

DIAGRAM OF SOCIAL WASP

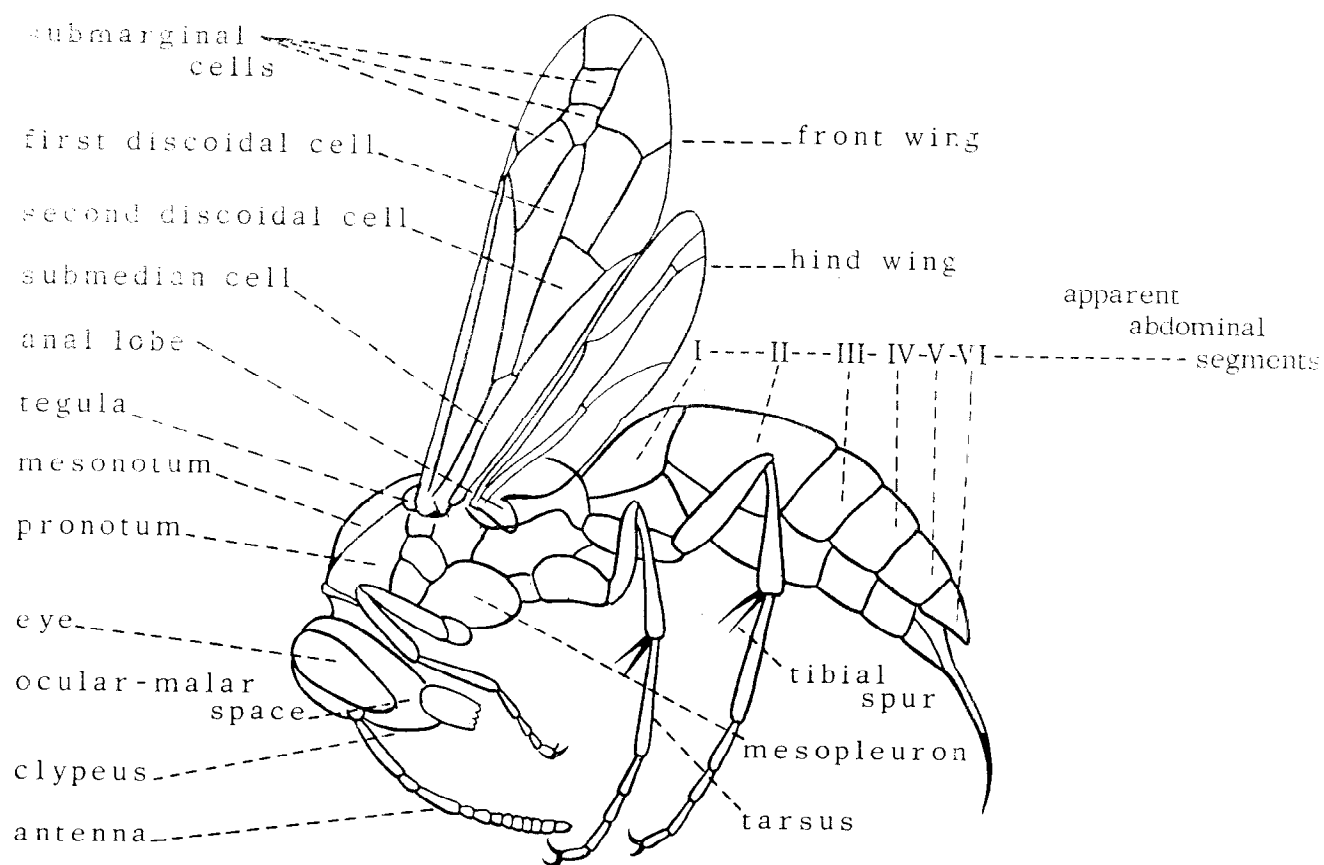
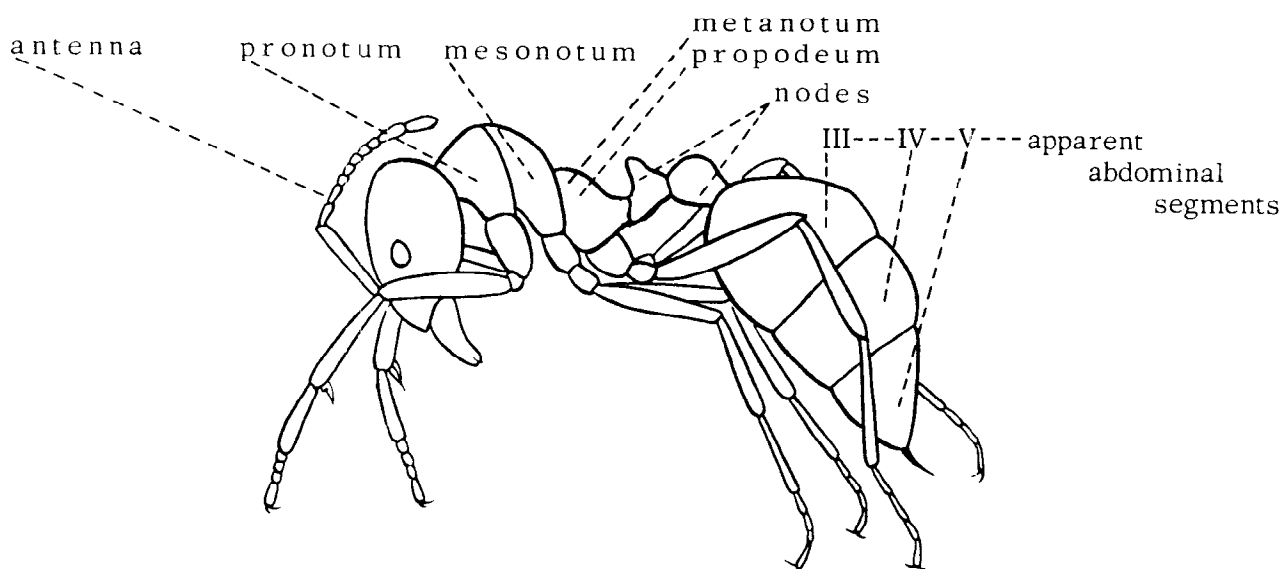


DIAGRAM OF FIRE ANT



HYMENOPTERA: KEY TO SOME COMMON SPECIES WHICH STING MAN
 Harry D. Pratt and Chester J. Stojanovich

- 1. With wings (Fig. 1 A).....2
- Without wings (Fig. 1 B).....32



Fig. 1 A

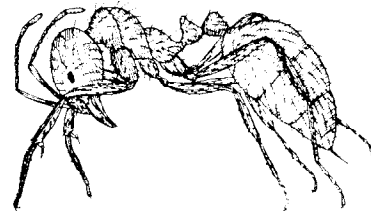


Fig. 1 B

- 2. First (and sometimes second) segment of the abdomen node-like, clearly separated above and below from rest of abdomen (Fig. 2 A). Nest in ground, wood, or buildings (Family Formicidae)....ANT

Abdomen with or without some constriction of first abdominal segments, but without true node formation of basal abdominal segments (Fig. 2 B).....3

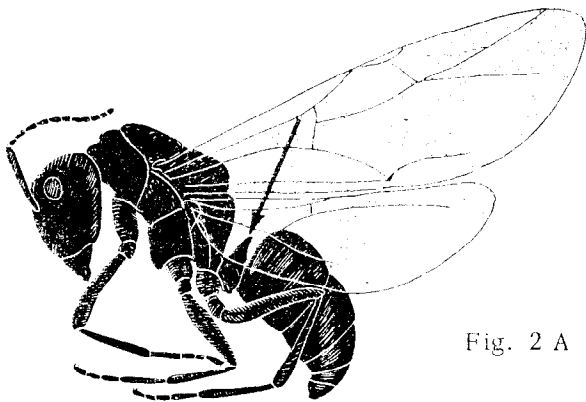


Fig. 2 A

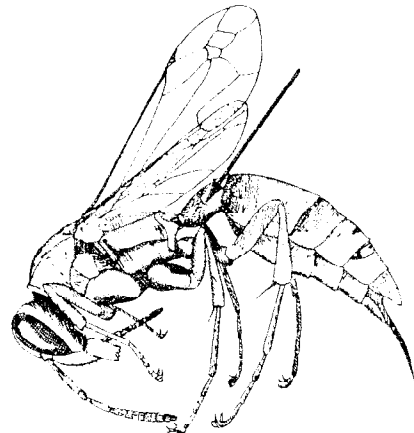


Fig. 2 B

- 3. All hairs on body simple, unbranched; hind tarsus slender, first segment not broadened or thickened (Fig. 3 A). (Superfamilies Vespoidea and Sphecoidea). Wasps and Hornets.....4

