W. Gutierrez [Gutiérrez]), VI-25-53, 200 ft., (Univ[ersity of] Kans[as] Mex[ican] Exped[ition]) [KU]. **Yucatan:** Chichén-Itza, VI-29 [MCZ]; 15 Chichén-Itza, E. Thompson [CNHM]; 2 Chichén-Itza, E. Thompson, (F.M.N.H. Coll[ection]) [MCZ].

HONDURAS

MALES

Morazán: 1 Agua Amarilla, Nov. 15, [1946, T.D.A.C.] [MCZ]; 1 Agua Amarilla, Nov. 15, [1946], W.P.C. [USNM]; 1 Agua Amarilla, Nov. 30, [1946], L. Williams, 3800'; 1 Agua Amarilla, Dec. 15, [yr.?] [both, HEM]. **Tegucigalpa:** 1 Gñiope (n[ea]r) [Guinope], January [1947], Williams, 4800', *Salvia* [USNM]. **Yoro:** 1 Subirana, 5-III-[yr.?), Stadelmann [MCZ].

MEXICO

MALES

Campeche: 2 San Dimas, December 1944, M. Guerra, (Frank Johnson, donor) [AMNH]. **Chiapas:** 1 Ocozacoautla (20 km S. [of]), 2-VIII-62, H.E.M., 4000' [CNC]. **Hidalgo:** 14 Chapulhuacan, V-20-1952, M. Cazier, W. Gertsch, R. Schrammel [AMNH]. **Oaxaca:** 1 Monte Alban, June 30, 1955, P.&C.V., 6391' [AMNH]; 1 Oaxaca, Crawford, (Cornell U[niversity]), Lot 546, sub. 1113, Baker Coll[ectio]n [CU]; 1 Palomares, IX-5-21-61, R.&K.D. [RRD]; 1 Tolosa, Sept. 1-4, 1647 [1947], B.M. [AMNH]. **San Luis Potosi:** 1 Ciudad del Maiz (6 mi E. [of]), VIII-22-23-1954, 4700', Univ[ersity of] Kans[as] Mex[ican] Exped[ition]) [KU]; 2 Huichihuyan (20 mi N. [of] Tamazunchale), V-19-1952, M. Cazier, W. Gertsch, R. Schrammel [AMNH]; 1 Tamazunchale, VI-19-41, C.H. Seevers [CNHM]; 1 Xilitla (5 mi W. [of]), VII-22-54, 2400', (Univ[ersity of] Kans[as] Mex[ican] Exped[ition]) [all, KU]. **Veracruz:** 1 Coatzacoalcas, September 1944, M. Gerra, 10 m, (Frank Johnson, donor) [AMNH]; 1 Cordoba, Dec. 17, '07, Fred[eric]k Knab [both, USNM]; 1 Fortin Jan. 1, 1951, R.F.S. [AMNH]; 1 Minatitlan, 18-26-IX-61, R.&K.D.; 2 Orizaba, 11-4-57, R.&K.D. [all, RRD]. **Locality unknown:** 1 3-23, N. 23 [USNM].

PANAMA

MALES

Chiriquí: 1 Boqueti [Boquete], 3500', (Rosenberg Coll[ectio]n); 1 Boquete [both, USNM].

Megabombus (M.) morio (Swed.)

Apis morio Swed., 1787, p. 283, (*nec Apis morio* F., 1793, p. 315): *Bombus carbonarius* Handl., 1888a, pp. 241, 242, (p.p.), (*nec Bombus carbonarius* Menge, 1856, p. 27): *Bombus cayennensis*, Handl., 1888a, p. 240, (p.p.), (*nec Apis cajennensis* F., 1798, p. 273): *Bombus cayennensis* (v. *velutinus*, vel *violaceus*), Handl., 1888a, p. 241, (p.p.), (*nec A. cajennensis* F., 1798, p. 273): *Bombus kohli* Ckll., 1906e, p. 75, (*nec kohli* Vogt, 1909, pp. 41, 61): *Bombus morio*, Hed., 1942, pp. (9), 10: *Bombus thoracicus* v. *umbricollis* Fr., 1931a, p. 302, (*nec thoracicus* Sich., 1862, p. 121): *Bombus velutinus* Ill., 1806, p. 175, (p.p.): *Bombus violaceus* Lep., 1836, p. 473, (p.p.): *Bombus violaceus* v. *brunescens* Fr., 1931a, p. 302: *Bombus* (B.) (Dumoucheli group), Fkln., 1913, p. 95, (p.p.): *Bombus* (B.) *kohli*, Fkln., 1913, p. 110, (*nec kohli* Vogt, 1909, pp. 41, 61): *Bremus kohli*, Fris., 1925a, pp. 155, 159, (*nec Bombus kohli* Vogt, 1909, pp. 41, 61): *Fervidobombus* (F.) *kohli*, Skor., 1922a, p. 153, (list), (*nec Bombus kohli* Vogt, 1909, pp. 41, 61): *Megabombus morio*, Mlrn., 1962b, p. 729: *Megabombus* (Dumoucheli group), Mlrn., 1962b, p. 729, (p.p.): *Megabombus* (M.) (Dumoucheli group), Mlrn., 1961a, p. 57, (p.p.): . . . *carbonarius*, Mlrn., 1960a, p. 90, (♂ H.E.M. lectotype), (*nec Bombus carbonarius* Menge, 1856, p. 27): . . . *morio*, Mlrn., 1960a, p. 94, (♀ type): . . . *velutinus*, Mlrn., 1960a, p. 97, (Bischoff ♂ type; H.E.M. lectotype): . . . *violaceus*, Mlrn., 1960a, p. 97, (♀ type).

DESCRIPTION. **Queen.** Length, 26.0 mm; width at wing bases, 11.0 mm; abdomen, 14.0 mm, width across T2, 12.0 mm; front wing length, 21.5 mm, width, 8.0 mm. **Head:** Frontal outline (excluding mouthparts) narrowly elongate trapezoidal, the upper angles rounded, little more than 1½ times higher than greatest width, the vertical region rather strongly inclined toward occiput with surface mostly flat to weakly concave and rather well covered with small punctures; ocellular area mostly smooth with only the approximate ocular half very weakly and sparsely punctate; ocelli about equal in size, situated near to one another in a weak arc just below supra-orbital line; compound eyes somewhat more broadly and evenly rounded below than above, their inner margins subparallel to slightly divergent below; malar space at least 1½ times longer than distance between (and including) mandibular articulations, its surface rather weakly and unevenly convex and practically free of noticeable punctation; labrum nearly twice as wide as greatest thickness, its ventral margin broadly arcuate, the labral shelf sharp and extending well onto each of the rather prominent tubercles which are irregularly punctate, flattened below and mesally conical, their summits separated by a somewhat shallow intertubercular depression wider than length of F1; flagellum little less than twice as long as scape, F1 distinctly longer than subquadrate F2 which is more than half the length of F3, F2, and F3 combined only little longer than F1; clypeus rather evenly convex, well but not densely covered with medium punctures, its median height about equal to widest ventral dimension. **Legs:** Mesobasitarsite nearly rectangular, about 5 times longer than widest part, its outer surface concave near mid-longitudinal axis, the distal end only shallowly emarginate with blunt distoanterior angle only slightly in recess of acute distoposterior angle; outer surface of hind tibia somewhat alutaceous, convex longitudinally near anterior margin, behind flat to weakly concave, the widest part about equal to longest hairs of corbicular (posterior) fringe; metabasitarsite with most of outer surface rather deeply concave longitudinally, the posterior margin weakly arcuate along basal half and straight beyond, the acute distoposterior angle extended noticeably beyond more blunt distoanterior angle, with shallow angulate emargination between. **Pubescence:** Rather short, dense and even except slightly longer and looser on head, posterior area of scutellum, on abdominal T3-5 and abdominal venter; corbicular fringe rather dense, mostly composed of weakly arcuate hairs; metabasitarsal posterior fringe not long, the longest hairs occurring on basal half of margin, beyond becoming very short and sparse distally. **Color:** Entirely black (*cf.* under Comments). Wings black with violaceous reflections under certain light.

Worker. Length, 19.0 mm; width at wing bases, 9.0 mm; abdomen, 9.0 mm, width across T2, 9.0 mm; front wing length, 16.5 mm, width, 6.0 mm. Otherwise, comparable to the queen in all important respects (*cf.* under Comments).

Male. Length, 18.5 mm; width at wing bases, 7.0 mm; abdomen, 10.0 mm, width across T2, 8.0 mm; front wing length, 16.5 mm, width, 5.5 mm. **Head:** Frontal outline (excluding mouth-parts) narrowly trapezoidal, about as high as widest dimension, the vertical region nearly flat, moderately inclined toward occiput, well covered with irregular medium punctures; ocelli positioned in a weak arc, separated from each other by little less than their diameters, the lateral ones touching supraorbital line; ocellar half of ocellocular area smooth, the ocular half with few medium punctures; compound eyes somewhat more broadly rounded below than above, their inner margins subparallel; malar space for the most part weakly convex and practically smooth, at least $1\frac{1}{2}$ times as long as distance between (and including) mandibular articulations; labrum more or less rectangular, about $2\frac{1}{2}$ times wider than greatest thickness, its ventral margin mostly straight, its surface weakly sculptured and with transverse shallow concavity below inconspicuous callosities; flagellum near 5 times longer than scape, most segments weakly crenulate, F1 little more than $\frac{1}{2}$ of F2 which is subequal to F3, F1 and 2 combined little longer than F3. **Legs:** Mesobasitarsite more or less rectangular, nearly 4 times longer than widest part, distal end subtruncate, the distoposterior angle somewhat sharper than distoanterior one and noticeably in recess of it; metabasitarsite similar but somewhat wider, its posterior margin weakly arcuate, the distal end weakly emarginate between distal angles which are equally extended, the distoposterior one the sharper (subacute), the outer surface alutaceous and with short well separated hairs. **Pubescence:** Character similar to that of the queen and worker except stronger pile on the clypeus is somewhat denser, that on abdominal terga is little shorter and more even and not quite as dense; mesobasitarsal posterior fringe mostly of medium length, the longest hairs more than $\frac{1}{2}$ as long as widest part of segment; metabasitarsal posterior fringe very short throughout. Genitalia, seventh and eighth abdominal sterna figured (Pl. XIV). **Color:** Black except fine pile on face, as well as some on lower thoracic pleura, venter and some on coxae, trochanters, and femora pallid (entirely or in part tinged with white or pale grey). Wings colored much as those of the queen.

Redescribed from hypotypes. **Queen,** Nova Teutonia [Santa Catharina], Brasil, 27°11' B., 52°23' L., 5-X-1939, Fritz Plaumann; **worker,** Nova Teutonia, Santa Catharina, Brazil, 29 March 1948, Fritz Plaumann; **male,** P. N. Itatiaia, 850 m, Est. Rio, Brasil, VIII-954, H. Gouvela (Coleção Campos Seabra) [all, HEM].

TYPE. Examined a ♀ in the Banks Collection, British Museum (N.H.), London (Milliron 1960a: 94).

TYPE LOCALITY. Brazil. Number of specimens at hand: 1666. In flight: Throughout the year, *i.e.*, queens, workers, or males, or combinations thereof might be captured any time at the appropriate place in the species' range. Distribution: (vertical), sea level to 7800 ft; (horizontal), most of Brazil south of the Amazon River, southward through Uruguay, northern Argentina, Paraguay, then northward through western South America to northern Venezuela. Floral visitations: *Capsicum*, *Cassia*, *Coffea*, *Cucumis*, *Hibiscus*, *Lupinus*, *Piper*, *Pseudoananas*, *Solanum*, *Vernonia*, and several unidentified Compositae and Leguminosae.

COMMENTS. Except for the rather wide range in size, especially of the workers, no morphological variation worthy of note has been detected in this taxon. Some of the smaller workers seen measure considerably less than one-half of that given here, whereas the larger workers are difficult to segregate from small queens. Infrequent chromatic variations, on the other hand, might be striking; specimens displaying these usually have part of an abdominal tergum (or terga) dull brownish coppery red, and sometimes the entire body is so colored without any evidence of the normal black. The presence of yellowish pile on any part of the body is very rare, and then in the form of only traces. I have regarded all these off-colour specimens as aberrations or freaks (*cf.* Milliron 1971).*

*Milliron, H.E. 1971. A monograph of the Western Hemisphere bumblebees (Hymenoptera: Apidae: Bombinae). I. The genera *Bombus* subgenus *Bombias*. *Ent. Soc. Can. Mem.* 82.

ARGENTINA

QUEENS

Buenos Aires: 1 Villa Elisa, 24-II-55 [HEM]; 1 (locality unknown), XI-54, R. Otamendi [KU]. **Chaco:** 1 Charata, X-1924 [KU]; 2 (locality unknown), Wagner [NRS]. **Formosa:** 30 Gran Guardia, X-21-52, J.F. [KU]; 5 Gran Guardia, 15-XI-52 [HEM]; 1 (locality indefinite), II-53, J.F. [Seabra]. **Jujuy:** 1 Ledesma, 8-II-50, Ms.-Wk. [MLF]; 1 San Pedro, II-1948, A.F.P.; 1 Yala, IV-1948, A.F.P.; 2 (locality unknown), XII-1950, A.F.P. [all, KU]. **Misiones:** 3 Campo Vierra, 31-XII-55; 1 Campo Vierra, XII-55; 2 Loreto, VIII-52; 1 Loreto, IX-54; 21 Loreto, IX-55; 1 Loreto, XII-55 [all, HEM]; 1 Obera, X-15-1950, M.S. [KU]; 1 Oro Verde, 26-III-52, Neuntenfel; 1 [Puerto] Bemberg, 14-30-III-1945, Hd.-Wk.-Gb. [both, MLF]; 1 [Puer]to Bremberg [Benberg], XI-9-45, Prosen; 2 San Ignacio, X-3-1950, M.S. [all, KU]. **Salta:** 1 Pocitos, I-1952, (F.H.W.); 1 Rosario de la Frontera, XI-1950, A.F.P. [both, KU]. **Santiago del Estero:** 1 Villa Gomez, XI-46, Huidobra [MLF]. **Tucuman:** 3 Cadillal, X-1947, A.F.P. [KU]; 1 D[e]p[ar]men[to] Tafi, 27-IX-55, H.E.M. [HEM]; 1 D[e]p[ar]men[to] Trancas, V-46, Bellamo; 1 El Saldaillo, IV-47, As.; 2 Los Nogales, III-47, A.A. [all, MLF]; 4 Marcos Paz, 8-X-55, H.E.M. [HEM]; 1 S[an] P[edro] d[e] Colalao [not Calalao], II-49, A. [MLF]; 14 San Pedro de Colalao (Trancas), II-50, A. (J.F.); 17 San Pedro de Colalao (Dpto. Trancas), II-51; 3 S[an] P[edro] de Colalao, I-1953, (F.H.W.) [all, KU]; 20 S[an] P[edro] d[e] Colalao [not Calalao], 5-X-55, H.E.M. [HEM]; 1 S[an] P[edro] d[e] Colalao [KU]; 1 S[an] P[edro] [e] Colalao; 1 Siambon (Tafi), II-45, D.O.; 1 Siambon (Tafi), IV-45, D.O.; 3 Siambon (Tafi), XII-45, D.O.; 1 Siambon (Tafi), V-46, D.O.; 1 Tacanas (Dpto. Trancas), XII-46, Gb.; 1 Tacanas (Dpto. Trancas), II-51, J.M.A. [all, MLF]; 1 Tucuman, XI-7-1928, H.A. Joynes [USNM]; 2 Tucuman, X-1932, J.M. Boas [KU]; 1 Tucuman, 4-5-I-41, K. Winder [CL]; 3 Tucuman, 1945 [MLF]; 1 Tucuman (Hospital City), 9-X-55, Willink & Milliron [HEM]. **Locality indeterminate:** 1 Chaco de Santiago, (no data), Wagner [NRS].

BOLIVIA

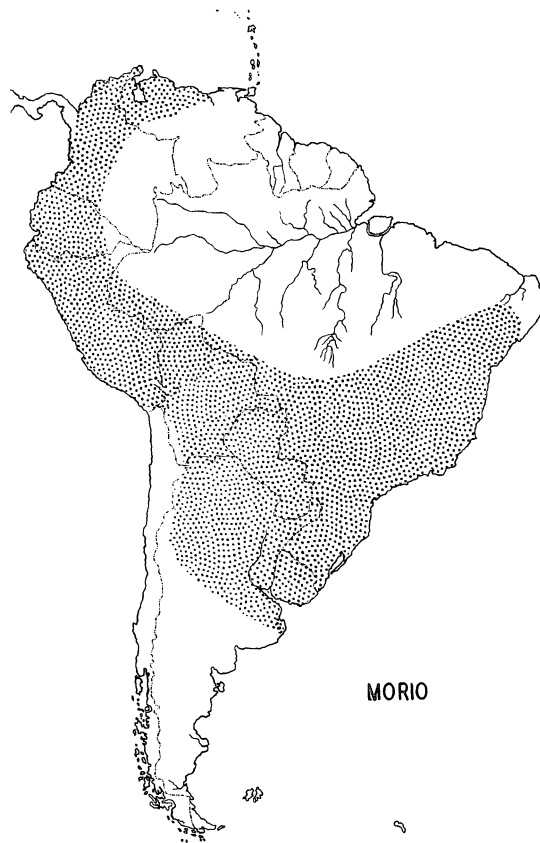
QUEENS

Beni: 1 Magdalena (Region Amazonica), V-15-1950, Foerster, 250 m; 3 Rurrenabaque, 17 Oct. 1956, (L.P.), 175 m [all, KU]. **La Paz:** 41 Yungas ([de] La Paz, Coroico), 3-12-XII-55, L.P., 1800 m [HEM]. **Santa Cruz:** 2 Buena Vista (Dept. Ichilo), V-10-1950, L.E.P. [KU]; 1 (Oriental), 1-V-55, Z. [Seabra].

BRAZIL

QUEENS

Mato Grosso: 2 "Chapada" [Cuiabá], (Acc. No. 2966) [CU]; 1 "Chapada" [Cuiabá] [CM]; 1 Diamantina, 15 Nov. '19, (Cornell Univ[er]sity Expedition, Lot No. 569) [CU]. **Minas Gerais:** 1 Leopoldina (S[an]t[a]), 1898, (Am[er]ican Mus[eum of] Nat[ur]al Hist[ory], Dept. Invert. Zool., No. 26158) [AMNH]; 2 S[erra] do Caparão, 800-2000 m, Lange-Larsson [NRS]. **Paraná:** 1 Guaratuba, 5-XI-55, H.E.M. [HEM]; 1 Morretes, 3 Nov. 1955, Me.-Mr. [Seabra]; 8 Morretes (10 mi N. [of]), 5-XI-55, H.E.M.; 1 Paranagua, 5-XI-55, C.D. Michener [all, HEM]. **Rio de Janeiro:** 1 Itatiaia [also Itatiaia] (Estação Biologica), 1-10-1930, 900 m [CL]; 1 Itatiaia [also Itatiaia] (P.N.), X-XI-1954, H.G., 450 m; 1 Itatiaia [also Itatiaia] (P.N.), November 1955, H.G., 400 m; 1 Pedro do Rio, III-1954, C.A.C.S. [all, Seabra]; 1 Rio de Janeiro (Campo Grande, Universidad Rural), 18-XI-55, H.E.M., [on lupine] [HEM]; 1 Rio [de Janeiro], Nov. [yr?] [ANSP]; 1 Rio de Jan[eiro], (Acc. No. 2966) [CM]; 2 S[ão] Bento (Duque de Caxias), VI-1953, P.A.R. [Seabra]; 1 S[ão] Bento (Duque de Caxias), II-1954, P.A.T. Seabra-(H.E.M. *morio* (Swed.), homotype); 2 S[ão] Bento (Duque de Caxias), II-1954, P.A.T.; 3 S[ão] Bento (Duque de Caxias), VI-1954, P.A.T. [all, Seabra]. **Rio Grande do Sul:** 1 Pelotas, X-7-1952, C.M. Biezanko [USNM]; 1 Pelotas, XI-1-1953, C.B.; 1 Pelotas, XI-20-1953, C.B. [both, AMNH]; 1 Pelotas, X-27-1954, C.M. Biezanko; 1 Pelotas, XI-7-1954, C.M. Biezanko [both, USNM]; 6 São Leopoldo, J.W. Stahl [NRS]. **Santa Catarina:** 2 Blumenau, 1897, Virgil [CNC]; 6 Corupa (Humboldt [River, n[ea]r] Hansa), October 1944, A.M., (Frank Johnson, donor); 3 Corupa (Humboldt [River, n[ea]r] Hansa), November 1944, A.M., (Frank Johnson, donor); 6 Corupa (Humboldt [River, n[ea]r] Hansa), XI-1945, A.M. (Frank Johnson, donor); 1 Corupa (Humboldt [River, n[ea]r] Hansa), 1-1946, A.M., (Frank Johnson, donor); 5 Corupa (Humboldt [River, n[ea]r] Hansa), 1-1946, A.M., (Frank Johnson, donor) [all, AMNH]; 1 Corupa, 2-52 [Seabra-(H.E.M. *morio* (Swed.), homotype)]; 1 Corupa, XI-1953, A.M. [Seabra]; 1 Corupa, I-1954, A.M. [KU]; 1 Corupa, III-1954, A.M. [Seabra-(H.E.M. *morio* (Swed.), homotype)]; 5 Corupa, III-1954, A.M.; 1 Corupa, VIII-1954, A.M.; 1 Corupa, X-1954, A.M. [all, Seabra]; 1 Nova Teutonia, 5-X-1939, F.Pn.; 1 Nova Teutonia, 29 March 1948, F.Pn.; 2 Nova Teutonia, 12 April 1948, F.Pn.; 1 Nova Teutonia, 7 May 1948, F.Pn.; 1 Nova Teutonia, 13 May 1948, F.Pn. [all, HEM]; 1 Nova Teutonia, I-8-50, F.Pn.; 1 Nova Teutonia, III-28-51, F.Pn., on *Piper* sp.; 1 Nova Teutonia, III-29-51, F.Pn.; 1



MAP 23.

Nova Teutonia, III-30-51, F.Pn. [all, KU]; 7 Nova Teutonia ($27^{\circ}11'-52^{\circ}23'$), 4-IV-1951, F.Pn., 300-500 m; 1 Nova Teutonia ($27^{\circ}11'-52^{\circ}23'$), 5-IV-1951, F.Pn., 300-500 m; 2 Nova Teutonia ($27^{\circ}11'-52^{\circ}23'$), 6-IV-1951, F.Pn., 300-500 m; 1 Nova Teutonia ($27^{\circ}11'-52^{\circ}23'$), 7-IV-1951, F.Pn., 300-500 m; 1 Nova Teutonia ($27^{\circ}11'-52^{\circ}23'$), 10-IV-1951, F.Pn., 300-500 m; 2 Nova Teutonia ($27^{\circ}11'-52^{\circ}23'$), 13-IV-1951, F.Pn., 300-500 m; 6 Nova Teutonia ($27^{\circ}11'-52^{\circ}23'$), 14-IV-1951, F.Pn., 300-500 m; 3 Nova Teutonia ($27^{\circ}11'-52^{\circ}23'$), 15-IV-1951, F.Pn., 300-500 m; 1 Nova Teutonia, 16-IV-1951, F.Pn., 300-500 m; 2 Nova Teutonia ($27^{\circ}11'-52^{\circ}23'$), 17-IV-1951, F.Pn., 300-500 m; 3 Nova Teutonia ($27^{\circ}11'-52^{\circ}23'$), 19-IV-1951, F.Pn., 300-500 m; 6 Nova Teutonia ($27^{\circ}11'-52^{\circ}23'$), 20-IV-1951, F.Pn., 300-500 m; 1 Nova Teutonia, 20-IV-51, F.Pn.; 1 Nova Teutonia ($27^{\circ}11'-52^{\circ}23'$), 26-IV-1951, F.Pn., 300-500 m [all, HEM]; 1 Nova Teutonia, X-1951, L.E. Plaumann [KU]. **São Paulo:** 1 Barueri, 11-III-1955, K.L., (320); 1 Barueri, 25-III-1955, K.L., (365); 1 Barueri, 25-III-1955, K.L., (366) [all, KL]; 1 Batatais, October 1942, (J. Moure); 1 Batatais, October 1943, (Stafuzza) [both, KU]; 1 Jundiahy, 1897, Schrottky [CNC]; 1 São Paulo, XII-49 [HEM]; 1 São Paulo, A. Heine [NRS]; 1 (locality unknown), Hammer, (Cornell U[niversity], Lot 298, sub. 116) [CU]. **Locality indeterminate:** 2 Esteio[?], January 1953, R. Laperriere, (Museum Paranaense, No. 18324) [JSM]. **Locality unknown:** 1 (no data), Frölich [collr.?]; 1 (no data), Kreuger [collr.?], (Sch[ö]n[her]r [Collection]); 1 (no data) Sekh. [collr.?] [all, NRS]; 1 (no data), [MCZ].

COLOMBIA

QUEEN

Santander: 1 Carare, 7-V-39, Richter, 1000 m [COL].

PARAGUAY

QUEENS

Acahai: 16 Nueva Stalia [Italia], 7-XII-55, F.S., on *Cucumis melo* [HEM]. **Asuncion:** 2 Asuncion (Jardin Botanico), 27-XI-55, F.S., on *Pseudoananas macrodotes*; 2 Asuncion (Jardin Botanico), 4-XII-55, F.S., on *Pseudoananas macrodotes*; 12 Villa Aurelia, 21-X-55, H.E.M.; 15 Villa Aurelia, 22-X-55, H.E.M. [all, HEM]. **Caa-Guazu:** 8 Col[onia] Sommerfeld, XII-58 [HEM]. **Caragatay:** 1 San Bernardino, 16-X-55, H.E.M. [HEM]. **Encarnacion:** 1 [Colonia] Hohenau, IV-53; 3 (locality uncertain-Dpto. Contrera [Cantera?]), III-54, F.S. [all, HEM]. **Guayra** (also Guaira): 2 Col[onia] Independencia, 17-X-55, H.E.M. [HEM-(both H.E.M. *morio* (Swed.), homotypes)]; 1 Col[onia] Independencia (C[am]po Melgarejo), 17-X-55, H.E.M. [HEM]; 4 Col[onia] Independencia (C[am]po Melgarejo), 18-X-55, H.E.M. [HEM-(all H.E.M. *morio* (Swed.), homotypes)]; 2 Col[onia] Independencia (C[am]po Melgarejo), 18-X-55, H.E.M. [HEM]; 1 [Colonia Carlos Pfanael (Pfannel)], XII-15-195[yr.?], (F.), 300 m [KU]. **Tacurupucu:** 1 Tacuru-Pucu [Tacurupucu], 2-7 April [yr.?], Donald Wees [MCZ]. **Villarrica:** 1 Villarrica, II-1925 [CNC]; 1 Villarrica, IV-1925, J.F.Z. [CL]; 1 Villarrica, XI-1925 [CNC]; 21 Villarrica, 10-IV-57, F.S., on *Solanum* sp.; 27 Villarrica, 17-IV-57, F.S., on *Solanum* sp. [all, HEM].

ARGENTINA

WORKERS

Buenos Aires: 1 San Isidro, XII-55 [HEM]. **Catamarca:** 3 Pedro Blanca, (Carn[egie] Mus[eum], Acc. 2966) [CM]; 1 (locality unknown), XII-46, Schäfer [MLF]. **Chaco:** 2 Colonia Benitez, 12-XII-1948, R.Gh. [MLF]. **Corrientes:** 1 San Roque (not Poque), II-1920, Bosa [KU]. **Formosa:** 12 Clorinda, III-1947, J. Morel [MLF]; 7 Gran Guardia, II-52; 7 Gran Guardia, 10-X-52; 6 Gran Guardia, 18-X-52; 1 Gran Guardia, X-52; 19 Gran Guardia, 15-XI-52; 15 Gran Guardia, 1-XII-52; 30 Gran Guardia, II-53 [all, HEM]; 5 Laguna Larga, IV-48, F. More [MLF]; 2 Pelga, II-1949, Prosen; 3 (locality unknown), February 1953, M.S. [all, KU]; 13 (locality unknown), II-1953, (J.F.) [Seabra]. **Jujuy:** 3 Calilegua, 13-II-1950, Ms.-Wk.; 2 Dique La Cienaga, 11-II-51, Wk.-Ms.; 7 Los Perales, 4-II-1950, Ms.-Wk.; 2 Los Perales, 6-II-1950, Ms.-Wk. [all, MLF]; 1 Los Perales [Perales], XII-1950, A.F.P.; 2 Monterrico, I-1948, A.F.P. [all, KU]; 11 Palpala, 27 Feb. '20, (Cornell University Exped[ition]) [CU]; 1 Perico, I-1950, A.F.P.; 1 Reyes, II-1948, A.F.P.; 2 San Pedro, II-1948, A.F.P. [all, KU]; 1 Santa Barbara, 7-IV-57, J.F. [HEM]; 1 Yala, IV-1948, A.F.P.; 2 Yuto (Estadode), November 1956, [all, KU]; locality unknown (or indefinite): 5 10 Feb. 1920, R.G.H., (Cornell Univ[ersity] Exped[ition]); 16 11 Feb. 1920, R.G.H., (Cornell Univ[ersity] Exped[ition]); 2 29 Feb. 1920, (Cornell Univ[ersity] Exped[ition]); 2 1 March 1920, (Cornell Univ[ersity] Expedition, Lot 569) [all, CU]; 1 27-I-48, Wk.-Ms. [MLF]; 1 21-XII-1950, A.F.P. [KU]. **Misiones:** 1 Campo Vierra, 31-XII-55; 11 Campo Vierra, XII-55; 1 Campo Vierra, II-56; 55 Loreto, II-55; 1 Loreto, IX-55; 20 Loreto, XII-55 [all, HEM]; 4 [Puerto] Bemberg, 14-30-III-1945, Hd.-Wk.-Gb.; 14 Puerto Bemberg, 24-III-45 [all, MLF]; 1 P[uer]to Bemberg, XI-1 945 [KU]; 1 Puerto Bemberg [MLF]; 1 San Ignacio, IV-56 [HEM]; 2 Santo Pipó (not Pope), Oct. 20, 1951, (J.F.) [KU]. **Salta:** 3 El Chorro ([Rio] Piquirenda), II-1948, (F.H.W.); 1 La Bomba [not La Boniba, Jujuy (or Catamarca)], III-1946, A.F.P.; 2 [Abra] Lesser, I-1946, A.F.P.; 1 Pocitos, XI-1950, (F.H.W.); 3 Pocitos, I-1952, F.H.W.; 1 Pocitos, II-1954, (F.H.W.) [all, KU]. **Santa Fe:** 7 Tartagal (Chaco Santaefecino), 27-II-46, Hd.-Wk.; 13 Villa Ana (Chaco Santaefecino), 4-II-46, Wk.-Hd.; 7 Villa Ana, 4-II-1946, Hd.-Wk.; 11 V[illa] Guillermino [not Guillermina], 21-II-46, Hd.-Wk. [all, MLF]. **Santiago del Estero:** 1 S[an] Juancito [not Jujuy], 27 Feb. 1920, (Cornell University Exped[ition]) [CU]; 1 Villa Gomez, XI-46, Huidobra [MLF]. **Tucuman:** 5 Aconquija (Parque), 24 Feb. '20, (Cornell University Exped[ition]) [CU]; 1 Cadillal, XII-46, de la Sota; 4 D[e]p[ar]tmen[t]o Trancas, V-46, Bellamo; 1 [El] Saladilla-Tapia (Ruta 9, Reserva Forestal, 10-I-48, Wk.-Gb.); 1 Gonzalo (Trancas), IV-1946, Bellamo, 1280 m; 1 Los Lechuzas [Arroyo Lechuza ?], IV-46, Bellamo; 1 Los Nogales, IV-47, Fernandez; 1 Rodeo Grande (Trancas), Bellamo, 1450 m [all, MLF]; 9 San Pedro de Colalao (Trancas), II-1948, A., (J.F.); 10 San Pedro de Colalao (Trancas), XII-1950, A., (J.F.); 2 San Pedro de Colalao (Dpto. Trancas), II-51; 2 S[an] P[edro] de Colalao, I-1953, (F.H.W.) [all, KU]; 6 Siambon (Tafi), II-45, D.O.; 1 Siambon (Tafi), IV-45, D.O.; 3 Siambon (Tafi), 4-II-46, D.O.; 5 Siambon (Tafi), V-46, D.O.; 1 Tacanas, I-47, J.M.A.; 1 Tacanas, I-49, J.M.A.; 1 Tranquitos (Dpto. Burruyacu [Burruyaco]), 26-III-50, Budin; 1 Tucuman, II-46, Gb.; 3 Tucuman, I-47, J. Cordoba; 3 Tucuman, 28-II-47, J. Cordoba; 1 Tucuman, III-50; 1 Villa Padre Monte (Burruyacu [Burruyaco]), 17-I [to] 7-II-48, R.Gh.; 1 Villa Padre Monte (Burruyacu [Burruyaco]), 25-IV-48, Gb. [all, MLF].

BOLIVIA

WORKERS

Beni: 1 Rurrenabaque, 1921-22, Wm. Mann, (Mulford Bio[logical] Expl[oration]) [USNM]; 2 Rurrenabaque, 5 Oct. 1956, (L.P.), 175 m; 11 Rurrenabaque, 17 Oct. 1956, (L.P.), 175 m [all, KU]. **Cochabamba:** 1 Chapare Region, V-30-1949, Z., 400 m [KU]. **La Paz:** 5 Chulumani (Yungas de La Paz), I-1948, P.B., 1800 m; 1 Chulumani (Sud Yungas), January 1948, Bi.; 1 Chulumani (not Sud Yungas), January 1948, Williner; 1 Colaya (Sud Yungas, d[e] La Paz), I-1-1949, Martinez; 1 Coroico (not Cororico), XII-1948, A. Martinez; 2 Coroico, February 1950 [all, KU]; 1 Coroico, 27-II-1952, F.M. [MLF]; 20 Coroico (Yungas), 3-12-XII-55, L.P., 1800 m [HEM]; 3 Coroico (Las Yungas), 8 Dec. 1955, 1700 m [KU]. **Santa Cruz:** 1 Buena Vista (Dpto. Ichilo), V-2-1950, L.E.P.; 4 Buena Vista (Dpto. Ichilo), V-6-1950, L.E.P.; 1 Buena Vista (Dpto. Ichilo), VII-1950, L.E.P. [all, KU]; 2 Buena Vista, 450 m [CNC]; 1 Santa Cruz, 6-19-53, J.A.M., (53-7800) [USNM]; 2 Santa Cruz (Hanez, d[e] l[a] Sierras Andes), XII-46, Peredo [MLF]; 1 (Santa Cruz, Or[jiental]), 25 April 1955, (Z.), 500 m; 1 (locality unknown), 400 m [both, KU]. **Locality unknown:** 1 (South Bolivia), I-49 [KU].