At least some hairs on thorax branched or plumose; hind tarsus with first segment broadened and thickened, often densely hairy (Fig. 3 B). (Superfamily Apoidea). Bees.....27

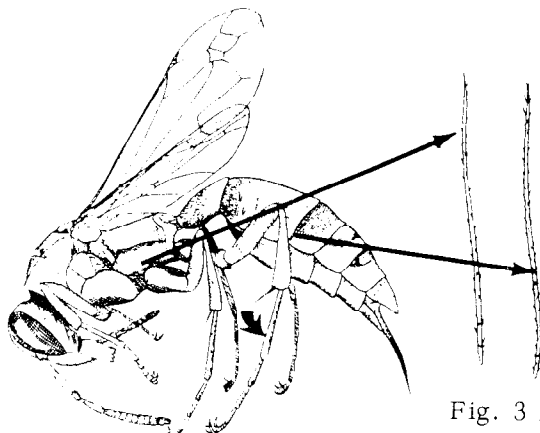


Fig. 3 A

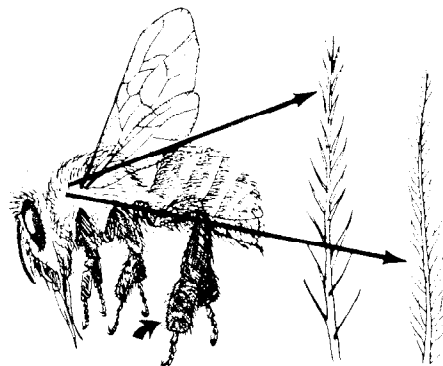
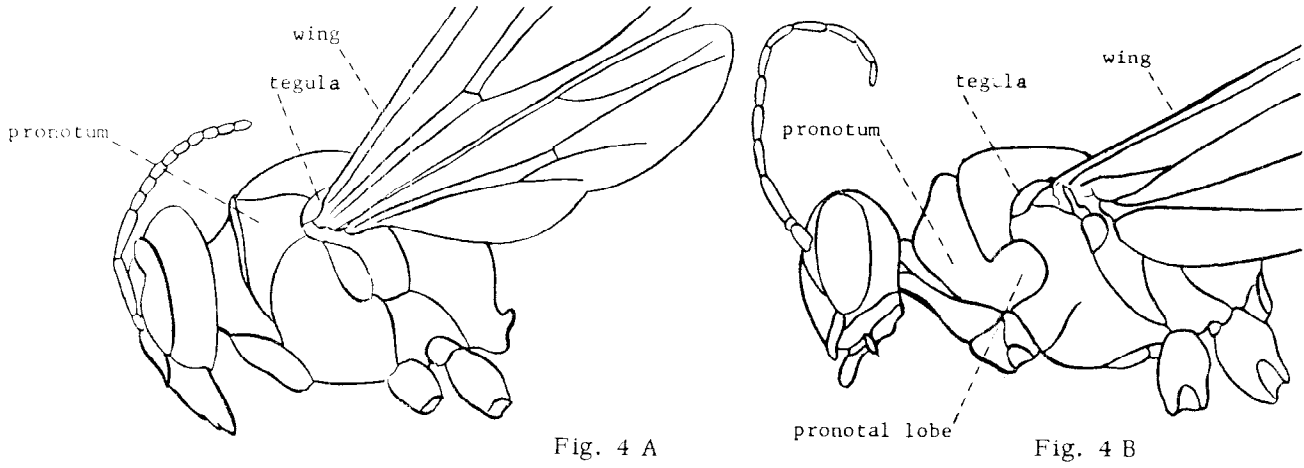
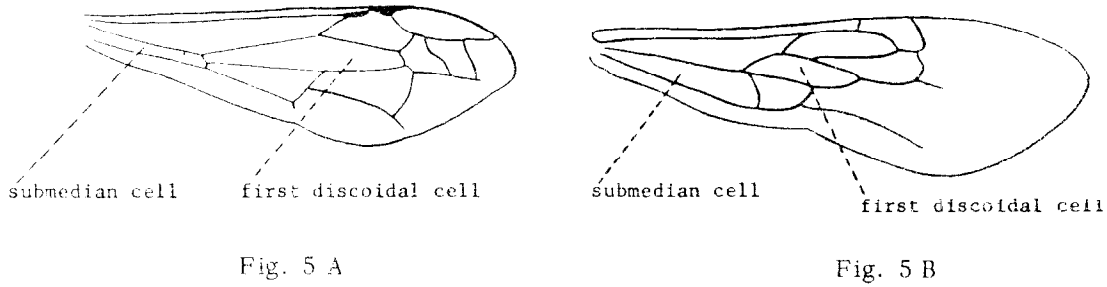


Fig. 3 B

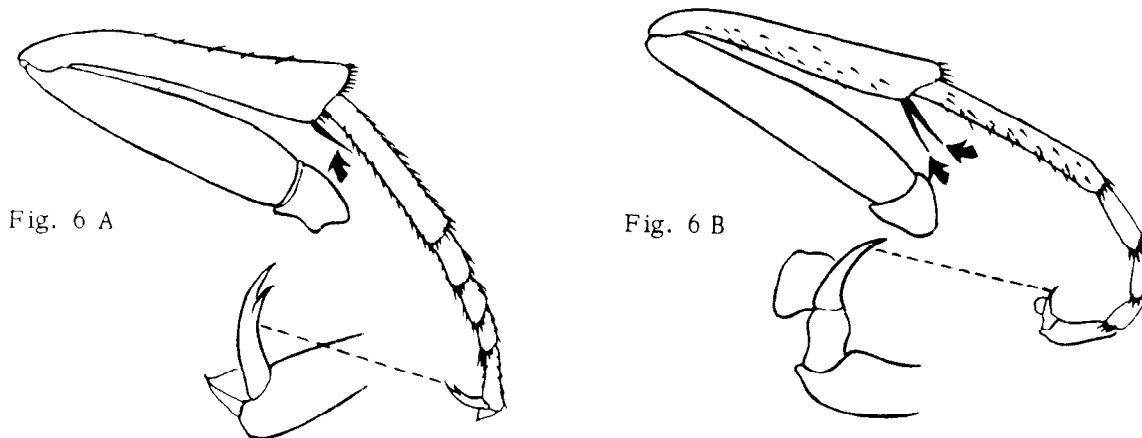
- 4. Pronotum extending entirely, or almost back, to the tegula (the scale covering base of fore-wing), its hind angles not lobed (Fig. 4 A). (Superfamily Vespoidea).....5
- Pronotum shortened, more or less collar-like, not extending back to tegula, its hind angles often produced into lobes (Fig. 4 B). (Superfamily Sphecoidea).....22



- 5. Fore wing almost always folded when in repose; first discoidal cell very long, as a rule much longer than the submedian cell (Fig. 5 A). Both solitary and colonial species (Family Vespidae).....6
- Fore wing very rarely folded; first discoidal cell shorter than submedian cell (Fig. 5 B). Solitary species.....21



- 6. One spur at tip of middle tibia; claws bifid, split at tip (Fig. 6 A). (Subfamily Eumeninae).....18
- Two spurs at tip of middle tibia; claws tapering to point (Fig. 6 B).....7



7. Clypeus (upper lip) broadly truncate and more or less notched at apex (Fig. 7 A); hind wing without a lobe at anal angle (Fig. 7 B). (Subfamily Vespinae). Hornets, Yellow Jackets..... 8
- Clypeus somewhat pointed at apex (Fig. 7 C); hind wing with a lobe at anal angle (Fig. 7 D)..... 15
 (Subfamily Polistinae). Paper Wasps.....