BRAZIL

WORKERS

Espírito Santo: 1 (locality unknown), Fruhstorfer, (Am[erican] Mus[eum of] Nat[ural] Hist[ory], Dept. Invert. Zool., No. 26171) [AMNH]. **Mato Grosso:** 2 Bello [also Belo] Horizonte, 1-6 Nov. '19, (Cornell University Expedi[tion]); 1 Bello [also Belo] Horizonte, or Nitcheroy (not Nitchtheroy), R.G.H., (Cornell Univ[ersity] Expedition, Lot #569); 13 Corumba (Urucum), 23-29 Dec. '19, (Cornell Univ[ersity] Expedition, Lot No. 569) [all, CU]; 2 Corumba, April [yr ?] [ANSP]; 1 Cáceres, 31-III-1954, M.A. [Seabra]; 1 [Cuiabá] ("Chapada"), October 1884, H.H.S., (Acc. 2966); 19 [Cuiabá] ("Chapada"), (Acc. 2966) [all, CM]; 1 Itapura, 6-(8)-9 Dec. '19, (Cornell Univ[ersity] Expedition, Lot #569); 1 Itapura, 11 June '20, R.G.H., (Cornell Univ[ersity] Expedition, Lot #569) [all, CU]; 1 Ponta Pora, V-1954, M.A. [Seabra]; 1 [Porto] (not Puerto) Esperanca, 31 Dec. 1919, (Cornell Univ[ersity] Expedition, Lot 569); 2 Tres Lagoas, 6-10 Dec. '19, (Cornell Univ[ersity] Expedi[tion]) [all, CU]. **Minas Gerais:** 2 Januaria, Dec. 17, 1907, (Carn[egie] Mus[eum], Acc. 2966) [CM]; 1 Januaria, 26-XI-1948 [Seabra]; 1 (S.) Leopoldina, 1897 [CNC]; 1 Mar de Espanha (R.), 1-III-1911, J.F.Z. [CL]; 1 [Sjerra] do Caparaó (not Carparao), Lange-Larsson, 800-2000 m [NRS]; 6 Varginha, II-1954, L.C.A. [Seabra]. **Paraná:** 2 Pôrto de Cima, III-1955, R. Lange [JSM]. **Rio de Janeiro:** 2 Floresta da Tijuca, I-1954, C.A.C.S.; 2 Floresta da Tijuca, II-1954, C.A.C.S. [all, Seabra]; 1 Gavea, 18-9-48, A. Bartholo [CL]; 1 Gavea Pequena, 7-III-1953, C.A.C.S. [Seabra]; 1 Guaratiba, 5-IV-1936, Aristoteles Silva, (Esc[ola] Nacional, Agr[ícola], 8524) [CL]; 1 Itatiaia (P.N.), VI-1954, H.G., 850 m; 6 Pedro do Rio, III-1954, C.A.C.S. [all, Seabra]; 1 Rio de Janeiro, (Acc. 2966) [CM]; 1 Rio de Janeiro, (N. Thayer Expedi[tion]); 1 Rio de Janeiro [both, MCZ]; 1 Santa Cruz, XII-1953, P.A.T.; 5 S[ão] Bento (Duque de Caxias), II-1954, P.A.T.; 2 S[ão] Bento (Duque de Caxias), 30-V-1954, P.A.T.; 6 S[ão] Bento (Duque de Caxias), 17-VI-1954, P.A.T.; 2 S[ão] Bento (Duque de Caxias), VI-1954, P.A.T.; 1 S[ão] Bento (Duque de Caxias), VII-1954, P.A.T.; 1 S[ão] Bento (Duque de Caxias), XII-1954, P.A.T. [all, Seabra]. **Rio Grande do Sul:** 1 Pelotas, 21-XII-1954, Bo.; 1 Pelotas, 27-XII-1954, Bo. [all, USNM]; 2 Pelotas, I-1-1955, C.B.; 1 Pelotas, XII-18-1955, C.B.; 2 Pelotas, I-4-1956, C.B.; 1 Pelotas, I-9-1956, C.B.; 1 Pelotas, I-13-1956, C.B.; 1 Pelotas, II-20-1956, C.B.; 1 Pelotas, May 4, 1956, C.B. [all, AMNH]; 1 Pelotas, 31-XII-57, C.B. [MCZ]. Locality indeterminate, 2 Esteio [?], XII-1952, R. Laperriere [JSM]. **Santa Catarina:** 1 Corupa (Humboldt [River, n[ea]r] Hansa), February 1940, A.M., (Frank Johnson, donor); 1 Corupa (Humboldt [River, n[ea]r] Hansa), March 1941, A.M., (Frank Johnson, donor); 3 Corupa (Humboldt [River, n[ea]r] Hansa), II-1946, A.M., (Frank Johnson, donor); 1 Corupa (Humboldt [River, n[ea]r] Hansa), III-1946, A.M., (Frank Johnson, donor) [all, AMNH]; 3 Corupa, II-1954, A.M.; 6 Corupa, III-1954, A.M.; 1 Corupa, IV-1954, A.M. [all, Seabra]; 1 Nova Teutonia, 25 April 1942, F.Pn.; 1 Nova Teutonia, 27 April 1942, F.Pn.; 1 Nova Teutonia, 2 May 1942, F.Pn.; 16 Nova Teutonia, January 1948, F.Pn.; 6 Nova Teutonia, 14 March 1948, F.Pn.; 15 Nova Teutonia, 29 March 1948, F.Pn.; 2 Nova Teutonia, 5 April 1948, F.Pn.; 1 Nova Teutonia, 8 April 1948, F.Pn.; 4 Nova Teutonia, 11 April 1948, F.Pn.; 3 Nova Teutonia, 12 April 1948, F.Pn.; 1 Nova Teutonia, 14 April 1948, F.Pn.; 1 Nova Teutonia, 17 April 1948, F.Pn.; 1 Nova Teutonia, 2 May 1948, F.Pn.; 1 Nova Teutonia, 7 June 1948, F.Pn.; [all, HEM]; 1 Nova Teutonia (27°11' B.[S.], 52°23' L.[W.]), 23 March 1949, F.Pn., 300-500 m; 1 Nova Teutonia, I-6-1950, F.Pn.; 2 Nova Teutonia, I-26-1950, F.Pn.; 1 Nova Teutonia, IV-1950, F.Pn.; 1 Nova Teutonia, III-23-1951, F.Pn.; 6 Nova Teutonia, III-28-51, F.Pn., taken on *Piper* sp.; 2 Nova Teutonia, III-29-51, F.Pn.; 2 Nova Teutonia, III-30-51, F.Pn.; 12 Nova Teutonia, IV-3-51, F.Pn. [all, KU]; 5 Nova Teutonia (27°11' [S.], 52°23' [W.]), 4-IV-1951, F.Pn. 300-500 m; 1 Nova Teutonia, 4 April '51, F.Pn.; 9 Nova Teutonia (27°11' [S.], 52°23'

[W.]), 5-VI-1951, F.Pn., 300–500 m; 11 Nova Teutonia (27°11' [S.], 52°23' [W.]), 6-IV-1951, F.Pn., 300–500 m; 4 Nova Teutonia (27°11' [S.], 52°23' [W.]), 7-IV-1951, F.Pn., 300–500 m; 2 Nova Teutonia (27°11' [S.], 52°23' [W.]), 8-IV-1951, F.Pn., 300–500 m; 1 Nova Teutonia (27°11' [S.], 52°23' [W.]), 11-IV-1951, F.Pn., 300–500 m; 13 Nova Teutonia (27°11' [S.], 52°23' [W.]), 14-IV-1951, F.Pn., 300–500 m; 8 Nova Teutonia (27°11' [S.], 52°23' [W.]), 15-IV-1951, F.Pn., 300–500 m; 6 Nova Teutonia (27°11' [S.], 52°23' [W.]), 16-IV-1951, F.Pn., 300–500 m; 7 Nova Teutonia (27°11' [S.], 52°23' [W.]), 17-IV-1951, F.Pn., 300–500 m; 5 Nova Teutonia (27°11' [S.], 52°23' [W.]), 18-IV-1951, F.Pn., 300–500 m; 3 Nova Teutonia (27°11' [S.], 52°23' [W.]), 19-IV-1951, F.Pn., 300–500 m; 2 Nova Teutonia (27°11' [S.], 52°23' [W.]), 20-IV-1951, F.Pn., 300–500 m; 2 Nova Teutonia, 20-IV-1951, F.Pn.; 2 Nova Teutonia (27°11' [S.], 52°23' [W.]), 26-IV-1951, F.Pn., 300–500 m; 1 Nova Teutonia (27°11' [S.], 52°23' [W.]), 27-IV-'51, F.Pn., 300–500 m [all, HEM]; 1 Nova Teutonia, XI-1951, L.E. Plaumann; 1 Nova Teutonia, XII-1952, F.Pn.; 1 Nova Teutonia, 19 Jan. 1954, F.Pn.; 2 Nova Teutonia, 23-II-1954, F.Pn.; 5 Nova Teutonia, 28-III-1954, F.Pn. [all, KU]; 1 Nova Teutonia, 23-I-57, F.Pn.; 1 Nova Teutonia, 28-IV-57, F.Pn. [both, HEM]; 2 Rio Vermelho, II-1946, A.M., (Frank Johnson, donor); 2 Rio Vermelho, III-1946, A.M., (Frank Johnson, donor) [all, AMNH]; 1 Rio Vermelho, January [yr ?] [HEM]. **São Paulo:** 1 Barueri, 16-II-1955, K.L., (288); 1 Barueri, 4-III-1955, K.L., (294); 3 Barueri, 12-III-1955, K.L., (373, 374, 375); 1 Barueri, 15-III-1955, K.L., (350); 1 Barueri, 22-III-1955, K.L., (357); 2 Barueri, 25-III-1955, K.L., (364, 367) [all, KL]; 4 Batatais [also Batataes], March 1943, (Stafuzza); 3 Batatais [also Batataes], August 1943, (Stafuzza) [all, KU]; 1 Jundiahy, III-1898, Schrottky [CNC]; 1 São Carlos, 1 Aug. 1956, (C.D. Michener) [KU]; 1 São Paulo, 13-XI-55, H.E.M.; 1 São Paulo, 14-XI-55, H.E.M. [both, HEM]; 1 (locality unknown), Hammer, (Cornell U[niversity]), Lot 298, sub. 46 [CU]. **Locality unknown (or indeterminate):** 2 (Zenta), '03, R.v. Skorl [CU]; 1 (no data) [MCZ]; 3 Monat[?], IV-1935, P. Sandig [USNM].

COLOMBIA

WORKER

Locality unknown: 1 (no data) [COL].

PARAGUAY

WORKERS

Acahai: 2 Nueva Stalia [Italia], 7-XII-55, F.S., on *Cucumis melo* [HEM]. **Asuncion:** 1 Asuncion (Jardín Botánico), 8-III-56, F.S., on *Cassia*; 1 Villa Aurelia, 21-X-55, H.E.M.; 1 Villa Aurelia, 22-X-55, H.E.M.; 3 Villa Aurelia, 10-III-56, F.S., on Compositae; 2 Villa Aurelia, 11-III-56, F.S., on Compositae; 2 Villa Aurelia, 12-III-56, F.S., on Compositae [all, HEM]. **Encarnacion:** 5 Buena Vista, February '21, Donald Wees [MCZ]; 2 Cantera (not Contesa), III-1954, (F.H.W.) [KU]; 3 [Colonia] Hohenau, IV-53 [HEM]. **Guayra** (also Guaira): 2 Col[onia] Independencia, III-1954, (F.H.W.) [KU]. **Tacurupucu:** 5 Tacuru-Pucu [Tacurupucu], 2-7 Apr. [yr. ?], Donald Wees [MCZ]. **Villarrica:** 25 Villarrica, 10-IV-57, F.S., on *Solanum* sp.; 15 Villarrica, 17-IV-57, F.S., on *Solanum* sp. [all, HEM]; locality unknown (or indefinite), 5 S[an]t[a] Barbara, 18-IV-57, F.S., on *Vernonia* [HEM].

PERU

WORKERS

San Martín: 2 Rio Huallaga, I-4-26, (H. Bassler Coll[ectio]n, Acc. 33591, F. 6038) [AMNH].

VENEZUELA

WORKER

Mérida: 1 Miranda, XI-94 [to] II-95, Andeer [USNM].

WRONG LOCALITY (mislabelled)

WORKERS

1 CiriQUI [Chirique], Panama [NRS]; 1 Chiriqui, [Panama], (*ex verz.* Z.L. Groningen), [♂, not ♀] [both, v.d.V.].

ARGENTINA

MALES

Buenos Aires: 1 Tandil, II-1941, A.F.P. [KU]. **Chaco:** 1 Colonia Benitez, 12-XII-48, R.Gh. [MLF]. **Cordoba:** 1 Calamchita, 1945 [MLF]. **Formosa:** 1 Clorinda, I-1947, J. Morel; 1 Clorinda, III-1947, J. Morel; 6 Laguna Larga, IV-48, F. Morel [all, MLF]; 1 Pilaga, II-1949, A.F.P. [KU]. **Jujuy:** 1 Los Peroles [Perales], XII-1950, A.F.P.; 1 Monterrico, I-1948, A.F.P.; 7 Perico, I-1950,

A.F.P.; 4 San Pedro, II-1948, A.F.P. [all, KU]; 32 Santa Barbara, 7-IV-57, J.F. [HEM]; 2 Yala, IV-1948, A.F.P.; 1 Zapla, IV-1948, A.F.P. [all, KU]. **Misiones:** 12 Campo Vierra, XII-55; 14 Loreto, II-55; 2 Loreto, XII-55 [all, HEM]; 1 [Puerto] Bemberg, 14-30-III-1945, Hd., Wk. & Gb. [MLF]; 19 San Ignacio, IV-56 [HEM]. **Salta:** 3 Cafayete, 15-II-52 [HEM]; 2 La Bamba, III-1946, A.F.P.; 1 [Abra] Lesser, I-1946, A.F.P. [all, KU]. **Santa Fe:** 1 La Gallareta (Chaco Santafecino), III-46, Hd.-Wk.; 2 Tartagal, 27-II-1946, Hd.-Wk.; 2 Villa Ana (Chaco Santafecino), 4-II-16, Wk. & Hd. [all, MLF]. **Santiago del Estero:** 1 S[an] Juancito [not Jujuy], 27 Feb. 1920, (Cornell University Expedit[ion]) [CU]; 1 (locality unknown), 1940, H.L. Parker, (Lot No. 40-255571) [USNM]. **Tucuman:** 7 D[e]p[artamento] Trancas, V-1946, Bellamo; 1 El Saladilla, IV-47, As.; 1 Los Higuera (Dpto. Trancas), 12-IV-53, Villalon; 3 Los Nogales, IV-47, As.; 1 Los Sarmientos, III-46, Fernandez; 2 Monte Bello (Dpto. Rio Chico), 18-IV-48, Wk. [all, MLF]; 1 San Pedro de Colalao (Dpto. Trancas), II-1951 [KU]; 10 Siambon (Tafi), II-45, D.O.; 1 Siambon (Tafi), V-46, D.O.; 1 Timbo Viejo, 8-II-1948, R.Gh.; 1 Tucuman (Est[ación] Exp[erimental], A.C. No. 57), IV-2-17; 1 Tucuman (Est[ación] Exp[erimental], A.C. No. 573), III-14-1918; 1 Tucuman (Est[ación] Exp[erimental], A.C. No. 572), III-21-1918; 2 Villa Padre Monte (Burruyacu [Burruyacu]), 25-IV-48, Gb. [all, MLF]; 2 (locality indefinite), 24 Feb. '20, (Cornell Univ[ersity] Expedit[ion]); 1 (locality indefinite), C.S. Reed [all, CU]; 3 (locality indefinite), 1945 [MLF]. **Locality unknown** (or indefinite): 2 XII-1950, A.F.P. [KU].

BOLIVIA

MALES

Beni: 1 (Prov. del Sara), November 1910, J.Sh., 450 m, (C[arnegie] M[useum], Acc. 4548) [CM]. **La Paz:** 1 Coroico (not Cororico), XII-1948, Martinez [KU]. **Santa Cruz:** 1 Santa Cruz de la Sierra, 13-III-1954, M.A. [Seabra-(H.E.M. *velutinus* Ill. homotype)]; 1 (Santa Cruz, Or[iental]), 25 April 1955, Z., 500 m [KU].

BRAZIL

MALES

Amazonas: 1 Icarahy [also Icarci], 8-4-23, Aguirre, Escola Superior de Agr[icola], Gab[inete] de Entom[ologia] [CL]. **Espirito Santo:** 1 (locality unknown), (*ex* Collection of Fruhstorfer), (Am[erican] Mus[eam] of Nat[ural] Hist[ory], Dept. Invert. Zool., No. 26171) [AMNH]. **Mato Grosso:** 3 "Chapada" [Cuiabá], (Acc. 2966) [CM]. **Minas Gerais** (also Geraes): 2 Januaria, 26-XI-1948 [Seabra-(both H.E.M. *velutinus* Ill. homotypes)]. **Rio de Janeiro:** 4 Floresta da Tijuca, III-1954, C.A.C.S. [Seabra-(all H.E.M. *velutinus* Ill. homotypes)]; 1 Floresta da Tijuca, III-1954, C.A.C.S. [Seabra]; 1 Rio de Janeiro, 28-3-43, Wygod [JSM]; 1 Rio de Janeiro, (N. Thayer Expedit[ion]) [WCZ]; 1 Itatiaya [also Itatiaia], 27-2-39, W. Zikan, 700 m, (Est[ação] Biologica) [CL]; 1 Itatiaya (P.N.), VIII-[1]954, H.G., 850 m [Seabra-(H.E.M. *velutinus* Ill. homotype)]; 2 Est[ado] Rio [de Janeiro to] S[ão] Paulo, 25-6-1945, J. Miranda, (47) [JSM]. **Rio Grande do Sul:** 1 Pelotas, 3-XII-1952, Bo. [USNM]; 1 Pelotas, VI-3-1953, C.B.; 1 Pelotas, IV-26-1956, C.B.; 1 Pelotas, May 18, 1958, C.B. [all, AMNH]. **Santa Catarina:** 1 Blumenau, 1897, Virgil [CNC]; 1 Corupa (Humboldt [River n[ame]] Hansa), II-1946, A.M., (Frank Johnson, donor) [AMNH]; 1 Corupa, 3-52 [Seabra-(H.E.M. *velutinus* Ill. homotype)]; 1 Nova Teutonia, 9 April 1942, F.Pn. [HEM]; 1 Nova Teutonia, IV-1942, F.Pn.; 1 Nova Teutonia, III-20-47, F.Pn. [all, KU]; 1 Nova Teutonia, 26 March 1947, F.Pn.; 1 Nova Teutonia, January 1948, F.Pn.; 1 Nova Teutonia, 5 April 1948, F.Pn.; 1 Nova Teutonia, 13 April 1948, F.Pn.; 1 Nova Teutonia, 17 April 1948, F.Pn. [all, HEM]; 4 Nova Teutonia, IV-23-48, F.Pn. [KU]; 2 Nova Teutonia, 25 April 1948, F.Pn.; 5 Nova Teutonia, 27 April 1948, F.Pn.; 1 Nova Teutonia, 29 April 1948, F.Pn.; 1 Nova Teutonia, 1 May 1948, F.Pn.; 1 Nova Teutonia, 2 May 1948, F.Pn.; 2 Nova Teutonia, 14 May 1948, F.Pn.; 1 Nova Teutonia, 7 June 1948, F.Pn.; 1 Nova Teutonia (27°11' [S.], 52°23' [W.]), 11-IV-1951, F.Pn., 300-500 m; 2 Nova Teutonia (27°11' [S.], 52°23' [W.]), 14-IV-1957, F.Pn., 300-500 m; 2 Nova Teutonia (27°11' [S.], 52°23' [W.]), 15-IV-1951, F.Pn., 300-500 m; 2 Nova Teutonia (27°11' [S.], 52°23' [W.]), 16-IV-1951, F.Pn., 300-500 m; 1 Nova Teutonia (27°11' [S.], 52°23' [W.]), 17-IV-1951, F.Pn., 300-500 m; 5 Nova Teutonia (27°11' [S.], 52°23' [W.]), 18-IV-1951, F.Pn., 300-500 m; 1 Nova Teutonia (27°11' [S.], 52°23' [W.]), 19-IV-1951, F.Pn., 300-500 m; 3 Nova Teutonia (27°11' [S.], 52°23' [W.]), 20-IV-1951, F.Pn., 300-500 m; 1 Nova Teutonia (27°11' [S.], 52°23' [W.]), 1-V-1951, F.Pn., 300-500 m; 1 Nova Teutonia, 2-V-57, F.Pn. [all, HEM]; 2 Rio Vermelho, I-1946, A.M., (Frank Johnson, donor) [AMNH]; 1 San Carlo, 10-V-57, F.P. [HEM]. **São Paulo:** 1 Barueri, 7-II-1955, K.L., (386) [KL]; 2 Itatiaya [Estado Rio de Janeiro?], V-1941, Aravio; 1 Perapora, III-1933, B.L.R.; 1 Rio Claro, X-42, Periero; 1 S[ão] Jose [dos] Campos, X-1935, L.U. [all, IBSA]. **Locality unknown:** 1 (no data), [CNC]; 1 (no data) [MCZ]; 1 (no data) [UNMH]; 1 Monat [?], IV-1935, P. Sandig [USNM].

PARAGUAY

MALES

Encarnacion: 2 Cantera (not Contesa), III-1954, (F.H.W.) [KU]; 6 D[e]p[artmen]to Contrera [Cantera?], III-54, F.S. 11 [Colonial] Hohenau, IV-53 [all, HEM]. **Guayra** (also Guaira): 8 Col[onia] Independencia, III-1954, (F.H.W.) [KU]. **Tacurupucu:** 14 Tacuru-Pucu [Tacurupucu], 2-7 April [yr?], Donald Wees [MCZ]. **Villarrica:** 2 Villa Rica [vel. Villarrica], Feb. 1941, F.S. [HEM]; locality unknown (or indefinite), 5 S[an]t[a] Barbara, 18-IV-57, F.S., on *Veronia* [HEM].

Megabombus (M.) opifex (Sm.)

Bombus opifex Sm., 1879, p. 133: *Bombus (B.) opifex*, Fkln., 1913, p. 107: *Bombus (B.)* (Dumoucheli group), Fkln., 1913, p. 95, (p.p.): *Bremus opifex*, Fris., 1925a, p. 147: *Bremus sulfuratus*, Fris., 1925a, pp. 150, 151, (*nec Bombus robustus* v. *sulfuratus* Fr., 1911a, p. 457, except p.p.), [n. syn.]: *Fervidobombus (F.) opifex*, Skor., 1922a, p. 154, (list): *Megabombus opifex*, Mlrm., 1962b, p. 730: *Megabombus* (Dumoucheli group), Mlrm., 1962b, p. 730, (p.p.): *Megabombus (M.)* (Dumoucheli group), Mlrm., 1961a, p. 57, (p.p.): . . . *opifex*, Mlrm., 1960a, p. 94, (♀ type).

DESCRIPTION. **Queen.** Length, 24.5 mm; width at wing bases, 11.0 mm; abdomen, 13.5 mm, width across T2, 11.5 mm; front wing length, 19.0 mm, width, 7.0 mm. **Head:** Frontal outline (excluding mouthparts) rather narrowly trapezoidal, rounded over the temples and arcuate across occiput, little higher medially than greatest width; vertical region moderately inclined toward the occiput, rather densely covered with small and medium punctures; ocular half of ocellular area irregularly covered with microscopic to small punctures, the ocellar half largely smooth; ocelli positioned in a weak arc, little closer together than their diameters, lateral ones touching the supraorbital line; compound eyes considerably more rounded below than above, their inner margins subparallel; malar space nearly $1\frac{1}{2}$ times longer than distance between (and including) mandibular articulations, the surface rather evenly and weakly convex with few very small punctures over lower half; labrum nearly twice as wide as thickest part, its ventral margin broadly arcuate, the irregularly arcuate shelf sharp, the tubercles for the most part rather coarsely punctate, their subconical mesal summits separated by a distinct but not sharp depression; flagellum about $1\frac{1}{2}$ times longer than scape, F1 almost twice as long as quadrate F2 and distinctly longer than rectangular F3, being subequal to combined lengths of F2 and F3; clypeus for the most part rather evenly but not strongly convex, well covered with small and medium irregular punctures more sparsely so mid-ventrally, nearly $1\frac{1}{2}$ times wider near the base than its median height. **Legs:** Mesobasitarsite subrectangular, little less than 5 times longer than widest part, its posterior margin slightly arcuate, its outer surface weakly concave longitudinally to nearly flat, the spinate distoposterior angle extended noticeably beyond the blunt distoanterior one; outer surface of hind tibia for the most part rather shiny, weakly and unevenly convex longitudinally, the broadest part little greater than length of longest hairs comprising the posterior fringe; metabasitarsite with somewhat alutaceous outer surface broadly concave longitudinally, the posterior margin weakly arcuate along basal third then nearly straight beyond, the acute distoposterior angle noticeably extended beyond the blunt distoanterior angle, with shallow emargination between. **Pubescence:** Moderately short, dense and of even length on most of body except somewhat longer and looser on the scutellum; corbicular fringe rather dense, most hairs of medium length and only weakly arcuate except distal ones; metabasitarsal posterior fringe with longer hairs only at proximal third of the segment, these of only medium length, remainder of fringe very short. **Color:** Head, rather broad interalar band with arcuate anterior margin and posteriorly encroaching onto scutellum, and legs black; remainder of thorax, abdominal T1-3 and abdominal venter (mostly) tawny yellow, abdominal T4-6 rufescent. Wings evenly infumated with light brown except streak in anterior area of the front wing marginal cell grading from dark to pale brown.

Worker. Length, 15.5 mm; width at wing bases, 7.5 mm; abdomen, 7.0 mm, width across T2, 8.0 mm; front wing length, 14.0 mm, width, 5.0 mm. Very similar to the queen in all important respects except that the given structural features are more diminutive. With regard to color pattern the interalar black "band" is most often more or less circular with somewhat less definitive outline; in the marginal cell the streak referred to above in the queen is usually entirely pallid.

Male. Length, 15.0 mm; width at wing bases, 7.0 mm; abdomen, 8.0 mm, width across T2, 7.0 mm; front wing length, 14.0 mm, width, 5.0 mm. **Head:** Frontal outline (excluding mouth-parts) roundly trapezoidal, weakly arched medially above, about as wide as medium height; vertical region nearly flat and not strongly inclined toward the occiput, well covered mostly with irregular medium punctures; ocelli situated in nearly a straight line just below or forward of the supraorbital line, slightly closer together than their diameters; ocellar half of ocellular area smooth and polished, the ocular half with some obscure small punctures; compound eyes little more broadly rounded below than above, their inner margins subparallel except weakly convergent above; malar space about $1\frac{1}{2}$ times as long as distance between (and including) mandibular articulations, weakly convex and having only some microscopic punctures; labrum little more than twice as wide as thick, its ventral margin broadly arcuate, the callosities very weak and not sharply separated from each other; flagellum near $5\frac{1}{2}$ times longer than scape, most of its segments very weakly crenulate, F1 subequal to rectangular F2, their combined lengths equal to F3. **Legs:** Mesobasitarsite narrow rectangular, at least $3\frac{1}{2}$ times longer than its widest part, its outer surface weakly concave longitudinally to nearly flat, the distal angles being equally extended with a shallow emargination between, the distoposterior one only noticeably sharper; metabasitarsite subrectangular, its outer surface for the most part broadly concave longitudinally, the posterior margin weakly but rather evenly arched from base to near distal end which has a shallow emargination between the equally extended angles, the distoposterior one being the sharper. **Pubescence:** On body similar to that of the queen and worker except somewhat shorter especially that on the abdomen; posterior fringe of hind tibia short and rather even throughout, the same fringes on both meso- and metabasitarsite very short and even. Genitalia and seventh and eighth abdominal sterna (Pl. XIV). **Color:** Similar to that of the queen and worker except the face has a noticeable amount of fine pale hairs intermixed with the black; coxae, trochanters, and (usually) all femora especially ventrally and/or laterally with some pale hairs; the interalar black band is narrower and (usually) less well defined; abdominal T5-7 are rufescent (often less vividly so); the front wing marginal cell has only a slight trace of the streak mentioned in the other castes.

Redescribed from hypotypes. **Queens**, 1 Mendoza, no date, C.S. Reed; 1 Puno, Peru, V-37, J. Soukup [AMNH and HEM]; **workers**, 1 Humahuaca, Arg., 29 Feb. '20, Cornell Univ. Expedition, Lot 569; 1 La Quiaca, Argentina, 15 Feb. 1920, Cornell Univ. Exped., R.C.[G.?] Harris [CU and HEM]; 1 Puno, Peru, XII-1947, alt. 3900 m, W. Weyrauch coll., Wm. Procter donor [AMNH]; **males**, 1 Cochabamba, Bol., April 29 - May 4, 1920, R. G. Harris; 1 Potrerillos, Mendoza, Argentina, 16-20 March '20, alt. 4000 ft, Cornell U. Exped., R.G. Harris [both, CU]; 1 Cochabamba, Bolivia, III-53, Zashka [HEM].

TYPE. Examined a ♀, Type Hym. 17B1015, in the collection of the British Museum (N.H.), London (Milliron 1960a: 94).

TYPE LOCALITY. Mendoza, Argentina. Number of specimens at hand: 430. In flight: Throughout the year, *i.e.*, queens, workers or males, or possibly combinations thereof, might be apparent at any time in the species' range at the appropriate place. Distribution: (vertical), sea level to 12,000 ft; (horizontal), Paraguay and northern Argentina and Chile, northward to Ecuador. Floral visitations: No plant records are attached to any of the specimens examined. Joergensen (1909) recorded this species as having been captured on: *Baccharis*, *Caesalpinia*, *Cirsium*, *Cucurbitella*, *Cynara*, *Delphinium*, *Dipsacus*, *Hualamia*, *Hyalis*, *Lippia*, *Luzerne*, *Lycium*, *Marrubium*, *Priva*, *Proustia*, *Salvia*, *Senecio*, and *Verbena*.

COMMENTS. Structurally, for the most part, this taxon has its closest ally in *M. (M.) pullatus* (Fkln.), but in coloration is entirely unlike that species. Despite some variation in color, this presents no problem in identification; sometimes the interalar band is variable in width to a limited degree, form and definitly, especially among workers and males. Often some of the yellow, especially that on the abdomen tends to have a very faint reddish tinge under certain lights, and the rufescens on the distal abdominal terga might be considerably diluted especially in the male.

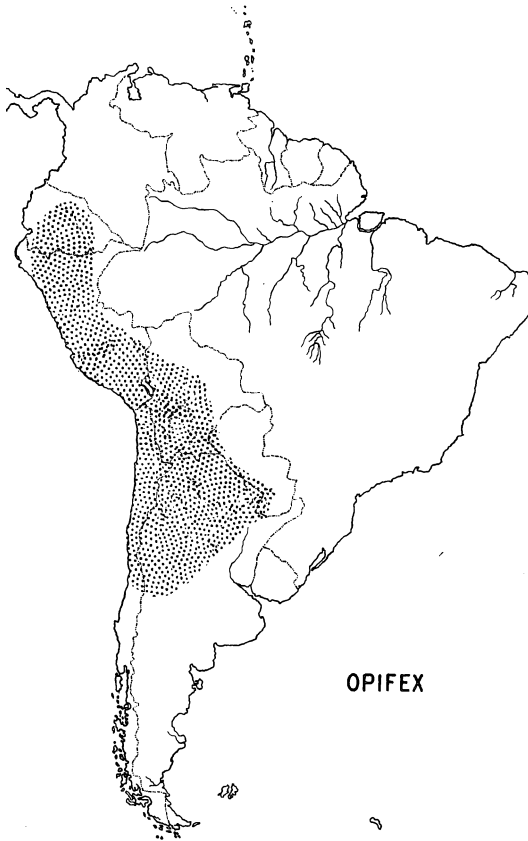
Senile specimens of this species are sometimes encountered and, in my opinion, part of the specimens described by Friese (1911a: 457) as *robustus* v. *sulfuratus* are in reality seniles that should be assigned to *opifex*; these have been examined. For a

fuller discussion of the confusion resulting from the description of *sulfuratus* see Comments under *Pyrobombus* (C.) *tucumanus* (Vach.) (Milliron: in press).^{*} My 1960 lectotype of *robustus* v. *sulfuratus* Fr. is from Salta, Argentina, 2500, 3-1905, Steinbach, which is in the Zoologische Museum, Humboldt Universität, East Berlin, and is being assigned to this latter species (*i.e.*, *tucumanus*).

ARGENTINA

QUEENS

Catamarca: 1 El Cavillo, XI-3-1951, F.Pn. [KU]; 1 Hualfin, 5-I-47, As., 1600 m; 1 Hualfin, 18-XII-1948, As.; 1 Hualfin (Los Nicimientos-Aguas Termales), 21-IX-1953, S. Pierotti [all, MLF]. **Cordoba:** 1 La Falda, Breyer [KU]. **Jujuy:** 1 Las Capillas, II-1950, (F.W.H.) [KU]; 2 Volcán [MLF]. **Mendoza:** 1 Potrerillos, 16-20 March '20, R.G.H., 4000', (Cornell U[niversity] Exped[ition]) [CU]; 14 Uspallata, I-1947, Hd.-Wk. [MLF]; 1 (locality unknown), C.S. Reed [CU]. **Salta:** 1 Angariaco, 23-II-1950, Ms.-Wk.; 2 Molinos, 29-1-1950, Ms.-Wk.; 1 San Lorenzo, 31-1-48, Ms.-Wk. [all, MLF]; 1 (locality unknown), III-1905, Sh., 2500 [m] [AMNH]. **Tucuman:** 1 Amaicha del Vallé, 1-II-46, D. Heller, 2000 m [MLF]; 1 S[an] P[edro] d[e] Colalao (not Calalao), 5-X-55, H.E.M. [HEM]; 2 San Pedro de Colalao (Trancas), II-1950, A. [KU]; 1 Siambon (Tafi), IV-45, D.O.; 1 Siambon (Tafi), XII-45, D.O.; 2 Tacanas (Dpto. Trancas), II-51, J.M.A. [all, MLF]. **Province indeterminate** (Argentina: Catamarca, Formosa, Jujuy, or Santiago del Estero): 1 Moreno, (no data), Erland Nordenskj [NRS].



MAP 24.

^{*}Milliron, H.E. A monograph of the Western Hemisphere bumblebees (Hymenoptera: Apidae; Bombinae). III. The genus *Pyrobombus* subgenus *Cullumanobombus*. *Ent. Soc. Can. Mem.* In press.

BOLIVIA

QUEENS

Cochabamba: 1 Cochabamba, 20 Feb. 1950, Z., 2000 m; 1 Cochabamba, March 1953, Z., 2000 m; 1 Cristal (Mayu, Chapare), XI-2-49, L.E.P., 200 m [all, KU]; 1 Incachaca, March 1921, J.S., 2500 m, (Carn[egie] Mus[eum], Acc. 6794) [CM]. **La Paz:** 1 La Paz, I-1948, P.B. [JSM].

PARAGUAY

QUEENS

Caragatatay: 2 Caragatatay (not Caraguaray), VIII-46, W.P. Beason [MLF]. **Guayra** (also Guaira): 1 Col[onia] [Carlos] Pfannell (Independencia [!]), 195[yr.?], (J.F.) [KU].

PERU

QUEENS

Cajamarca: 7 Chimo [Chillo?], 18-XI-55, Luis Peña, 3700 m; 24 La[s] Huerta, 24-28-XI-55, L.P., 3800 m [all, HEM]; 3 La[s] Huerta, 25 Nov. 1956, 2800 m [KU]. **Puno:** 1 Puno, V-37, J.Sp.; (Ac. 35015) [both, AMNH]. **Department indeterminate:** 2 Camacani, 19-21-XI-55, L.P., 3700 m [HEM]; 1 Camacani, 19-21 Nov. 1955, 3700 m [KU]. **Locality unknown:** 1 (no data) [MCZ].

ARGENTINA

WORKERS

Cajamarca: 7 Chimo [Chillo?], 18-XI-1955, L.P., 3700 m; 24 La[s] Huerta, 24-28-XI-1955, L.P., [all, MLF]. **Cordoba:** 1 Cordoba, 23-X-47, P.L. [MLF]; 2 Huerta Grande, II-1947, (F. Walz) [KU]; 2 La Cocha (not Los Cacos), 18-4-43 [HEM]; 1 Mercedes (S[an] Luis), I-1948, (F.H.W.) [KU]; 6 Ojo de Agua (not Agua de Oro), January 1940, F.S. [HEM]; 2 Punilla, M. Villafane [MLF]; 2 Villa Hermosa, XII-45, A.F.P. [KU]. **Jujuy:** 1 Carmen (La Sala Cerro del), 27-I-1948, Ms.-Wk. [MLF]; 2 Guerrero, 31-III-51, (F.H.W.), 1500 m [KU]; 3 Humahuaca, 29 Feb. '20, (Cornell Univer[sity] Expedition, Lot 569); 1 La Quiaca, 13 Feb. 1920, R.G.H., (Cornell Univer[sity] Exp[edition]) [all, CU]; 2 Los Perales, 4-II-1950, Ms.-Wk. [MLF]; 1 Malpaso, V-1950, A. Prosen, 4800 m [KU]; 1 Volcán [MLF]; 1 (locality unknown), XII-1950, A.F.P. [KU]. **La Rioja:** 8 Los Sauces (Dique), XII-1951, (F.H.W.) [KU]; 2 (locality unknown), (no data), (Ac. 5307) [AMNH]. **Mendoza:** 1 Pedregal, III-15-07 [AMNH]; 5 Potrerillos, 16-20 March '20, R.G.H., 4000', (Cornell U[niversity] Exped[ition]); 5 Potrerillos, 16-20 March '20, 4000', (Cornell U[niversity] Exped[ition]) [all, CU]; 4 Potrerillos, I-56 [HEM-(H.E.M. *opifex* homotypes)]; 88 Potrerillos, I-56 [HEM]; 1 Potrerillos, (no data), Reimoser [NMW]; 3 S[an]ta Rosa, III-15-07 [AMNH]; 2 Uspallata, 18-I-47, Hd.-Wk., 1850 m; 4 Uspallata, I-1947, Hd.-Wk. [all, MLF]; 1 (locality unknown), (no data), C.S. Reed [CU]. **Salta:** 1 Cafayate, V-1945, K.J.H.; 2 Cafayate, 12-II-1948, K.J.H.; 1 Cerro S[an] Bernardo, 29-I-1950, Ms.-Wk.; 1 San Carlos, 20-I-50, Ms.-Wk. [all, MLF]; 1 (locality unknown), III-1905, Sh., 2500 [m], (Am[erican] Mus[eum] Nat[ural] Hist[ory], Dept. Invert. Zool., No. 26192) [AMNH]. **Tucuman:** 1 Abra de la Quenoz, IV-1946, Bellamo, 3200 m; 5 Amaicha del Vallé, 4-II-1946, D. Heller; 1 Cainzo (Quebrada), 30-IV-[yr.?], Gb.; 1 D[e]p[artmen]to Trancas, V-46, Bellamo, 1280 m [all, MLF]; 3 San Pedro de Colalao (Trancas), II-1948, A.; 7 San Pedro de Colalao (Trancas), XII-1950, A.; 1 San Pedro de Colalao (Dpto. Trancas), II-1951 [all, KU]; 1 Siambon (Tafi), IV-45, D.O.; 2 (locality unknown), (no data except 1945) [all, MLF]. **Locality unknown:** 1 3-2-1905 [NRS].

BOLIVIA

WORKERS

Cochabamba: 4 Aquirre, 3200 m [HEM]; 1 Chapare (Region), IV-5-1949, Z., 400 m; 1 Chapare, 25 Jan. 1951, Z., 2600 m [all, KU]; 12 Cochabamba, April 29 [to] May 4, 1920, R.G.H. [CU]; 1 Cochabamba, 1942 [JSM]; 1 Cochabamba, 20 Feb. 1950, Z., 2000 m; 9 Cochabamba, III-1950, Z., 2600 m; 1 Cochabamba, 13 Jan. 1951, Z., 2600 m; 7 Cochabamba, March 1953, Z., 2000 m [all, KU]; 14 Cochabamba, 12-III-57, J.F.; 3 Cochabamba, 14-III-57, J.F.; 1 Cochabamba, 24-III-57, J.F.; 11 Cochabamba, 25-III-57, J.F., 2600 m; 3 Cochabamba, 26-III-57, J.F., 2600 m; 2 Cochabamba, 27-III-57, J.F., 2600 m [all, HEM]. **La Paz:** 3 La Paz, I-1948, P.B. [KU]; 1 La Paz, I-1948, P. Williner [JSM]; 2 La Paz, VI-1-1958, (F. Walsh [Walz?]), 12,000' [AMNH]; 5 Lake [Lago de] Titicaca, 4-26-53, J.A.M., (156); 1 Puerto Acosta (n[ea]r Lake Titicaca), April 25, '53, J.A.M., 4000' [all, USNM]. **Locality unknown:** 3 20-III-57, 3200 m [HEM].

CHILE

WORKERS

Coquimbo: 7 Las Vacas, II-9-50, L.E.P. [KU].

ECUADOR

WORKER

Esmeraldas: 1 Ambato, XI-56, J.F., 2600 m [HEM].

PARAGUAY

WORKER

Caraguatay: 1 Caraguatay, VIII-1945, W.P. Benson [MLF].

PERU

WORKERS

Arequipa: 14 Arequipa (no data) [AMNH]. **Puno:** 2 Puno (Lago d[e] Titicaca), XII-40, Wh., 3900 m, (312U) [HEM]; 1 Puno, XII-1940, Wh.; 1 Puno, XII-1940 [both, JSM]; 25 Puno, XII-1947, W.W., 3900 m, (Wm. Procter, donor) [AMNH].