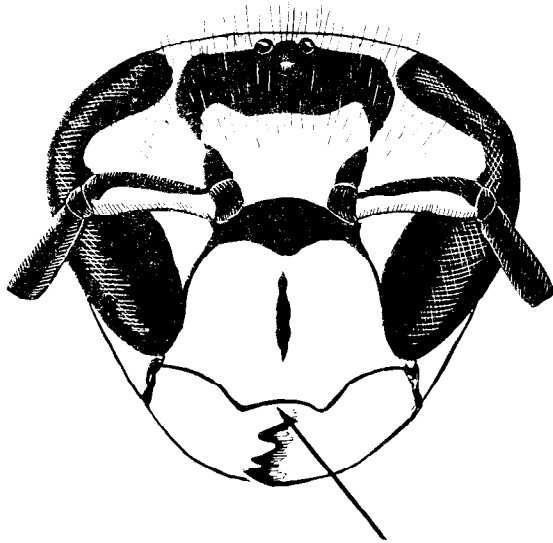


Fig. 7 A

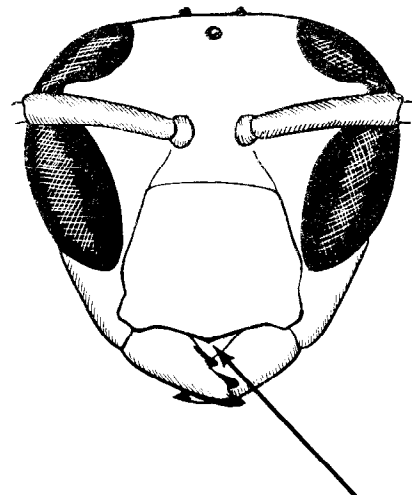


Fig. 7 C



Fig. 7 B

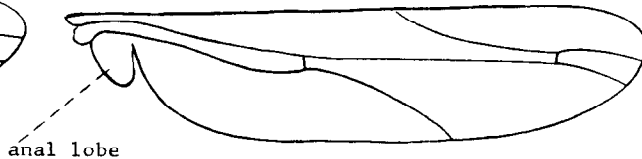


Fig. 7 D

8. Oculo-malar space long, more than half the length of next to last antennal segment; vertical carina on pronotum (Fig. 8 A)..... 9
- Oculo-malar space short, less than half the length of next to last antennal segment; no vertical carina on pronotum (Fig. 8 B)..... 11

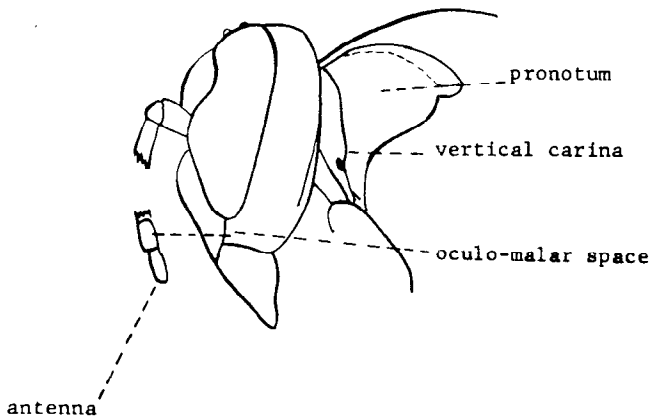


Fig. 8 A

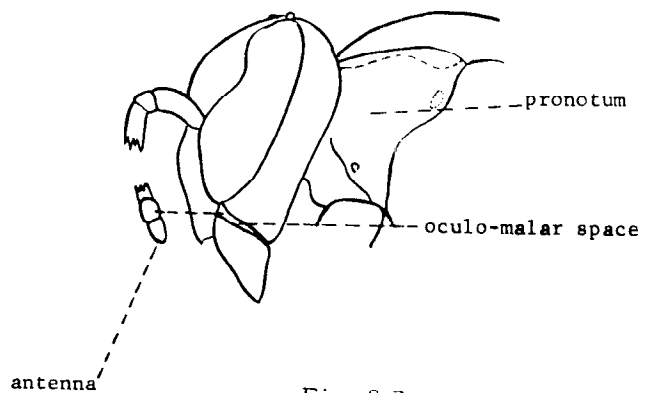


Fig. 8 B

9. Very large species, 20-30 mm. long, extensively reddish-brown; postocellar area of vertex at least as long as ocellar triangle in dorsal view (Fig. 9 A). Builds paper nest in homes or hollow trees. (*Vespa crabro germana*).....GIANT HORNET

Smaller species, 8-20 mm. long; black species with white, ivory white, or yellowish markings; postocellar area of vertex not as long as ocellar triangle (Fig. 9 B)..... 10

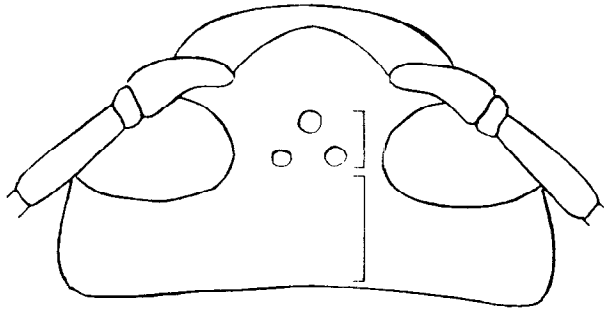


Fig. 9 A

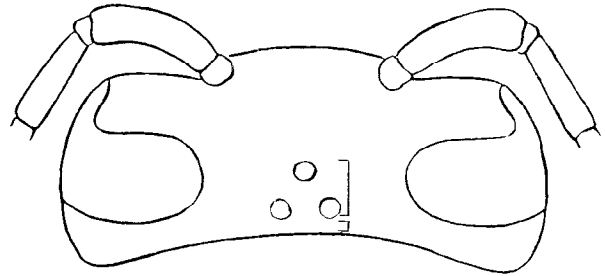
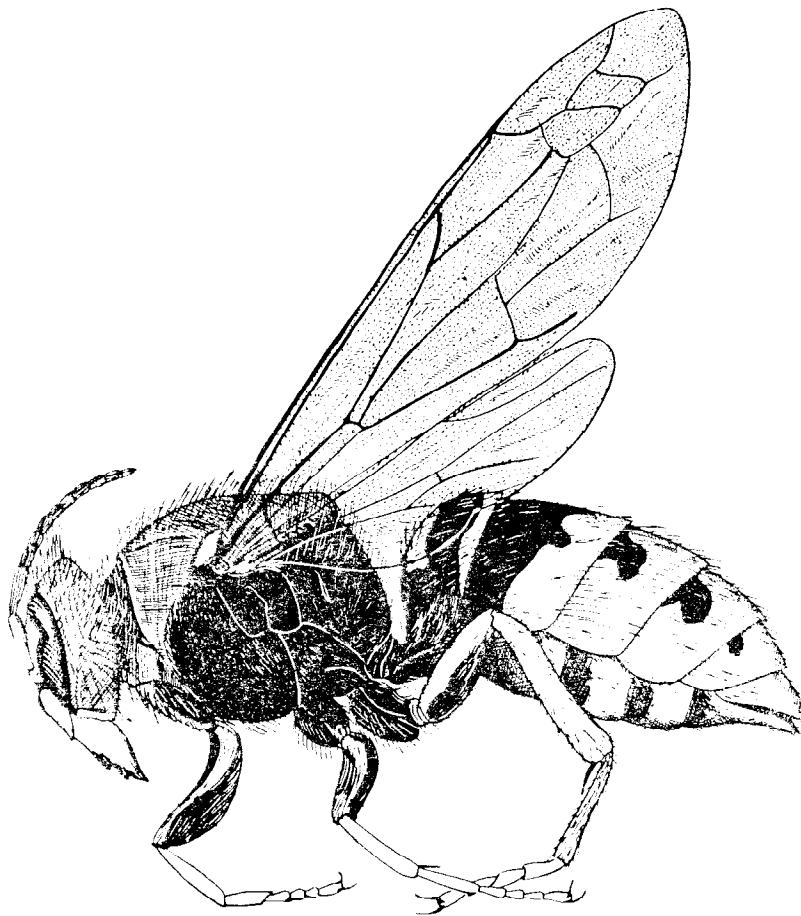


Fig. 9 B



- 10. Black and white species; first and second abdominal segments entirely black, some males with very narrow pale markings at tip of first segments in some males (Fig. 10 A). Builds enclosed globular nests under eaves or in trees. (*Vespula maculata*).....BALD-FACED HORNET

Black and yellow species; yellowish posterior margins of first and second abdominal segments deeply notched (Fig. 10 B). Builds globular paper nests under eaves or in trees.....
 (*Vespula arenaria*)..... A YELLOW JACKET

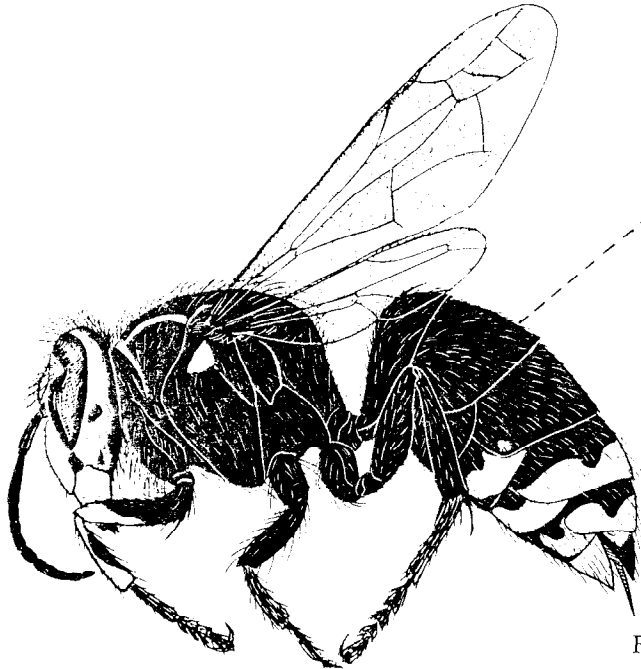


Fig. 10 A

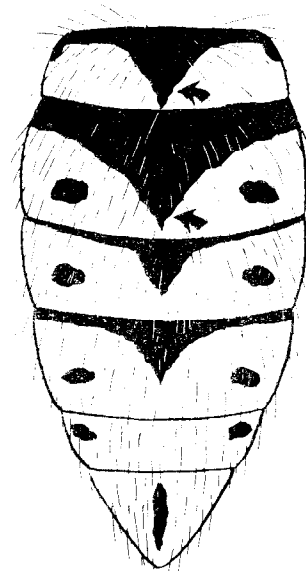
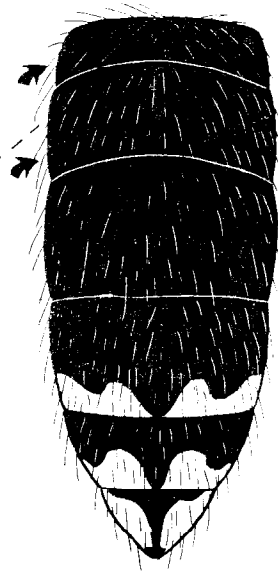


Fig. 10 B

- 11. Black and white species (Fig. 11 A). Builds paper nest in ground or on trees.....
 (*Vespula consobrina*).....A HORNET

Black and yellowish species (Fig. 11 B). All build paper nests in ground.....12

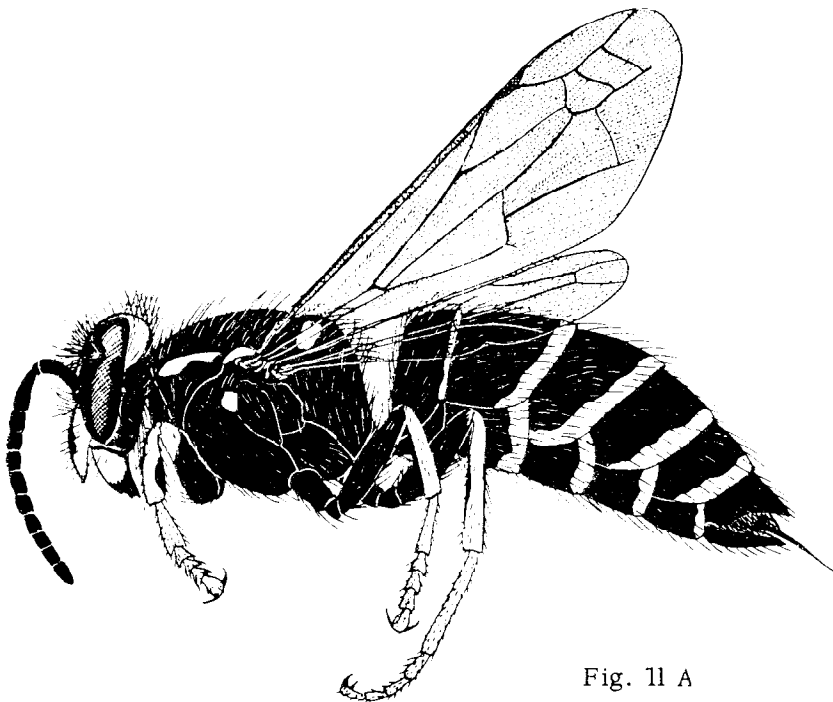


Fig. 11 A



Fig. 11 B

12. Mesonotum with two, broad, longitudinal, curved yellowish stripes reaching almost from front to hind margins (Fig. 12 A). Eastern species (*Vespula squamosa*). California and Oregon species (*Vespula sulphurea*)..... A YELLOW JACKET

Mesonotum entirely black, or with two short yellowish stripes near scutellum (Fig. 12 B).....13

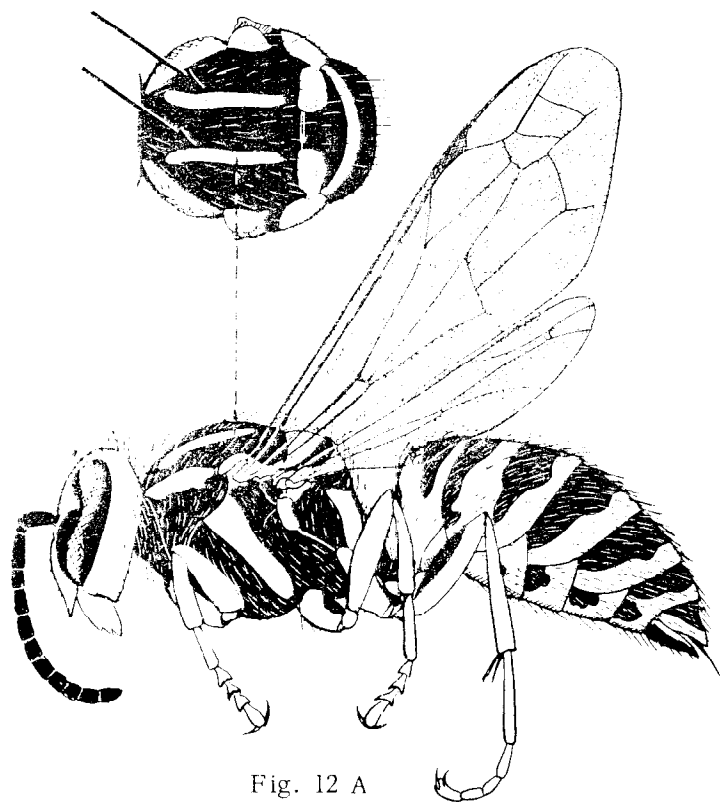


Fig. 12 A

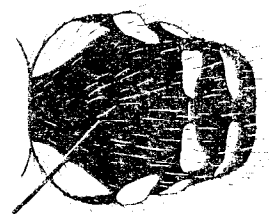


Fig. 12 B

13. Yellowish postero-lateral margins of pronotum usually even, parallel-sided; clypeus with broad, dark, longitudinal stripe, often anchor-shaped (Fig. 13 A & B). Northern species..... (*Vespula vulgaris*)..... A YELLOW JACKET

Yellowish postero-lateral margin of pronotum not parallel-sided; clypeus with short dark median stripe or one or more small dark spots (Fig. 13 C & D).....14

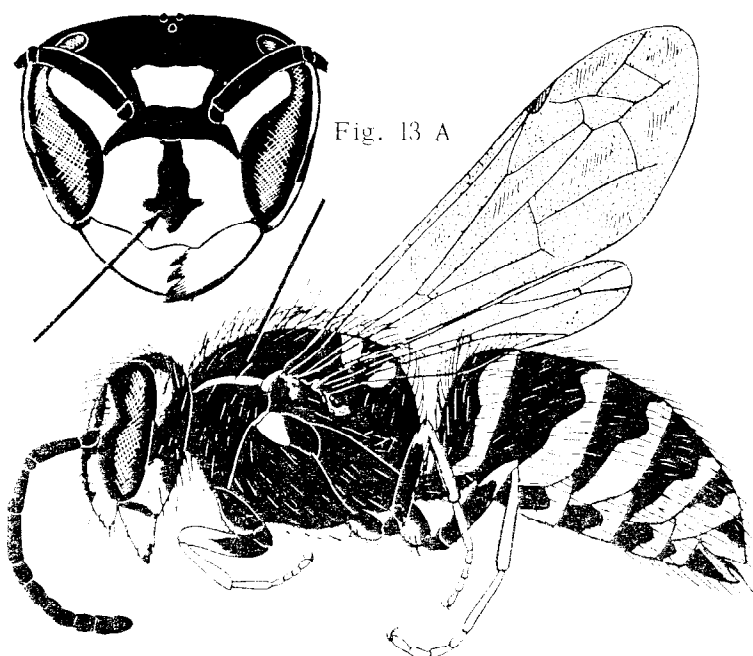


Fig. 13 A

Fig. 13 B

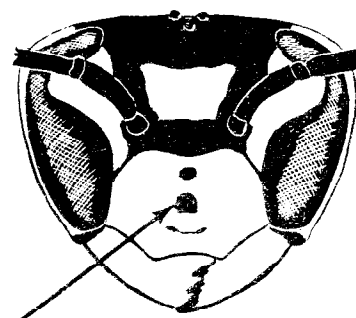


Fig. 13 C

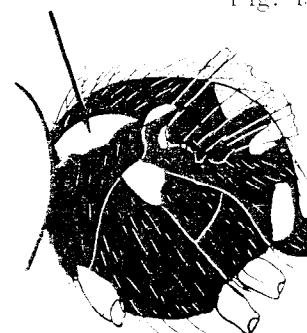


Fig. 13 D

14. First antennal segment largely yellowish in front; eyes encircled by yellowish band on upper three-fourths (Fig. 14 A). Western species (*Vespula pennsylvanica*)... . A YELLOW JACKET