ARGENTINA

MALES

Catamarca: 1 Los Angeles, II-1946, Shaefer [MLF]. **Cordoba:** 1 Huerta Grande, 19-4-48; 1 La Cocha (not Los Cacos), 18-4-43; 1 Ojo de Agua (not Agua de Oro), January 1940, F.S. [all, HEM]. **Jujuy:** 1 La Esperanza, III-55; 1 (locality unknown), May 9, 1927, M. Kisiuk, (No. 617), in orchards [both, HEM]. **Mendoza:** 2 Cachueta (not Cacheuta), I-53, M. Aczel [MLF]; 4 Potrerillos, 16-20 March '20, R.G.H., 4000', (Cornell Univ[ersity] Exped[ition]) 6 Potrerillos, 16-20 March '20, 4000', (Cornell Univ[ersity] Exped[ition]) [all CU]; 1 Potrerillos, I-56 [HEM]; 1 (locality unknown), (no data), [AMNH]. **Salta:** 1 Cafayete, IV-1945, K.J.H. [MLF].

BOLIVIA

MALES

Cochabamba: 23 Cochabamba, April 29 [to] May 4, 1920, R.G.H. [CU]; 27 Cochabamba, III-1950, Z., 2600 m; 2 Cochabamba, March 1950, Z., 2000 m; 1 Cochabamba, March 1952, Z., 2000 m; 16 Cochabamba, March 1953, Z., 2000 m [all, KU]; 3 Cochabamba, March III-53, Z., 2000 [Seabra]; 8 Cochabamba, 12-III-57, J.F.; 1 Cochabamba, 14-III-57, J.F.; 2 Cochabamba, 24-III-57, J.F.; 5 Cochabamba, 25-III-57, J.F., 2600 m; 2 Cochabamba, 27-III-57, J.F., 2600 m [all, HEM]. **Locality unknown:** 1 20-III-57, 3200 m [HEM]. **La Paz:** 2 Lake [Lago de] Titicaca, 4-26-53, J.A.M., (156); 1 (locality unknown), (no data) [USNM].

ECUADOR

MALES

Esmeraldas: 1 Ambato, XI-XII-56, J.F., 2600 m; 2 Ambato, XII-56, J.F., 2600 m [all, HEM].

PERU

MALES

Arequipa: 1 Arequipa, (no data) [AMNH]. **Puno:** 1 Puno, V-37, J.S. [AMNH].

Megabombus (M.) pennsylvanicus (De G.)

KEY TO SUBSPECIES

Females

- Thorax with light pubescence usually canary or lemon yellow, scutellum sometimes this color though often more or less black; light pubescence on abdomen usually canary or lemon yellow; punctuation on clypeus, remainder of head moderately coarse *p. pennsylvanicus* (De G.) (p. 190)
- Thorax with light pubescence deep or golden yellow, scutellum usually this color, rarely with noticeable black; punctuation on clypeus, remainder of head deep, coarse *p. sonorus* (Say) (p. 196)

Males

- Thorax with light pubescence pale to olivaceous yellow, only lowermost portion of pleura dark; abdomen pale to olivaceous yellow, though T5 (distally) – 7 often with black or ferruginous predominating *p. pennsylvanicus* (De G.) (p. 190)
- Thorax with light pubescence golden-yellow, pleura below tegulae usually entirely black; abdomen golden-yellow except T5–7 black, rarely with yellowish hairs *p. sonorus* (Say) (p. 196)

***Megabombus (M.) pennsylvanicus pennsylvanicus* (De G.) new status**

Apis pensylvanica De G., 1773, p. 575, (re: nominate ssp. only): *Apathus elatus*, auctt., (nec *Apis alata* F., 1798, p. 274; nec *Bombus elatus* F., 1805, p. 352): *Apathus elatus* v. *nidulans*, Cr., 1879a, p. 230, (nec *A. alata* F., 1798, p. 274; nec *B. elatus* F., 1805, p. 352; nec *Apis nidulans* F., 1793, p. 330): *Bombus americana* How., 1901, pl. 1, figs. 30, 31: *Bombus americanorum* F., 1805, p. 346: *Bombus americanorum* v. *pallidus*, Mhn., 1902, p. 35, (nec *smithianus* v. *pallidus* Evs., 1901, p. 47): “?” *Bombus* “*americanorum*” v. *umbratus*, Friese, Brs., 1951, 1249, *In Muesebeck et al.*, (lapsus): *Bombus fervidus*, auctt., (nec *Apis fervida* F., 1798, p. 274): *Bombus nevadensis*, Handl., 1888a, p. 245, (p.p.), (nec *nevadensis* Cr., 1874, p. 102), [n. syn.]: *Bombus nidulans* F., 1805, p. 349, (nec *Apis nidulans* F., 1793, p. 330): *Bombus pallidus* Cr., 1863a, p. 92, (nec *smithianus* v. *pallidus* Evs., 1901, p. 47): *Bombus pennsylvanicus*, Cr., 1863a, p. 94, (p.p.), (emend.): *Bombus pennsylvanicus*, Handl., 1888a, p. 238, (p.p.): *Bombus pennsylvanicus* v. *umbratus* Fr., 1931a, p. 301, [n. syn.]: *Bombus titusi* Ashm., 1902a, p. 50: *Bombus* (*B.*) *pennsylvanicus*, Fkln., 1912, p. 399: *Bombus* (*Fervidobombus*) *americanorum*, Brs., 1951, p. 1249, *In Muesebeck et al.*: *Bombus* (*B.*) (*Dumoucheli* group), Fkln., 1912, p. 387, (p.p.): *Bremus americanorum*, Jur., 1807, p. 260: *Bremus pennsylvanicus*, Fris., 1919a, p. 161 (*et seq.*): *Bremus* (*Fervidobombus*) *americanorum*, Fris., 1927e, p. 68: *Megabombus* (*M.*) *pennsylvanicus*, Mitch., 1962, p. 514: *Megabombus* (*M.*) (*Dumoucheli* group), Mltn., 1961a, p. 57, (p.p.): *Psithyrus elatus*, auctt., (nec *Apis alata* F., 1798, p. 274; nec *Bombus elatus* F., 1805, p. 352): *Psithyrus cevalliae* Ckll., 1899b, p. 157: . . . *americanorum*, Mltn., 1960a, p. 88, (♀ type): . . . *nidulans*, Mltn., 1960a, p. 94, (♂ type): . . . *pennsylvanica*, Mltn., 1960a, p. 95, (*pro pensylvanica*, error), (♀ H.E.M. lectotype).

DESCRIPTION. Queen. Length, 24.0 mm; width at wing bases, 10.0 mm; abdomen, 11.0 mm, width across T2, 11.5 mm; front wing length, 21.0 mm, width, 7.5 mm. **Head:** Frontal outline (excluding mouthparts) ovate trapezoidal, about as high as its greatest width, the upper angles rounded; vertical region nearly flat, moderately inclined, rather evenly covered with medium irregular punctures; ocellar third of ocellocular area smooth, the remainder of area with rather weak punctation; compound eyes only a little wider below than above, their inner margins nearly parallel; ocelli comparatively small, positioned closer together than their diameters and in a weak arc distinctly below supraorbital line; malar space very little (if any) longer than distance between (and including) mandibular articulations, weakly and somewhat irregularly convex, with some small irregular punctures over lower half; labrum about twice as wide as its greatest thickness, arcuate labral shelf moderately prominent, the coarsely punctate tubercles well separated but not strongly conical; scape near 3/5 as long as flagellum, F1 considerably longer than either rectangular F2 or F3 (2 subequal to 3) and nearly as long as F2–3 combined; clypeus distinctly broader at widest basal portion than median height, rather unevenly but not strongly convex, well covered with small to medium punctures which are somewhat sparser medially below. **Legs:** Mesobasitarsite very similar to that of *f. fervidus* (cf.); outer surface of hind tibia mostly weakly and unevenly convex mid-longitudinally, somewhat alutaceous, the widest part equal to or slightly

exceeding length of longest hairs of corbicular (posterior) fringe; metabasitarsite subrectangular with its outer surface broadly concave mid-longitudinally, the posterior margin arcuate only at base then beyond nearly straight, the widest part near twice that of the length of longest hairs of posterior fringe at basal third, the blunt distoanterior angle somewhat in recess of the acutely rounded distoposterior one. *Pubescence*: Medium in length, dense and rather even throughout; corbicular fringe for the most part rather dense and of even length, most hairs nearly straight to weakly arcuate except distal ones more strongly so; metabasitarsal posterior fringe of medium length at basal third of margin, gradually becoming short distally. *Color*: Thoracic dorsum anterior to tegulae, a small more pallid lobe (yellowish intermixed with some black hairs) extending onto thoracic pleuron anterior to tegula, the approximate posterior half of abdominal T1, all of T2-3 yellow, head and remainder of body and legs black except some intermixed yellowish hairs discernible on scutellum. Wings uniformly deeply infuscated throughout, with slight violaceous reflection under certain light.

Worker. Length, 14.5 mm; width at wing bases, 5.5 mm; abdomen, 7.5 mm, width across T2, 6.5 mm; front wing length, 14.0 mm, width, 5.0 mm. Structural features relatively similar to those of the queen. Color pattern like that of the queen except the yellow (usually) slightly paler.

Male. Length, 17.0 mm; width at wing bases, 7.0 mm; abdomen, 9.0 mm, width across T2, 8.0 mm; front wing length, 16.5, width, 5.5 mm. *Head*: Frontal outline (excluding mouth-parts) roundly trapezoidal, about as high medially as widest dimension, the vertical region weakly convex to nearly flat, well covered with irregular medium punctures; ocellocular area largely impunctate except duller approximate ocular half with few small irregular punctures; ocelli situated in very weak arc only slightly below supraorbital line, removed from one another by less than their diameters; compound eyes somewhat more broadly rounded below than above, their inner margins for the most part subparallel; malar space near $1\frac{1}{4}$ times longer than distance between (and including) mandibular articulations, weakly convex and well covered with mostly minute punctures; labrum subrectangular, nearly twice as broad as greatest thickness, its ventral margin for the most part nearly straight except arcuate at lower corners, mostly pubescent, the callosities very weak and with few punctures; flagellum with weakly crenulate segments beyond F3, four times longer than scape, F1 distinctly longer than subquadrate F2 (noticeably longer than thick) and little more than $\frac{1}{2}$ of F3, F1-2 combined as long as or only a little longer than F3. *Legs*: Mesobasitarsite subrectangular, about 4 times longer than greatest width, broadly and weakly concave mid-longitudinally, the blunt distoanterior angle considerably in recess of the more acute distoposterior one with shallow emargination between; metabasitarsite narrowest basally, the slightly alutaceous (but shining) outer surface broadly concave mid-longitudinally, the posterior margin arcuate at basal third then nearly straight to distal end, the blunt distoanterior angle only slightly in recess of acute distoposterior angle, with shallow emargination between. *Pubescence*: On head, thorax and abdomen similar to that of the queen but less dense or compact; mesobasitarsal posterior fringe short and rather even in length throughout as is the same posterior fringe on the metabasitarsite. Genitalia, seventh and eighth abdominal sterna (Pl. XIII). *Color*: Head black except for noticeable amount of fine pallid hairs intermixed on face, especially on clypeus; thoracic dorsum yellow (paler than that of the queen and extending farther down on pleura in front of and under wing bases, as on many workers) with rather narrow distinct black interalar band, the remainder of thorax also black; legs black except coxae, trochanters and femora are mostly covered with pallid yellowish pile; abdominal T1-5 yellow (paler than that on queen abdomen), T6 predominantly black intermixed (especially basally and medially) with some yellowish hairs, T7 black, the abdominal venter for the most part black or blackish. Wings evenly infuscated but paler than those of the queen.

Redescribed from hypotypes. **Queen**, Altamont, Fla., Collection Frederick Allen Eddy [MCZ]; **worker**, Manchester, Vt., 14-VIII-57, [Dale F. Bray]; **male**, Newark, Del., 2-X-1956, H.E. Milliron [both, HEM].

TYPE. Examined a ♀ in the De Geer Collection, Naturhistoriske Riksmuseet, Stockholm (Milliron 1960a: 95).

TYPE LOCALITY. Pennsylvania, U.S.A. Number of specimens at hand: 613. In flight: Mid-February to late November, especially in southern latitudes, the males first appearing in early May at places in the southern part of the range. *Distribution*: (vertical), from sea level to ca. 9000 ft; (horizontal), southern Quebec and Ontario in Canada, all the eastern United States, northwest to South Dakota and Wyoming, south to Texas, thence southward to southernmost Mexico (and likely into Central America). *Floral visitations*: *Abelmoschus*, *Acer*, *Apocynum*, *Areolaria*, *Cal-*

liandra, *Cevallia*, *Cucurbita*, *Delphinium*, *Helianthus*, *Lippia*, *Lobelia*, *Opuntia*, *Pentstemon*, and *Vicia*. Cockerell and Porter (1899a) listed *Cleome*. Cockerell (1915c) recorded *Phaseolus*, and Lutz and Cockerell (1920) compiled the following records: *Berberna*, *Carduus*, *Cnicum*, *Erythronium*, *Salomonina* and *Trillium*. Many of the following listings for this taxon by Robertson (1929) appeared in his earlier publications: *Abutilon*, *Actinomeria*, *Aesculus*, *Agastache*, *Amelanchier*, *Amorpha*, *Antennaria*, *Arctium*, *Asclepias*, *Aster*, *Astragalus*, *Baptisia*, *Bidens*, *Blephilia*, *Boltonia*, *Brauneria*, *Campanula*, *Cassia*, *Cephalanthus*, *Cerastium*, *Cercis*, *Circaea*, *Claytonia*, *Clematis*, *Collinsia*, *Convolvulus*, *Coreopsis*, *Cornus*, *Crataegus*, *Crotalaria*, *Cuphea*, *Desmodium*, *Dentaria*, *Dianthera*, *Dicentra*, *Diospyros*, *Dipsacus*, *Dodecatheon*, *Eryngium*, *Frasera*, *Gaura*, *Gentiana*, *Geranium*, *Gerardia*, *Gymnocladus*, *Helenium*, *Heliopsis*, *Heuchera*, *Hibiscus*, *Hydrangea*, *Hydrophyllum*, *Impatiens*, *Ipomoea*, *Iris*, *Isopyrum*, *Krigia*, *Lantana*, *Leonurus*, *Lespedeza*, *Linaria*, *Lithospermum*, *Lonicera*, *Ludwigia*, *Lycopus*, *Marrobium*, *Martinia*, *Melilotus*, *Mertensia*, *Mimulus*, *Monarda*, *Nelumbo*, *Nepeta*, *Oenothera*, *Orobancha*, *Oxalis*, *Pastinaca*, *Petalostemum*, *Philadelphus*, *Phlox*, *Physostegia*, *Plantago*, *Podophyllum*, *Polemonium*, *Polygonatum*, *Polytaenia*, *Potentilla*, *Prenathes*, *Prunella*, *Prunus*, *Psoralea*, *Pycnanthemum*, *Pyrus* [*Malus*?], *Ranunculus*, *Rhamnus*, *Ribes*, *Robinia*, *Rudbeckia*, *Ruelia*, *Sagittaria*, *Salix*, *Scutellaria*, *Seymeria*, *Sida*, *Silene*, *Silphium*, *Sium*, *Solanum*, *Specularia*, *Stachys*, *Staphylea*, *Strophostyles*, *Stylosanthes*, *Synphoricarpos*, *Tecoma*, *Teucrium*, *Tilia*, *Tradescantia*, *Triosteum*, *Trifolium*, *Uvularia*, *Verbascum*, *Verbesina*, *Verbena*, *Veronica*, *Viburnum*, *Viola*, *Vitis* and *Zizia*. Mitchell (1962) added: *Cirsium*, *Daucus*, *Eupatorium*, *Galactia*, *Hydrolea*, *Hypericum*, *Kuhnistera*, *Liatris*, *Malus*, *Medicago*, *Pontederia*, *Rhus*, *Richardia*, *Rubus*, *Spiraea*, and *Vernonia*. Graenicher (1930) added: *Antigonon*, *Chamaecrista* [*Cassia*?], *Cirsium*, *Citrus*, *Lantana*, *Morinda*, *Opuntia*, and *Vernonia*.

COMMENTS. Aside from differences of size within the castes there seems to be little morphological variation in this taxon except with respect to regularity and coarseness of the punctation on the female head, especially on the clypeus and over much of the vertical region. Some specimens taken in certain parts of Mexico have noticeably coarser punctures that approximate those commonly encountered in *p. sonorus*. The color pattern is somewhat variable applying to the degree the yellow extends downward on the thoracic pleura, the amount of this color occurring on the scutellum and to some extent on the anterior face of addominal T1. Sometimes the normally predominant black on the scutellum is entirely replaced by yellow as is commonly encountered at some places in Mexico and infrequently elsewhere in the species range. The shade of yellow also varies from a deep golden or brownish yellow to that of straw yellow.

The smallest worker seen is less than one-half that given here for that caste and the size varies to considerably longer; in this regard, it is often virtually impossible to recognize some specimens as either large workers or small queens.

CANADA

QUEENS

Ontario: 4 Ottawa, Oct. 3, 1961, H.E.M. [HEM].

MEXICO

QUEENS

Chihuahua: 1 Ciudad Juarez (239 km S. [of]), VII-1-47, Mr., (D. Rockefeller Exp[edition]); 1 [Las] Delicias, VII-13-47, Mr., (D. Rockefeller Exp[edition]); 8 Madera, VII-6-47, Mr., 7200' (D. Rockefeller Exp[edition]); 1 Matachic (2 mi W. [of]), VII-7-47, Mr., 6400' (D. Rockefeller Exp[edition]); 2 San José [de] Babicora (Summit NE. of), July 4, 1947, Gh., 7700' (D. Rockefeller Exp[edition]); 2 San José [de] Babicora, July 5, 1947, Schramel, (D. Rockefeller Exp[edition])

[all, AMNH]. **Durango:** 2 Durango, Aug. 14, 1947, Mr., 6200', (D. Rockefeller Exp[edition]) [AMNH]. **Mexico:** 1 Toluca (20 mi E. [of]), VII-31-54, 8900', (Univ[ersity of] Kans[as] Exped[ition]) [KU]. **Nayarit:** 1 Ahuactlan, VII-18-22-51, H.E.E. [KU]. **Oaxaca:** 1 Mitla, 25-VIII-62, H.E.M., 5500'; 1 Mitla, 26-VIII-62, H.E.M., 5500' [both, CNC]. **Puebla:** 2 Puebla (6 mi SW. [of]), VII-2-53, 6600', on *Lobelia fenestralis*, (Univ[ersity of] Kans[as] Mex[ican] Exped[ition]) [KU]. **San Luis Potosi:** 1 Ciudad del Maiz (5 mi E. [of]), VIII-22-23-54, 4700' (Univ[ersity of] Kans[as] Mex[ican] Exped[ition]) [KU].



PENNSYLVANICUS

MAP 25.

UNITED STATES

QUEENS

Arkansas: 4 Goodwin, S[ain]t Francis Co[unty], V-12-1938, F.W.P., at *Pentstemon tubaeiflorus* and *digitalis* [ANSP]. **Delaware:** 1 Clayton, 17-IX-52, H.E.M. [HEM]. **District of Columbia:** 1 Washington, (no data), Sjöstedt [NRS]. **Florida:** 5 Altamont, (no data), (Frederick Allen Eddy Coll[ectio]n) [MCZ]; 1 Crystal River, Citrus Co[unty], 5-IV-1955, Mary Wible [CM]; 1 Dade Co[unty] (Subtrop[ical] Exp[erimen]t Sta[tion]), Apr. 7, 1959, T.B.M. [HEM]; 1 Homestead, April 9, 1955, T.B.M. [TBM]; 1 Miami, 2-26-[yr. ?], P. Laurent [ANSP]; 1 Punta Gorda, Charlotte Co[unty], IV-2-53, H.E.E. [HEM]. **Indiana:** 1 Turkey Run Park [locality indefinite], 10-V-58, F.Po. [INIA]. **Kentucky:** 1 Morehead, July 3, 1962, F.&L. [CNC]. **Louisiana:** 2 Slidell, March 29, 1939, R.W.D. [HEM]. **Massachusetts:** 1 Amherst, VI-4-1919 [MASS]; 1 Lincoln, 27-VI-37, C.H. Blake, (F 296) [MCZ]; 1 Westfield, 2-VII-46; 2 Westfield, 4-VII-46; 1 (no data), (C.H. Fernald, [second] Coll[ectio]n); 2 (locality unknown & no data) [all, MASS]. **Minnesota:** 2 S[ain]t Paul, June 8, 1939, R.W.D. [HEM-(one like Moure's "lectotype" [sic] *antiguensis* in the Kiel Collection)]. **New Jersey:** 1 [Manantico Creek] (not Menantico), 14 May, 1923, J.C.B.; 1 (locality unknown) (no data) [all, NRS]. **New York:** 1 Ithaca, IX-22-1936, S. Settini [ANSP]. **North Carolina:** 1 Raleigh, April 28, 1933 [TBM]. **Ohio:** 1 Columbus, May 31, 1947, H.E.M.; 1 Columbus, July 27, 1947, H.E.M.; 1 Kelley's Isl[and], June 23, 1947, H.E.M., on vetch [all, HEM]. **Pennsylvania:** 1 Rector (Powdermill Nature Res[erve], 4 mi S. [of]), W[est]m[ore]land Co[unty],

3-VII-1960; 1 Rector (Powdermill Nature Res[erve], 4 mi S. [of]), W[est]m[ore]land Co[unty], 6-VIII-1960; 1 Pittsburgh, May 20, 1939, H.K., (C[arnegie] M[useum], Acc. 12676) [all, CM]; 1 Pittsburgh, 30-V-1960, Timothy Slusser [HEM]. **South Dakota:** 1 Philip, June 25, 1923, H.C.S.; 1 Rapid City, June 28, 1923, H.C.S.; 1 Yankton, June 18, 1930, G.I. Gilbertson [all, SD]. **Texas:** 1 Bastrop, V-11-54, L.D. Beamer, on *Opuntia* [KU]; 1 Fedor, IV-1898, Birkman [NRS]; 1 Smithville, V-12-54, R.H. & L.D. Beamer [KU]; 1 Electra, Wichita Co[unty], VI-27-48, C.&P.V.; 2 Electra (9 mi N. [of]), Wichita Co[unty], VI-27-48, C.&P.V. [all, AMNH]; 1 (locality unknown), Belgrade [NRS]. **Vermont:** 1 Cornwall, 14-VI-36, Richard Dow [MCZ]; 1 Manchester, 14-VIII-57, (colony in sugar maple) [HEM]. **Wisconsin:** 1 (locality unknown), (no data), Kumlien [NRS]. **Locality unknown:** 1 Carolinmer [Carolinas?], (no data), Belfrage; 1 (no data), (Mus[eum] Payk[ull]) [all, NRS].

CANADA

WORKERS

Ontario: 2 Ottawa, Oct. 3, 1961, H.E.M. [HEM].

MEXICO

WORKERS

Chiapas: 24 Comitán (5 mi S. [of]), 6-VIII-62, H.E.M., 6000'; 2 Comitán (8 mi S. [of]), 6-VIII-62, H.E.M., 6500' [all, CNC]. **Chihuahua:** 1 Chihuahua (20 mi NW. [of]), VII-27-52, 4900 ft (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion) [KU]. **Durango:** 1 Palos Colorados (not Colorados), VIII-5-47, Cazier, 8000', (D. Rockefeller Exp[edition]) [AMNH]. **Mexico:** 1 Altacomulco, 18-VIII-1954, J.G.C., 8500' [CNC]; 8 Ixtapan de la Sall, VIII-9-1954, 5500 ft, (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion); 1 Toluca (20 mi E. [of]), VII-31-54, 8900 ft, (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion); 1 Toluca (22 mi N. [of]), VIII-17-54, 8500 ft, (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion) [all, KU]. **Michoacan:** 1 C[hu]d[ad] H[u]d[al]go (4 mi W. [of]), VI-16-53, 6400 ft, (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion) [KU]. **Nuevo Leon:** 1 China (15 mi SW. [of]), VII-19-54, (Univ[ersity of] Kans[as] Mex[ican] Expedition); 2 General Terán [Trevino?], VII-19-54, (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion) [all, KU]. **Oaxaca:** 7 Huitzo (2 mi SE. [of]), VII-5-53, 5300 ft, (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion) [KU]; 12 La Rosa, (R[ou]t[e] 190, 469 km S. [of] Mex[ico] City), 20-VII-62, H.E.M., 5-6000'; 4 Mitla, 25-VII-62, H.E.M., 5500'; 6 Mitla, 26-VII-62, H.E.M., 5500'; 5 Mitla, 27-VII-62, H.E.M., 5500'; 3 Mitla, 28-VII-62, H.E.M., 5-5500'; 36 Mitla, 28-VII-62, H.E.M., 6000'; 50 Mitla, 29 [not 22]-VII-62, H.E.M., 6000'; 8 Mitla, 29-VII-62, H.E.M., 6500-7000'; 61 Mitla, 13-VIII-62, H.E.M., 6000' [all, CNC]; 16 Monte Alban, June 30, 1955, P.&C.V., 6391' [AMNH]; 2 Monte Alban, VII-15-1956, (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion); 1 Nochixtlan (23 mi SE. [of]), VII-5-53, 7000 ft, (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion); 2 Oaxaca (5 mi W. [of]), VII-11-53, 5400 ft, (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion) [all, KU]; 5 Oaxaca, 4-22-59, H.E.E., 5100' [CU]; 1 R[ou]t[e] 190 (5 mi inside n[or]thern boundry of] Oaxaca), 23-VIII-62, H.E.M. [CNC]; 2 (locality unknown), 13-14 July 1928, G.L., 1800 m [CU]; 1 (locality unknown), May 13, 1938, R. Greenfield [USNM]. **Puebla:** 2 Puebla (6 mi SW. [of]), VII-2-53, 6600 ft, on *Lobelia fenestralis*, (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion) [KU]. **San Luis Potosi:** 1 Ciudad del Maiz (5 mi E. [of]), VIII-22-1954, 4700 ft, (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion) [KU]. **Tamaulipas:** 1 El Limón, 6-17-53, (P.B.L.), on *Lippia*, (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion); 4 Llera, VII-19-54, (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion); 1 Padilla, VI-15-53, on *Cevallia sinuata*, (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion) [all, KU]. **Veracruz:** 3 Ciudad Mendoza, 15-VIII-62, H.E.M., 6000'; 6 C[hu]dad Mendoza (4 mi SW. [of]), 16-VIII-62, H.E.M., 6-8000' [all, CNC]; 2 Hueypan, II-26-54, R.R.D. [RRD]; 1 Jalapa [AMNH]; 1 Orizaba, 8-12-22-61, R.&K.D.; 1 Rio Blanca, 7-26-56, R.&K.D. [all, RRD].

UNITED STATES

WORKERS

Arkansas: 1 Milmot (6 mi E. [of]), Ashley Co[unty], June 7, 1956, H.E. Evans & E.G. Matthews [HEM-(H.E.M., compared with *americanorum* F., determined Fabricius, Banks Collection, Brit. Mus. (N.H.), 1960)]. **Colorado:** 1 J. Martin Dam, 8-22-60, R.K.D. [HEM]. **Connecticut:** 2 Meriden, July 15, 1950, S.I. Parfin [USNM]. **Delaware:** 1 Newark, 9-VII-1957, H.E.M., (ex nest) [HEM]. **Florida:** 1 Bonita Springs, VI-20-29; 1 Everglade, Collier Co[unty], VI-20-28 [both, MCZ]; 1 F[or]t Lauderdale, June 16, '36, M.C. Slagle [HEM]; 1 Gainesville, 8-4-18, P.W.F. [HEM-(H.E.M., compared with *americanorum* F., determined Fabricius, Banks Collection, Brit. Mus. (N.H.), 1960)]; 1 Gainesville, 9-16-18, P.W.F.; 1 Gainesville, 8-29-18, P.W.F. [both, HEM]; 7 Pinecrest, Collier Co[unty], IV-19-29 [MCZ]. **Illinois:** 2 Urbana, VIII-18-58, F.Po. [INIA].

Indiana: 1 Brown Co[unty], July 15, 1932, C.H. Zavitz [CNC]. **Iowa:** 1 Ames, July 27, 1949, K. Swepson [SD]. **Kansas:** 3 Geary Co[unty], 8-30-60, R.K.D.; 1 Wabaunsee (not Waubanaee) Co[unty], 8-31-60, R.&K.D. [all, RRD]. **Kentucky:** 1 Morehead, 3-VII-62, F.&L.; 1 Morehead, July 5, 1962, F.&L.; 1 Morehead, 6-VII-62, F.&L.; 4 Morehead, 23 Aug. 1962, F.; 2 Morehead, 24 Aug. 1962, F.; 4 Morehead, 30 Aug. 1962, F.; 4 Morehead, 31 Aug. 1962, F.; 5 Morehead, 2 Sept. 1962, F.; 3 Morehead, 3 Sept. 1962, F.; 1 Morehead, 4 Sept. 1962, F.; 3 Morehead, 9 Sept. 1962, F. [all, CNC]. **Maine:** 1 Saco, June 13, 1951, T.B.M. [TBM]. **Maryland:** 1 Bethesda, Montgomery Co[unty], 16-VIII-1952, L.B. Holthuis, (Museum Leiden) [v.d.V.]. **Mississippi:** 2 Hinds Co[unty] [betw[een] Bolton & Clinton], IX-1-1939, R.&R., 250 ft [ANSP]. **Nebraska:** 8 Ogallala (9 mi N. [of]), VIII-28-62, Phyllis Spangler, *Helianthus* [USNM]; 2 Thedford, 8-31-60, R.&K.D. [RRD]. **New Jersey:** 2 Stone Harbor, 5-VIII-51 [ANSP]; 1 (locality unknown), (no data), Belfrage [NRS]. **New Mexico:** 1 Albuquerque (not Alberquerque), VIII-[yr. ?], M. Bates [MCZ]; 3 Cubero, Valencia Co[unty], VIII-18-48, C. & P.V. [AMNH]. **New York:** 1 Ithaca, Sept. 1, 1925, Babi [NRS]; 1 Pine Island, IX-8-10 [AMNH]. **North Carolina:** 1 Perquimans Co[unty], VI-3-1954, T.B.M., on squash [HEM]; 1 Southern Pines, 11-IX-59, F.W. Mead, *Aureolaria* [*Aureolaria*] *pectinata*; 1 Wilkesboro, Sept. 20, 1945, T.B.M.; 1 Wilmington, Aug. 19, 1948, T.B.M. [all, TBM]. **Ohio:** 2 Columbus, Aug. 13, 1947, H.E.M.; 1 Columbus, August 1947, Johnson [all, HEM]. **Pennsylvania:** 1 Benton, Columbia Co[unty], 20-VIII-1920, H.K.; 1 Benton, Columbia Co[unty], 10-VIII-1930, H.K. [both, CM]; 1 E[ast] Charleston, Tioga Co[unty], VII-19-1937, E.T. Cresson Jr. [ANSP]; 4 Pittsburgh, All[egheny] Co[unty], IX-1921, H.K. [CM]. **South Dakota:** 1 Big Stone, Sept. 8, 1946, H.C.S.; 4 Brookings, Sept. 6, '61, H.C.S.; 3 Brookings, Sept. 9, '61, H.C.S.; 4 Brookings, Sept. 15, '61, H.C.S.; 3 Capa, Aug. 12, '22, H.C.S.; 3 Cottonwood, July 26, 1948, H.C.S.; 1 Cottonwood, Aug. 3, 1953, H.C.S.; 7 Elk Point, Aug. 29, 1954, H.C.S.; 1 L[ake] Preston, Aug. 22, 1923, H.C.S.; 1 McNeely, Aug. 20, 1927, H.C.S.; 1 Mitchell, 9-15-61, H.C.S.; 1 Slim Buttes, Aug. 4, 1953, H.C.S.; 6 Springfield, Sept. 1, 1954, H.C.S.; 2 Vermillion, Oct. 1, 1946, H.C.S.; 1 Whitewood, June 26, 1923, H.C.S.; 1 (locality unknown) (no data) [all, SD]. **Texas:** 1 Anahuac, Nov. 1, 1918, H.S. Barber, on okra [USNM]; 2 Dallas (6 mi N. [of]), VII-16-1954, (Univ[ersity of] Kans[as] Mex[ican] Exped[ition]) [KU]; 1 Fedor, 15-6-1898, Birkmann; 6 (locality unknown), Belfrage [all, NRS]. **Utah:** 1 Ouray, VII-12-62, R.&K.D. [RRD]. **Vermont:** 12 Manchester, 14-VIII-57, (colony in sugar maple) [HEM]. **Virginia:** 13 Lanexa (1 mi SE. [of]), New Kent Co[unty], 17-VII-1960, N.D. Richmond [CM]; 1 Tangier [Island], Sept. 18, '39, A.H. Clark [USNM]. **West Virginia:** 1 Bartow, 6-VIII-60, H.E.M. [HEM]. **Locality unknown:** 1 Carolinmer [Carolinas?], (no data), Belfrage [NRS]; 2 (no data), [Massachusetts?] [MASS]; 1 N[orth] Am[erica], 1901, (A.R.); 1 (no data), Seh[hh]; 2 (no data) [all, NRS].

MEXICO

MALES

Mexico: 2 Ixtapan de la Sall, VIII-9-1954, 5500', (Univ[ersity of] Kans[as] Mex[ican] Exped[ition]) [KU]. **Oaxaca:** 2 Mitla, 28-VII-62, H.E.M., 6000'; 1 Mitla, 29-VII-62, H.E.M., 6000' [all, CNC]; 1 Oaxaca, July 29, 1947, B.M. [AMNH]. 2 Oaxaca, V-5-59, H.E.E., 5000', (at light) [CU]. **Vera-cruz:** 1 C[udad] Mendoza (4 mi SW. [of]), 16-VIII-62, H.E.M., 3-4000' [CNC].

UNITED STATES

MALES

Colorado: 2 Crook, Aug. 30, 1920, Sandhouse [USNM]. **Delaware:** 1 Houston, 22-IX-54, H.E.M.; 1 Newark, 5-X-54, H.E.M.; 1 Newark, 2-X-56, H.E.M. [all, HEM]; 1 Woodland Beach, 17-IX-52, H.E.M. [HEM-(H.E.M. *nidulans* F. homotype)]. **Florida:** 1 Gainseville, 10-25-18, P.W.F. [HEM]. **Illinois:** 1 (locality unknown), (no data), Belfrage [NRS]. **Kentucky:** 1 Morehead, 1 Sept. 1962, F.; 1 Morehead, 3 Sept. 1962, F. [both, CNC]. **Massachusetts:** 1 Martha's Vineyard, Sept. 1956, C.W. Sabrosky [USNM]; 1 Wellsley, 25-VIII-46 [MASS]. **Minnesota:** 1 Hokan, Oct. 9, 1938, R.W.D.; 2 Preston, Oct. 9, 1938, R.W.D.; 2 S[ain]t Anthony P[ar]k, Sept. 5, 1948, H.E.M. [all, HEM]. **New Jersey:** 1 (locality unknown), (no data), Belfrage [NRS]. **New York:** 1 Covert, (no data), Seneca Co[unty]; 1 Ithaca (Campus), 16 Sept. 1926, P.P. Babi [both, NRS]. **North Carolina:** 1 Raleigh, 2-X-1959, A. Saldarriaga; 1 Rockingham Co[unty], Sept. 26, 1959, W.D. Duckworth [both, HEM]; 1 Rockingham Co[unty], Sept. 26, 1959, W.D. Duckworth; 1 Wake Co[unty], 9-25-54, T. Olive [both, TBM]. **Ohio:** 5 Columbus, July 30, 1947, H.E.M.; 1 Columbus, Aug. 13, 1947, H.E.M. [all, HEM]. **Pennsylvania:** 1 Rector (Powdermill Nature Res[erve], n[ea]r), W[est]-moreland Co[unty], 25-VIII-1960 [CM]. **South Dakota:** 2 Capa, Aug. 12, '22, H.C.S.; 3 Elk Point, Aug. 29, 1954, H.C.S.; 1 Hot Springs, Sept. 12, 1927, H.C.S.; 1 Pierre, Sept. 10, '21, H.C.S.; 1 Sand Hills, Martin [County], Sept. 15, 1930, H.C.S.; 1 Springfield, Sept. 1, 1954, H.C.S.; 1 Wasta, Sept. 12, 1923, H.C.S. [all, SD]. **Tennessee:** 1 Sevierville, 14-IX-48, C.L. Gibson [USNM]. **Texas:** 1 Fedor, X-6-1897, Birkmann [NRS]; 1 Kingsville (27 mi S. of), 28-VIII-1954, J.G.C. [CNC]; 1 Salado, Oct. 8-14, '49, (Carn[egie] Mus[eum], Acc. 13515) [CM]; 3 (locality unknown), (no data),

Belfrage [NRS]. **Vermont**: 1 Manchester, 14-VIII-57, (colony in sugar maple) [HEM]. **Virginia**: 1 Limeton, Oct. 8, 1939; 1 Tangier I[sland], Sept. 18, '39, A.H. Clark [both, USNM]. **Wisconsin**: 1 (locality unknown), (no data), Kumlien [NRS]. **Locality unknown** (United States?): 1 (no data), (Mus[eu]m Payk[ull]) [NRS].

***Megabombus (M.) pennsylvanicus sonorus* (Say) new status**

Apis pensylvanica De G., 1773, p. 575, (re: nominate ssp. only): *Bombus sonorus* Say, 1837, p. 413, (re: paranominate ssp. only): *Bombus pennsylvanicus*, Handl., 1888a, p. 238, (p.p., *sonorus* Say, *supra*): *Bombus sonorensis* [sic!], Fox, 1893, p. 23, (*sonorus* Say, 1837, p. 413), [n. syn.]: *Bombus (B.) sonorus*, Fkln., 1912, p. 407: *Bombus (B.) sonorus* ssp. *flavodorsalis* Fkln., 1912, p. 409, [n. syn.]: *Bombus (Fervidobombus) sonorus flavodorsalis*, Brs., 1951, p. 1249, *In Muesebeck et al.*, [n. syn.]: *Bombus (Fervidobombus) sonorus sonorus*, Brs., 1951, p. 1249, *In Muesebeck et al.*: *Bombus (B.)* (Dumoucheli group), Fkln., 1912, p. 387, (p.p.): *Bremus sonorus*, Fris., 1927c, p. 373: *Bremus sonorus* v. *flavodorsalis*, Fris., 1924, p. 294, [n. syn.]: *Bremus (Fervidobombus) sonorus*, Fris., 1927e, p. 68: *Bremus (Fervidobombus) sonorus* v. *flavodorsalis*, Fris., 1927e, p. 68, [n. syn.]: *Fervidobombus (F.) sonorus*, Skor., 1922a, p. 154, (list): *Megabombus (M.)* (Dumoucheli group), Mlrm., 1961a, p. 57, (p.p.).