First antennal segment largely or entirely blackish; eyes with a blackish area dorsally separating pale anterior and posterior orbital bands (Fig. 14 B). Eastern species (*Vespula maculifrons*)... . A YELLOW JACKET

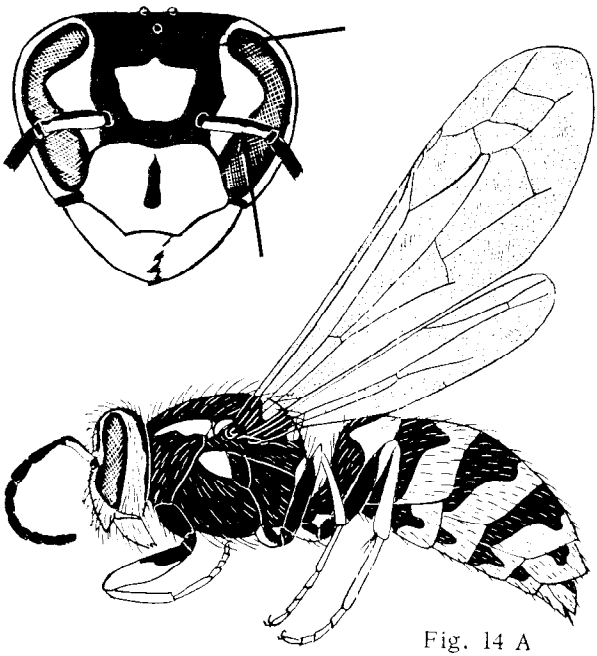


Fig. 14 A

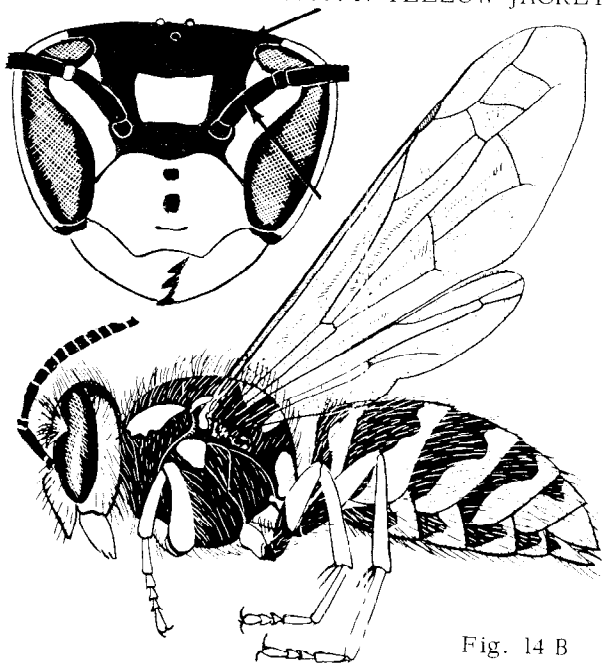


Fig. 14 B

15. Body and all legs entirely or largely orange-colored (Fig. 15 A). Builds paper combs in walls of house or hollow trees. (*Polistes rubiginosus*)... . ORANGE PAPER WASP

Body with some blackish markings; at least hind tarsi pale-colored (Fig. 15 B)... . 16

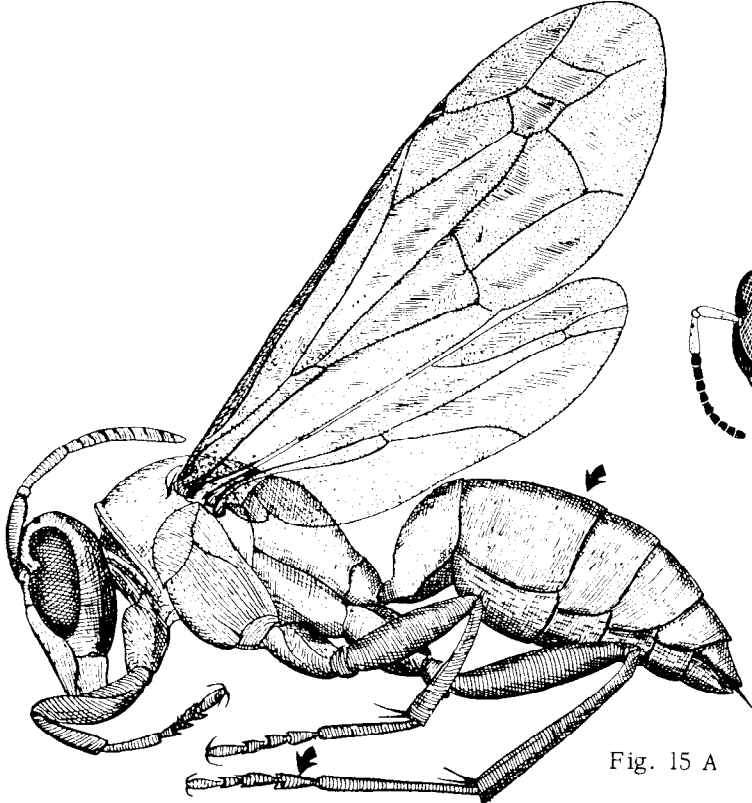


Fig. 15 A

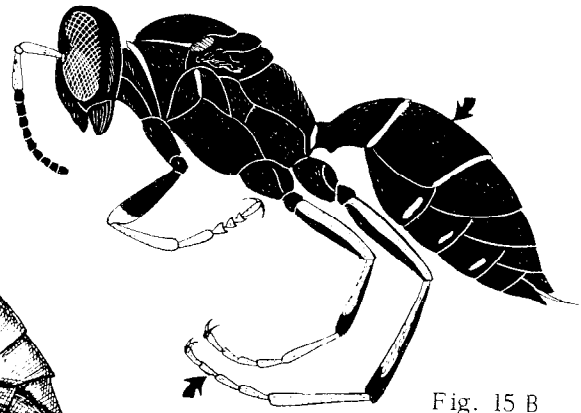


Fig. 15 B

Darkish, yellowish, and reddish markings; nuchal suture reddish; a yellowish band behind ocelli (Fig. 16 A). Builds single or double paper combs under eaves or in buildings. (*Polistes exclamans*)..... ZEBRA PAPER WASP

Anderson largely blackish, with one or more pale bands starting at posterior margin of first or second segment; mesonotum largely blackish; no yellowish band behind ocelli (Fig. 16 B)..... 17

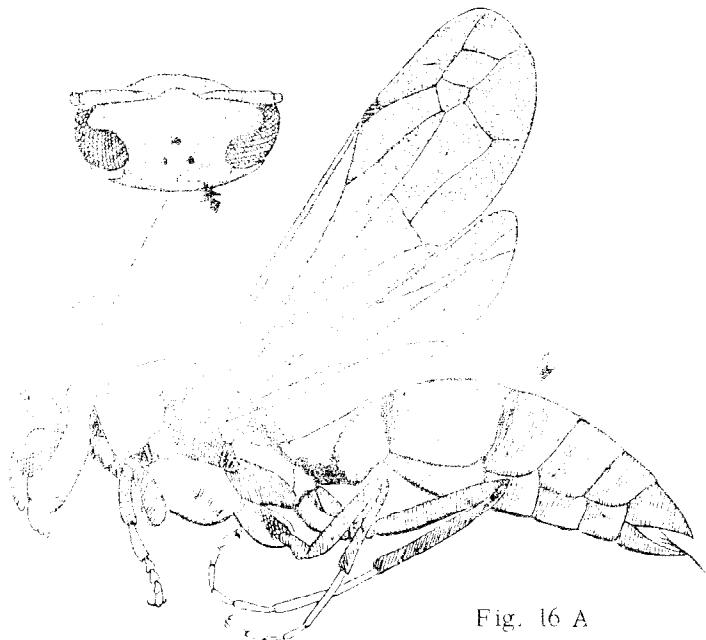


Fig. 16 A

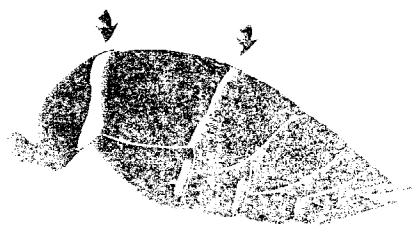


Fig. 16 B

17. Large species 20-25 mm. long, propodeum with coarse transverse striae (Fig. 17 A). Builds paper combs in bushes or trees. (*Polistes annularis*)..... LARGE PAPER WASP

Medium-sized species, 12-17 mm. long; propodeum with fine striae or essentially smooth (Fig. 17 B). Builds paper combs under eaves or in buildings. (*Polistes fuscatus pallipes*)..... DARK PAPER WASP