DESCRIPTION. **Queen.** Length, 23.0 mm; width at wing bases, 11.0 mm; abdomen, 12.0 mm, width across T2, 12.0 mm; front wing length, 21.0 mm, width, 8.0 mm. Morphologically, no constant significant characters have been discovered that will separate this taxon from the nominate subspecies (*cf.* under Comments). **Color:** Pattern similar to that of nominate subspecies except scutellum all yellow (rarely intermixed with any black hairs), the yellow throughout is (usually) of deeper or richer shade. Also, refer to Comments.

Worker. Measurements similar to those of this caste under nominate subspecies. **Color:** Similar to that of the nominate subspecies except for few deviations noted above under queen. Also refer to Comments.

Male. Length, 19.0 mm; width at wing bases, 8.0 mm; abdomen, 10.0 mm, width across T2, 9.0 mm; front wing length, 18.0 mm, width, 6.5 mm. Morphologically like the nominate subspecies. **Color:** Similar to that of the nominate subspecies except the yellow is deeper in shade (or even tawny golden-yellow), the scutellum (usually) completely yellow or predominantly so, the interalar black band usually more definite and often wider, abdominal T5-7 and legs entirely black. Wings usually darker than those of the nominate subspecies. Genitalia and abdominal sterna 7-8 like those of *p. pennsylvanicus* (Pl. XIII).

Redescriptive remarks from hypotypes. **Queen**, Westwood Hills, L.A. Co., Calif., 4-22-50, J. Doner; **workers**, 1 Tumacacori Mts., Ariz., I. Wilson, (813131), on *Lotus*; 1 Tumacacori Mts., Ariz., I. Wilson, (8129131); **male**, Graham Mts., Ariz., Aug. 16, 1953, G.D. Butler, 5000', sunflower [all, HEM].

TYPE. Not examined. The ♀ type is lost.

TYPE LOCALITY. Mexico. Number of specimens at hand: 792. In flight: At southern locations, throughout the year, *i.e.*, queens or workers or males, or combinations thereof, might be taken any time at the appropriate location in the taxon's range. Distribution: (vertical), 1700 to 9000 ft; (horizontal), California to Texas, and Mexico (including Lower California) to Yucatan. Floral visitations: *Agave*, *Aster*, *Bebia*, *Celtis*, *Cirsium*, *Cleome*, *Delphinium*, *Eysenhardtia*, *Helenium*, *Helianthus*, *Lobelia*, *Lotus*, *Melilotus*, *Opuntia*, *Prosopis*, *Salvia*, *Solanum* and *Sphaeralcea*. Lutz and Cockerell (1920) added: *Caesalpinia*, *Datura*, *Mentzelia*, *Monarda*, *Prunella*, *Rhus*, *Verbascum*, and *Vicia*.

COMMENTS. Size differences, especially in the females, stated under *p. pennsylvanicus* apply equally well here. Despite the relative constancy of color differences

that can be used to separate *p. sonorus* from the nominate subspecies, there is some question as to whether this taxon should be regarded as something that actually does represent a good subspecies; however, until future critical studies on the effects of certain ecological factors on bumblebee populations are undertaken and indicate otherwise, it is treated here as a subspecies.

In general, the punctuation on the head of this taxon over most of its range is somewhat coarser than that of *p. pennsylvanicus*, but in areas where they are sympatric this might be of little value as a distinguishing feature, just as might be the difference in deepness of the yellow color which seems to lessen. This suggests that at least occasionally hybridization possibly occurs.

The differentiating chromatic features of typical *p. sonorus* are its yellow scutellum (rarely with noticeable intermixture of black), its abdominal T1 being entirely or predominantly yellow (if black occurs it is limited to the anterior face of this tergum) and, in the male the legs, and (usually) abdominal T5–7, are entirely black. The interalar black band, when present, is typically definitive and rather broad, but often in certain areas of the range and less so elsewhere this band might be narrowed in varying degrees on different individuals or even replaced entirely by yellow pile. To these latter forms Franklin (1912: 409) gave the subspecific name *flavodorsalis*; despite the more frequent occurrences of these variations at some localities, I have examined series (from the same places) showing perfect and complete gradation of the interalar band from that of typical width to a condition where it is entirely absent. Therefore, I do not regard *flavodorsalis* as a good subspecies.

MEXICO

QUEENS

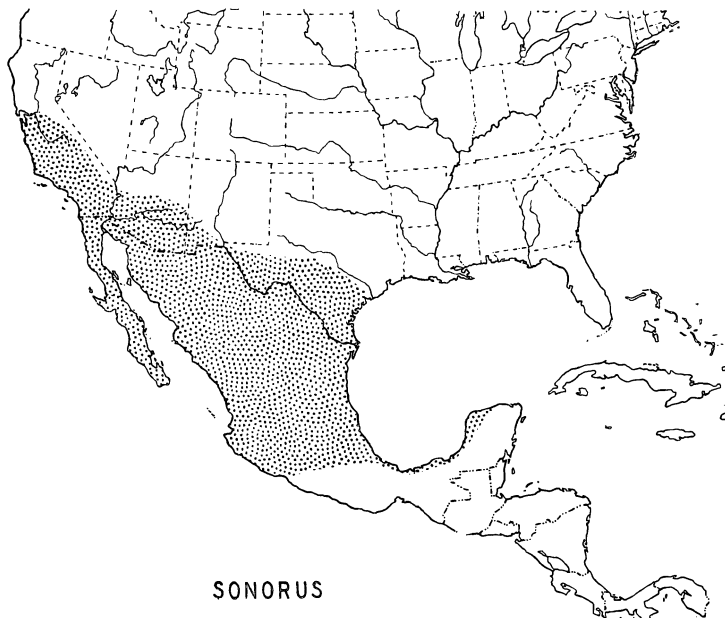
Chihuahua: 4 Catarinas, IV-10-1948, G.M.B., 6100'; 3 Catarinas, IV-11-1948, G.M.B., 6100'; 1 Ciudad (not Cuidad) Juarez (239 km S. [of]), VII-1-47, M., (D. Rockefeller Exp[edition]); 1 Delicias, VII-13-47, M., (D. Rockefeller Exp[edition]); 1 Madera, VII-6-1947, M., 7200', (D. Rockefeller Exp[edition]); 4 Santa Barbara, IV-23-47, G.M.B., 6200'; 1 Santa Barbara, IV-27-47, G.M.B., 6200'; 2 Santa Barbara, V-2-47, G.M.B., 6200'; 2 S[an]ta Barbara, V-6-1947, G.M.B., 6200'; 1 S[an]ta Barbara, V-13-47, G.M.B., 6200'; 1 Santa Barbara (63 mi W. [of]), VII-20-47, Gh., 5500', (D. Rockefeller Exp[edition]); 1 S[an]ta Barbara, 10-20-47, G.M.B., 6200'; 1 Terrero, V-26-1948, G.M.B., 5500' [all, AMNH]. **Durango:** 1 Durango, Aug. 14, 1947, Mr., 6200', (D. Rockefeller Exp[edition]); 1 El Táscate, VII-28-47, Mr., 6400', (D. Rockefeller Exp[edition]); 1 San Juan del Rio, VII-30-47, Mr., 5200', on *Celtis pallida*, (D. Rockefeller Exp[edition]) [all, AMNH]. **Federal District:** 1 (locality unknown), 30-III-57, W.W.G. [INIA]. **Hidalgo:** 1 Zimapan, VI-11-14-51, P.D.H., on *Eysenhardtia polystachya* [CIS]. **Mexico:** 1 Chapingo, V-[date ?]-61, F.Po.; 1 Chapingo, 24-VI-61, d. Vazquez G.; 1 Chapingo, 29-VI-61, Jorge Avila; 1 Chapingo, J[un]y 1962, F.Po.; 1 Chapingo, 14-X-57, Volando & W.W.G. [all, INIA]. **Michoacan:** 1 La Piedad (15 km ote. de), 18-III-57 [INIA]; 2 Morelia, 9-22-57, R.&K.D. [RRD]. **San Luis Potosi:** 1 Ciudad del Maiz (5 mi NE. [of]), 22-VIII-1954, J.G.C., 4500' [CNC]; 1 Ciudad del Maiz (13 mi NW. [of]), VIII-22-51, 3700 ft, (Univ[ersity of] Kans[as] Mex[ican] Exp[edition]) [KU]; 1 San L[uis] Potosi (18 mi S. [of]), Sept. 1, '58, H.F.H. [CNC]. **Zacatecas:** 1 (55 K., R. 45), VII-3-61, R.&K.D. [RRD].

UNITED STATES

QUEENS

Arizona: 1 Canelo, V-27-53, A. & H. Dietrich; 3 Catalina M[oun]t[ain]s, April 3, 1953, G.D.B.; 1 Chiricahua M[ount]ains, IX-29-47, D.J. & J.N.K.; 1 Huachua M[oun]t[ain]s (Ramsey C[anyo]n), Cochise Co[unty], July, 11, 1955, F.G.W. & G.D.B., on *agave*; 1 Huachua M[oun]t[ain]s (Ramsey C[anyo]n), July 12, 1955, G.B. & F.Wr., *Melilotus alba*; 1 M[oun]t Lemmon, April 3, 1953, G.B.; 2 M[oun]t Lemmon (Molino Basin), IV-28-53, A. & H. Dietrich; 1 M[oun]t Lemmon (Molino Basin), V-5-53, A. & H. Dietrich [all, HEM]; 1 M[oun]t Wrightson (Santa Rita M[oun]t[ain]s), 28-VIII-62, H.E.M., 8-9000'; 1 Portal (S[outh]w[estern] Research St[ation] to Rustler's Park, n[ear], VI-28-1959, R.H. Arnett Jr., (Lot no. 384) [both, CNC]; 1 Sabino Canyon, May 5, 1955, G.D.B.; 1 Tucson, 28 March 1921; 1 Tucson, 5 April 1921; 1 Tucson, 2 Oct., 1927, J.M. Breazeale; 1 Tumacacori M[oun]t[ain]s, 8-28-31, I. Wilson; 1 Tumacacori M[oun]t[ain]s, 9-3-31,

I. Wilson, on *Lotus* [all, HEM]. **California:** 1 Westwood Hills, L[os] A[ngeles] Co[unty], 4-22-50, J. Donek; 1 Westwood Hills, L[os] A[ngeles] Co[unty], A. Mutzernberg, (500430) [both, HEM]. **Texas:** 2 Davis M[oun]t[ain]s, Jeff Davis Co[unty], June 26, 1942, H.A.S. [HEM]; 3 Davis M[oun]t[ain]s, (Maders Canyon), Jeff Davis Co[unty], VII-1-48, C.&P.V. [AMNH].



MAP 26.

MEXICO

WORKERS

Aguascalientes: 2 Aguascalientes (4 mi SW. [of]), Oct. 24, 1950, R.F.S., 6100 ft; 1 Aguascalientes, VIII-18-1953, C.&P.V., (D. Rockefeller Mex[ican] Exp[edition], 1953); 5 El Retono (10 mi E. [of] Aguascalientes), VII-26-1953, C.&P.V., (D. Rockefeller Mex[ican] Exp[edition], 1953) [all AMNH]. **Chihuahua:** 3 Barranca del Cobre (23 mi S., 1½ mi E. [of] Creel), 24 July 1957, P. Ogilvie [KU]; 2 Catarinas, VII-25-47, Schramel, 5800', (D. Rockefeller Exp[edition]); 1 Catarinas, VII-26-47, Mr., 5800', (D. Rockefeller Exp[edition]); 4 Chihuahua (80 km N. [of]), VI-30-47, Mr. (D. Rockefeller Exp[edition]) [all, AMNH]; 1 Chihuahua, 12 Aug. 1951, H.E.E. [KU]; 1 Ciudad Juarez (239 km S. [of]), VII-1-47, Mr., (D. Rockefeller Exp[edition]) [AMNH]; 1 Encinillas (17 mi N. [of]), VII-27-1953, 4900 ft, (Univ[ersity of] Kans[as] Mex[ican] Exp[edition]); 2 Gallego (8 mi S. [of]), VII-27-53, 5,000', (Univ. Kans[as] Mex[ican] Exp[edition] [all, KU]; 1 Ojo Laguna, VI-30-47, Spieth, (D. Rockefeller Exp[edition]); 7 Parral, July 16, '47, Cazier, (D. Rockefeller Exp[edition]); 1 Pedernales (2 mi W. [of]), Aug. 17, 1950, R.F.S.; 2 Salaires, VII-23-1947, Mr., 5200', (D. Rockefeller Exp[edition]); 5 Salaires, Aug. 20, 1947, G.M.B. (not Bradt), 5200 ft; 1 Salaires, 9-21-47, G.M.B. [not Bradt], 5200'; 10 Santa Barbara (S[an]ta Barbara Dist[ri]ct), July 17, 1947, Gh., 6300', (D. Rockefeller Exp[edition]); 2 Santa Barbara (S[an]ta Barbara Dist[ri]ct), July 18, 1947, Mr., 7500', (D. Rockefeller Exp[edition]); 1 Terrero, V-16-1948, G.M.B., 5500' [all, AMNH]. **Coahuila:** 2 Cabos, VIII-21-47, Mr., 4000', (D. Rockefeller Exp[edition]); 1 La Gloria (S. of Monclova), Aug. 24, 1947, Cazier, 3300', (D. Rockefeller Exp[edition]) [all, AMNH]; 3 Monclova (not Montclovia), 8-80, D. Palmer; 1 Monclova (not Monclovia), (no data), Palmer [all, NRS]. **Durango:** 3 Canutillo (8 mi S. [of]), 9 Aug. 1951, P.D.H. [CIS]; 1 Canutillo (8 mi S. [of]), 9 Aug. 1951, H.E.E. [KU]; 3 Durango, Aug. 14, 1947, Gh., 6200', (D. Rockefeller Exp[edition]); 1 Durango (9 mi W. [of]), Sept. 16, 1950, R.F.S. [all, AMNH]; 3 Durango (12 mi SW. [of]), VII-24-58, 7000 ft, (Univ[ersity of] Kans[as] Mex[ican] Exp[edition]) [KU]; 1 El Pino, VIII-23-53, C.&P.V., (D. Rockefeller Mex[ican] Exp[edition], 1953); 2 Encino, VII-27-47, Gh., 6200', (D. Rockefeller Exp[edition]) [all, AMNH]; 1 Los Angeles (R. 40), VII-1-60, R.&K.D. [RRD]; 16 Nombre de Dios, Aug. 13, 1947, Mr., 5900', (D. Rockefeller Exp[edition]) [AMNH]; 1 Nombre de Dios (10 km N. of), 5 Aug. '51, H.E.E.

[KU]; 1 Nombre de Dios, Aug. 4, 1954, M. Cazier, W. Gertsch, Brandt; 3 Palos Colorados, VIII-5-47, Cazier, 8000', (D. Rockefeller Exp[edition]); 1 San Juan del Rio, July 30, '47, Gh., 5200', (D. Rockefeller Exp[edition]); 10 San Juan del Rio, VII-30-47, Spieth, 5200', (D. Rockefeller Exp[edition]); 15 Yerbanis (Cuencame Dist[ri]ct), Mr., 6700', (D. Rockefeller Exp[edition]) [all, AMNH]; 4 (locality indefinite, K. 771, R. 45), VII-2-61, R.&K.D. [RRD]. **Federal District:** 1 Mexico [City], 13-VIII-57, F.Po. [INIA]; 1 Mexico [City], 30 July 28, G.L., 2350 m; 1 Mexico [City], 3 Aug. 1928, G.L., 2350 m; 1 Mexico [City], 5 Aug. 1928, G.L., 2350 m; 1 Mexico [City], 9 Aug., 1928, G.L., 2350 m; 4 Mexico [City], 19 Aug. 1928, G.L., 2350 m; 4 Mexico [City], 21 Aug., 1928, G.L., 2350 m; 1 Mexico [City], 26 Aug., 1928, G.L., 2350 m; 1 Mexico [City], 3 Sept., 1928, G.L., 2350 m [all, CU]; 2 Xochimilco, Aug. 29, 1947, H.E.M.; 1 Xochimilco, Aug. 30, 1947, H.E.M.; 3 Xochimilco, Aug. 31, 1947, H.E.M.; 1 Xochimilco, September 1, 1947, H.E.M. [all, HEM]. **Guanajuato:** 1 Dolores Hidalgo, VIII-12-1953, C.&P.V. [AMNH]. **Hidalgo:** 1 Huichapan (7 SW. [of]), 29-VII-1954, J.G.C., 1700' [CNC]; 2 Ixmiquilpan, VI-23-53, 5300 ft, on *Sphaeralcea*, (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion) [KU]; 1 Jacala, 22-VI-1939, Ralph Haag, 4500 ft [MCZ]; 1 Jacala (not Tacalo, 29 mi SW. [of]), VI-25-59, 6500', (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion); 4 Pachuca, VII-28-54, 7300 ft, (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion) [all, KU]; 3 Zimapan, VI-11 to 14-51, P.D.H., on *Eysenhardtia polystachya* [CIS]; 1 Zimapan, VI-11 to 14-51, H.E.E. [KU]; 1 Zimapan (8 mi NE. [of]), 28-VII-1954, J.G.C., 4600' [CNC]; 9 Zimapan (8 mi [from]), VII-54, (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion) [KU]. **Jalisco:** 2 Encarnacion de Diaz, 28 July 1951, P.D.H. [CIS]; 2 Encarnacion de Diaz, 28 July 1951, H.E.E. [KU]; 1 Encarnacion de Diaz (12 mi S. [of]), VIII-18-1953, C.&P.V., (D. Rockefeller Mex[ican] Exp[edition]); 1 Guadalajara, Sept. '03, W.L. Tower [both, AMNH]; 1 Guadalajara (11 mi S. [of]), VII-18-53, 4800 ft, (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion); 3 Lagos de Moreno (15 mi. N.E. [of]), VIII-21-54, 6600 ft, (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion) [all, KU]; 1 Perqueros (vicinity [of]), 6-16-49, G.M.B., 6700' [AMNH]; 2 Puente Grande, 20-VIII-1954, J.G.C., 5000' [CNC]; 1 Villa Hidalgo (Mi[le] NE. [of]), Oct. 24, 1950, R.F.S., 6500 ft [AMNH]. **Mexico:** 1 Chapingo, Ago. 27, '60 F.Po.; 1 Chapingo, IX-8-60, F.Po.; 1 Chapingo, Abr. 5, '61, F.Po.; 1 Chapingo, 20-VI-61, Javier Vasquez; 1 Chapingo, VII-26-1961, F.Po.; 1 Chapingo, 27-VII-1961, F.Po.; 7 Chapingo, VIII-3-1961, F.Po.; 6 Chapingo, VIII-10-1961, F.Po.; 1 Chapingo, V-7-1962, F.Po.; 3 Chapingo, VI-7-1962, F.Po.; 4 Chapingo, 2-VII-1962, F.Po.; 18 Chapingo, 5-VII-1962, F.Po.; 26 Chapingo, 7-VII-1962, F.Po.; 4 Chapingo, VII-20-1962, F.Po.; 30 Chapingo, 21-VII-1962, F.Po.; 1 Chapingo, VIII-7-1962, P. Carajo [all, INIA]; 1 Teotihuacán, 7-21-56, R.&K.D. [RRD]. **Michoacan:** 10 C[ru]da[d] Hidalgo (4 mi W. [of]), VI-16-53, 6400 ft, (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion); 2 Jacona (3 mi W. [of]), VII-18-53, 5300 ft, (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion) [all, KU]; 1 Jacona, 7-15-56, R.&K.D. [RRD]; 1 La Piedad (15 km ote. de), 18-III-57, P. Gonzalez, ("en habitacion") [INIA]; 2 Morelia, 9-22-57, R.&K.D. [RRD]; 1 Quiroga, VII-17-53, 6300 ft, (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion); 1 Uruapan, X-1954, N.L.H.K. [both, KU]; 1 Zitacuaro (10 km W. [of]), 11 July 1951, P.D.H. [CIS]; 1 Zitacuaro (10 km W. of), 11 July 1951, H.E.E. [KU]. **Morelos:** 1 Zacatepec, 27-VII-62 [INIA]. **Nuevo Leon:** 2 Galeana, 3-VIII-1939, Ralph Haag, 5-6000' [MCZ]. **Oaxaca:** 1 Ruinas de Monte Alban, IX-29-61, Javier Vasquez [INIA]. **Puebla:** 11 Puebla (6 mi SW. [of]), VII-2-53, 6600', on *Lobelia fenestralis*, (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion) [KU]. **Queretaro:** 1 Querétaro, 24 de Marze, '62, F.Po. [INIA]. 2 San Juan del Rio (5 mi E. [of]), VII-30-51, 6750', (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion) [KU]. **San Luis Potosi:** 14 Ciudad del Maiz (13 mi NW. [of]), VIII-22-54, 3700', (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion); 1 Ciudad del Maiz (5 mi E. [of]), VIII-22-23-54, 4700', (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion) [all, KU]; 1 El Huizache, 22-VIII-1954, J.G.C., 4500' [CNC]; 1 El Salto, 6-19-55, (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion) [KU]. **Sonora:** 3 Pitiquito, VII-4-1952, C.&P.V. [AMNH]; 3 San Luis, Sept.-Oct. [yr?], Palmer [MCZ]. **Tamaulipas:** 3 Llera, VII-19-54, (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion) [KU]. **Yucatan:** 1 (locality unknown, no data), G.F. Gaumer [KU]. **Zacatecas:** 2 Fresnillo, Aug. 15, 1947, Mr., 7000', (D. Rockefeller Exp[edition]); 3 Sain Alto, Aug. 14, 1947, Cazier, 7000', (D. Rockefeller Exp[edition]) [all, AMNH]. **Locality unknown:** 1 (no data), Boucard; 1 (no data), Chevrol; 1 (no data), Sallé [all, NRS].

UNITED STATES

WORKERS

Arizona: 1 Atascosa M[oun]t[ain]s, May 22, 1954, G.B.; 2 Baboquivari M[oun]t[ain]s (Brown Can[yon]), Aug. 8, 1953, G.D.B.; 1 Catalina M[oun]t[ain]s, Aug. 22, 1954, G.D.B., mesquite; 1 Chiricahua M[oun]t[ain]s, IX-29-47, D.J.&J.N.K.; 1 Chiricahua M[oun]t[ain]s, Sept. 7, 1953, G.D.B., 7-8000', thistle [all, HEM]; 21 Chiricahua M[oun]t[ain]s, Cochise Co[unty], 4-IX-60, R.S.C., 7500', on *Cirsium*; 2 Chiricahua M[oun]t[ain]s, Cochise Co[unty], 4-IX-60, 7700', on *Cirsium* [all, CM]; 2 Graham M[oun]t[ain]s, Aug. 15, 1953, G.D.B., larkspur; 1 Huachuca

M[oun]t[ain]s (Mouth, Carr, Can[yon]), Sept. 5, 1955, G.B., F.W., *Helianthus* sp. [all, HEM]; 1 Mammoth, Pinal Co[un]ty], 4-IX-60, R.S.C., 3450' [CM]; 3 Mescal, Cochise Co[un]ty], VIII-25-1937, Rehn, Pate & Rehn, 4100 ft [ANSP]; 2 M[oun]t Lemmon (S[anta] Catalina M[oun]t[ain]s), July 27, 1917, R.C. Shannon, 8000 ft; 1 M[oun]t Lemmon (Molino Basin), V-20-53, A. & H. Dietrich [all, HEM]; 5 M[oun]t Wrightson (Santa Rita M[oun]t[ain]s), 27-VIII-62, H.E.M., 6000-8000'; 7 M[oun]t Wrightson (Santa Rita M[oun]t[ain]s), 28-VIII-62, H.E.M., 8-9000' [all, CNC]; 16 Oracle, Pinal Co[un]ty], 4-IX-60, R.S.C., 4,134' [CM]; 1 Patagonia, S[an]ta Cruz Co[un]ty], Aug. 25, 1955, G.B., F.W., *Cleome jonesii*; 1 Patagonia M[oun]t[ain]s (W. sl[ope]), S[an]ta Cruz Co[un]ty], Sept. 1, 1956, G.B., F.W., *Aster* [both, HEM]; 3 Patagonia M[oun]t[ain]s (5-10 mi NE. [of] Nogales), 10-VII-62, H.E.M., 5500'; 17 Patagonia M[oun]t[ain]s, 11-VII-62, H.E.M., 5000-5500', on mesquite; 1 Patagonia M[oun]t[ain]s, 12-VII-62, H.E.M.; 5 Patagonia M[oun]t[ain]s, (n[ea]r Patagonia), 13-VII-62, H.E.M., 4000', on *Cleome*; 9 Patagonia M[oun]t[ain]s, (n[ea]r Patagonia), 13-VII-62, H.E.M., 5000', on *Helianthus*; 13 Patagonia M[oun]t[ain]s, (15 mi NE.) of [Patagonia], 13-VII-62, H.E.M., 5000-5500', on mesquite [all, CNC]; 1 Payson [both, HEM]; 1 Pinto Cr[ee]k (Roosevelt Reservoir, Upper Salt R[iver]), Maricopa Co[un]ty], VII-23-1937, Rehn, Pate & Rehn, 3150 ft [ANSP]; 2 Oujitoota (30 mi. E. [of]), Pima Co[un]ty], 28-29 August, 1927; 1 Santa Rita M[oun]t[ain]s, 6 Aug., '35, R.A. Flock; 1 Santa Rita M[oun]t[ain]s, Oct. 6, 1938, E.R.T.; 1 S[an]ta Rita M[oun]t[ain]s (Box Can[yon]), June 5, 1954, G.D.B., *Bebia juncea* [all, HEM]; 13 S[an]ta Rita M[oun]t[ain]s, Pima Co[un]ty], 4-IX-60, R.S.C., 5000' [CM]; 1 Sedona (15 mi S. [of]), Sept. 17, 1955, G.D.B.; 1 Tucson, 9 Sept. 1920, 3000-4000'; 1 Tucson, July 22, 1925, R.B. Streets, 2400 ft; 1 Tucson, July 25, 1925, R.B. Streets, 2400 ft; 1 Tucson, Oct. 1927, J. Hamilton; 1 Tucson (25 mi NE. [of]), Aug. 13, 1936, H.A.S.; 1 Tucson, Aug. 15, 1946, H.A.S., 2400'; 1 Tumacacori M[oun]t[ain]s, 8-28-31, I. Wilson; 1 Tumacacori M[oun]t[ain]s, 9-3-31, I. Wilson, on *Lotus*; 1 Yarnell to Prescott, July 23, 1942, H.A.S. [all, HEM]. **California:** 2 Etiwanda, Sept. 16, 1939, E. Appel; 1 Laguna Beach, Aug. 16, '17, Wheeler, (W.M. Mann 1954 Coll[ectio]n); 1 Modesto, Oct. 3-6, 1935, J.C. Chamberlin [all, HEM]. **Texas:** 1 Alpine, July 8, 1942, H.A.S.; 1 Chisos M[oun]t[ain]s, VII-17-46, D.J.&J.N.K. [both, HEM]; 1 Hot Spring, Brewster Co[un]ty], VII-6-48, C.&P.V. [AMNH]; 1 Ozona (19 mi E. [of]), Sutton Co[un]ty], IX-1-1937, Rehn, Pate & Rehn, 1775 ft [ANSP]; 4 Uvalde (Garner State Park, N. [of]), Aug. 7, 1957, R.H. Arnett, (Lot 301) [CNC].

MEXICO

MALES

Chihuahua: 1 Meoqui (6 mi NE. [of]), Sept. 2, 1950, R.F.S.; 2 Parral (9 mi E. [of]), Sept. 11, 1950, R.F.S.; 1 Santa Barbara (S[an]ta Barbara Dist[ri]ct), July 17, 1947, Schramel, 6300', (D. Rockefeller Exp[editio]n) [all, AMNH]. **Coahuila:** 1 San Pedro de Colonias, Aug. 20, 1947, M., 3700', on *Helianthus annuus*, (D. Rockefeller Exp[editio]n) [AMNH]. **Durango:** 1 Durango, Aug. 14, 1947, M., (D. Rockefeller Exp[editio]n); 1 Nombre de Dios, Aug. 13, 1947, M., 5900', (D. Rockefeller Exp[editio]n); 1 Yerbanis (Cuencame Dist[ri]ct), Aug. 19, 1947, Mr., 6900', (D. Rockefeller Exp[editio]n) [all, AMNH]. **Federal District:** 1 Mexico [City], 19 August, 1928, G.L., 2350 m [CU]; 2 Mexico [City], 9-25-57, R.&K.D. [RRD]; 1 Mexico [City], 14-IX-58, W.W.G. [INIA]; 1 Xochimilco, Aug. 28, 1947, H.E.M.; 21 Xochimilco, Aug. 29, 1947, H.E.M.; 1 Xochimilco, Aug. 30, 1947, H.E.M.; 2 Xochimilco, Aug. 31, 1947, H.E.M. [all, HEM]; 3 Xochimilco, 16-VIII-62, H.E.M., 8000'; 5 Xochimilco, 17-VIII-62, H.E.M., 8000'; 4 Xochimilco, 18-VIII-62, H.E.M., 8000'; 3 Xochimilco, 19-VIII-62, H.E.M., 8000' [all, CNC]. **Jalisco:** 1 Lagos de Moreno (15 mi NE. [of]), VIII-21-54, 6600 ft, (Univ[ersity of] Kans[as] Mex[ican] Exp[editio]n) [KU]. Locality indefinite: 1 Villa Guadalupe, 26 July 1951, H.E.E. [KU]. **Mexico:** 1 Chapingo, VII-21-1961, F. Po.; 1 Chapingo, VI-7-1962, F.Po.; 1 Chapingo, VI-17-1962, F.Po.; 1 Chapingo, 5-VII-1962, F.Po.; 8 Chapingo, 21-VII-1962, F.Po. [all, INIA]; 1 Teotihuacán, 21 Aug. 1954, (Univ[ersity of] Kans[as] Mex[ican] Exp[editio]n) [KU]. **Puebla:** 1 Puebla (6 mi SW. [of]), VII-2-53, 6600 ft, on *Lobelia fenestralis*, (Univ[ersity of] Kans[as] Mex[ican] Exp[editio]n) [KU]. **Querétaro:** 1 Rio Blanco, 7-26-56, R.&K.D. [RRD]. **San Luis Potosi:** 4 Ciudad del Maiz (13 mi NW. [of]), VIII-22-54, 3700 ft, (Univ[ersity of] Kans[as] Mex[ican] Exp[editio]n) [KU]; 1 San Luis Potosi (18 mi S. [of]), Sept. 1, '58, H.F.H. [CNC]. **Sonora:** 1 Pitiquito, VII-4-1952, C.&P.V. [AMNH].

UNITED STATES

MALES

Arizona: 1 [Santa] Catalina M[oun]t[ain]s (Hghy. [?No. 789]), Oct. 11, 1955, G.D.B.; 1 Chiricahua M[oun]tains IX-29-47, D.J.&J.N.K.; 1 Douglas (40 mi N. [of]), July 31, 1946, H.A.S., 4800

ft; 1 Graham M[oun]t[ain]s, Aug. 16, 1953, G.D.B., 5000 ft [all, HEM]; 1 Nogales (15 mi NE. [of]), 13-VII-62, H.E.M., 5000-5500', on mesquite; 2 Patagonia (Patagonia M[oun]t[ain]s), 13-VII-62, H.E.M., 4000', on *Cleome*; 2 Patagonia M[oun]t[ain]s, 11-VII-62, H.E.M., 5000-5500', on mesquite [all, CNC]; 1 Portal (S[outh]w[estern] R[esearch] S[itation], 5 mi W. [of]), Sept. 17, 1956, E. Ordway, 5400' [AMNH]; 1 Sabino Canyon, Oct. 21, 1949; 1 Sabino Canyon, Oct. 2, 1954, G.D.B.; 1 Tucson, 17 Sept. 1940, Gordon Smith; 1 Tucson, 1 Oct. 1942, Stanford Allen; 1 Tucson, Sept. 30, 1953, S.E. McGregor [all, HEM]. **California:** 1 San Diego, Aug. 2-5, 1954, H.E.&M.A.E.; 1 San Pedro, 10-18-30, I. Wilson [both, HEM]. **Locality unknown:** 1 (no data, no collector), [HEM].

WRONG LOCALITY

3 Ivon Beni, Bolivia, January 1921, [or] 22, (W.M. Mann Mulford Bio[logical] Expl[oration]) [USNM].

Megabombus (M.) pullatus (Fkln.)

Bombus (B.) pullatus Fkln., 1913, p. 122: *Bombus carbonarius* Handl., 1888a, p. 241, (p.p.), (*nec carbonarius* Menge, 1856, p. 27), [n. syn.]: *Bombus violaceus*, auctt., (*nec violaceus* Lep., 1836, p. 473), [n. syn.]: *Bombus (B.) atratus* Fkln., 1913, p. 118, (p.p.), [n. syn.]: *Bombus (B.) niger* Fkln., 1913, p. 120, (p.p.): *Bombus (B.)* (Dumoucheli group), Fkln., 1913, p. 95, (p.p.): *Bremus pullatus*, Fris., 1925a, p. 162: *Fervidobombus (F.) niger*, Skor., 1922a, p. 153, (list): *Fervidobombus (F.) pullatus*, Skor., 1922a, p. 154, (list): *Megabombus pullatus*, Mltn., 1962b, p. 729: *Megabombus* (Dumoucheli group), Mltn., 1962b, p. 729, (p.p.): *Megabombus (M.)* (Dumoucheli group), Mltn., 1961a, p. 57, (p.p.).

DESCRIPTION. **Queen.** Length, 21.0 mm; width at wing bases, 10.0 mm; abdomen, 10.0 mm, width across T2, 10.5 mm; front wing length, 20.0 mm, width, 6.5 mm. **Head:** Frontal outline (excluding mouthparts) narrowly trapezoidal, broadly arcuate above, only slightly higher than greatest width, vertical region noticeably inclined toward occiput, for the most part rather densely covered with small to medium punctures; ocular half of ocellular area with some small distinct punctures, the ocellar half smooth; ocelli situated in weak arc just below supraorbital line, the distance between each little less than their diameters; compound eyes little more broadly rounded below than above, their inner margins for the most part subparallel and weakly convergent above; malar space about equal in length to distance between (and including) mandibular articulations, its outer surface somewhat unevenly convex and with some minute punctures; labrum little wider than its greatest thickness, with broadly arcuate ventral margin, with both labral shelf and tubercles prominent, the latter coarsely punctate but not especially flattened below and with well-separated conical mesal summits; flagellum about $1\frac{1}{2}$ times longer than scape, F1 much longer than either F2 or F3 and very nearly equal to their combined lengths; clypeus for the most part rather weakly convex, sloping laterally, well covered with a mixture of small and medium punctures, about $1\frac{1}{2}$ times wider near base than its median height. **Legs:** Mesobasitarsite subrectangular, little less than 4 times longer than greatest width, its outer surface weakly concave longitudinally, the spinate distoposterior angle extended considerably beyond blunt distoanterior angle, outer surface of hind tibia weakly alutaceous anteriorly and distally otherwise shining, unevenly convex longitudinally, the widest part being near $1\frac{1}{2}$ times wider than longest hairs of corbicular (posterior) fringe; metabasitarsite with outer surface broadly concave longitudinally and mostly alutaceous, the posterior margin arcuate only near base, beyond nearly straight, the blunt distoanterior angle considerably in recess of sharply acute distoposterior angle with distinct emargination between. **Pubescence:** Rather short, dense, being only somewhat longer and looser on head, posterior region of scutellum and over most of abdominal dorsum; corbicular fringe rather dense, of medium length, most hairs except distal ones being nearly straight; metabasitarsal posterior fringe rather short becoming gradually shorter distally, the hairs mostly very weakly arcuate to straight. **Color:** Entirely black. Wings black with noticeable violaceous reflection, under certain lights tending to display slight coppery tinge.

Worker. Length, 17.0 mm; width at wing bases, 7.0 mm; abdomen, 9.0 mm, width across T2, 6.5 mm; front wing length, 15.5 mm, width, 5.0 mm. Essentially like the queen in all respects except the relative morphological features usually are more diminutive.

Male. Length, 14.5 mm; width at wing bases, 6.0 mm; abdomen, 7.0 mm, width across T2, 6.0 mm; front wing length, 14.5 mm, width, 5.0 mm. *Head:* Frontal outline (excluding mouth-parts) mostly roundish trapezoidal, broadly arched above and behind eyes, slightly wider than median height, vertical region weakly convex and covered for the most part, with small and medium punctures; ocelli situated in nearly a straight line, little closer together than their diameters, the latter ones touching the supraorbital line; ocular half of ocellular area with very few small to medium irregular punctures; compound eyes nearly as broadly rounded above as below, their inner margins almost parallel; malar space little longer than distance between (and including) mandibular articulations, its surface weakly irregularly convex, rather sparsely covered for the most part with small punctures; labrum about twice as wide as thick, its ventral margin broadly arcuate, its surface more or less flat and irregularly sculptured, the callosities much reduced; flagellum little more than 5 times longer than scape, most segments slightly crenulate, F1 subequal to F2 and about one-half of F3, F1 and F2 combined about equal to F3. *Legs:* Mesobasitarsite rectangular, somewhat less than 4 times longer than widest part, its outer surface shallowly concave longitudinally, the distal end weakly emarginate with distoanterior angle only slightly produced beyond the more acute distoposterior angle; metabasitarsite subrectangular, most of its outer surface rather deeply concave longitudinally, its posterior margin weakly but rather evenly arcuate from base to distal end which is emarginate between the evenly extended distal angles, the distoposterior one more acute than the distoanterior angle. *Pubescence:* Very similar to that of queen but not quite as dense, especially on the thorax; mesobasitarsal posterior fringe of medium and rather even length throughout; metabasitarsal posterior fringe of even and short length throughout. Genitalia, seventh and eighth abdominal sterna (Pl. XIII). *Color:* Black except some finer pile on face and some pubescence on venter, including leg bases, slightly tinged with greyish, most of that distomedially on last abdominal sternum very pale ferruginous (or golden) in the form of a dense patch. Wings colored like those of the queen.

Redescribed from hypotypes. **Queens**, 2 El Volcán Chiriquí, R.P., III-6-36, W.J. Gertsch [AMNH and HEM]; 1 [Villeta] (not Villet), Cundinamarca, Colombia, I-40, L. Richter [HEM]; **workers**, 2 Palmar, Dept. Puntarenas, Costa Rica, P. & D. Allen [MCZ and HEM]; **male**, Muzo, Colombia, 3-II-57, Juan Foerster, 4260 m [HEM].

TYPE. Examined a ♂ (No. 24111) in the collection of the United States National Museum, Washington.

TYPE LOCALITY. Ecuador, S.A. Number of specimens at hand: 268. In flight: Throughout the year, *i.e.*, queens or workers or males, or combinations thereof, might be captured any time at the appropriate location in the species' range. Distribution: (vertical), sea level to *ca.* 12,800 ft; (horizontal), Mato Grosso in Brazil, northern Bolivia northward to Venezuela (and probably the Guineas), thence northwestward through Central America to southern Mexico. Floral visitations: *Anthonius* and *Zea* are the only available records, though undoubtedly the species is polylectic.

COMMENTS. This species is close to *M. (M.) morio* (Swed.) with which it frequently has been confused. From that species it can be separated in the females, along with other features, by the shorter malar space, the sharper metabasitarsal distoposterior angle and the somewhat less violaceous reflections on the wings; the male can be distinguished by the sagittal heads of the genitalia having their mesal margins devoid of any serrations, most of the flagellar segments are more pronouncedly crenulate than those of *morio*, and the posterior fringes on parts of the legs referred to in the redescription are different.

Some workers seen are only one-half or less the size given for that caste.

BRAZIL

QUEEN

Locality unknown: 1 (no data except 1931) [AMNH].

COLOMBIA

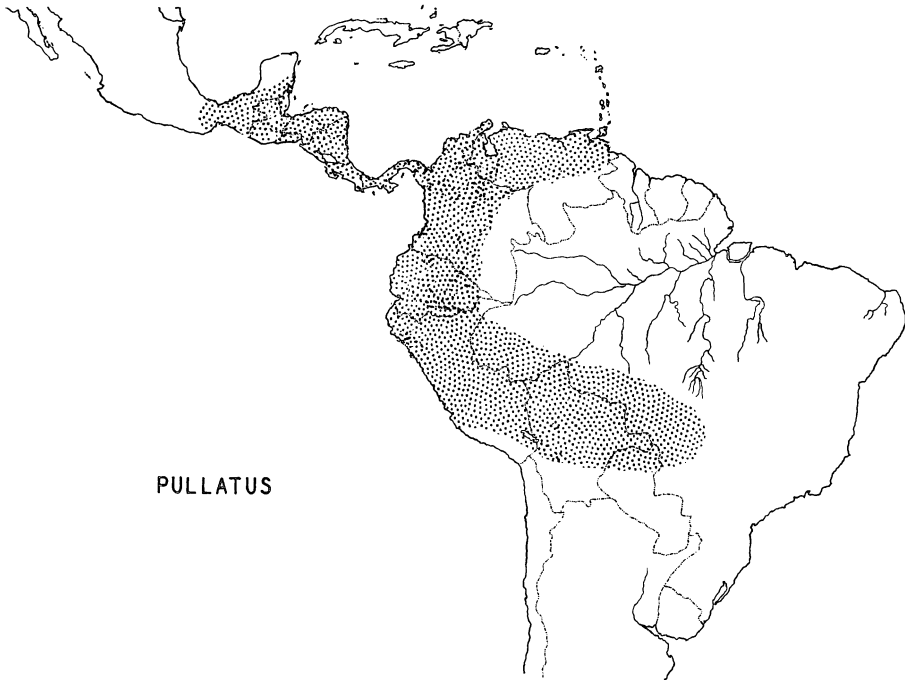
QUEENS

Cundinamarca: 1 Funza, 27-VII-55, M. Revelo, Maiz; 1 Villeta (not Villet), I-40, L. Richter [both, COL]. **Locality unknown:** 1 (no data) [COL].

COSTA RICA

QUEENS

San José: 1 San José, 1903 [USNM]. **Locality indeterminate:** 2 Rancho Rumondo, 5-IX-[yr ?], C.P. Dodge, 2300 ft [MCZ].



MAP 27.

NICARAGUA

QUEENS

Cabo Gracias a Dios: 5 Musawas (Waspuc Riv[er]), 24-X-55, B.M. [MCZ].

PANAMA

QUEENS

Chiriquí: 1 Almirante, J.D. Smith [MCZ]; 1 El Volcán, II-27-36, W.J.G.; 1 El Volcán, II-29-36, W.J.G.; 2 El Volcán, III-6-36, W.J.G. [all, AMNH]; 1 El Volcán, June-July 1952 [MCZ]; 1 Potrerillos, April 25, 1935, J.W.M. [KU].

BRAZIL

WORKERS

Mato Grosso: 1 Cuiabá (Chapada), April [yr.?], (Acc. No. 2966) [CM]; 3 Miranda to [Cuiabá] (not Cujaba), I to VI, '95, Andeer [USNM].

COLOMBIA

WORKERS

Boyacá: 21 Muzo, 3-II-57, J.F., 1260 m [HEM]. **Cachipax:** 4 Contreras, VII-20-49, 1750 m; 1 Contreras, 25-IX-49 [all, COL]. **Caldas:** 3 Victoria (Purnio R[iver]), 3-IV-40, E.O. [COL]. **Choco:** 4 Andragoya, 26-VII-40, F.J. Otoyá, 100 [m]; 2 Andragoya, 29-VII-40, F.J. Otoyá [all, COL]. **Cundinamarca:** 1 Bogotá, (no data), Petersen, (Cat. No. 18); 1 Bogotá, (no data), (Cat. No. 43); 1 Bogotá, (no data), (Cat. No. 45) [all, v.d.V.]; 1 Girardot, 10-I-57, J.F., 360 m; 3 Girardot, 7-X-57, J.F., 360 m [all, HEM]; 4 Pacho, 26-IX-40, H.O.; 1 Rio Ocoa, 24-II-41, L. Richter; 1 Termes

(Nevado del Ruiz), 6-V-40, L. Richter, 3800 m [all, COL]. **Huila**: 1 Gazon, (no data), N. Noricao [COL]. **Meta**: 1 Puerto López, 25-VII-40, (#B 507) [COL]; 1 Restrepo, 7-10-VIII-1936, J. Bequaert, 500 m [MCZ]; 1 Villavicencio, XII-40, Richter, 490 [m]; 1 Villavicencio (35 k[m] de), 24-II-41, L. Richter; 1 Villav[icenci]o, 10-XII-41, 500 m [all, COL]. **Santander**: 3 Bucarcanga, 1-II-46, Upegui, 1018 [m] [COL]; 1 San Vicente de Chucuri, 12-IX-1936, J. Bequaert, 500 m [MCZ]. **Valle del Cauca**: 1 Palmira, June '42, B. Losada S., (4-168) [COL]. **Locality unknown**: 1 (no data), Q. Felipe Ovalle, (Ac. 33501) [AMNH]; 6 19-VII-40, F.J. Otoy; 1 26-VII-40, F.J. Otoy; 1 20-VII-49, Marin H. Pacma [all, COL].

COSTA RICA

WORKERS

Cartago: 2 Guapiles, IX-12-1927, Rehn, 984' [ANSP]; 1 Turrialba, 16-V-48, F. Schrader [KU]; 2 Turrialba, 15-V-55, (P.A.B.), (No. 603-1) [USNM]. **Guanacaste**: 1 San Mateo, II-1911 [ZMB]. **Heredia**: 1 Jimenéz (Gulfo Dulce), 30-III [to] 14-IV-30, E. Reimoser [NMW]. **Puntarenas**: 1 Dominical, 10 June 1951, O.L. Cartwright [USNM]; 8 Palmar, (no data), P. & D. Allen [MCZ]; 1 Rio Neuvo (Gulfo Dulce), 4-IV-30, Reimoser [NMW]. **San José**: 1 Carillo, (no data), Schild & Burgdorf [USNM-(*niger* Fkln. syntype, U.S.N.M., No. 24110)]; 1 La Palma, (no data), M. Valerio, (No. 137) [USNM]; 1 S[an] Isidro (bei S[an] José), E. Reimoser [NMW]; 1 San José, 3-I-1922; 1 San José, 1923, Dutra [both, ZMB]; 4 San José, VII-1936, A. Alfaro, (Acc. 35874) [AMNH]; 1 Tarapiqui, 1923 [ZMB]. **Tilarán**: 1 Tilarán, (no data), Reimoser [NMW].

ECUADOR

WORKERS

Napo: 2 [Pucay River ?] (Buccay ?), X-4-1922, F.X. Williams, 1000' [INHS]. **Guayas**: 1 Guayagil, 1922, Buchwald; 1 Guayagil, III-1928, Buchwald; 1 Guayagil, IV-1928, Buchwald [all, ZMB]; 1 [Naranjal ?] (Naranjapata ?), XI-1926, W.J. Coxey, 1850', (*ex Coll[ectio]n W.J. Coxey*) [ANSP].

HONDURAS

WORKERS

Atlantida: 1 Lancetilla (n[ea]r Tela), IX-5-1930, 75-110', (Honduras Exped[ition]) [ANSP]; 1 Lancetilla, (no data), D.O. Allen [MCZ]. **Locality unknown**: 1 (no data), Kjabins [NRS].

NICARAGUA

WORKERS

Cabo Gracias a Dios: 48 Musawas (Waspuc Riv[er]), 24-X-55, B.M. [MCZ].

PANAMA

WORKERS

Chiriquí: 1 Chiriqui, (no data), (Cat. No. 23), [v.d.V.]; 1 El Volcán, VI-17-1937, C.B. Worth; 1 El Volcán, VII-VIII-1937, C.B. Worth, 4-10,000' [both, ANSP]; 1 Potrerillos, May 5, 1935, J.W.M.; 2 Potrerillos, May 13-14, 1935 [all, KU].

VENEZUELA

WORKERS

Aragua: 1 Lagunita de Aroa, (no data), M.A. Carriker, 2000' [USNM]. **Bolívar**: 1 [Acurima] (not Akuriman), X-1940, P.J.A. [CU]. **Carache**: 1 P[uer]to Cabello, II-6-1940, P.J.A.; 1 P[uer]to Cabello, XI-12-1940, P.J.A. [both, CU]. **Mérida**: 2 Mérida, VIII-1883 [NMW]. **Miranda**: 1 Caracas (n[ea]r), '38, *Anthoni*us, (Hy[menoptera] 6, U.S.N.M. 149968) [USNM]. **Julia**: 1 San Julian, 19 Jul. '00, M.W. Lynn Jr. [ZMB]. **Sucre**: 1 [Carúpano] (not Curupas), VI-7-1938, P. Anduze [USNM]. **Locality unknown**: 1 (no data) [NMW].

LOCALITY UNKNOWN (Central or South America)

WORKER

1 (no data), Graeffe [NMW].

BRAZIL

MALES

Mato Grosso: 1 [Cuiabá] (Chapada), Oct. '15, H.H.S., (Acc. 29966); 1 [Cuiabá] (Chapada), Jan. [yr.?], (Acc. No. 2966); 3 [Cuiabá] (Chapada), March [yr.?] [all, CM]; 1 [Cuiabá] (Chapada), Sept. [yr.?], (Acc. No. 2966, 1644) [INHS]; 1 [Cuiabá] (Chapada), Dec. [yr.?] [CM]; 1 [Cuiabá] (Chapada), (Acc. No. 2966) [MCZ].

COLOMBIA

MALES

Boyacá: 2 Muzo, 1936, J. Bequaert, 900 m [INHS]; 1 Muzo, 3-II-57, J.F., 4260 m [HEM]. **Magdalena:** 1 Rio Frio (Quebrada Mateo), 31-II-[yr.?], Darlington, 1500' [MCZ]. **Santa Marta:** 1 M[on][t][e] Lorenzo, 11-II-27, G. Salt, 8300' [AMNH]; 1 M[on][t][e] Lorenzo, 11-II-27, G. Salt, 8300' [INHS]. **Locality unknown:** 3 (no data) [COL].

COSTA RICA

MALES

Cartago: 1 [Volcán] Irazu, 21-28-V-30, Reimoser, 2200-2500 m [INHS]; 1 [Volcán] Irazu, 21-28-V-30, Reimoser, 2200-2500 m [NMW]. **Guanacaste:** 1 San Mateo, 1904 [AMNH]. **Puntarenas:** 1 Boruca, July 1907, M.A. Carriker [USNM]. **San José:** 1 San José, 1903 [NRS].

ECUADOR

MALE

Guayas: 1 Guayagil, 1922, Buchwald [ZMB].

MEXICO

MALE

Oaxaca: 1 Palomares [Istmo de Tehuantepec], IX-15-21-61, R.&K.D. [RRD].

NICARAGUA

MALES

Cabo Gracias de Dios: 38 Musawas (Waspuc Riv[er]), 24-X-55, B.M. [MCZ]; 2 Los Nubes, 13-X-1952 [ZMA].

PANAMA

MALES

Chiriquí: 1 Chiriquí, (no data) [USNM-(*niger* Fkln. syntype, U.S.N.M. No. 24105)]; 1 Chiriquí, (Cat. No. 22), [v.d.V.]; 1 El Volcán, June-July 1952 [MCZ]. **Colon:** 3 Cerro [de] Campana, 18 Aug. 1958, W.J. Hanson [KU].

Megabombus (M.) steindachneri (Handl.)

Bombus steindachneri Handl., 1888a, p. 239: *Bombus (B.) steindachneri*, Fkln., 1913, p. 105: *Bombus (B.)* (Dumoucheli group), Fkln., 1913, p. 95, (p.p.): *Bremus steindachneri*, Fris., 1925a, p. 159: *Fervidobombus (F.) steindachneri*, Skor., 1922a, p. 154, (list): *Megabombus steindachneri*, Mlrn., 1962b, p. 729: *Megabombus* (Dumoucheli group), Mlrn., 1962b, p. 729, (p.p.): *Megabombus (M.)* (Dumoucheli group), Mlrn., 1961a, p. 57, (p.p.): ... *steindachneri*, Mlrn., 1960a, p. 96, (♂ H.E.M. lectotype).

DESCRIPTION. Queen. Length, 24.0 mm; width at wing bases, 11.0 mm; abdomen, 12.0 mm, width across T2, 12.0 mm; front wing length, 19.5 mm, width, 7.5 mm. **Head:** Frontal outline (excluding mouthparts) trapezoidal, a little higher medially than widest dimension, the upper angles at temple broadly rounded, between them the occiput nearly straight; vertical region for the most part nearly flat and inclined toward occiput, mostly covered with medium punctures; compound eyes noticeably more broadly rounded below than above, their inner margins subparallel to weakly convergent above; ocelli somewhat closer together than their diameters, located in a weak arc just below the supraorbital line; little less than ocellar half of ocellular area smooth, remainder of this area covered with small punctures to vague microscopic punctation; malar space about as long as distance between (and including) mandibular articulations, rather evenly convex and smooth except for few minute punctures; labrum nearly twice as wide as thick, with its ventral margin and prominent shelf rather evenly arcuate, extending to about the middle of tubercles which are flattened ventrally, mesially moderately conical, irregularly punctate and well separated by a rather deep intertubercular depression; flagellum about $1\frac{1}{3}$ times longer than scape, F1 nearly $1\frac{1}{2}$ times as long as subquadrate F2 and distinctly longer than F3, being about $\frac{2}{3}$ as long as F2 and F3 combined; clypeus rather evenly and strongly convex,

approximately $1/3$ wider near base than median height, covered for the most part with small and medium punctures which are sparser medially below. *Legs*: Mesobasitarsite subrectangular, nearly 4 times longer than widest part, its outer surface rather shallowly concave longitudinally, the spinate distoposterior angle considerably extended beyond the blunt distoanterior angle, only a shallow emargination between; outer surface of hind tibia (corbicula) alutaceous and not smooth and especially polished, for the most part broadly and weakly convex longitudinally, widest part considerably broader than length of longer hairs comprising the posterior fringe; metabasitarsite with its outer surface rather deeply and broadly concave longitudinally, the posterior margin of segment arcuate only near base, virtually straight beyond to distal end, the distal angles similar to those of the mesobasitarsite but the emargination between is wider and deeper. *Pubescence*: That on head and abdomen looser and somewhat longer than the rather short, even, fine, and very dense thoracic pile especially on dorsum; basal half of mesobasitarsal posterior fringe of medium length (longest hairs scarcely as long as widest part of the segment) diminishing in length to becoming very short at distal end; metabasitarsal posterior fringe with only a few longer hairs (longest not more than $\frac{1}{2}$ as long as widest part of segment) near base, beyond becoming short to very short at the distal end. *Color*: Head, thoracic pleura below line from bases of hind wings forward, legs, abdominal T1, T2 (except trace of yellow mid-basally), T4-6 and entire venter black; entire thoracic dorsum, few hairs mid-basally on abdominal T2 and all on T3 a rich golden yellow (sometimes more pallid to nearly lemon yellow, cf. under Comments). Wings rather uniformly infumated with brownish black, with a somewhat violaceous luster under certain lights.

Worker. Length, 15.0 mm; width at wing bases, 8.0 mm; abdomen, 8.0 mm, width across T2, 9.0 mm; front wing length, 16.5 mm, width, 6.0 mm. Except for its smaller size, much like the queen; often the corbiculae are more shiny. Generally, the yellow pattern is more pallid and might even approach a straw or canary yellow (cf. under Comments).

Male. Length, 17.5 mm; width at wing bases, 8.5 mm; abdomen, 9.0 mm, width across T2, 8.0 mm; front wing length, 17.0 mm, width, 5.5 mm. *Head*: Frontal outline (excluding mouth-parts) rather narrowly trapezoidal, little higher medially than its widest part, the upper angles rather evenly rounded, the occiput only weakly arcuate; vertical region nearly flat, not strongly sloped and for the most part covered with medium punctures; ocelli positioned in nearly a straight line just below the supraorbital line, removed from one another about as far as their diameters; ocellocular area mostly smooth with only small or obscure punctures in the ocular half; compound eyes only little more broadly rounded below than above, their inner margins almost parallel; malar space about as long as distance between (and including) mandibular articulations, evenly convex and for the most part covered with minute punctures; labrum irregularly flattened, its ventral margin nearly straight, little more than twice as wide as its median thickness, the callosities much reduced and inconspicuous; flagellum at least $4\frac{1}{4}$ times longer than scape, most of its segments distinctly crenulate, F1 about $2/3$ as long as rectangular F2, the combined lengths of these segments only a little more than that of F3. *Legs*: Mesobasitarsite narrowly subrectangular, its outer surface longitudinally concave, the distal end virtually truncate; metabasitarsite subrectangular, the posterior margin weakly arcuate near base and beyond nearly straight, its outer surface for the most part rather deeply concave longitudinally, the distal end subtruncate (with only a shallow emargination between the distal angles). *Pubescence*: Relatively short, dense, and rather even throughout except somewhat longer and looser on most of the scutellum; mesobasitarsal posterior fringe of medium almost even length throughout; posterior fringe on hind tibia medium in length, dense and even; metabasitarsal posterior fringe sparse, short, and of rather even length throughout. Genitalia (not figured) similar to that of *M. (M.) brasiliensis* (Lep.) (Pl. XIV) but differ from that by possessing several distinctive features principal among which are the following: The distal end of the squama is sharply truncate; the end of the mesal process of the squama is more or less curved upwardly; the distal end of the volsella projects much farther beyond the squama and its mesal process is much more prominent; the ectal margin of the sagitta is more sharply angulate medially and the sagittal head is longer. Some of the features above (e.g., those pertaining to the mesal process of the squama, the volsella, and the sagittal head) are similar to the condition found in the genitalia of *M. (M.) opifex* (Sm.) (cf. that species, also on Pl. XIV). The shape of the seventh abdominal sternum resembles that of *brasiliensis* but is distally evenly rounded and this sternum bears more prominent hairs; the shape of the eighth abdominal sternum also resembles that of *brasiliensis* but the more heavily sclerotized arms from the base converge medially and terminate with the formation of two separate, less sclerotized small elongate oval spots (similar to the condition found in *M. (M.) morio* (Swed.), also on Pl. XIV, but larger). *Color*: Face predominantly pale yellow intermixed with some black hairs, remainder of head largely golden-yellow except for a few intermixed black hairs on the vertical region; thoracic dorsum, as well as thoracic pleura anterior to hind wing

bases, trace mid-basally on abdominal T2 and all of T3-4 golden-yellow; remainder of thorax, legs, and remainder of abdomen (except usually some dull pallid hairs along distal margins of the abdominal sterna) black. Wings infumated as deeply as in the other castes, at most only slightly less so.

Redescribed from hypotypes. **Queens**, 3 Mex., 1905, P. H. Goldsmith [2 MCZ, 1 HEM]; **workers**, 1 Bella Vista (Nayarit), Mex., 7-5-56, R. & K. Dreisbach; 1 Cuernavaca, Mex., 9-28-57, R. & K. Dreisbach; 1 Tepic, Mexico, 7-5-56, R. & K. Dreisbach [all, HEM]; **males**, 1 El Molino (Jalisco), Mex., 7-10-56, R. & K. Dreisbach [HEM]; 1 Mex., 1905, P. H. Goldsmith [MCZ].

TYPE. Examined my (1960a: 96) lectotype ♂ in the Naturhistorische Hofmuseum, Vienna.

TYPE LOCALITY. Cuernavaca, Mexico. Number of specimens at hand: 247. In flight: Throughout the year, *i.e.*, a caste or sex of this species might be captured at any time at some particular place in the range of the species. Distribution: (vertical), from *ca.* 1500 to 7700 ft; (horizontal), occurs over most of southcentral Mexico, from Nayarit to southern Veracruz. Floral visitations: *Asclepias*, *Cassia*, *Cuphea*, *Vitex*, and some unidentified Leguminosae.

COMMENTS. Except for size differences, especially in the worker caste where the smallest specimens might not be much more than one-half the given length, few minor morphological inconsistencies have been noted; likewise, the color pattern is very stable except that on some few queens (and possibly true of some workers as well) I have detected a small trace of yellow distolaterally on abdominal T1, and on the same specimens the narrow patch of yellow extends across most of the very base of T2. This species is one of the easiest to identify.

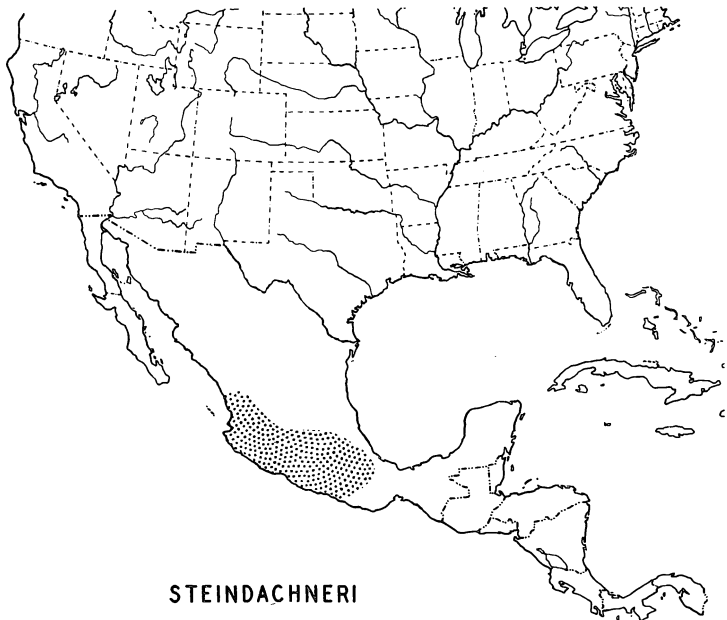
MEXICO

QUEENS

Colima: 1 Colima (vulcano), (no data), L. Conrad [USNM]. **Guerrero:** 1 Chilpancingo, 30 June 1951, H.E.E., on *Asclepias* [KU]; 1 Chilpancingo, H.H.S., 4600', (Godman-Salvin Collection, 1913-214) [MASS]; 1 Teloloapan, VI-12-57, Volando, W.W.G. [INIA]. **Jalisco:** 1 Sayula, May [yr.?] [USNM]. **Mexico:** 1 Valle de Bravo, 10 Julio 1962, Balderas y Ortiz [INIA]. **Morelos:** 1 Alpuyecá [not Alpuyecá] (2 mi S. [of]), V-14-59, H.E.E., 3000' [CU]; 1 Cuautla, July-August '03 (W.L. Tower Collection) [AMNH]; 2 Cuautla, 5-VII-61, F.Po. [INIA]; 1 Cuautla (5 mi W. [of]), 22-VII-62, H.E.M.; 3 Cuautla (10 mi W. [of]), 22-VII-62, H.E.M. [all, CNC]; 1 Cuernavaca, II-7-54, R.R.D., 6000' [RRD]; 1 Cuernavaca, IV-26-1954, ("habitante local") [INIA]; 1 Cuernavaca, VIII-14-54, 5000', (University of) Kans[as] Mex[ican] Exped[ition]; 1 Cuernavaca (12 mi E. [of]), VIII-14-54, 4300', (University of) Kans[as] Mex[ican] Exped[ition]; 2 Cuernavaca (10 mi N. [of]), VIII-15-54, 7700', (University of) Kans[as] Mex[ican] Exped[ition], [all, KU]; 2 Vautepec (Canyon d[e] Lobos), V-25-59, H.E.E., 4000' [CU]. **Puebla:** 3 Matamoros (12 mi SE. [SW.?] [of] Puebla), VII-3-53, 3700', (University of) Kans[as] Mex[ican] Exped[ition]; 1 Tehuizingo (10 mi SE. [of] Puebla [?? 20 mi S.]), VII-3-53, 3900', (University of) Kans[as] Mex[ican] Exped[ition] [all, KU]; 1 Tehuizingo (10 mi SE. [of] Puebla [?? 20 mi S.]), VII-3-53, 3900', (University of) Kans[as] Mex[ican] Exped[ition] [HEM]. **Locality unknown:** 35 (no data except 1905), P.H. Goldsmith [MCZ].

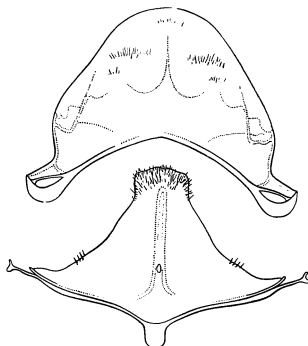
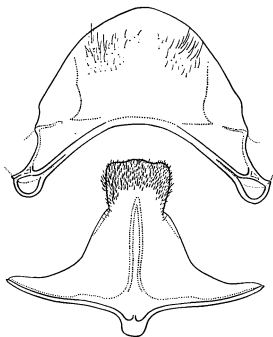
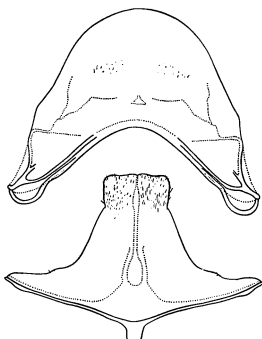
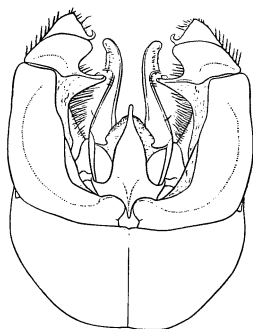
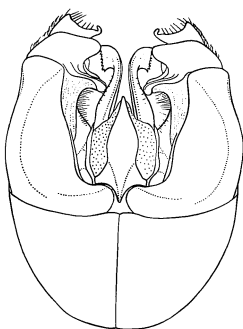
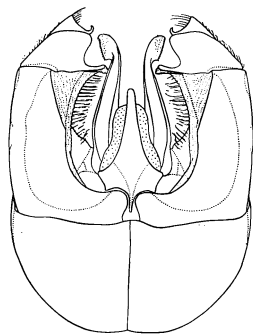
WORKERS

Colima: 1 Colima (Volcán, not Vulcan), (no data), L. Conrad [USNM]. **Federal District:** 1 Mexico City, 22 Aug. '29, G. [Lassmann] (not Lastman) [CU]. **Guerrero:** 1 Amuco (not Amula), Sept. [yr. ?], H.H.S., 6000', (Godman-Salvin Collection, 1913-214) [MASS]; 1 Chilpancingo (not Chipancuiga), II-5-54, R.R.D. [RRD]; 1 Chilpancingo (3 mi N. [of]), 3-19-59, H.E.E., 4000' [CU]; 1 Iguala (33 mi S. [of]), VIII-5-54, 1450', (University of) Kans[as] Mex[ican] Exped[ition] [KU]; 1 Taxco (23 mi N. [of]), 8-VIII-1954, J.G.C., 4700' [CNC]; 1 Taxco (8 mi NE. [of]), VIII-8-54, 5400', (University of) Kans[as] Mex[ican] Exped[ition] [KU]; 1 Tepetlapa, (no data), H.H.S., 3000', (Godman-Salvin Collection, 1913-214) [MASS]. **Jalisco:** 1 El Molino, 7-10-56, R.&K.D. [RRD]; 1 Guadalajara (11 mi S. [of]), VII-18-53, 4800', on *Vitex pyramidata*, (University of) Kans[as] Mex[ican] Expedition [HEM]; 8 Guadalajara (11 mi S. [of]), VII-18-1953, 4800', (University of) Kans[as] Mex[ican] Exped[ition] [KU]; 1 Guadalajara, (no data),



MAP 28.

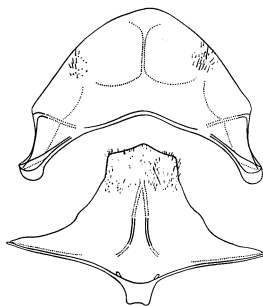
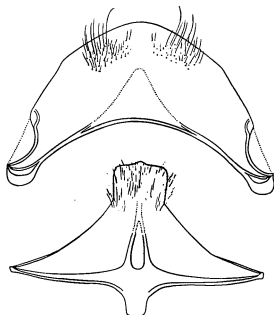
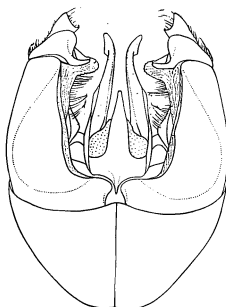
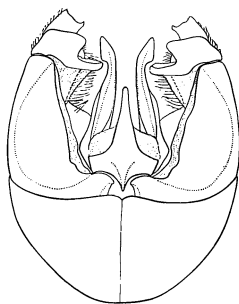
Crawford [AMNH]; 3 Guadalajara, VII-15-[yr. ?], McClendon; 1 Guadalajara, VII-21-[yr. ?], McClendon [all, ANSP]; 5 Guadalajara, (no data), Crawford, (Baker Coll[ectio]n, Cornell U[niversity], Lot 546, sub. 1114) [CU]; 1 Guadalajara, VII-13-[yr. ?], McClendon; 4 Guadalajara, VII-16-[yr. ?], McClendon [all, HEM]; 1 Guadalajara, VII-15-[yr. ?], McClendon [MCZ]; 1 Puente Grande, VIII-20-54, 5000' (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion) [KU]; 2 Sayula, May, [yr. ?] [USNM]; 13 Tequila (8 km W. [of]), 18 July 1951, H.E.E. [KU]; 2 Tequila, VII-18-53, C.&P.V., (D. Rockefeller Mex[ican] Exp[edit]ion), 1953; 1 Tequila (3 mi NW. [of]), VII-19-53, 4000', on *Vitex pyramidata*, (Univ[ersity of] Kans[as] Mex[ican] Expedition) [all, HEM]; 3 Tequila (3 mi NW. [of]), VII-19-53, 4000', on *Vitex pyramidata*, (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion) [KU]. Mexico: 14 Ixtapan de la Sal (not Sall), VIII-19-1954, 5500 ft, (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion) [KU]. Michoacan: 1 Jacona (3 mi W. [of]), VII-18-1953, 5300 ft, (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion) [KU]; 1 Tumbiscatio (7 mi S. [of]), Dec. 1, 1950, R.F.S. [AMNH]; 2 Tumbiscatio (7 mi S. [of]), Dec. 1, 1950, R.F.S. [HEM]. Morelos: 1 Alpuyecá, 3 July 1951, H.E.E. [KU]; 4 Alpuyecá, III-9-59, H.E.E. & D.M. Anderson, 3400' [CU]; 3 Cuautla, July-Aug. '03, (W.L. Tower Coll[ectio]n), [AMNH]; 1 Cuautla (not Cautcia), 7-28-1938, L.J. Lipovsky [KU]; 1 Cuautla, 5-VII-1961, F.Po. [INIA]; 1 Cuautla (5 mi E. [of]), 22-VII-62, H.E.M.; 1 Cuautla (10 mi W. [of]), 22-VII-62, H.E.M. [both, CNC]; 1 Cuernavaca, VII-53, Krauss; 3 Cuernavaca (12 mi E. [of]), VIII-14-1954, 4300', (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion) [all, KU]; 1 Cuernavaca, VI-5-57, W.W.G. [INIA]; 1 Cuernavaca, 9-28-57, R.&K.D.; 1 Cuernavaca, 10-29-57, R.&K.D. [both, RRD]; 1 Cuernavaca, 31-VIII-58, W.W.G. [INIA]; 3 Cuernavaca, III-5-59, H.E.E., 5500'; 1 Cuernavaca, V-16-59, M.A.&H.E.E., 5500'; 1 Cuernavaca, VI-2-59, H.E.&M.A.E., 5500' [all, CU]; 1 Cuernavaca, VII-9-61, R.&K.D.; 2 Cuernavaca, VII-12-19-61, R.&K.D. [all, RRD]; 1 Cuernavaca, 27-VII-62 [INIA]; 2 Cuernavaca, (no data), Crawford, (Baker Coll[ectio]n, Cornell U[niversity], Lot 546, sub. 1114) [CU]; 1 Cuernavaca, (no data), Barrett, (Coll[ectio]n of Frederick Allen Eddy) [MCZ]; 2 Vautepec (Canyon d[e] Lobos), 3-18-59, H.E.E., 4000' [CU]; 1 Xochicalco, 7-13-61, R.&K.D., 4000' [RRD]. Nayarit: 3 Ahuacatlan, VII-18-22-51, H.E.E. [KU]; 2 Bella Vista, 7-5-56, R.&K.D. [RRD]; 1 Compostela (vic[inity of]), IV-34; 3 Compostela (vic[inity of]), VI-1934; 1 Compostela (vic[inity of]), 30-VII-1934; 2 Compostela (vic[inity of]), VIII-1934; 5 Compostela (vic[inity of]), IX-34; 1 Compostela (vic[inity of]), VII-1936 [all, CU]; 13 Ixtlan (16 mi NW. [of]), VII-19-53, 2800', (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion) [KU]; 1 Tepic (25 mi NW. [of]), Oct. 8, 1950, R.F.S. [HEM]; 1 Tepic (16 mi NW. [of]), VII-19-1953, (Univ[ersity of] Kans[as] Mex[ican] Exped[it]ion) [KU]; 1 Tepic (15 mi N. [of]), July 25, 1954, M. Cazier, W. Gertsch, Brandt [AMNH]; 2 Tepic, 7-5-56, R.&K.D.; 1 Tepic, 9-18-57, R.&K.D.



PENNSYLVANICUS

FERVIDUS

DILIGENS

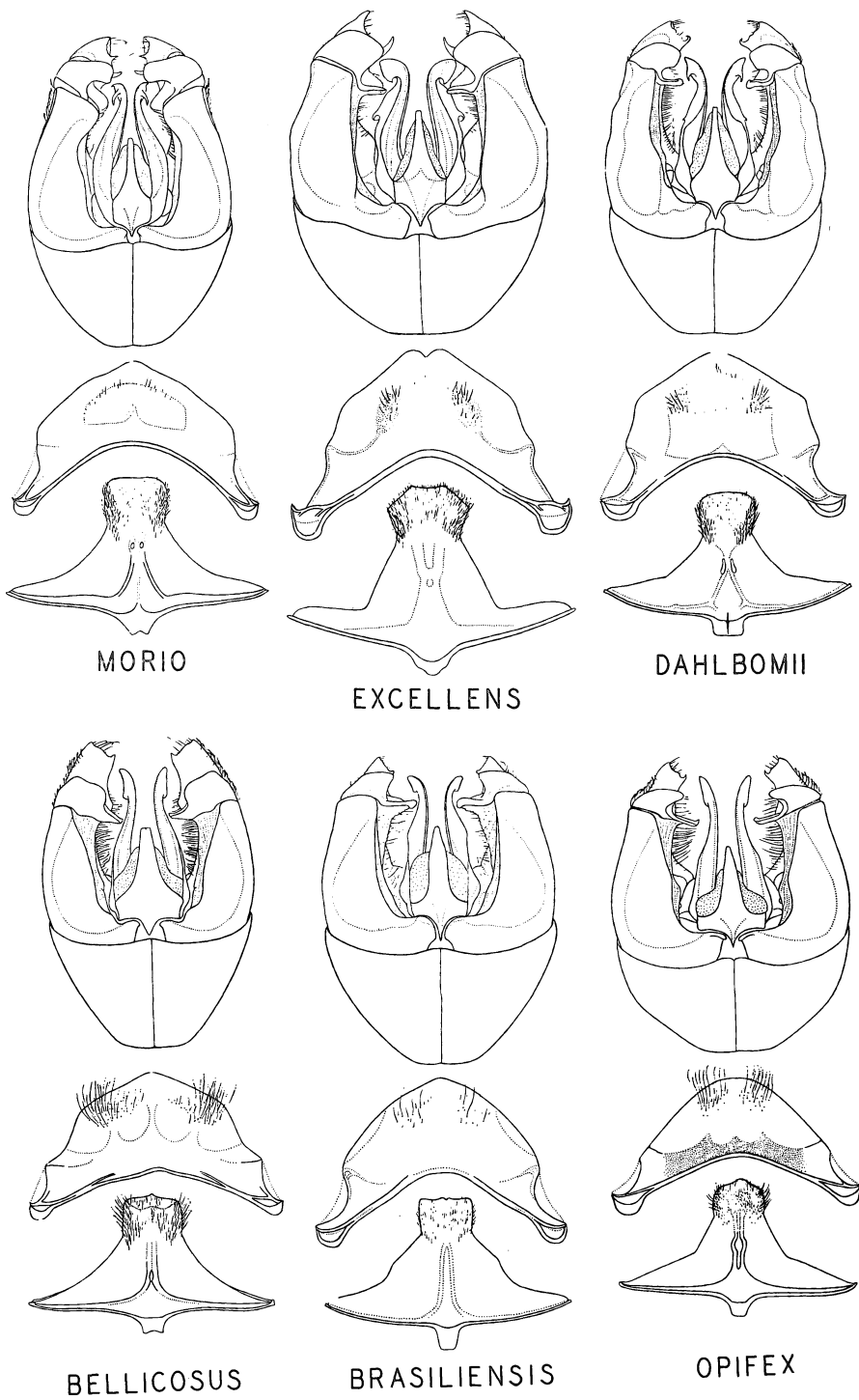


MEDIUS

PULLATUS

(DUMOUCHELI GROUP)

PLATE XIII.