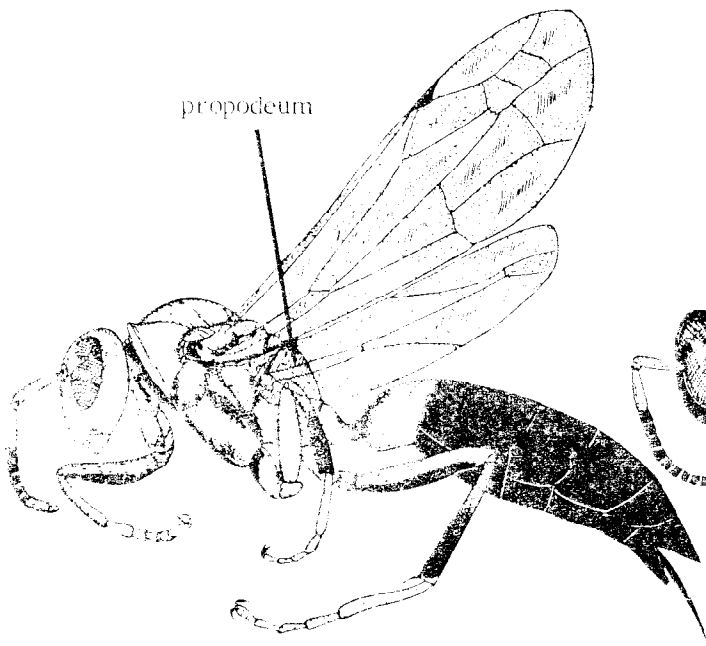


Fig. 17 A



Fig. 17 B

18. Slender species with extremely elongate first abdominal segment (Fig. 18 A). Builds small mud, potter nests provisioned with caterpillars. (*Eumenes fraterna*)..... POTTER WASP

Stocky species, with stout first abdominal segment (Fig. 18 B). Nest in holes in ground or wood, or old mud-dauber nests provisioned with caterpillars. (*Odynerus* species and *Monobia* species) SOLITARY WASPS



Fig. 18 A

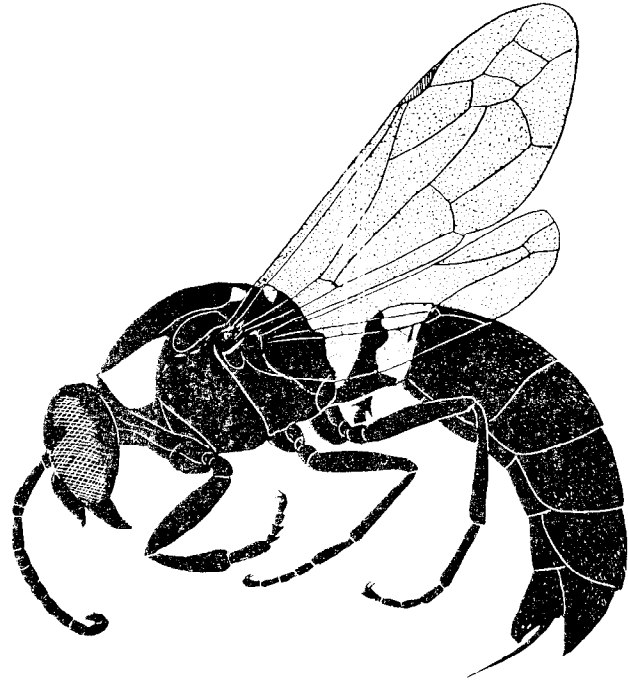


Fig. 18 B

19. Mesopleuron divided by an oblique suture into upper and lower parts (Fig. 19 A). Usually nest in holes in ground provisioned with spiders or tarantulas (Family Psammocharidae)..... SPIDER AND TARANTULA WASPS

Mesopleuron not divided by such an oblique suture (Fig. 19 B)..... 20

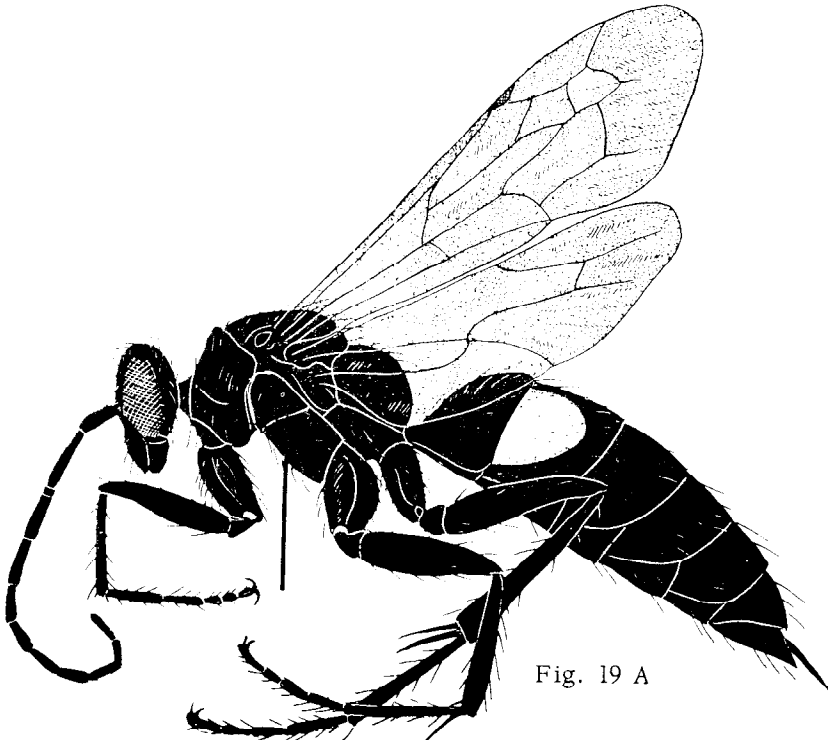


Fig. 19 A



Fig. 19 B

20. Bases of middle and hind coxae not covered by plates (Fig. 20 A). Parasites of other wasps and bees nesting in ground..... VELVET ANTS
- Bases of middle, and sometimes hind, coxae covered by plates (Fig. 20 B)..... 21

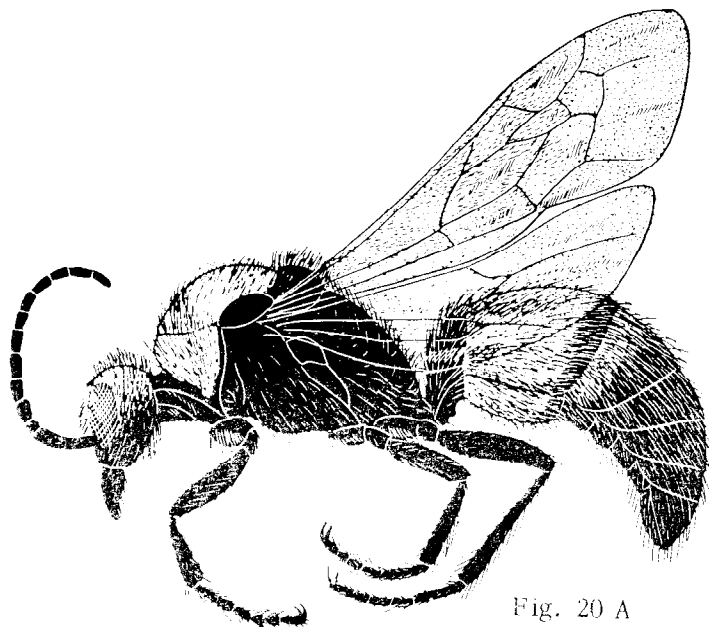


Fig. 20 A

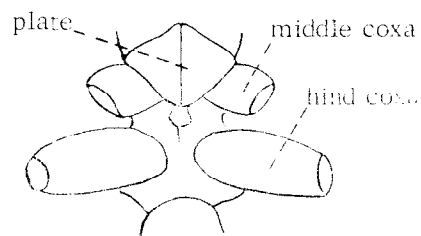


Fig. 20 B

21. Wing membrane beyond cells with wrinkles; inner margin of eye with a sinus; bases of middle and hind coxae covered by plates (Fig. 21 A & B). Male with three spines at tip of abdomen..... SCOLIID WASPS

Wing membrane beyond cells without wrinkles; inner margin of eye essentially straight; bases of middle coxae covered by plates (Fig. 21 C & D). Male with a single upturned spine at tip of abdomen. (Family Tiphidae)..... TIPHIID WASPS