(DUMOUCHELI GROUP)

PLATE XIV.

[all, RRD]. **Puebla:** 1 Atlixco (12 mi S. [of]), VII-2-53, 4900', (Univ[ersity of] Kans[as] Mex[ican] Exped[ition]); 1 Atlixco (7 mi S. [of]), VII-13-1953, 4900', (Univ[ersity of] Kans[as] Mex[ican] Exped[ition]) [both, KU]; 1 Chietla, 23-VII-62, H.E.M. [CNC]; 2 Matamoros (3 mi W., 1 mi S. [of] Iqucarde), VII-16-54, J.R. Alcorn [KU]. **Sinaloa:** 1 Pericos (1 m S. [of]), VI-11-54, A.A. Alcorn [KU]. **Veracruz:** 2 C[udad] Mendoza (4 mi SW. [of]), 16-VIII-62, H.E.M., 3-4000' [CNC]. **Locality indefinite:** 1 Jalisco [or] Nayarit, Sept. 1954, Sharon Keef [AMNH]. **Locality unknown:** 4 1905, P.H. Goldsmith [MCZ]; 1 (no data), (Wm. J. Fox, donor) [ANSP]; 1 (no data), (Baker Coll[ectio]n, Cornell U[niversity], Lot 546, sub. 1114) [CU].

MEXICO

MALES

Colima: 1 Colima (Volcán, not Vulcan), (no data), L. Conrad [USNM]. **Jalisco:** 2 El Molino, 7-10-56, R.&K.D. [RRD]; 5 Guadalajara, (no data), Crawford, (Baker Coll[ectio]n, Cornell U[niversity], Lot 546, sub. 1115) [CU]; 1 Magdalena (14 mi NW. [of]), VII-19-53, 3500', on *Vitex pyramidata*, (Univ[ersity of] Kans[as] Mex[ican] Exped[ition]) [KU]; 1 Tequila (3 mi NW. [of]), VII-19-53, 4000', on *Vitex pyramidata*, (Univ[ersity of] Kans[as] Mex[ican] Expedition) [HEM]; 2 Tequila (3 mi NW. [of]), VII-19-1953, 4000', *Vitex pyramidata*, (Univ[ersity of] Kans[as] Mex[ican] Exped[ition]) [KU]. **Michoacan:** 1 Jacona (3 mi W. [of]), VII-18-53, 5300', (Univ[ersity of] Kans[as] Mex[ican] Exped[ition]) [KU]. **Morelos:** 1 Alpuyecá (3 mi N. [of]), III-4-59, H.E. Evans & D.M. Anderson, 3400' [CU]; 1 Cuernavaca (3 mi W. [of]), 3-3-59, H.E. Evans & D.M. Anderson, 6500'; 1 Cuernavaca (3 mi NW. [of]), IV-12-59, H.E.E., 6500'; 1 Cuernavaca (3 mi NW. [of]), VI-3-59, H.E.E., 6500' [all, CU-(all H.E.M. *steindachneri* homotypes)]; 1 Tepazilan (Y.M.C.A. camp), Aug. 21, '58, H.F.H. [CNC]. **Locality unknown:** 3 1905, P.H. Goldsmith [MCZ]; 1 (no data), Sallé [NRS].

NIGRODORSALIS GROUP

KEY TO SPECIES

Females

1. Clypeus well covered with fine dense punctures; metabasitarsite terminated disto-posteriorly as 90° angle (at most short spinate), apex truncate, distinctly narrower than base, posterior margin nearly straight except strongly arched proximally; pubescence rather long, fine, loose (or shaggy), uneven; thoracic dorsum black, pleura yellow; approximate lateral one-third of abdominal T1-2 yellow, remainder of abdomen black (except sometimes fine tawny yellow distally on T3-6); worker only *digressus* Mltn.* (p. 218)
 Clypeus dorsally and basolaterally coarsely punctate, median area more sparsely sculptured or nearly impunctate; metabasitarsite terminated distoposteriorly as about 80° angle or less, usually at least apex acutely spinate; pubescence medium in length, fine, usually even; not with above color pattern 2
2. Interval between first and second mandibular keels wider distally than between second and basal keels; lower median area of clypeus mostly covered with small weak punctures; thoracic dorsum black or predominantly so, pleura pallid or canary yellow; abdominal T1-2, T3 (except sides) yellow *nigrodorsalis* (Fkln.) (p. 212)
 Interval between first and second mandibular keels and that between second and basal keels about equal distally; median clypeal area shining, sparsely punctate; thoracic dorsum anterior to scutellum mostly yellow to light fulvous, posterior margin of mesonotum often with considerable black (then poorly defined interalar black band with biconcave anterior margin), pleura mostly black, scutellum either yellow or black; abdominal T3 (except extreme base)-4 yellow to light fulvous, T5 (distally), T6 tawny yellow (or slightly rufescent), remainder of abdomen black *trinominatus* (D.T.) (p. 220)

*Queen unknown.

Males

F1 plus F2 slightly longer than F3, F2 short rectangular; labrum about three times as long (or wide) as high mid-vertically which is equal to F4; metabasitarsal outer surface not concave at base; thoracic dorsum mostly yellow to light fulvous, mesonotum and scutellum (posteriorly) usually black intermixed with yellow, pleura mostly black; abdominal T3 (except approximate basal half black) – 4 yellow, T5 with mixture of black and tawny yellow, T6 (distally), T7 tawny yellow (or rufescent), remainder of abdomen above black; genitalia (Pl. XV) *trinominatus* (D.T.) (p. 220)

F1 plus F2 about equal to F3, F2 quadrate; labrum shorter than three times as long (or wide) as high mid-vertically which is less than F4; metabasitarsal outer surface at least weakly concave to near base; thoracic dorsum predominantly black, pleura pale yellow; abdominal T1–2, T3 (sometimes middle) yellow to pale luteous; genitalia (Pl. XV) *nigrodorsalis* (Fkln.) (p. 212)

N.B. *Digressus* Mltn. ♂ is unknown; its genitalia should approximate those of *trinominatus* (D.T.).

***Megabombus (M.) nigrodorsalis* (Fkln.)**

KEY TO SUBSPECIES

Females

Distal margin of abdominal T5, all T6 tawny rufescent, sides of T3, all T4, T5 (otherwise) black *n. nigrodorsalis* (Fkln.) (p. 212)

Sides of abdominal T3, T4–6 entirely black, or nearly so *n. montezumae* (Ckll.) (p. 216)

Males

Extreme distal margins of abdominal T3–5 often with noticeable fine tawny yellow, T6 (distally), all T7 tawny yellow (or rufescent) *n. nigrodorsalis* (Fkln.) (p. 212)

Abdominal T3 (sides and distally) and all terga beyond black or predominantly so *n. montezumae* (Ckll.) (p. 216)

***Megabombus (M.) nigrodorsalis nigrodorsalis* (Fkln.)**

Bombus nigrodorsalis Fkln., 1907, p. 90, (re: nominate ssp. only); Fkln., 1915, p. 410: *Bombus ephippiatus* v. *laboriosus*, Handl., 1888a, p. 233, (p.p.), (*nec ephippiatus* Say, 1837, p. 414; *nec Bombus laboriosus* F., 1805, p. 352), [n. syn.]: *Bombus ephippiatus* v. *laboriosus*, Fkln., 1907, p. 91, (*nec ephippiatus* Say, 1837, p. 414; *nec B. laboriosus* F., 1805, p. 352), [n. syn.]: *Bombus laboriosus* Sm., 1861, p. 153, (*nec B. laboriosus* F., 1805, p. 352), [n. syn.]: *Bombus mateonis* Ckll., 1949, p. 487, [n. syn.]: *Bombus nigrodorsalis* v. *laticollis* Fkln., 1907, p. 91: *Bombus weisi* Fr., 1903, p. 253, ♀, not ♂, (p.p.): *Bombus (B.) nigrodorsalis* Fkln., 1913, p. 98: *Bombus (B.)* (Dumoucheli group), Fkln., 1913, p. 95, (p.p.): *Bremus nigrodorsalis*, Fris., 1925a, p. 150, (p.p.): *Fervidobombus (F.) nigrodorsalis*, Skor., 1922a, p. 154, (list): *Megabombus nigrodorsalis*, Mltn., 1962b, p. 731, (p.p.): *Megabombus* (Nigrodorsalis group) Mltn., 1962b, p. 731, (p.p.): *Megabombus (M.) nigrodorsalis*, Mltn., 1961a, p. 57, (p.p.): *Megabombus (M.)* (Nigrodorsalis group) Mltn., 1961a, p. 57, (p.p.): . . . *laboriosus*, Mltn., 1960a, p. 93 (♀ type), (*nec Bombus laboriosus* F., 1805, p. 352): . . . *weisi*, Mltn., 1960a, p. 98, (♀ type H.E.M. lectotype).

DESCRIPTION. **Queen.** Length, 18.5 mm; width at wing bases, 9.0 mm; abdomen, 9.5 mm, width across T2, 9.5 mm; front wing length, 14.5 mm, width, 5.0 mm. **Head:** Frontal outline (excluding mouthparts) rather narrowly trapezoidal, above weakly arcuate, the temples evenly rounded, medially about as high as widest dimension; vertical region weakly concave, moderate-

ly sloped toward occiput and for the most part rather densely covered with small and medium punctures; ocelli situated in a weak arc just below the supraorbital line, about equal in size and separated from one another by distinctly less than their diameters; compound eyes noticeably more broadly rounded below than above, their inner margins nearly parallel except becoming convergent above; malar space nearly $1\frac{1}{4}$ times longer than distance between (and including) mandibular articulations, irregularly weakly convex, with sparse irregular small somewhat oval punctures; labrum about $2\frac{1}{2}$ times wider than median thickness, the ventral margin nearly straight except rounded at lateral corners, the weakly arcuate shelf moderately sharp, close to ventral margin and transversely extended beyond middle of transversely rather arcuate tubercles which are well but not sharply separated, mostly medium punctate and have somewhat conical and slightly elevated mesal summits; flagellum nearly twice as long as scape, F1 little more than $1\frac{1}{4}$ times longer than rectangular F2, slightly longer than F3 and about $\frac{2}{3}$ the combined lengths of F2 and F3; clypeus rather strongly and evenly convex, the approximate upper half noticeably more densely covered with both medium and small punctures than lower half especially medially below, at broadest part near base about $1\frac{1}{2}$ times wider than median height. *Legs*: Mesobasitarsite rectangular except at very base and distal end, the outer surface nearly flat, little more than 3 times longer than widest part which is about equal to longest hairs of posterior fringe, the sharply acute distoposterior angle extended noticeably beyond the blunter distoanterior one with a moderately deep emargination between; widest part of hind tibia about equal to length of longest hairs of posterior fringe, the outer surface (corbicula) for the most part rather strongly and evenly convex longitudinally and microscopically alutaceous (or granulose); metabasitarsite with outer surface broadly and shallowly concave, the widest part nearly twice as broad as the length of the longest hairs in the posterior fringe, the posterior margin weakly arcuate near base, straight beyond, the acute distoposterior angle extended noticeably beyond the blunt (near right angled) distoanterior one with very shallow gradual emargination between. *Pubescence*: Fine, of medium length and density, somewhat longer on vertex, much of the scutellum and on abdominal T4-5, the distal margins of most abdominal sterna with longer pile than elsewhere on sterna; mesobasitarsal posterior fringe longest near base, gradually becoming short distally; most hairs of corbicular fringe rather long, the fringe not dense, the hairs straight or nearly so except for a few arched distal ones; metabasitarsal posterior fringe of medium length near base becoming very short distally, not dense, most hairs slightly curved. *Color*: Black, except thoracic pleura, a trace on the pronotal lobes and along posterior margin of the pronotum, a trace along extreme anterior margin of scutum (*cf.* under Comments), along posterior margin of the scutellum, and on abdominal T1-2 and most of T3 yellow, most of the abdominal yellow of a slightly deeper shade, and posterior margin of the fifth abdominal segment fringed with burnt sienna which covers all of segment six. Wings uniformly moderately infumated with brownish black.

Worker. Length, 12.5 mm; width at wing bases, 6.5 mm; abdomen, 6.0 mm, width across T2, 6.5 mm; front wing length, 10.0 mm, width, 3.5 mm. Aside from differences in size, essentially like the queen except the following principal points are notable: Head has a less punctate clypeus, the malar space appears very slightly longer in relation to the distance between (and including) mandibular articulations, the lateral ocelli touch the supraorbital line and F1 is comparatively slightly longer. Color pattern is the same as that of the queen except that traces of yellow on the pronotum and anterior margin of the scutum are (usually) variable from faint to being entirely absent as is the yellow along the posterior margin of the scutellum; sometimes there is a noticeable admixture of black hairs beneath the wing bases and on the metapleura; the yellow on the thoracic pleura and abdominal T1-3 is as pale as that on the thoracic pleura of the queen or even more so, and sometimes the burnt sienna on the distal margin of abdominal T5 is replaced by black at least laterally (*cf.* under Comments). Wings are somewhat paler than those of the queen.

Male. Length, 12.5 mm; width at wing bases, 6.0 mm; abdomen, 6.0 mm, width across T2, 6.0 mm; front wing length, 11.0 mm, width, 3.7 mm. *Head*: Frontal outline (excluding mouthparts) trapezoidal, its widest part about equal to the median height, nearly straight across the vertex, the temples somewhat abruptly rounded; vertical region nearly flat, not strongly inclined toward occiput, moderately well covered with small punctures; ocellar half of ocellular area mostly smooth, the ocular half with some small punctures; ocelli positioned in a weak arc, removed from one another by about their diameters, the lateral ones at least touching the supraorbital line; compound eyes more broadly and evenly rounded below than above, slightly bulging, their inner margins mostly parallel except converging above; malar space unevenly convex with some small punctures especially over lower half, little longer (if any) than distance between (and including) mandibular articulations; labrum little more than twice as wide as median thickness, its ventral margin for the most part weakly arcuate, the weak callosities flattened, with few punctures, not sharply divided by a strong depression; clypeus with median height nearly equal to widest part near base, moderately and rather evenly convex, well

covered with small and medium punctures which are sparser medially on the lower half; flagellum between 5 and 6 times longer than scape, with most segments slightly crenulate, F1 little longer than quadrate F2 and at most only slightly more than $\frac{1}{2}$ of F3, F1 and F2 combined little (if any) longer than F3. *Legs*: Mesobasitarsite narrow, subrectangular, about $3\frac{1}{2}$ times longer than broadest part which is as wide as the longest hairs of the posterior fringe, the outer surface shallowly concave longitudinally, the subacute distoposterior angle extended considerably beyond the more or less rounded distoanterior one, with a weak emargination between; outer surface of hind tibia rather evenly convex longitudinally, shining and somewhat sparsely pubescent, the widest part not quite equal to length of longest hairs of posterior fringe; metabasitarsite nearly rectangular, with rather strong (posterior) angle at the base, for the most part at least about $1\frac{1}{2}$ times wider than most of the longer hairs of the posterior fringe, the outer surface broadly and shallowly concave longitudinally, shining, covered with fine recumbent pubescence, the distal end subtruncate (*i.e.*, with a shallow emargination between the two equally extended, more or less rounded distal angles). *Pubescence*: Fine and rather even like that of the female but somewhat looser and not as dense, especially on the abdomen. *Genitalia*, seventh and eighth abdominal sterna (Pl. XV) are representative of this taxon (*cf.* under Comments). *Color*: Head black except a noticeable amount of light yellow on lower portion of gena (cheek) and fine intermixed paler hairs on the face; pattern on thorax like that of the worker, the dorsum almost totally black, there being only a faint trace of yellow on the pronotum, the extreme anterior margin of the scutum and along the posterior margin of the scutellum, the thoracic pleura almost completely light yellow with only very few black hairs beneath tegulae; abdominal T1-2 and most of T3 (which has few black hairs at the sides) deeper yellow than that on thoracic pleura, T4 black, T5 black except its distal burnt sienna fringe (also the corresponding sternum distally) which is also the color on T6 and all of segment 7, the abdominal sterna 2-5 with black or blackish pile and longer more pallid distal fringes. Wings less deeply infumated than those of the queen but similar in color to those of the worker.

Redescribed from hypotypes. **Queens**, 1 Xochimilco, D. F., Mexico, 18-VIII-62, elev. 8000 ft, H. E. Milliron; 1 Oaxaca to Tuxtepec (Rt. 175), Oaxaca, Mexico, 14-VIII-62, elev. 9-10,000 ft, H. E. Milliron [both, HEM]; **workers**, 1 Navios, 26 mi E. El Salto, Dgo., Mexico, 27-VII-1964, 8000', J.F. McAlpine; 1 Navios, 26 mi E. El Salto, Dgo., Mex., 2-VIII-1964, 8000', J. F. McAlpine [both, CNC]; **male**, Rio Blanco, V.C., Mex., 11-13-57, R. & K. Dreisbach [HEM].

TYPE. Examined a ♀ (No. 10452) in the collection of the United States National Museum, Washington.

TYPE LOCALITY. Headwaters, Río Piedras Verdes, Chihuahua, Mexico. Number of specimens at hand: 77. In flight: Throughout the year, *i.e.*, queens, workers, or males, or combinations thereof might be taken any time at the appropriate location in the species' range. Distribution: (vertical), 5000 to 9000 ft; (horizontal), from Costa Rica northward to northcentral Mexico. Floral visitations: *Heterotheca* and *Salvia*. Taken by me on several additional unidentified flowering plants.

COMMENTS. Except for structural differences alluded to in the redescription of the worker caste there is little variation in the female; in the male the genitalia varies to some extent with regard to the following: Distal width of volsellae, size of distal lobe of the squamae, the sharpness of the mid-ectal angle on the sagitta, and shape (broadness) of the basal half of the spatha. The color pattern is noticeably variable as follows: Sometimes there is a distinct narrow yellow band (intermixed with a very few black hairs or not) over the entire pronotum and extending onto the anterior margin of the scutum; frequently abdominal T3 is not entirely yellow, having its extreme lateral portions bearing from a few black hairs intermixed to being predominantly black.

COSTA RICA

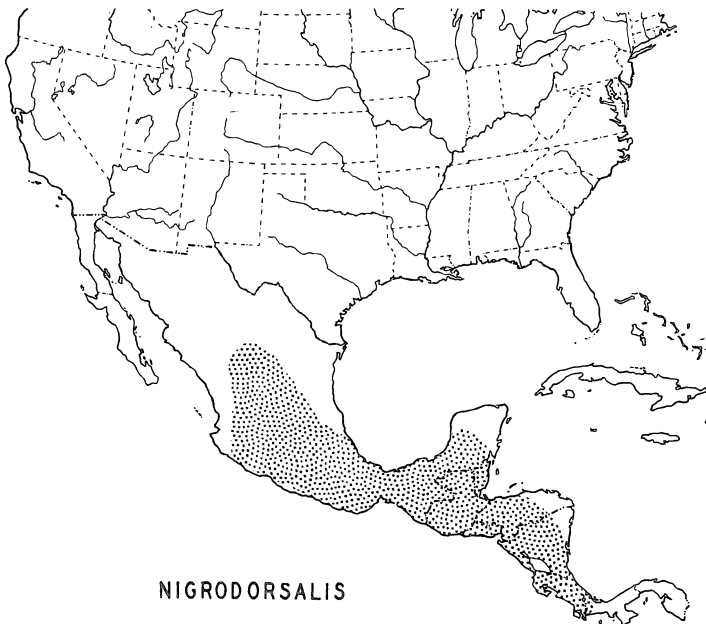
QUEEN

Cartago: 1 Tres Rios, XII-8-55, B.M. [MCZ].

GUATEMALA

QUEEN

Solola: 1 Cunén, Aug. 11, '47, C.&P.V., 6000', (Frank Johnson, donor) [AMNH].



MAP 29.

MEXICO

QUEENS

Chiapas: 1 [San Cristóbal de] Las Casas (4 mi W. [of] Ciudad), VII-25-54, J.R. Alcora [KU]. **Chihuahua:** 1 Meadow V[alle]y, Townsend [USNM-(H.J.F. *nigrodorsalis* type, No. 10452, U.S.N.M.)]. **Federal District:** 1 Atzacapozalco, Aug. 10-20, 1921 [CU]; 2 Xochimilco, Aug. 29, 1947, H.E.M.; 3 Xochimilco, Aug. 31, 1947, H.E.M.; 1 Xochimilco, Sept. 1, 1947, H.E.M. [all, HEM]; 3 Xochimilco, 17-VIII-62, H.E.M., 8000'; 11 Xochimilco, 18-VIII-62, H.E.M., 8000' [all, CNC]; 2 (locality unknown), 26 Aug. 1928, G.L., 2350 m [CU]. **Guerrero:** 1 Omilteme (not Omiteme), H.H.S., 8000', (Godman-Salvin Coll[ectio]n, 1913-13); 1 Xucumanatlan, July [yr.?], H.H.S., 7000', (Godman-Salvin Coll[ectio]n, 1913-14) [both, MASS]. **Hidalgo:** 1 Jacula (7 mi E. [of]), VII-27-54, 5000' (Univ[ersity of] Kan[sas] Expedition) [KU]. **Mexico:** 1 Altacomulco, VIII-18-54, 8800', (Univ[ersity of] Kan[sas] Expedition) [KU]; 1 Chapingo, VI-29-1961, F.Po.; 2 Chapingo, VII-26-1961, F. Po.; 1 Chapingo, VIII-3-1961, F.Po.; 1 Chapingo, VIII-10-1961, F.Po.; 1 Chapingo, 7-VII-1962, F.Po.; 1 Chapingo, 21-VII-62, F.Po. [all, INIA]. **Michoacan:** 1 Morelia, 9-7-1938, L.J. Lipovsky [KU]; 2 Morelia, 9-22-57, R.&K.D. [RRD]; 1 Morelia, 9-22-57, R.&K.D. [RRD]-(H.E.M. *laboriosus* Sm., & *weisi* Fr. p.p., ♀ homotype) 1 Zacapu (5 km W. [of]), 13 July 1951, H.E.E. [KU]. **Morelos:** 1 Cuernavaca, VII-4-1951, H.E.E. [KU]; 1 Cuernavaca (6 mi N. [of]), 15-VIII-54, J.G.C., 7500' [CNC]; 3 Cuernavaca 10 mi N. [of], VIII-15-54, 7700', (Univ[ersity of] Kan[sas] Expedition) [KU]. **Oaxaca:** 1 Oaxaca to Tuxtepec (R[ou]t[e] 175, 142 km NE. (not S.) [of]), 14-VIII-62, H.E.M., 9,000-10,000' [CNC]. **Veracruz:** 1 Jalapa, VIII-1-6-61, R.&K.D. [RRD]; 1 (locality unknown), (Baker Coll[ectio]n, Cornell Univ[ersity], Lot 546, sub. 1200) [CU]. **Locality unknown:** 1 Sallé, (no data) [NRS].

COSTA RICA

WORKER

San José: 1 Santa Ana, 1-13-56, (P.A.B.), (No. 648.58) [USNM].

GUATEMALA

WORKERS

Quezaltenango: 1 (locality unknown), Champion, 7800', (Godman-Salvin Coll[ectio]n, 1913-14) [MASS]. **Sacatepequez:** 1 Comalapa, XI-12-44, 7500' [KU]. **San Marcos:** 3 San Cristóbal, Jan. [yr.?], (Ac. 4875) [AMNH-(H.E.M. *weisi* Fr. homotypes)].

MEXICO

WORKERS

Mexico: 1 Chapingo, X-31-1961, Jorge Avila [INIA]. **Puebla:** 3 M[oun]t Popocatepetl, Sept. 12, 1948, K.W. Marx [HEM]. **Veracruz:** 1 Jalapa, 9-28 [to] X-3-61, R.&K.D. [RRD]; 1 Rio Blanco, 11-13-57, R.&K.D. [RRD-(H.E.M. *weisi* Fr. homotype)]. **Locality unknown:** 3 Salle, (no data) [NRS].

GUATEMALA

MALES

Huehuetenango: 1 (locality unknown), March 10, 1949, H.T. Dalmat [USNM]. **Quezaltenango:** 1 San Mateo, Pelen [USNM-(U.S.N.M. *mateonis* Ckll. paratype, No. 58898)]. **San Marcos:** 2 San Cristobal, Jan. [yr.?], (Acc. 4875) [AMNH].

MEXICO

MALES

Chihuahua: 1 Meadow V[alle]y, Townsend [USNM-(H.J.F. *nigrodorsalis* syntype)]. **Federal District:** 1 Tlalpam, November '87 [ZMB]. **Morelos:** 3 Cuernavaca (10 k[m] N. [of]), XII-28-1949, L.D. Beamer [KU]. **Locality unknown:** 1 Sallé, (no data) [NRS].

Megabombus (M.) nigrodorsalis montezumae (Ckll.)

Bombus nigrodorsalis Fkln., 1907, p. 90, (p.p.), (re: nominate ssp. only): *Bombus ephippiatus* v. *montezumae* Ckll., 1908a, p. 344, (nom. nov., pro *Bombus laboriosus* Sm., 1861, p. 153; nec *Bombus laboriosus* F., 1805, p. 352; nec *ephippiatus* Say, 1837, p. 414), (re: paranominate ssp. only): *Alpigenobombus* (*Robustobombus*) *weisi*, Skor., 1922a, p. 157, (p.p.), (list), (nec *weisi* Fr., 1903, p. 254), [n. syn.]: *Bombus ephippiatus* v. *laboriosus*, Handl., 1888a, p. 233, (p.p.), (nec *ephippiatus* Say, 1837, p. 414; nec *B. laboriosus* F., 1805, p. 352): *Bombus laboriosus* Sm., 1861, p. 153, (nec *laboriosus* F., 1805, p. 352): *Bombus weisi*, Fkln., 1907, p. 91, [n. syn.]: *Bombus* (*Bombias*) *weisi*, Fkln., 1913, p. 148, ♀, (nec *weisi* Fr., 1903, p. 254), [n. syn.]: *Bombus* (*B.*) *montezumae*, Fkln., 1913, p. 95, (p.p.): *Bombus* (*B.*) (Dumoucheli group), Fkln., 1913, p. 95, (p.p.): *Bremus nigrodorsalis*, Fris., 1925a, p. 150, (p.p.): *Fervidobombus* (*F.*) *montezumae*, Skor., 1922a, p. 153, (list): *Megabombus nigrodorsalis*, Mlrm., 1962b, p. 731, (p.p.): *Megabombus* (*M.*) *nigrodorsalis*, Mlrm., 1961a, p. 57: *Megabombus* (*M.*) (*Nigrodorsalis* group) Mlrm., 1961a, p. 57, (p.p.).

DESCRIPTION. Queen, Worker. Size and structure like those of the corresponding females of the nominate subspecies except the queen of this subspecies (usually) is more extensively and coarsely punctate on the clypeus, and the outer surface of the hind tibia is often more noticeably alutaceous or granulose; the same differences might frequently also apply to the worker. **Color:** Pattern as in the nominate subspecies except that the yellow on the pronotum is reduced to a mere trace along the posterior margin and sometimes a very few yellow hairs at the anterolateral corners of the scutum; the yellow along the posterior margin of the scutellum is often more reduced than that in the nominate subspecies and at most only a very few black hairs occur just below the tegulae (or wing bases) and on the metapleura; the yellow of the abdominal pattern most often is concolorous with that on the thoracic pleura; while abdominal T1 is entirely yellow, T2 sometimes has a noticeable admixture of black hairs toward the sides, T3 has at least the approximate lateral fourth entirely black (the median yellow part on this tergum typically is broader basally and narrowly rounded distally, cf. under Comments), T5 like 4 is entirely black, a noticeable amount of black occurs on the ultimate abdominal segment especially basally, and the abdominal venter is black except for the last sternum (hypopygium) which is (like the epipygium) at least predominantly covered with burnt sienna pubescence. Wings sometimes slightly lighter than those of the nominate subspecies especially in the queen.

Male. Structurally (including size) like the corresponding sex of the nominate subspecies. Genitalia, seventh and eighth abdominal sterna similar to those representing the nominate subspecies (Pl. XV) (*cf.* under Comments). **Color:** Pattern (including color) like that of the nominate subspecies except that there is no trace of yellow on the extreme median anterior margin of the scutum and yellow on the scutellar posterior margin is either reduced or absent; the yellow on the abdominal terga (1-3) is usually paler than that of the nominate subspecies, is much reduced on T3, and T4 is black as is T5 entirely, T6 and at least much of T7; abdominal venter black. Wings slightly paler than those of the nominate subspecies.

Redescribed from hypotypes. **Queens**, 1 5-7 mi S. San Cristóbal de las Casas, Chiapas, Mexico, 5-VIII-62, elev. 12,000 ft, H.E. Milliron [CNC]; 1 San Cristóbal de las Casas, Chiapas, Mexico, 6-VIII-62, H.E. Milliron [HEM]; **workers**, 1 San Cristóbal de las Casas, Chiapas, Mexico, 5-VIII-62, elev. 11,000 ft, H.E. Milliron; 1 San Cristóbal de las Casas, Chiapas, Mexico, 8-VIII-62, elev. 11,000 ft, H.E. Milliron [CNC, HEM]; **males**, 2 San Cristóbal de las Casas, Chiapas, Mexico, 7-VIII-62, elev. 11,000 ft, H.E. Milliron [CNC, HEM].

TYPE. Examined a ♀ (the type of *laboriosus* Sm. (1861) *nec* Fabricius 1805), Type Hym. 17B1051, in the British Museum (N.H.), London.

TYPE LOCALITY. Oaxaca, Mexico. Number of specimens at hand: 99. In flight: Early August to *ca.* mid-October is indicated by available records, but the period probably should be somewhat extended as associated males have been captured during the first half of August. **Distribution:** (vertical), 9,000 to 12,000 ft; (horizontal), southern Mexico. **Floral visitations:** *Aster*, *Calliandra*, and *Cirsium*.

COMMENTS. There appears to be little structural variation of any significance in this taxon; in the female there are some slight differences in the nature and extent of punctuation on the clypeus, the relative lengths of the basal flagellar segments referred to (in the nominate subspecies), and possibly the length of the malar space. The male genitalia show a small degree of variability in width of the tips of the volsellae, size and shape of the squamae and in width and shape of the spatha, but these are within the expected ranges of differences in certain species and subspecies. The color pattern, however, varies to a noticeable extent, the yellow often being completely absent, or nearly so, on the thoracic dorsum whereas on some specimens it is present as indicated or even to a greater degree. The yellow on abdominal T3 varies in extent from being present as a small patch more or less mid-basally and with an arcuate posterior margin, or this color might cover virtually all this tergum except its extreme lateral portions where at least some black pubescence usually occurs.

Franklin (1913: 95) was the first to elevate this form to specific status but later (1915: 410) considered it nothing more than a color variant of *nigrodorsalis*.

MEXICO

QUEENS

Chiapas: 1 San Cristóbal de las Casas, 4-VIII-62, H.E.M., 11000'; 2 San Cristóbal de las Casas, (5-7 mi S. [of]), 5-VIII-62, H.E.M., 12,000'; 1 San Cristóbal de las Casas, 6-VIII-62, H.E.M., 11,000'; 2 San Cristóbal de las Casas, 7-VIII-62, H.E.M., 11,000'; 3 San Cristóbal de las Casas, 9-VIII-62, H.E.M., 11,000'; 4 Tuxtla (R[ou]t[e] 190, 30 mi S. [of], or km 1148 S. of Mex[ico] City), 10-VIII-62, H.E.M., 9500' [all, CNC].

WORKERS

Chiapas: 1 San Cristóbal de las Casas, 4-VIII-62, H.E.M., 11,000'; 18 San Cristóbal de las Casas, 5-VIII-62, H.E.M., 11,000'; 2 San Cristóbal de las Casas, 6-VIII-62, H.E.M., 11,000'; 22 San Cristóbal de las Casas, 7-VIII-62, H.E.M., 11,000'; 16 San Cristóbal de las Casas, 8-VIII-62, H.E.M., 11,000'; 10 San Cristóbal de las Casas, 9-VIII-62, H.E.M., 11,000' [all, CNC]. **Hidalgo:** 5 San Juan (Tezontla [Tezoantla]), X-16-160, F.Po. [INIA]. **Oaxaca:** 1 Monte Alban (Ruinas de), IX-29-61, Jorge Avila [INIA]; 7 Oaxaca to Tuxtepec (R[ou]t[e] 175, 142 km NE. of Oaxaca [not S.]), 14-VIII-62, H.E.M., 9600' [CNC].

MALES

Chiapas: 2 San Cristóbal de las Casas, 7-VIII-62, H.E.M., 11,000' [CNC]. **Hidalgo:** 2 San Juan (Tezontla [Tezoantla]), X-16-1960, F.Po. [INIA].



MAP 30.

Megabombus (M.) digressus Mltn.

Bombus lateralis "var." Sm., 1879, p. 134: *Megabombus digressus* Mltn., 1962b, p. 730: *Megabombus* (Nigrodorsalis group) Mltn., 1962b, p. 730, (p.p.): *Megabombus (M.)* (Nigrodorsalis group) Mltn., 1961a, p. 57, (p.p.).

DESCRIPTION. Worker. Length, 14.0 mm. *Head:* Frontal outline trapezoidal, little higher than wide; lateral ocelli touching supraorbital line; clypeus weakly convex to nearly flat medially; labrum with rather weak shelf overlying evenly arcuate anterior (ventral) margin; malar space about $1\frac{1}{4}$ times longer than distance between (and including) mandibular articulations; F1 one and one-fourth times longer than quadrate F2, only slightly (if any) longer than F3; meso-basitarsal distoposterior angle acutely rounded, not spinate as in *nigrodorsalis*; metabasitarsite wider basally than distally, distoposterior angle acutely rounded, outer surface distinctly concave and smooth, posterior margin nearly straight except weakly arcuate near base. *Pubescence:* Medium in length, uneven, moderately fine and loose throughout. *Color:* Head, thoracic dorsum, median thirds of abdominal T1–2, remainder of abdomen above and legs for the most part black, thoracic pleura and lateral thirds of abdominal T1–2 yellow.

Queen, male. Unknown.

VARIATION. Only the holotype and a paratype worker are known. The latter has the black on abdominal T1 and T2 covering slightly more than the median third of each, and there is a trace of drab yellow on abdominal T3 along the lateral third of the extreme distal margin. Also, there is microscopic pale pile along the posterior margins of abdominal T4–5 and laterally on T6.

TYPE. Examined a ♀, Val de Fuego, Guatemala, deposited in the British Museum (N.H.), London.

TYPE LOCALITY. Val de Fuego, Guatemala. Number of specimens at hand: 2. In flight: Unknown. Distribution: (vertical), unknown; (horizontal), Guatemala and Costa Rica. Floral visitations: None recorded.

COMMENTS. The species, which is structurally allied to *Megabombus* (*M.*) *nigrodorsalis* (Fkln.), differs as follows: Its ocelli are located slightly higher; the anterior margin of the labrum is more arcuate; the labral tubercles are not as strongly extended mesally; the relative lengths of the basal flagellar segments are not alike; the shapes of the meso- and metabasitarsites do not conform; and, the color pattern is markedly dissimilar.

COSTA RICA

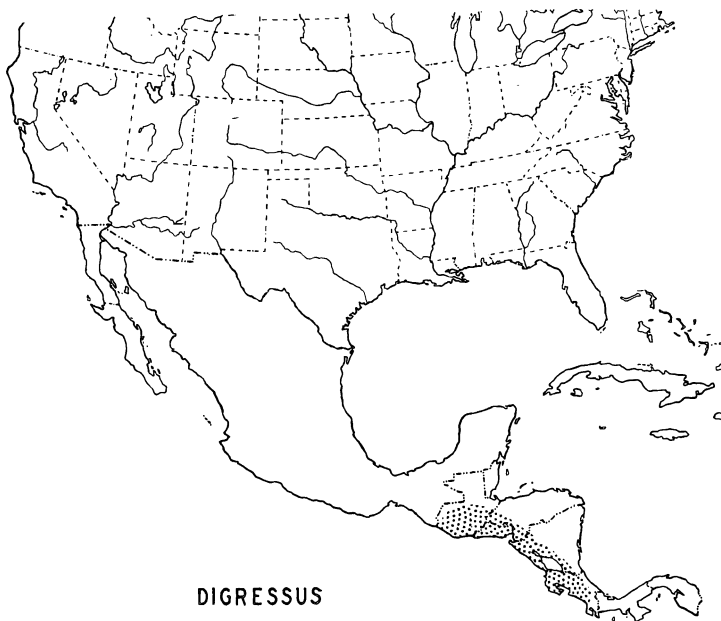
WORKER

Limón: 1 R[io] Susio, (no data) [BMNH, paratype].

GUATEMALA

WORKER

Escuintla: 1 Val de Fuego, (no data) [BMNH, holotype].



MAP 31.

Megabombus (M.) trinominatus (D.T.)

Bombus trinominatus D.T., 1890, p. 139: *Bombus modestus* Sm., 1861, p. 153, ♀, ♂, (*nec modestus* Evsn., 1852, p. 134: *nec modestus* Cr., 1863a, p. 99): *Bombus* (B.) *trinominatus*, Fkln., 1913, p. 83: *Bombus* (B.) (Pratorum group), Fkln., 1913, p. 83, (p.p.), [n. syn.]: *Megabombus trinominatus*, Mltn., 1962b, p. 730: *Megabombus* (Nigrodorsalis group) Mltn., 1962b, p. 730, (p.p.): *Megabombus* (M.) (Nigrodorsalis group) Mltn., 1961a, p. 57, (p.p.): *Pratobombus trinominatus*, Skor., 1922a, p. 158, (list): . . . *modestus*, Mltn., 1960a, p. 94, (♀ type).

DESCRIPTION. **Queen.** Length, 19.0 mm, abdomen, 11.0 mm, width at wing bases, 9.5 mm, width across abdominal T2, 10.5 mm front wing length, 17.0 mm, width, 6.0 mm. **Head:** Frontal outline broadly triangular (excluding mouthparts), little higher than wide; vertex depressed in ocellar area and somewhat strongly inclined behind, rather evenly covered with small irregular punctures except inner half of ocellocular area and anterior of noticeably larger median ocellus; ocelli situated in very weak arc, closer together than diameters of lateral ones which are very close to supraorbital line; ocellocular line little greater than interocellar line; compound eye more widely rounded below than above, little more than twice as high as wide, inner margin nearly parallel to its counterpart except weakly convergent dorsally and divergent ventrally; clypeus approximately $1\frac{1}{2}$ times wider at base than high, rather strongly and evenly convex over median area which is moderately well covered with fine irregular punctures except small smooth mid-ventral spot; labrum subrectangular, little more than $2\frac{1}{2}$ times wider than thick, its ventro-lateral corners broadly rounded, its anterior (ventral) margin nearly straight except for very weak median lobe, the prominent mesally pointed tubercles with irregularly weakly sculptured concave summits, inner tubercular depression rather wide but not sharply defined, area beneath irregularly sculptured, without strongly differentiated shelf, rather narrowly transversely sulcate basally, pubescent; malar space $1\frac{1}{2}$ times as long as distance between (and including) mandibular articulations, somewhat irregularly convex medially, polished and microscopically sculptured; flagellum about $1\frac{3}{4}$ times as long as scape, F1 much longer than F2 which is little longer than wide, distinctly longer than F3 which is $\frac{1}{4}$ longer than wide or about equal to $\frac{2}{3}$ of F2 and F3 combined. **Legs:** Mesobasitarsite little more than 3 times longer than wide, subrectangular except attenuated at base, rather sharply emarginate distally, distoposterior angle acute spinate, outer surface concave; outer surface of hind tibia mostly finely granulose (or alutaceous), moderately convex longitudinally along anterior (ventral) half, only wider distal half relatively free of pubescence; metabasitarsite little more than twice as long as greatest width, distinctly wider at auricle than at distal end which is subtruncate with shallow emargination and subacute distoposterior angle, posterior margin rather strongly evenly arcuate on proximal half, virtually straight on distal half, outer surface broadly concave. **Pubescence:** Fine, uneven, most on thoracic dorsum rather short and dense, elsewhere moderately long and dense; hind tibial posterior fringe not thick, comprised mostly of straight hairs equal in length to greatest tibial width, proximal half of outer hind tibial surface with noticeable semi-erect hairs; metabasitarsal posterior fringe moderately long basally, becoming short on distal half. **Color:** Head black. Thoracic dorsum yellow ocher on approximate anterior half and on interalar area mesad of tegula; interalar area predominantly intermixed with black, forming narrow rather indefinite interalar band pointedly extended medially forward but black on mesoscutum posteriorly and on scutellum anteriorly, with sharp median extension onto latter; scutellum brownish yellow and black intermixed, dominantly black anteriorly and at posterior margin; remainder of thorax black. Legs black except limited pale pile on coxae, trochanters, femoral bases, the hind tibial fringe with slight ferruginous tinge. Abdominal T1–2, T3 (narrowly at base) black; remainder of T3, all T4 yellow ocher; T5 black except finer hairs on distal margin and at sides with yellowish-ferruginous tinge; T6 mostly with pale ferruginous tinge; venter for the most part pale yellow ocher. Wings infuscated with light brown, venation brown to black.

Worker. Length, 12.0 mm, abdomen, 6.0 mm; width at wing bases, 6.0 mm, width across abdominal T2, 7.0 mm; length of front wing, 11.0 mm, width, 4.0 mm. Structurally similar to queen but differs in the following respects. **Head:** Vertex weakly convex, somewhat more extensively punctate; ocelli about equal, in nearly straight line, lateral ones touching supraorbital line; labral tubercles less prominent, labral shelf considerably narrower but somewhat more distinct; F1 noticeably longer than quadrate F2, little less than $\frac{2}{3}$ of F2 and F3 combined. **Legs:** Outer hind tibial surface rather evenly convex mid-longitudinally, much less pubescent than in queen; metabasitarsal posterior margin less strongly arched proximally. **Pubescence:** Similar

to that in queen but somewhat more even. *Color*: Throughout much as in the queen except yellow on mesoscutum more extended posteriorly, nearly covering it. Wings less deeply infumated.

Male. Length, 12.0 mm, abdomen, 6.0 mm; width at wing bases, 6.0 mm, width across abdominal T2, 7.0 mm; length of front wing, 12.0 mm, width, 4.0 mm. *Head*: Frontal outline triangular (excluding mouthparts), little higher than wide; vertex weakly convex, sloped posteriad, covered with moderate-sized punctures except smooth and polished in front of median ocellus; interior one-half of ocellular area with few punctures and continued smooth noticeably posteriad and lateroanteriad; ocelli less than their diameters apart, situated in weak arc, lateral ones on supraorbital line; ocellular line less than interocellar line; compound eye about $2\frac{1}{2}$ times higher than wide, inner margin weakly incurved above; clypeus about as high as wide at base, rather strongly evenly convex, covered with moderate-sized punctures except sparsely and weakly so on mid-vertical area; labrum pubescent, nearly rectangular, evenly punctate except on weak basal callosities, transversely slightly concave, anterior (ventral) margin rounded at corners, otherwise nearly straight; mandibular space slightly convex, smooth except for microscopic sculpture and pubescence, nearly as long as distance between (and including) mandibular articulations; flagellum nearly 4 times longer than scape, median segments weakly arcuate ventrally, F1 distinctly longer than F2 which is only slightly longer than wide, about $\frac{3}{4}$ length of either F3 or F4. *Legs*: Mesobasitarsite subrectangular, attenuated basally, subtruncate distally, distoposterior angle acutely rounded, outer surface nearly flat; hind tibial outer surface rather uniformly convex mid-longitudinally, evenly covered with fine semi-erect pubescence; metabasitarsite subrectangular, rather abruptly attenuated basally, distal end truncate except for shallow emargination, distoposterior angle a rounded right-angle, posterior margin weakly evenly arcuate, outer surface mostly concave mid-longitudinally. *Pubescence*: Moderately long, loose, rather dense on thorax, and uneven throughout; hind tibial posterior fringe not dense or even; metabasitarsal posterior fringe longest on proximal half (subequal to greatest width of segment) and that on distal half distinctly shorter. Genitalia and seventh and eighth abdominal sterna (Pl. XV). *Color*: Stronger pubescence on head entirely black, finer pile on face and vertex behind ocelli pallid under strong light; thoracic dorsum to beyond wing bases yellow ocher, extreme posterior margin of mesoscutum and scutellum dominantly brownish black intermixed with some yellowish pile, thoracic pleura dark except intermixed with yellowish anteroventrad of tegulae; legs entirely dark except yellowish on coxae, trochanters and basoventrally on femora, hind tibial (in part) and metabasitarsal posterior fringes with faint ferruginous tinge under strong light; abdominal T1–2, T3 (most of basal half) brownish black, remainder of T3 and all T4 yellow ocher, T5 dominantly yellow ocher laterally intermixed with dark pile which predominates near center, T6 dominantly brownish black with fine pile on distal margin having ferruginous tinge, T7 pale ferruginous, abdominal venter yellowish. Wings moderately uniformly infuscated with brown, venation dark brown to black.

Redescribed from hypotypes. **Queen**, Mex[ico], Sum., 6 4, (O. Sichel Colln.): **worker**, Mexico, (Perez Colln.), both in the collection of the author. "Allotype" **male** (also labeled as a hypotype), 96, Oax[aca], Mex[ico], 8 6 4, Sum., (O. Sichel Colln.), in the collection of the Museum National d'Histoire Naturelle, Paris. "Parallotypes": 1 96, Oax[aca], Mex[ico], 8 6 7, (O. Sichel Colln.) 1 96, Oaxac[a], Mex[ico], Sum., 6 4 3, (O. Sichel Colln.) 1 96, Oax[aca], Mex[ico], 8 6 4, Sum., (O. Sichel Colln.), all in the collection of the Museum National d'Histoire Naturelle, Paris. 1 96, Oaxac[a], Mex[ico], Sum., 6 4 3, (Perez Colln.), in the collection of the author.

TYPE. Examined Smith's ♀ *modestus*, Type Hym. 17B1046, in the British Museum (N.H.), London (Milliron 1960a: 94).

TYPE LOCALITY. Oaxaca, Mexico. Number of specimens at hand: 39. In flight: The only available definite records for this species refer to queens observed by me, searching for nest sites in mid-August. *Distribution*: (vertical), known from ca. 10,000 to 12,000 ft; (horizontal), southcentral Mexico. *Floral visitations*: Captured by me on *Cirsium*.

VARIATION. Queen. Relative to other specimens seen, few conspicuous structural differences are noted. With respect to size the range is small. Some specimens show minor differences in sculpture; the labral shelf is sometimes more pronounced than described though still situated very close to or on the ventral margin as component part. The most pronounced chromatic variation concerns the amount

of yellow on the scutellum. Some specimens have a predominantly yellow scutellum, while on others this part is longitudinally bisected by a rather narrow black line. If a noticeable amount of yellow occurs on the scutellum then a rather peculiar interalar band (variable in width, sharply extended medially onto the mesoscutum and pointed medially onto the scutellum as a bisector) forms a black interalar cruciform pattern. Sometimes the yellow does not extend backward even quite to the tegulae and from this point posteriad the thoracic dorsum may be entirely black. The pattern of the abdomen appears to be rather stable, however, on some there might be scattered yellow hairs along the distal margin of T2, in which case nearly all of T3 is yellow. **Worker.** The chromatic variation is presumably like that of the queen, but none of the workers seen has as much yellow on the scutellum as does the lightest queen. **Male.** The complete range of variation cannot be given, as only four specimens of this sex have been seen. However, in one male the scutellum resembles that of some females having this part mostly yellow ochre, narrowly margined behind with black and with a faint indication of a narrow black bisector. The distal abdominal terga might be dominantly black, or T7 might be brownish yellow and lack any ferruginous tinge.

COMMENTS. This species appears to be rather uncommon and confined to a limited area in Mexico, presumably only at the higher elevations. Except for meager information about the altitude where some specimens have been captured, little is known about the habitat, behavior, and biology of the species. In the past, it has been confused with *fervidus californicus* (Sm.), from which it is distinctly different structurally. In the female, the clypeus is less strongly punctate, F1 is shorter, the malar space a little shorter, the posterior margin of the metabasitarsite more strongly and less evenly arched, the body form smaller and more compact, and the pubescence longer and shaggier than in *f. californicus*. Franklin (1913), who had but two queens, incorrectly believed that the species belonged to the Pratorum group and that *Pyrobombus* (*P.*) *vosnesenskii* (Rad.) was its closest relative; of course, a comparative study of the female mesobasitarsite, wing venation, antennae, and mandibles reveals that this cannot be so, and that the species really belongs to the Mendax Line. Additional characteristics afforded by the male show that *trinominatus* is closely related either to *nigrodorsalis* (Fkln.) or to *digressus* Mlrm., from both of which it easily can be distinguished by its chromatic pattern or by the structural differences given in the keys.

MEXICO

QUEENS

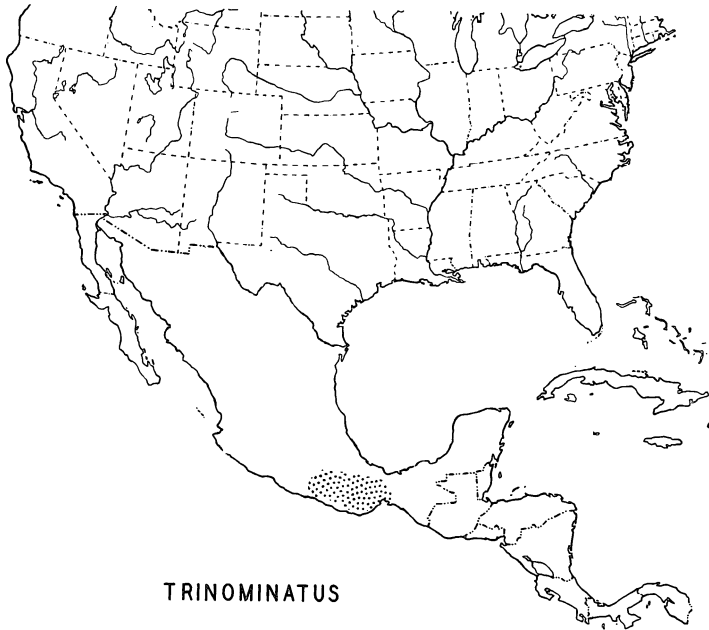
Oaxaca: 7 Oaxaca (40 mi E. [of] R[ou]t[e] 175 to Tuxtepec), 14-VIII-62, H.E.M., 12,000' [CNC]; 4 (locality unknown), 1867, O. Sichel; 1 (locality unknown), 1915, J. Perez [all, MNHN]. **Locality unknown** (Mexico; Guerrero and/or Oaxaca?): 4 (no data except 1859), Sallé; 3 (no data except 1867), O. Sichel; 1 (no data except 1915), J. Perez; 1 (no data), Benoist [all, MNHN]; 2 (no data) [ANSP, one a H.E.M. *modestus* Sm. homotype]; 1 (no data) [USNM, H.E.M. *modestus* Sm. homotype]; 1 (no data) [UZM].

WORKERS

Oaxaca: 5 (locality unknown), 1867, O. Sichel [MNHN]. **Locality unknown** (Mexico; Guerrero and/or Oaxaca?): 1 (no data except 1859), Sallé; 1 (no data except 1867), O. Sichel; 1 (no data except 1915), J. Perez [all, MNHN]; 1 (no data), Sallé [NRS].

MALES

Oaxaca: 4 (locality unknown), 1867, O. Sichel; 1 (locality unknown), 1915, J. Perez [all, MNHN, one a H.E.M. "allotype" *trinominatus* D.T., two H.E.M. "parallotypes"].



MAP 32.

MEXICANUS GROUP

KEY TO SPECIES

Females

1. Clypeus triangularly flattened (at most very weakly convex), laterally sloping sharply; vertex surrounding ocelli concave, behind distinctly elevated, arched, strongly ventose anterior to median ocellus; malar space slightly longer than distance between and including mandibular articulations; pubescence short, dense, entirely jet-black; wings black with steel-blue reflection under certain light *brevivillus* (Fkln.) (p. 224)
Not with this combination of characters, at least with some yellow 2
2. Clypeus little wider basally than high, median surface rather evenly convex, well covered with dense small punctures; metabasitarsal posterior margin straight except strongly arched at base; thoracic dorsum rich golden yellow, except for moderately wide sharp interalar jet-black band; abdominal T3 golden-yellow, remainder of abdomen jet-black except fine dense rufescent hairs distally on T6; wings black with some violaceous reflection under certain light *transversalis* (Oliv.) (p. 232)
Clypeus wider than high, somewhat more strongly convex, more coarsely punctate dorsally than below; metabasitarsal posterior margin weakly arched from base to apex; abdominal T3 golden yellow to luteous, dense fine pubescence on T6 (distal margin) rufescent; remainder of body jet-black; wings black with some violaceous reflection under certain light *mexicanus* (Cr.) (p. 227)

Males

1. F1 distinctly longer than F2; metabasitarsal outer surface mid-longitudinally concave; at least some part of body yellow 2
 F1 shorter than F2; hind tibial posterior fringe short, rather uniform, dense; metabasitarsite elongate-narrow, more than 4 times longer than greatest width, outer surface nearly flat except narrowly elevated along posterior margin; entirely jet-black; wings black with steel-blue reflection under certain light; genitalia (Pl. XV) *brevivillus* (Fkln.) (p. 224)
2. F1 not greatly shorter than F2, combined only slightly longer than F3; malar space subequal in length to distance between and including mandibular articulations; labrum transversely concave; hind tibial posterior fringe rather short, even, not dense; body black except abdominal T3 golden yellow, T4-7 usually black though often intermixed with varying amounts of yellow; wings dark (blackish) with violaceous reflections under certain light; genitalia (Pl. XV) *mexicanus* (Cr.) (p. 227)
 F1 distinctly shorter than F2, together definitely longer than F3; malar space about as long as distance between and including mandibular articulations; labrum not transversely concave, callosities separated medially; hind tibial posterior fringe moderately long, dense, longest medially; thorax golden-yellow, except rather narrow well-defined interalar black band; abdominal T3 golden-yellow, T4 sometimes with yellowish basally though usually black like T1-2 and T5-7; wings black with dull violaceous reflections under certain light; genitalia (Pl. XV) *transversalis* (Oliv.) (p. 232)

Megabombus (M.) brevivillus (Fkln.)

Bombus (B.) *brevivillus* Fkln., 1913, p. 119: *Bombus cayennensis* v. *violaceus*, auctt., (nec *Apis cajennensis* F., 1798, p. 273; nec *violaceus* Lep., 1836, p. 473), [n. syn.]: *Bombus* (B.) *niger* Fkln., 1913, p. 120, ♀, (p.p.): *Bombus* (B.) *solus* Fkln., 1913, p. 117: *Bombus violaceus*, auctt., (nec *violaceus* Lep., 1836, p. 473), [n. syn.]: *Bombus* (B.) (Dumoucheli group), Fkln., 1913, p. 95, (p.p.): *Bremus solus*, Fris., 1925a, p. 161: *Fervidobombus* (F.) *brevivillus*, Skor., 1922a, p. 153, (list): *Fervidobombus* (F.) *solus*, Skor., 1922a, p. 154, (list): *Megabombus* (Mexicanus group) Mlrm., 1962b, p. 731, (p.p.): *Megabombus* (M.) (Mexicanus group) Mlrm., 1961a, p. 57, (p.p.).

DESCRIPTION. **Queen.** Length, 26.5 mm; width at wing bases, 11.0 mm; abdomen, 13.5 mm, width across T2, 12.0 mm front wing length, 20.5 mm, width, 7.5 mm. **Head:** Frontal outline (excluding mouthparts) roundly trapezoidal, above weakly arcuate, temples somewhat bulging and sharply rounded, little higher medially than widest dimension; vertical region mostly weakly concave and for the most part covered with medium and small punctures, moderately inclined toward the occiput, with a rather striking crescent-shaped elevation above; ocular half of ocellocular area mostly covered with minute to microscopic punctures, the ocellar half smooth except for few small separate punctures outwardly; compound eyes distinctly more broadly and evenly rounded below than above, their inner margins subparallel except evenly convergent above; ocelli rather large, located in a weak arc distinctly below the supraorbital line and separated from one another by about $\frac{1}{2}$ their diameters; malar space nearly equal in length to distance between (and including) mandibular articulations, rather weakly and somewhat unevenly convex, shining and bearing microscopic punctations; labrum about twice as wide as its greatest thickness, the ventral margin arcuate, the shelf prominent but not especially sharp, tubercles roughly sculptured with their subconical mesal summits well separated by a moderately deep depression; flagellum $1\frac{3}{4}$ times longer than scape, F1 about $1\frac{1}{2}$ times longer than F2 which is distinctly shorter than F3, the combined lengths of F2 and 3 not much in excess of the length of F1; clypeus nearly $1\frac{1}{2}$ times wider near base than median height, most of the middle portion weakly convex to nearly flat forming a trapezoidal appearance with the smaller more or less arcuate dimension above, for the most part not densely covered with small to medium punctures. **Legs:** Mesobasitarsite subrectangular, about $3\frac{1}{2}$ times longer than widest part which is nearly

1½ times the length of longest hairs in posterior fringe, the outer surface broadly concave longitudinally, the distoposterior angle acute but not sharply so, extended considerably beyond the blunt distoanterior angle, with a narrow emargination between; outer surface of hind tibia weakly convex longitudinally to nearly flat, somewhat alutaceous (microscopically granulose), the broadest portion about 1½ times wider than length of longer hairs of the posterior (corbicular) fringe; metabasitarsite with posterior margin for the most part straight being abruptly and strongly arcuate near base, the outer surface broadly concave longitudinally, the broadest portion about 3 times wider than length of longest hairs of posterior fringe, the subacute distoposterior angle extended considerably beyond the blunter distoanterior one, with a shallow emargination between. *Pubescence*: Short, dense, even throughout; corbicular fringe dense, comprised mostly of straight hairs of medium length except somewhat shorter toward base and longer, evenly arcuate ones distally; metabasitarsal posterior fringe dense, of nearly straight hairs which are longest basally and gradually diminished in length toward distal end of the segment. *Color*: Jet-black throughout. Wings uniformly black with some violaceous reflections under certain light.

Worker. Length, 18.0 mm; width at wing bases, 8.5 mm; abdomen, 9.0 mm, width across T2, 8.5 mm; front wing length, 16.5 mm, width, 6.0 mm. Disregarding difference in size, the features of this caste are so similar to those of the queen that they need not be treated in detail; generally these are more diminutive, and sometimes they are less clearly evident; for example, the weakly convex to flattened condition on the clypeus might be more difficult to detect, the limits of any depressed or flattened area on the vertical region might not be so sharply defined, and sometimes the posterior margin of the metabasitarsite is not as abruptly and strongly arcuate near the base. Often the outer surface of the hind tibia is somewhat more shiny, and on certain parts the punctation is subject to some variation.

Male. Length, 18.5 mm; width at wing bases, 8.0 mm; abdomen, 9.5 mm, width across T2, 8.0 mm; front wing length, 17.0 mm, width, 6.0 mm. *Head*: Frontal outline (excluding mouth-parts) rather narrowly trapezoidal, nearly straight above and evenly rounded at the temples, about as high as its widest dimension; vertical region nearly flat and well covered with mostly medium punctures, weakly inclined toward occiput; ocular half of ocellocular area with minute punctures, the ocellar half largely smooth; ocelli situated in a weak arc, separated from one another by slightly less than their diameters, distinctly below the supraorbital line; compound eyes somewhat more broadly and more evenly rounded below than above, their inner margins almost parallel; malar space little longer than distance between (and including) mandibular articulations, weakly convex, with some minute punctures; labrum little more than twice as wide as thick, its ventral margin broadly arcuate, its surface mostly flat and with very weak finely punctate callosities; clypeus weakly convex over most of its median area, the sides prominently sloped; flagellum about 4 times longer than scape, F1 as long as or slightly longer than F2 and little more than ½ of F3, being distinctly more than ¼ the combined lengths of F2 and F3. *Legs*: Mesobasitarsite narrow elongate rectangular, at least 4 times longer than widest part which is little wider than longest hairs of posterior fringe, the outer surface broadly concave longitudinally, distoposterior angle only slightly sharper than the distoanterior one, and both about equally extended with shallow emargination between; outer surface of hind tibia rather weakly and unevenly convex; metabasitarsite with broadest part nearly 4 times as wide as longest hairs of posterior fringe, its outer surface for the most part weakly concave to nearly flat then rising rather strongly to the posterior margin which is weakly and evenly arched along the proximal half, beyond less arcuate to nearly straight, the distal angles about equally extended with shallow emargination between, both subacute, the distoposterior one being somewhat more rounded. *Pubescence*: Length, density, and evenness similar to that given for the queen. *Genitalia*, seventh and eighth abdominal sterna (Pl. XV). *Color*: Entirely black except face with some fine pallid pubescence intermixed, and sometimes part of the pile on leg bases will be at least pale tipped; and that along the posterior margins of some abdominal sterna (especially the distal ones) will be pale. Wings black but not as deeply so as those of the females.

Redescribed from hypotypes. **Queens**, 1 Xavantina, M. Grosso, Brasil, 3-VIII-54, M. Alvaranga, Coleção Campos Seabra [HEM]; 2 Cachimbo, Pará, Brazil, VI-1955, P.M. Oliveira, Coleção Campos Seabra [Seabra]; **workers**, 1 Brazil, Paraíba, Santa Luzia Mun., Serra do Brandão dos Chandoca, 4-8 Dec. 1955, (Sebastidos Madeiros) [HEM]; 1 Brasil, Paraíba, Mun. Soledade, Joazeirinho, 20 Aug. 1955, (Paulino Lima) [KU]; **males**, Mangabeira, Mocajuba, Pará, Brasil, IV-1953, Orlando Rego, Coleção Campos Seabra [HEM]; 1 Upper Mazaruni R., Br. Guiana, IX-X, 1938 [AMNH].

TYPE. Examined a ♀ (No. 24106) in the collection of the United States National Museum, Washington.

TYPE LOCALITY. Bonito (Pernambuco), Brazil. Number of specimens at hand: 77. In flight: Throughout the year, *i.e.*, queens or workers or males, or combinations thereof, might be captured at any place or date in the species' range. Distribution: (vertical), the only records are near sea level; (horizontal), British Guiana, northeastern states of Brazil (including some parts of Mato Grosso), and eastern Colombia. I have seen one of the *niger* Fkln. syntype workers labeled Peru (Callanga); this and a very questionable record from the State of São Paulo in Brazil need confirmation. Floral visitations: No botanical records are associated with any available material.

COMMENTS. This taxon is very distinctive and easy to recognize. In the female the median area of the clypeus is, for the most part, weakly convex to nearly flat and does not vary widely in this respect as to be unreliable. The genitalia of the male is very characteristic and does not closely resemble that of other species.

Chromatic aberrations are not often encountered in this species. I have found only a very few non-striking ones on which one or more isolated yellow hairs occur almost anywhere on the abdominal dorsum, especially along the extreme lateral limits of a tergum.

BRAZIL

QUEENS

Bahia: 1 Iguas[s]ú (or Iguacú), 27 Aug. [yr.?], Roman, (Sv. [Swedish] Amaz[onian] Exp[edition]) [NRS]. **Ceara:** 1 Acarahú (not Acarau), X-19-2, Maturino [Seabra]. **Mato Grosso:** 1 Corumba, April [yr.?] [ANSP]; 1 Xavartina, 3-VIII-1954, M.A. [Seabra]. **Minas Gerais:** 1 Bello Horizonte, 1 [to] 6 Nov. '19, (Cornell University Expedition) [CU], **Pará:** 1 Belem, XII-1954, R. Damasceno; 1 Cachimbo, VI-1955, M.A.; 12 Cachimbo, VI-1955, F.M.O.; 3 Mocajuba, (Mangabeira), IV-1953; Orlando Rego; 1 Mocajuba, (Mangabeira), VII-1953, Orlando Rego [all, Seabra]; 2 Rio Acara, 1930, E. Horvath [NRS]; 1 Santarem, (Igarape Assú), 5-X-55, Marcirio da Silva [Seabra]; 1 Utinga, (Mangabeira), 9-11-1938 [CL].

COLOMBIA

QUEEN

Department and locality unknown: 1 (no data), (C.F. Baker Coll[ectio]n) [USNM].

BRAZIL

WORKERS

Alagoas: 1 Penedo, XI-1951, J. Viana [Seabra]. **Bahia:** 1 Nazareth, 30-6-15 [USNM]; 1 Villa Nova, (no data), (18422; 96230) [SADZ]. **Ceará:** 1 Acarahú (not Acarau), X-1952, Maturino [Seabra]; 1 Fortaleza, 1935, Othon Diogenes [USNM]; 1 Serrinha, X-34, O. Diog[enes], (96245) [SADZ]. **Goiás:** 3 Aragarcas, 30-III-1953, M.A. [Seabra]. **Pará:** 2 Cachimbo, I-1955, J.A. Arujo; 9 Cachimbo, VI-1955, F.M.O. [all, Seabra]; 2 Cachimbo, X-55, P[adr]e F.S. Pereira, (Pastrana, donor) [HEM]; 1 Mocajuba, (Mangabeira), III-1953, Orlando M. Rego; 3 Mocajuba, (Mangabeira), IV-1953, Orlando Rego [all, Seabra]; 4 Santarem, (no data) [ANSP]. **Paraíba:** 1 Campina Grande, 24-XI-1955, M.&M.; 1 Joazeirinho, (Soledade, Man[dacarú]), 20 Aug. 1955, Paulino Lima; 1 Santa Luzia, (Man[dacarú], Serro do Brandão dos Chandoca), 4 [to] 8 Dec. 1955, Sebastidos Madeiros [all, KU]. **Pernambuco:** 1 Pern[a]mbuco, (B[o]nito Prov[ince]), 5-I-83 [USNM-(*niger* Fkln. syntype, U.S.N.M. No. 24110)]. **Rio Grande do Norte:** 1 Macaíba, 2-I-52, M.A.; 1 Natal, III-1950, L.C.A. [both, Seabra]. **MISLABELED (Brazil):** 1 (Estaç[ão] R.D.S., S[ão] P[aulo]), (18494; 96227) [SADZ].

BRITISH GUIANA

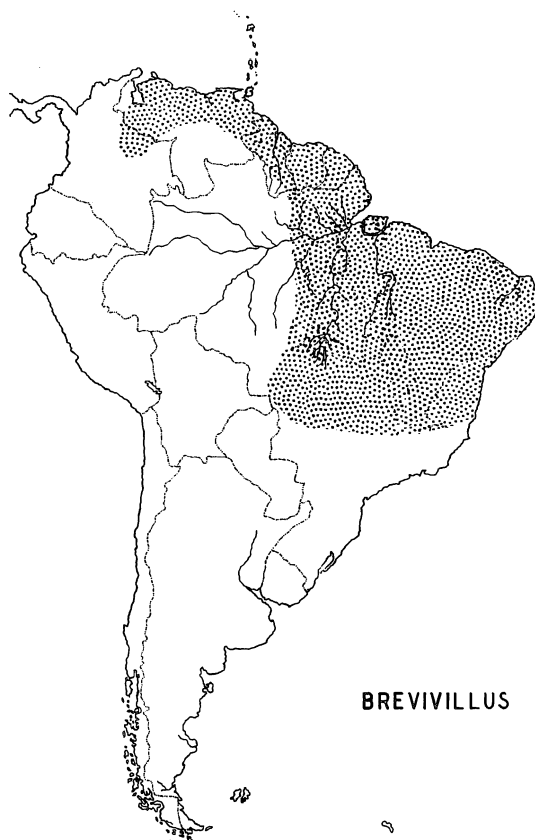
WORKERS

District unknown: 3 Upper Mazaruni R[iver], IX-X 1938, A.S. Pinkus [AMNH].

BRAZIL

MALES

Bahia: 1 Iguas[s]ú (or Iguacú), 21 July [yr.?], Roman, (Sv. [Swedish] Amaz[onian] Exp[edition]) [NRS]. **Mato Grosso:** 1 Chapada, [Cuiabá], Oct. 21 [yr.?], H.H.S., (Acc. No. 2966); 1 Chapada,



MAP 33.

[Cuiabá], (no data), (Acc. No. 2966) [both, CM]. **Pará:** 2 Mocajuba, (Mangabeira), IV-1953, Orlando Rego [Seabra]; 1 (locality unknown), 6-1903, Ducke [ZMB]. **Paraíba:** Joazeirinho, (Soledade, Man[dacarúl]), 25 Sept. 1955, Paulino Lima [KU]. **Pernambuco:** 1 Recife, 27-IV [to] 4-V-27, Zerny [NMW].

BRITISH GUIANA

MALE

District unknown: 1 Upper Mazaruni R[iver], IX-X-1938, A.S. Pinkus [AMNH].

Megabombus (M.) mexicanus (Cr.)

Bombus mexicanus Cr., 1878, p. 187: *Bombus cayennensis*, Handl., 1888a, pp. 240, 241, (p.p.), (nec *Apis cajennensis* F., 1798, p. 273), [n. syn.]: *Bombus cayennensis* v. *mexicanus*, (vel *unifasciatus* Sm., 1879, p. 133), Handl., 1888a, p. 241, (nec *A. cajennensis* F., 1798, p. 273), [n. syn.]: *Bombus mexicanus* v. *adani* Ckll., 1949, p. 488, [n. syn.]: *Bombus unifasciatus* Sm., 1879, p. 133: *Bombus (B.) mexicanus*, Fkln., 1913, p. 128: *Bombus (B.)* (Dumoucheli group), Fkln., 1913, p. 95, (p.p.): *Bremus mexicanus*, Fris., 1925a, p. 148: *Fervidobombus (F.) mexicanus*, Skor., 1922a, p. 153, (list): *Megabombus (M.) mexicanus*, Mltn., 1961a, p. 57: *Megabombus* (Mexicanus group) Mltn., 1961a, p. 57, (p.p.): . . . *unifasciatus*, Mltn., 1960a, p. 97 (♀ type).

DESCRIPTION. Queen. Length, 25.0 mm; width at wing bases, 10.0 mm; abdomen, 14.0 mm, width across T2, 11.0 mm; front wing length, 19.5 mm, width, 6.5 mm. *Head:* Frontal outline (excluding mouthparts) rather broadly trapezoidal, only slightly higher than its greatest width, the temples evenly rounded, the occiput only weakly elevated; vertical region for the most part flat, moderately inclined toward the occiput, rather evenly covered with medium punctures; ocular half of ocellocular area mostly minutely punctate, the ocellar half smooth except for few very small punctures outwardly; compound eyes more widely and evenly rounded below than above, their inner margins nearly straight and slightly diverging below; ocelli comparatively small, positioned in a very weak arc, separated from one another by about their diameters, the lateral ones touching the supraorbital line; malar space about as long as distance between (and including) mandibular articulations, its surface unevenly convex and mostly bearing very small irregular punctures; labrum about $2\frac{1}{2}$ times wider than its greatest thickness, the ventral margin evenly arcuate, the shelf weak and not very sharp, the tubercles covered with small punctures, flat below and with subconical mesal summits that are not deeply and sharply separated; flagellum little more than $1\frac{1}{2}$ times longer than scape, F1 at least $1\frac{1}{2}$ times longer than quadrate F2 and considerably longer than F3, being about $\frac{2}{3}$ as long as F2 and F3 combined; clypeus evenly convex but not strongly bulging, little less than $2\frac{1}{2}$ times as high as widest part near base, well covered with medium and small punctures except sparsely so mid-basally. *Legs:* Mesobasitarsite rectangular, $4\frac{1}{2}$ times longer than wide, concave longitudinally, the acute disto-posterior angle extended slightly beyond the blunt distoanterior angle, with shallow emargination between; outer surface (corbicula) of hind tibia barely concave to nearly flat on posterior half with a weak convexity longitudinally on most of the anterior half, most of the surface being alutaceous (granulose), not highly polished anywhere, the widest part little less than twice the length of longest hairs comprising most of posterior (corbicular) fringe; metabasitarsite with outer surface widely concave mid-longitudinally, its posterior margin weakly arcuate at basal third, beyond nearly straight to the rather blunt distoposterior angle which is about equally produced as the blunt distoanterior angle, with a somewhat pronounced emargination between, the widest part being about $2\frac{1}{2}$ times as wide as longest hairs of the posterior fringe. *Pubescence:* Short, dense, and even throughout except somewhat longer and looser on most of scutellum and on abdominal T4-5; mesobasitarsal posterior fringe short and even; corbicular fringe comprised of hairs that are mostly straight and of medium length except very short basally, distally longest and arcuate, rather dense; metabasitarsal posterior fringe moderately dense, short, longest basally and gradually diminishing in length beyond, becoming very short and sparse or absent distally. *Color:* Entirely black except abdominal T3 which is golden-yellow. Wings brownish black to black with some violaceous reflection under certain lights.

Worker. Length, 16.5 mm; width at wing bases, 8.0 mm; abdomen, 8.0 mm, width across T2, 7.0 mm; front wing length, 15.0 mm, width, 5.0 mm. Except for its smaller size, it closely resembles the queen in structural details save for a few minor points; for example, often the clypeus might be less densely punctate than in the queen, and the outer surface of the hind tibia is sometimes more strongly and evenly convex longitudinally as well as more shiny. *Color:* Like that of the queen except often the yellow on abdominal T3 is noticeably paler.

Male. Length, 14.5 mm; width at wing bases, 6.5 mm; abdomen, 7.0 mm, width across T2, 6.0 mm; front wing length, 14.0 mm, width, 4.5 mm. *Head:* Frontal outline (excluding mouthparts) roundly trapezoidal, slightly wider than median height, the upper angles (temples) rather sharply rounded, the occiput straight to at most only weakly arcuate; vertical region virtually flat, mostly covered with medium punctures, only weakly sloped toward occiput; ocelli situated in a weak arc and separated from each other by noticeably more than their diameter, the lateral ones fully touching the supraorbital line; most of the ocular half of ocellocular area with some medium to small punctures, the ocellar half smooth and impunctate; compound eyes distinctly more broadly and evenly rounded below than above, their inner margins subparallel; malar space about $1\frac{1}{2}$ times as long as the distance between (and including) mandibular articulations, the surface rather unevenly convex and for the most part minutely punctate; labrum pubescent, little more than twice as wide as thick, mostly flat, the callosities much reduced and irregularly punctate, the ventral margin nearly straight; most flagellar segments very weakly crenulate, F1 subequal to F2 and little more than $\frac{1}{2}$ that of F3. *Legs:* Mesobasitarsite narrow elongate-rectangular, at least 4 times longer than widest part, little wider than longest hairs of posterior fringe, only weakly concave longitudinally, the distal end nearly truncate with both distal angles about equally extended; metabasitarsite subrectangular, about $3\frac{1}{2}$ times longer than the widest part, close to $\frac{1}{2}$ wider than longest hairs of posterior fringe, the posterior margin only weakly arcuate at basal third, beyond nearly straight, the outer surface shallowly to rather deeply concave longitudinally, the distoposterior angle somewhat sharper than distoanterior one, both about equally extended with shallow emargination between. *Pubescence:* Similar to that of queen and worker but somewhat shorter and less dense especially

on the abdomen; mesobasitarsal posterior fringe rather short, moderately dense, longest on the basal half and gradually diminishing in length distally, all hairs being virtually straight; metabasitarsal posterior fringe short, straight and rather even except distal hairs somewhat shorter, noticeably less dense than fringe on corresponding segment of middle leg. Genitalia, seventh and eighth abdominal sterna (Pl. XV). *Color*: Black except traces of yellowish brown (especially intermixed with the black on the clypeus) and traces of fine pallid pubescence elsewhere on the face, and all abdominal T3 and at least the basal portion of T4 yellow. Wings infumated as in the queen and worker though somewhat less deeply so.