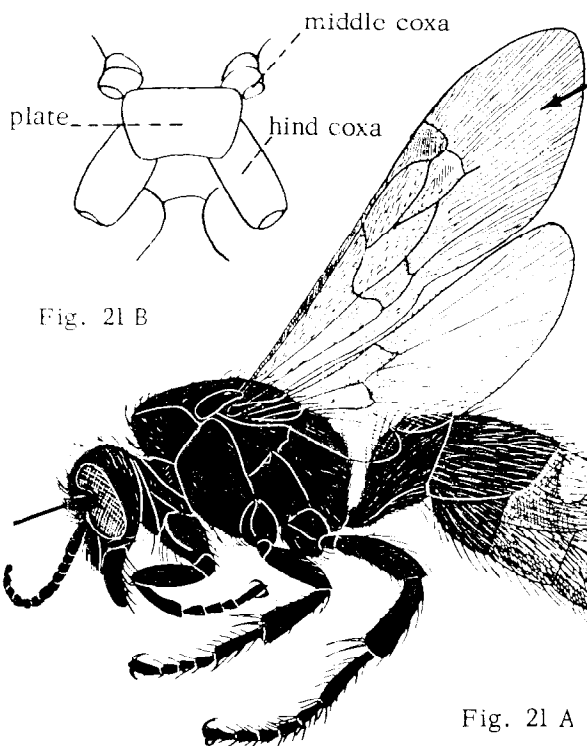


Fig. 21 A

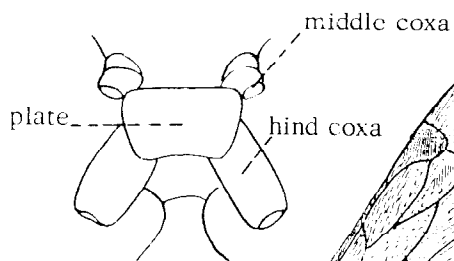


Fig. 21 B

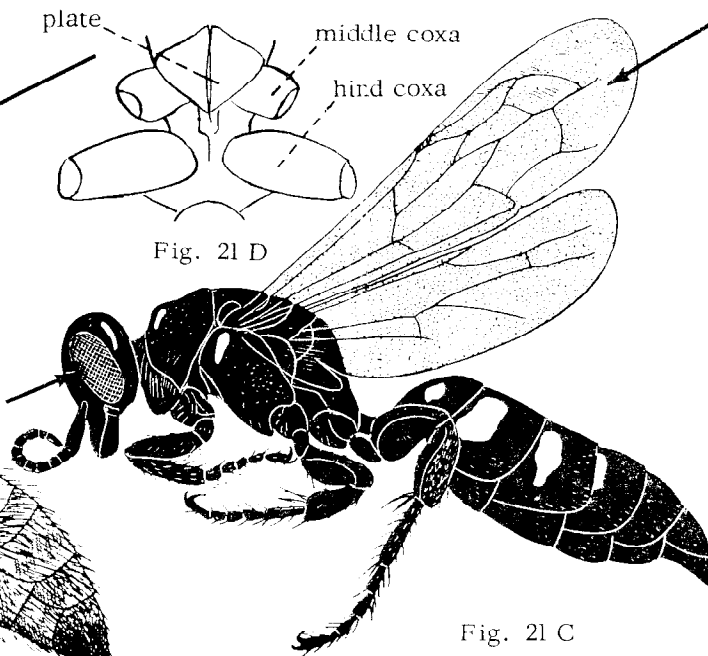


Fig. 21 C

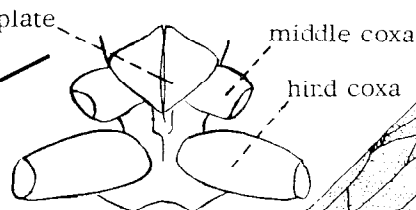


Fig. 21 D

- 22. Very large species, 30 mm. long or more; first abdominal segment broad and sessile (Fig. 22 A)
Nest in holes in ground provisioned with cicadas. (Sphecius speciosus).....CICADA KILLER

Smaller species, less than 25 mm. long; first abdominal segment longer and more slender (Fig. 22 B).....23

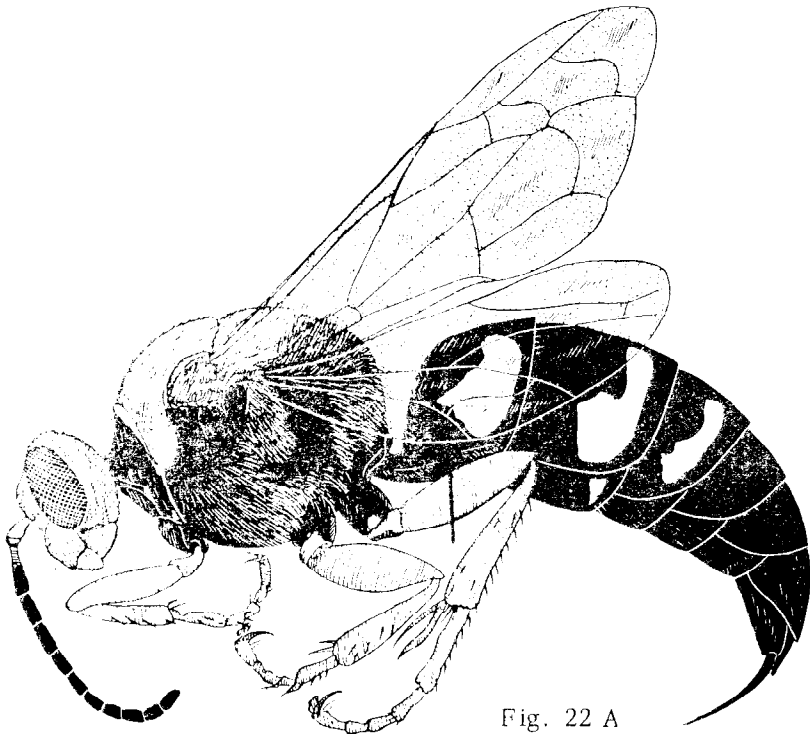


Fig. 22 A



Fig. 22 B

- 23. Eyes with deep sinus on inner side; one or two clearly defined submarginal cells; dark species with whitish tarsus (Fig. 23 A). Builds organ-pipe mud nests. (Trypoxylon species)..... PIPE ORGAN MUD-DAUBER

Eyes nearly straight on inner side; three well-defined submarginal cells; metallic blue, or species with some pale markings on abdomen (Fig. 23 B & C).....24