Redescribed from hypotypes. **Queens**, 2 Guatemala City, December 1911, W.M. Wheeler [MCZ]; 1 Samorano, Honduras, Nov. 15, [1946 or 1947], Lloyd Strand [HEM]; **workers**, 1 San Salvador, El Salvador, 15 June 1958, O.L. Cartwright [USNM]; 1 Zamorano, Honduras, Oct. 23, [1946 or 1947], Vidales; **male**, Acatenango, Guatemala, August 1948, H.T. Dalmat [both, HEM].

TYPE. Examined a Cresson (1916: 124) lectotype ♀ (No. 2646) in the collection of the Academy of Natural Sciences of Philadelphia.

TYPE LOCALITY. Mexico. Number of specimens at hand: 288. In flight: specimens of any caste (or sex) of this species might be taken any time during the year at the appropriate location. Distribution: (vertical), sea level to 11,000 ft; (horizontal), definitely known from Panama northward to southern Mexico; *reported* as extending into South America to Ecuador. Floral visitations: *Calliandra*, *Candelarita*, *Coffea*, *Dahlia*, *Prosopis*, *Tabebuia*, and *Duranta* (Cockerell 1949: 487).

COMMENTS. Except for variability of size of workers some of which might not be much more than $\frac{1}{2}$ that given above, both queen and worker are reasonably stable structurally as well as in color pattern. The male, on the other hand, is subject to a certain degree of chromatic variation whereby yellow might occur on the basal middle of abdominal T2 as well as over all of T3–4; perhaps there is even more extensive color variability but too few males are at hand to permit a more informative statement in this regard.

Reputedly taken in Ecuador, I have before me a male in too poor condition for complete description; it is close to *mexicanus* to which I had long considered it to belong. However, after critical study of the specimen, noticeable structural differences were noted concerning the genitalia, antenna, malar space, and punctuation on the head; the color is at variance in that the face bears more pallid pubescence, the pronotum has numerous yellowish hairs, traces of yellow occur on abdominal T2, all of T3–4 are yellow, there are traces of burnt sienna on T6 and abdominal segment 7 is largely of this color; most of the abdominal sterna have pale pile on their distal margins. This might represent an undescribed species, or if it is *mexicanus* it shows that considerable variation can occur especially in the male.

COSTA RICA

QUEEN

Cartago: 1 Tres [Amigos] Rios, XII-8-55, B.M. [MCZ].

GUATEMALA

QUEENS

Guatemala: 4 Guatemala City, December 1911, W.M. Wheeler [MCZ]. **San Marcos**: 1 San Cristóbal, January [yr.?], (Ac. 4875) [AMNH].

HONDURAS

QUEENS

Tegucigalpa: 1 Tegulgalpa [Tegucigalpa], XII-9-19, F.J.D. (No. 30558) [AMNH]; 1 Zamorano, Nov. 15, [1946], Lloyd Shank [HEM].



MAP 34.

MEXICO

QUEEN

1 (locality unknown) (no data) [ANSP].

PANAMA

QUEEN

Chiriqui: 1 Lino, (no data except 800 m) [MCZ].

COSTA RICA

WORKERS

Bagaces: 1 Orosi, X-53, N.L.H.K. [KU]. **Cartago:** 3 Cartago, X-1953, N.L.H.K.; 3 Cartago, XI-1953, N.L.H.K. [all, KU]; 3 Cartago, (Cornell U[niversity], Lot 724, sub. 9); 1 Cartago, (Cornell U[niversity], Lot 724, sub. 13) [all, CU]; 1 Cartago [MCZ]; 1 Pacayas, C. Werckele [AMNH]. **Heredia:** 3 Guapiles, VII-1915, D.E. Harrower; 1 Monte Redondo, January 1903, C.F. Underwood; 16 M[on]t[e] Redondo, I-03; 2 Tarbaca, 1919 [all, ANSP]; 3 Santa Clara (Colombiana Farm), Mar.-Apr. 1924, W.M.Mn. [USNM]. **Puntarenas:** 1 Orotina, 1 May 1924, J.C.B., (Cornell Univ[ersity], Lot 7005) [CU]; 1 San Mateo, 1904 [ZMB]; 1 San Mateo, 2-1911 [AMNH-(H.E.M. *unifasciatus* Sm. homotype)]. **Santa Cruz:** 1 Pozo Azul (Cosbade [?], Pirris [Rio]), October '17, (C[arnegie] M[useum], Acc. 2448) [CU]. **San José:** 5 San José, June 25, '03, J.C. Crawford, on dahlia, (S. Graenicher, donor) [MCZ]; 1 San José, VI-25-03, J.C. Crawford, on dahlia [USNM]; 1 San José, 1903 [AMNH-(H.E.M. *unifasciatus* Sm. homotype)]; 1 San José, 1903, Buchwald [ZMB]; 1 San José, V-20-37, A. Alfero, (Ac. 35874) [AMNH]. **Locality unknown:** 6 V-1-02, M.A. Carriker [USNM].

EL SALVADOR

WORKERS

San Salvador: 1 San Salvador, 15 June 1958, O.L. Cartwright; 1 San Salvador, 15 Julie 1958, O.L. Cartwright [both, USNM].

GUATEMALA

WORKERS

Amatitlan: 2 Amatitlan, VIII-24-1947, C.&P.V., 4000', (F. Johnson, donor) [AMNH]. **Chimaltenango:** 1 Antigua, VIII-15-51, R.H. Painter [KU] 1 Antigua, W.P.C. [CNC] 2 Pochuta (S[an]ta Emilia [Elena]), Feb.-Mar. '31, J. Bequaert, 1000 m [MCZ]. **Escuintla:** 4 Guatalon (Moca), Mar.-Apr. '31, J. Bequaert, 1000 m, on flowers of coffee; 12 Guatalon (Moca), Mar.-Apr. '31, J. Bequaert, 1000 m [all, MCZ]; 4 Obispo (La Providencia), VI-14-26, J.M. Aldrich [USNM]; 2 Patulul, M. Bates [MCZ]. **Guatemala:** 1 Guatemala, 11 May 1931, Bates (522); 1 Guatemala, 22 May 1931, Bates (522); 3 Guatemala City, December 1911, W.M. Wheeler [all, MCZ]; 2 Guat[emala] City, M[ar]ch 1932, C.N. Ainslie, 5000'; 2 Guat[emala] City, C.N. Ainslie, 5000' [all, USNM]; 1 Guat[emala] City, W.P.C. [MASS]. **Jutiapa:** 1 Lag[o] Atescatempa, 7-23-58, Neff & Matthews, 2000' [CU]. **San Marcos:** 8 San Cristóbal, January [yr.?], (Acc. 4875) [AMNH]. **Solola:** 1 Lake [Lago de] Atitlan, Feb. 27, 1932, C.N. Ainslie, 6000' [USNM]. **Suchitepequez:** 4 Panama, VI-23-1947, C.&P.V., 2500', (F. Johnson, donor); 5 S[an]ta Barbara (8 mi N. [of]), Finca S[an]ta Adeliada), July 14-16, 1959, P.&C.V., 2600'; 1 Variedades, VII-1-47, C.&P.V., 500', (F. Johnson, donor), 3 Variedades, VII-3-47, C.&P.V., 500', (F. Johnson, donor); 10 Variedades, VIII-28-47, C.&P.V., 500', (F. Johnson, donor); 8 Variedades, VIII-29-47, C.&P.V., 500', (F. Johnson, donor) [all, AMNH]. **Locality unknown** (Guatemala): 3 1923, (F 4697); 1 (no data), (F 4697), [all, AMNH]; 1 (no data), (*ex* Geo. P. Engelhardt Coll[ectio]n, Brooklyn Mus[eum] 1929 Coll[ectio]n, Acc. No. 99025) [USNM]; 25 (no data) [MCZ].

HONDURAS

WORKERS

Choluteca: 1 Cantarranas (Rio Cholteca), VIII-5-1930, 2200', (Honduras Exped[itio]n) [ANSP]. **Tegucigalpa:** 2 Tegucigalpa, May 19, 1917, F.J.D.; 1 Tegucigalpa, June 16, '17, F.J.D.; 1 Tegucigalpa, VI-26-17, F.J.D., (No. 27084); 1 Tegucigalpa, VII-19-17, F.J.D., (No. 23045); 1 Tegucigalpa, VII-25-17, F.J.D., (No. 28729, [*vel* 28701]); 1 Tegucigalpa, VII-28-17, F.J.D., (No. 28964); 1 Tegucigalpa, II-7-18, F.J.D., (No. 33335); 1 Tegucigalpa, F.J.D., (No. 43354) [all, AMNH]; 1 Tegucigalpa, F.J.D. [USNM]; 1 Zamorana (Antonio Moliva R[iver]), Feb. 12, 1907, on *Tabebuia pentaphylla*; 1 Zamorano, Oct. 23, [1946], Vidales; 1 Zamorana, Dec. 7, 1946, W.P.C. [all, HEM].

MEXICO

WORKERS

Chiapas: 2 Comitán (5 mi S. [of]), 6-VIII-62, H.E.M., 6000'; 3 Comitán (20 mi S. [of]), 6-VIII-62, H.E.M., 6-7000'; 1 Ocozocoautla [not Ocozocuautila] (10 km S. [of]), 2-VIII-62, H.E.M., 3-4000'; 6 Ocozocoautla [not Ocozocuautila] (20 km S. [of]), 2-VIII-62, H.E.M., 4000'; 2 Ocozocoautla [not Ocozocuautila] (30 km S. [of]), 2-VIII-62, H.E.M., 3000'; 2 Ocozocoautla [not Ocozocuautila] (5-10 mi S. [of]), 11-VIII-62, H.E.M., 3000'; 1 Las Cardinas (R[oute] 190, 985 km S. [of] Mex[ico] City), 31-VII-62, H.E.M.; 16 Las Cardinas (R[oute] 190, 985 km S. [of] Mex[ico] City), 1-VIII-62, H.E.M., 3-4000'; 15 Las Cardinas (3 mi N. [of]), 11-VIII-62, H.E.M., 3000'; 10 Las Cardinas (3 mi N. [of]), 12-VIII-62, H.E.M., 3000' [all CNC]; 1 Tuxtla [Tuxtla] Gutierrez (17 mi W. [of]), 4-24-59, H.E.E., 3000' [CU]. **San Luis Potosi:** 1 Desterro [Destierro], December [yr.?] [ANSP]. **Locality unknown:** 1 (no data), [ANSP].

NICARAGUA

WORKER

Carazo: 1 Diriamba, November 1959, N.L.H.K. [KU].

PANAMA

WORKERS

Bocas del Toro: 1 Potrerillos, May 5, 1935, J.W.M.; 2 Potrerillos, May 25, 1935 [all, KU]. **Chiriquí:** 1 Boquete, X-1953, N.L.H.K. [KU]; 1 Chiriquí, (Nos. 18.172, 96499); 1 Chiriquí, (Nos. 18.172, 96500) [both, SADZ]; 1 Chiriquí, 63, (*ex* [Collection of] Z.L. Gronningen) [v.d.V.].

COSTA RICA

MALES

Cartago: 1 Pacqyas, C. Werckele [AMNH]. **Puntarenas:** 1 San Mateo, 7-1911 [AMNH]. **Locality unknown:** 1 16 May 1951, O.L. Cartwright, *Candelarita* [USNM].

GUATEMALA

MALES

Chimaltenango: 1 Acatenango, August 1948, H.T. Dalmat [HEM]; 1 Antigua, X-7-1929, D.M. Bates, (Cat. No. 324); 1 Antigua, VIII-15-51, R.H. Painter [both, KU]. **Chiquimula:** 1 (locality unknown), 1908, R. Guérin, 600–1000 m, (Museum Paris) [MNHN]. **Suchitepequez:** 1 Variedades, VIII-29-47, C.&P.V., 500', (F. Johnson, donor) [AMNH]. **Locality unknown:** 1 (no data), Rehn [USNM].

HONDURAS

MALES

Tegucigalpa: 1 Tegulgalpa Tegucigalpa, XII-9-17, F.J.D., (No. 30559) [AMNH]; 1 Tegucigalpa, II-10-18, F.J.D., (34446) [USNM]; 1 Zamorano (20 mi from Tegucigalpa), December '14, T.D.A.C. [MCZ].

MEXICO

MALE

Chiapas: 1 San Cristóbal de las Casas, 4-VIII-62, H.E.M., 11,000' [CNC].

PANAMA

MALES

Chiriquí: 1 Boquete, XII-1946, N.L.H.K. [KU]; 1 Boquete, 7-V-[yr.?], G.B.F. [MCZ]. **Locality unknown** (Mexico or Central America): 1 (no data); 3 Ecua[dor!], (C.F. Baker Coll[ectio]n) [all, USNM].

Megabombus (M.) transversalis (Oliv.)

Apis transversalis Oliv., 1789, p. 65: *Apis cajennensis* F., 1798, p. 273: *Bombus americanorum*, Skp., 1943, p. 269, (*nec americanorum* F., 1805, p. 346): *Bombus cajennensis* F., 1805, p. 345, (*pro Apis cajennensis* F., 1798, p. 273): *Bombus cayennensis* (*sensu atratus* Fkln., 1913, p. 118, p.p.) v. *ochraceus* Fr., 1931a, p. 301, (*nec atratus* Fkln., 1913, p. 118, ♂): *Bombus transversalis*, Mre., 1960, pp. 99, 150: *Bombus* (*B.*) *incarum* Fkln., 1913, p. 131: *Bombus* (*B.*) (*Dumoucheli* group), Fkln., 1913, p. 95, (p.p.): *Bremus cayennensis*, Jur., 1807, p. 259: *Fervidobombus* (*F.*) *incarum*, Skor., 1922a, p. 153, (list): *Megabombus transversalis*, Mlrn., 1962b, p. 731: *Megabombus* (*Mexicanus* group) Mlrn., 1962b, p. 731, (p.p.): *Megabombus* (*M.*) (*Mexicanus* group) Mlrn., 1961a, p. 57, (p.p.): . . . *cajennensis* (not *cayennensis*, error), Mlrn., 1960a, p. 90, (♀ type).

DESCRIPTION. **Queen.** Length, 26.0 mm; width at wing bases, 11.5 mm; abdomen, 13.0 mm, width across T2, 12.0 mm; front wing length, 20.0 mm, width, 7.0 mm. **Head:** Frontal outline (excluding mouthparts) rather narrowly trapezoidal, weakly arcuate above and rounded at the temples, little higher medially than its widest dimension, the occiput narrowly but rather abruptly elevated; vertical region flat to weakly concave, weakly inclined toward the occiput and rather sparsely covered with small inconspicuous punctures; ocular half of ocellocular area somewhat dull and with only a few microscopic punctures, the ocellar half mostly smooth and polished; compound eyes distinctly more broadly rounded below than above, their inner margins subparallel for the most part; ocelli of medium size, located in a weak arc, removed from one another by less than their diameters, the lateral ones nearly touching the supraorbital line; malar space very little longer than distance between (and including) mandibular articulations, its surface rather unevenly and weakly convex with some irregular small punctures on lower half; labrum little more than twice as wide as its greatest thickness, the lower margin nearly straight except rounded at lateral corners, the rather prominent but not sharp shelf evenly arcuate, the tubercles only moderately prominent, not distinctly conical but transversely convex, rather deeply but not sharply separated, irregularly and rather coarsely punctate; flagellum nearly $1\frac{1}{2}$ times longer than scape, F1 about $1\frac{1}{2}$ times longer than nearly quadrate F2 and nearly $1\frac{1}{2}$ times longer than rectangular F3, being almost subequal to F2 and F3 combined; clypeus sloping at sides, the entire median area evenly but not strongly convex and rather densely covered with a mixture of small to medium punctures that are sparser medially below, its median height about

equal to widest part near base. *Legs*: Mesobasitarsite subrectangular, about $3\frac{1}{2}$ times longer than its widest dimension and distinctly wider than longest hairs of the posterior fringe, its outer surface broadly concave longitudinally, the acute distoposterior angle extended somewhat beyond the blunt distoanterior angle, with shallow emargination between; outer surface of hind tibia (corbicula) shiny and mostly microscopically granulose (alutaceous), only weakly convex mid-longitudinally, the broadest part distinctly wider than longest hairs of the posterior fringe; metabasitarsite with posterior margin strongly arcuate at base, beyond very weakly so to nearly straight, the widest part at least twice as broad as longest hairs of the posterior fringe, the outer surface broadly evenly and shallowly concave longitudinally, the rather subacute distoposterior angle projecting little beyond the blunt distoanterior one with a shallow emargination between. *Pubescence*: Rather short, dense, and even throughout except somewhat longer posteriorly on the scutellum, longer and looser distally and ventrally on the abdomen; mesobasitarsal posterior fringe longer along the basal half, gradually becoming shorter beyond; corbicular fringe of medium length, rather dense, most hairs straight or nearly so except distal ones arcuate; metabasitarsal posterior fringe rather short, longest along basal half, gradually becoming shorter and sparser at the distal end of segment. *Color*: Mesopleura above antieriad of wing bases, thoracic dorsum except for (black) interalar band of medium width and abdominal T3 a rich golden-yellow (sometimes paler), head except for a few fine intermixed yellow hairs on vertex, legs and remainder of body black; often the anterior margin of interalar band appears irregular due to invasion of yellow and often the posterior margin is noticeably invaded in the middle by a yellow patch with its anterior margin arched onto the mesonotum (scutum). Wings black with some violaceous reflections under certain lights.

Worker. Length, 20.0 mm; width at wing bases, 9.0 mm; abdomen, 10.0 mm, width across T2, 10.0 mm; front wing length, 18.0 mm, width, 6.0 mm. Disregarding difference in overall size, this caste is essentially like the queen, except more diminutive comparative relationships of the different parts; sometimes the punctation on the clypeus is weaker, and the basitarsal posterior fringes are comparatively stronger and denser than indicated under the queen; and often the shade of yellow is paler and the interalar band narrower, lacking noticeable intrusion of yellow.

Male. Length, 19.0 mm; width at wing bases, 8.0 mm; abdomen, 9.0 mm, width across T2, 8.0 mm; front wing length, 17.0 mm, width, 6.0 mm. *Head*: Frontal outline (excluding mouthparts) trapezoidal, the median height little less than the widest dimension, rather evenly arched across the top; vertical region weakly sloped toward occiput, with some medium punctures; ocellar half of the ocellular area smooth, the ocular half at most with only weak small and medium punctures near the eye; ocelli located in a weak arc, separated from one another by slightly less than their diameters, the lateral ones well on the supraorbital line; compound eyes only a little more broadly rounded below than above, the inner margins nearly parallel; malar space nearly $1\frac{1}{2}$ times as long as the distance between (and including) mandibular articulations, its surface irregularly weakly convex, with few small obscure punctures; labrum nearly $2\frac{1}{2}$ times wider than thick, the ventral margin mostly straight but rounded at the corners, its surface irregularly flattened, the callosities weak, each with few small punctures; flagellum 4 times longer than scape, F1 equal to F2, both combined at most only slightly exceeding F3, the middle segments very weakly crenulate. *Legs*: Mesobasitarsite subrectangular, about 4 times longer than widest part which is nearly as wide as length of most longest hairs of the posterior fringe, the outer surface shallowly concave longitudinally, the distal end subtruncate with subacute posterior angle and blunter anterior one about equally extended; shape of metabasitarsite similar to that of mesobasitarsite except wider for the most part, with its posterior margin weakly but rather evenly arcuate from near base to distal end. *Pubescence*: Character similar to that in the female except slightly less dense, the more prominent hairs on the head and scutellum slightly longer; mesobasitarsal posterior fringe of medium length and density, the corresponding fringe on the metabasitarsite very short, sparse, and rather even. Genitalia and seventh and eighth abdominal sterna (Pl. XV). *Color*: Head black except for noticeable admixture of yellow on vertex and fine pallid hairs intermixed on the face; thoracic pattern like that of the female except the yellow is paler and the rather indefinite (black) interalar band is much reduced by invasion of yellow; legs black; abdomen black except T3 and at least the basal half of T4 yellow. Wings black but somewhat less intensively so as in the female.

Redescribed from hypotypes. **Queens**, 1 Brasil, Benjamin Constant, Amazonas, IX-55, Izidio C. Lima; 1 Itaituba, Rio Tapajoz, Pará, A.G.T.; **worker**, Brasil, Benjamin Constant, Amazonas, IX-55, Izidio C. Lima; **male**, Brasil, Benjamin Constant, Amazonas, IX-55, Izidio C. Lima [all, HEM].

TYPE. Not examined. A search for the possible whereabouts of Oliver's type (evidently a ♀) was not successful, and it is presumed lost (Milliron 1962b: 731).

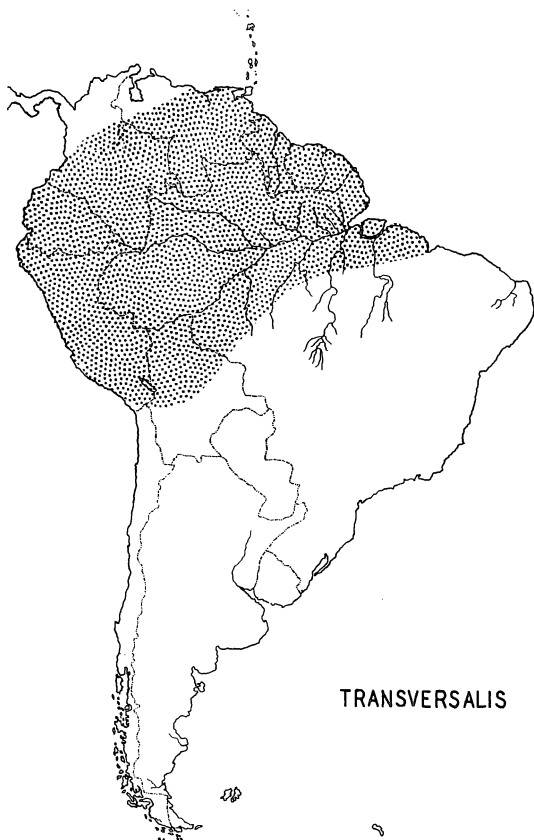
TYPE LOCALITY. Cayenne, French Guiana. Number of specimens at hand: 344. In flight: Throughout the year, *i.e.*, queens or workers or males, or combinations thereof, might be captured at the appropriate location in the range any time of year. Distribution: (vertical), sea level to 5400 ft; (horizontal), Brazil (region of the Amazon River and major tributaries), Bolivia (northeastern) through Peru and northward to eastern Colombia and eastward through Venezuela to the Guianas. Floral visitations: Myers (1935) reported *Gossypium*, *Lecythis*, and *Solanum*. I have had no additional definite records.

COMMENTS. Aside from what has already been indicated in the redescription, little more need be said about the structural or chromatic variability in this taxon. The interalar band varies in that it is somewhat wider on certain specimens and has better defined margins; this is particularly true of the female. The nests of this humid tropical species are sometimes exceedingly populous, ranking among the largest yet known.

BOLIVIA

QUEENS

Beni: 1 Villa Bella, Oct. 8, 1909, (Carn[egie] Mus[eum], Acc. 4043) [CM]. **Chapare:** 1 Rio Cristalmayo (not Cristal, Mayu), X-6-1949, L.E.P.; 1 Rio Cristalmayo (not Cristal, Mayu), X-9-1949, L.E.P.; 1 Rio Cristalmayo (not Cristal, Mayu), X-20-1949, L.E.P.; 1 Rio Cristalmayo (not Cristal, Mayu), X-31-1949, L.E.P.; 1 Rio Cristalmayo (not Cristal, Mayu), XI-1-1949, L.E.P. [all, KU].



MAP 35.

BRAZIL

QUEENS

Amazonas: 9 Benjamin Constant, IX-55, Izidro C. Lima [Seabra]; 1 Teffé, Raulin, (Thayer Exped[ition]), [MCZ]. **Pará:** 1 Belem, XII-1954, R. Damasceno [Seabra]; 1 Itaituba, Rio Tapojoz, A[u]l[g]us[t]o 1955, (Dirings[hofer]) [HEM] 1 Mangabeira, Mocajuba, IV-1953, Oriando Rego, (Coleção Campos Seabra) [KU]; 1 Mangabeira, Mocajuba, X-1953, O. Rego [JSM]; 1 Obidos, (Baixo Amazonas), A[u]l[g]us[t]o 1955, (Dirings[hofer]) [HEM]; 1 Santarem [ANSP].

BRITISH GUIANA

QUEEN

Locality indeterminate: 1 Demerara, S. Harris, (B.E. Dahlgren, donor) [CNHM].

COLOMBIA

QUEENS

Cundinamarca: 1 Bogotá, B.G. [USNM]. **Locality unknown:** 1 (no data) [AMNH].

PERU

QUEENS

Junin: 1 [Valle de] Chanchamayo, Sept. 20, 1948, 1100 m; 2 Valle de Chanchamayo, Oct. 16, 1948, Schunke [all, HEM]. **Amazonas** (or Loreto?): 1 Rio Santiago, VII-11-30, (F 6139), (H. Basser Coll[ectio]n, [Acc. 33591]) [AMNH].

ARGENTINA

WORKER

La Rioja: 1 Chilecito, 29 Feb. 1920, R.G.H., (Cornell Univers[ity] Expedit[ion]), [locality doubtful] [CU].

BOLIVIA

WORKERS

Chapare: 1 [Los] Yungas, January 1949, Bi.; 7 Rio Cristalmayo, (not Cristal, Mayu), VIII-23-1949, L.E.P.; 1 Rio Cristalmayo, (not Cristal, Mayu), VIII-28-1949, L.E.P. [all, KU]. **La Paz:** 1 Mapiří, 1900 [AMNH]. **Sara:** 1 (locality unknown), November 1910, J.S., 450 m, (C[arnegie] M[useum], Acc. 4548) [CM].

BRAZIL

WORKERS

Amapá: 3 Amapá (not Ampá), Oiapoque, May 1959, M.A.; 1 Amapá (not Ampá), Oiapoque, June 1959, F.V. Rodrigues [all, KU]. **Amazonas:** 22 Benjamin Constant, IX-55, Izidro C. Lima [Seabra]; 6 Benjamin Constant, May 1956, Izidro C. Lima [KU]; 2 Esperanza (Rio Ica), 9 Aug. 1920, (Cornell Univ[ersity] Expedition, Lot 569) [CU]; 1 Hyutanahan [Hyutanaha], Rio Purús, February 1922, S.M. Klages, (C[arnegie] M[useum], Acc. 6926) [CM-(H.E.M. homotype *cayennensis* F.)]; 1 Hyutanahan [Hyutanaha], Rio Purús, Feb. 1922, S.M. Klages, (Carn[egie] Mus[eum], Acc. 6962) [CM]; 1 Ipiranga, Putumayo River, 29 Aug. 1920, (Cornell Univer[sity] Expedition, Lot 569) [CU]; 1 Porto Velho, XI-1954, M. Alvarenga, Dente F. Perera Werner, (Seabra Coll[ectio]n) [USNM]; 3 Rio Autaz, Roman [NRS]; 4 Rio Caiary (Uaupés) VII-20 [to] IX-12-1906, H. Schmidt; 1 Rio Caiary (Uaupés), XI-6-1906, H. Schmidt; 8 Rio Caiary (Uaupés), XI-1906, H. Schmidt; 2 Rio Caiary (Uaupés), 1906, H. Schmidt [all, AMNH]; 1 Teffé, (no data), (Raulin Thayer Exped[ition]) [MCZ]. **Mato Grosso:** 1 Estação, (no data) [IBSA]. **Pará:** 1 Mangabeira, Mocojuba, IV-1953, Oriando Rego, (Coleção Campos Seabra); 2 Mangabeira, Mocajuba, VI-1953, Oriando Rego, (Coleção Campos Seabra); 2 Mangabeira, Mocajuba, X-1953, O. Rego, (Coleção Campos Seabra); 1 Obidos, Colonia Rio Branco, X-1953, F.M.O., (Coleção Campos Seabra) [all, KU]; 1 Obidos, Colonia Rio Branco (not Blanco), X-1953, F.M.O. [JSM]; 15 Rio Branco Albides, VII-55, F.M.d.O.; 14 Rio Branquinho, Municipio d[e] Oleides, VII-55, F.M.D.O. [Seabra]; 6 Rio Moju, X-1954, R. Damasceno, (Coleção Campos Seabra) [KU]; 1 Santarem, Sept. [yr.?] [ANSP]; 1 Santarem, (no data), (Acc. No. 2966) [CM-(H.E.M. homotype *cayennensis* F.)]; 2 Santarem, (no data), (Acc. No. 2966) [CM]; 3 Santarem, (no data) [ANSP]. **Paraná:** 1 Ipiranga, Putamayo River, 29 Aug. 1920, (Cornell Univer[sity] Expedition, Lot 569); 1 Rio Nigro, 6 Sept. 1920, (Cornell Univ[ersity] Expedition, Lot 569) [both, CU].

BRITISH GUIANA

WORKERS

Bartica: 1 Bartica, 15-VIII-1922; 2 Kalacoon, 1916, (Acc. 5632); 1 Kalacoon, 1916, (Hym. 118); 1 Kalacoon, 1916; 1 Kalacoon, 29-VI-24, Jay F.W. Pearson; 1 Kamaria Falls (not Camaria), 30-VI-24, F.W. Pearson; 16 Kamaria Falls (not Camaria), 31-VII-1924, Jay F.W. Pearson; 2 Matope [Falls], 23-VII-1954, Jay F.W. Pearson; 1 Penal Settlement, 1917, (Hym. 129) [all, AMNH]. **Berbice:** 9 Demerara, S. Harris, (B.E. Dahlgren, donor); 2 Demerara, (no data), [Mus[eum] Exped[ition], B.E. Dahlgren, donor] [all, CNHM]. **Essequibo:** 2 Rockstone, July 9, '11; 1 Tumatumari, July 11, '11; 1 Tumatumari, July 12, '11 [all, AMNH]. **Locality unknown:** 1 Derc R[iver], 5-I-1923, W. Bank [AMNH]; 2 Forest Set[tle]m[en]t, VIII-IX-1953, R. Mazaruni, N.A. Wever [MCZ]; 1 I-15-12, A.F. Porter [CNHM].

COLOMBIA

WORKERS

Amazonas: 8 La Chorrera, Putumayo Distr[ict], (not Peru), 12-17 Aug. 1920, (Cornell Univer[sity] Expedition, Lot 569), [CU].

FRENCH GUIANA

WORKERS

1 Maroni [River] [CU]; 4 Petit Saut (not Pied Saut), Oyapok River, March 1918, S.M. Klages, (C[arnegie] M[useum], Acc. 6962) [CM-(H.E.M. homotype *cayennensis* F.)].

PERU

WORKERS

Amazonas: 4 Rio Itayó (not Itata), Dec. 1928, W. Klug; 1 Rio Itayó (not Itaya), December 1928, Klug; 1 Rio Itayó (not Itaya), January 1929, Klug; 6 Rio Mishu-Yacu (not Mishayacu), 15 Aug. 1929, W. Klug [all, CU]; 2 Rio Mishu-Yacu (not Mishayacu), III-4-1931 [ANSP]. **Huanuco:** 3 Tingo Maria, (Rio Huallaga), VIII-46, Wh., 670 m; 2 Tingo Maria, (Rio Huallaga), IV-47, Wh., 700 m [all, HEM]; 1 Tingo Maria, (Rio Huallaga), W.W., 700 m [MCZ]. **Ica:** 2 San Juan H[acienda], June 1920, (Col[lection] Pereme, Cornell Univer[sity] Expedition, Lot 569) [CU]. **Junin:** 2 San Ramon, Valle de Chanchamayo, January 1941, F.S., 800 m [HEM-(H.E.M. homotypes *cayennensis* F.)] 27 San Ramon, Valle de Chanchamayo, January 1941, F.S., 800 m [HEM]; 1 Satipo, [Jauja], II-1945, P. Paprzycki, (F. Johnson donor); 1 Satipo, [Jauja], V-1945, P. Paprzycki, (F. Johnson, donor); 1 Satipo, [Jauja], VI-1945, P. Paprzycki, (F. Johnson, donor) [all, AMNH]; 1 Valle [de] Chanchamayo, I-IV-39, Wh., 800 m, (1319A); 2 [Valle de] Chanchamayo, Oct. 16, '48, Schunke; 1 [Valle de] Chanchamayo, Feb. 3, 1949, Schunke, 1200 m [all, HEM]; 1 [Valle de] Chanchamayo, Feb. 10, 1949, Schunke [HEM-H.E.M. homotype *cayennensis* F.]; 3 [Valle de] Chanchamayo, April 29, '49, Schunke [HEM]. **Loreto:** 2 Iquitos, VI-18-1931; 2 Iquitos, VI-1931; 1 Iquitos, VII-8-1931 [all, ANSP]; 1 Iquitos, 19 Aug. 1920 [CU]; 10 Iquitos, (no data), (F6062, H. Bassler Coll[ectio]n, Acc. 33591) [AMNH]; 4 Iquitos-San Roque, March 1929, Klug; 2 Iquitos-San Roque, April 1929, Klug; 2 Iquitos-San Roque, July 1929, Klug [all, CU]. **Pasco:** 13 Oxapampa, March 1941, F.S., 1800 m [HEM].

SURINAME (also Surinam, or Dutch Guiana)

WORKERS

1 Moengo, Boven Cottica R[iver], May 12, 1927, (Cornell U[niversity], Lot 760, sub. 50); 1 Moengo, Boven Cottica R[iver], May 13, 1927, (Cornell U[niversity], Lot 760, sub. 52); 1 Moengo, Boven Cottica R[iver], May 19, 1927, (Cornell U[niversity], Lot 760, sub. 66) [all, CU]; 1 Paranaba, 7-92; 1 Paranaba, 5-93; 1 Paranaba, '93 [all, CNC].

VENEZUELA

WORKER

Bolivar: 1 Paraitepuy, December '40, P.J.A. [CU].

LOCALITY UNKNOWN (South America)

WORKERS

4 (no data) [AMNH].

BRAZIL

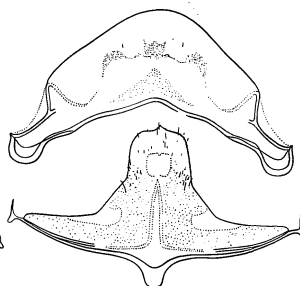
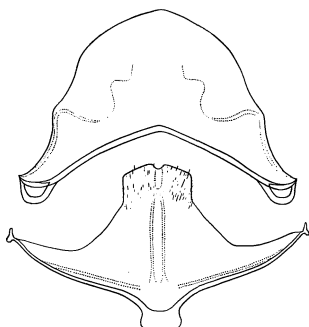
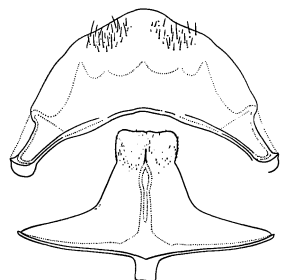
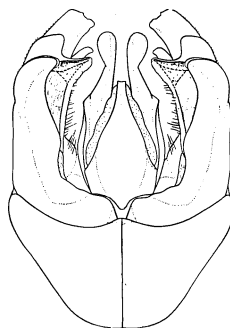
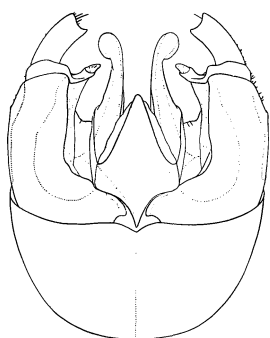
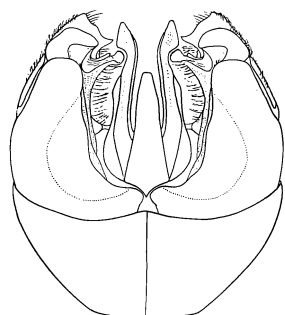
MALES

Amazonas: 12 Benjamin Constant, IX-55, Izidro C. Lima [Seabra]; 1 Porto Velho, Rio Madeira (not Madeiio), 1954, (W.M. Mann Coll[ectio]n) [USNM]. **Pará:** 1 Mangabeira, Mocajuba, VII-1953, Orlando Rego [JSM]; 1 (no data), (Thayer Exped[ition]) [MCZ].

BRITISH GUIANA

MALES

Bartica: 1 Kamaria Falls (not Camaria), 30-VI-24, Jay F.W. Pearson (24.63); 1 Kartabo, 15-VIII-1922 [both, AMNH].



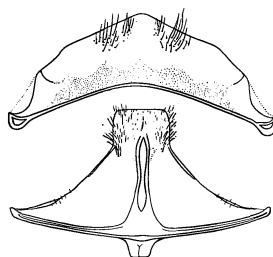
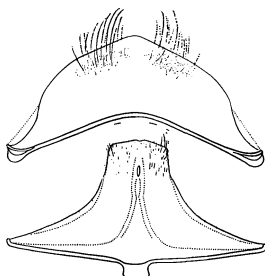
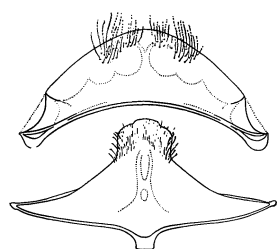
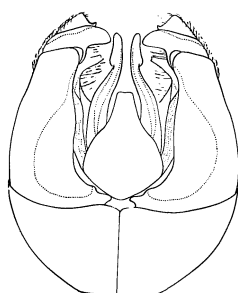
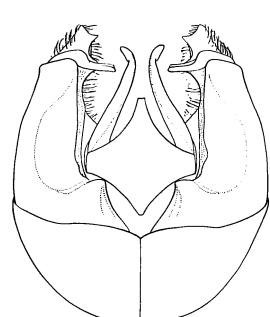
ATRATUS

(DUMOUCHELI GROUP)

TRINOMINATUS

NIGRODORSALIS

(NIGRODORSALIS GROUP)



MEXICANUS

TRANSVERSALIS

BREVIVILLUS

(MEXICANUS GROUP)

PLATE XV.