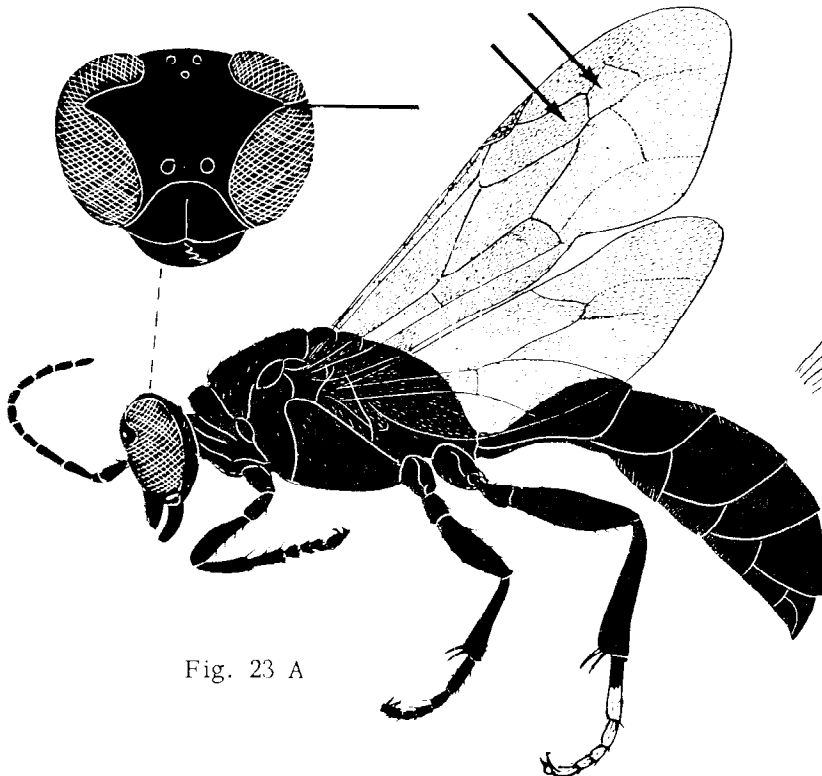


Fig. 23 A

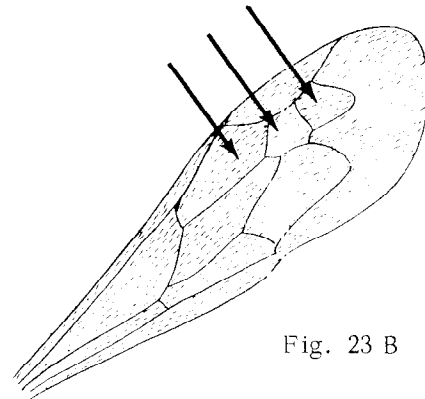


Fig. 23 B

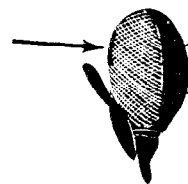


Fig. 23 C

24. Petiole of abdomen two-segmented (Fig. 24 A). Nest in holes in ground. (*Sphex* species) SOLITARY WASP

 Petiole of abdomen one-segmented (Fig. 24 B)..... 25

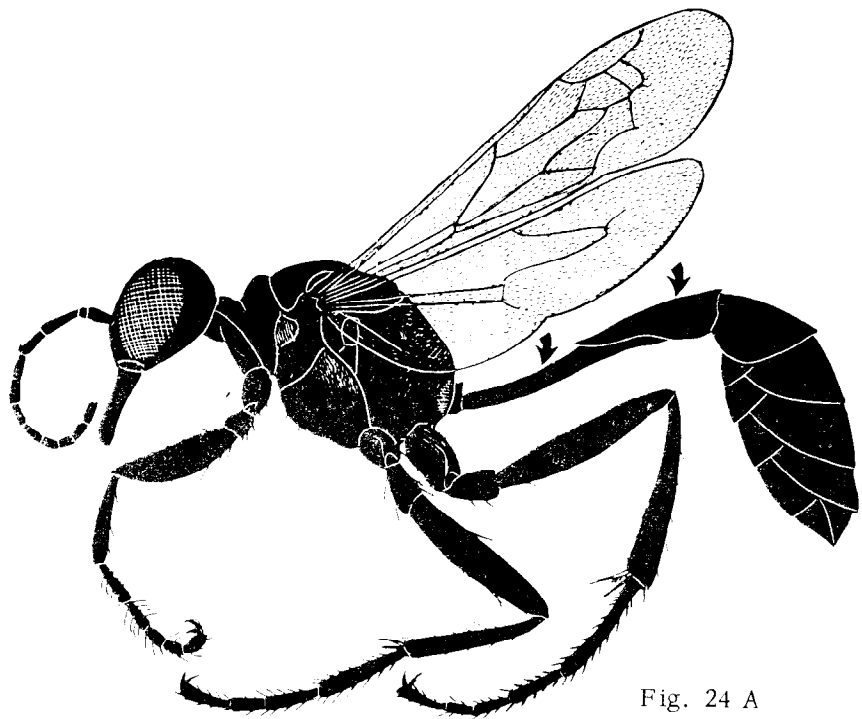


Fig. 24 A



Fig. 24 B

25. Bright metallic-bluish species (Fig. 25 A). Builds mud nests provisioned with spiders..... BLUE MUD-DAUBER
 (*Chalybion californicum*).....
 Darker species with yellowish or orange markings (Fig. 25 B)..... 26

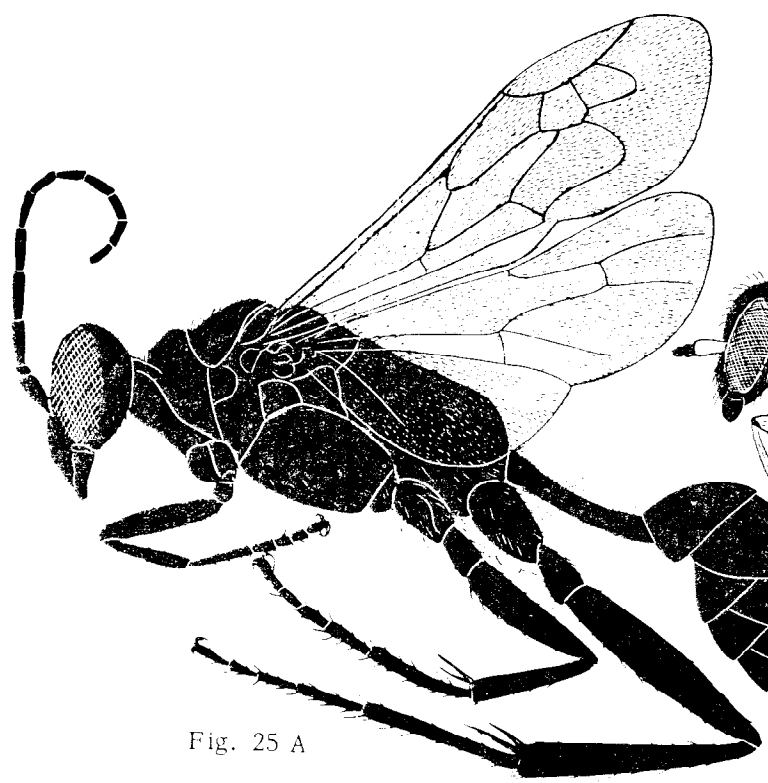


Fig. 25 A



Fig. 25 B

26. Dark species with yellowish markings (Fig. 26 A). Builds mud nests provisioned with spiders..
(Sceliphron caementarium).....COMMON MUD-DAUBER

Dark hairy species with orange markings (Fig. 26 B). Nest in holes in ground.....
(Chlorion ichneumonea).....ORANGE THREAD-WAISTED WASP



Fig. 26 A

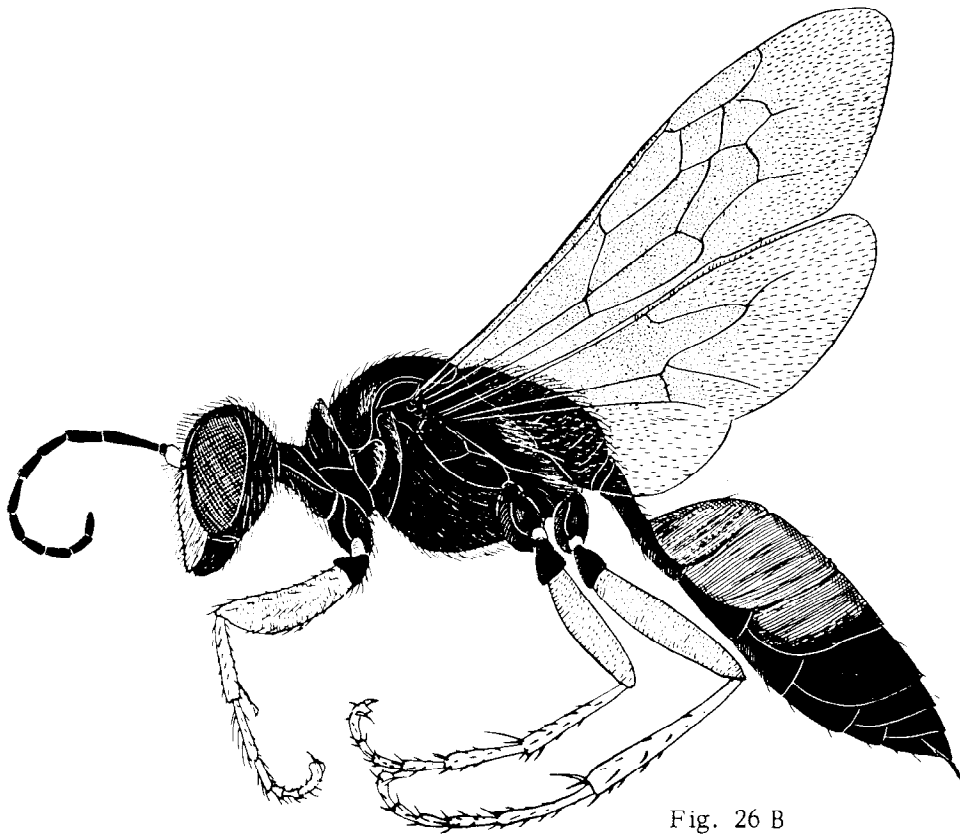


Fig. 26 B

Hind tibia without spurs (Fig. 27 A). Colony builds wax combs in bee hives, in houses, and in trees. (*Apis mellifera*)..... HONEY BEE

Hind tibia with one or two spurs (Fig. 27 B)..... 28



Fig. 27 A

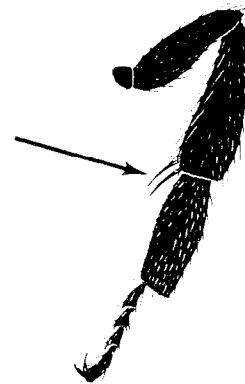


Fig. 27 B

28. Oculo-malar space longer than second segment of antenna; large hairy species with contrasting blackish and yellowish (sometimes reddish) pile (Fig. 28 A). Colony builds wax combs in nests in ground or logs, often in old mouse nests. (Family Bombidae; *Bombus* sp.)..... BUMBLEBEES

Oculo-malar space short, eye reaching (or nearly reaching) base of mandible (Fig. 28 B).....29

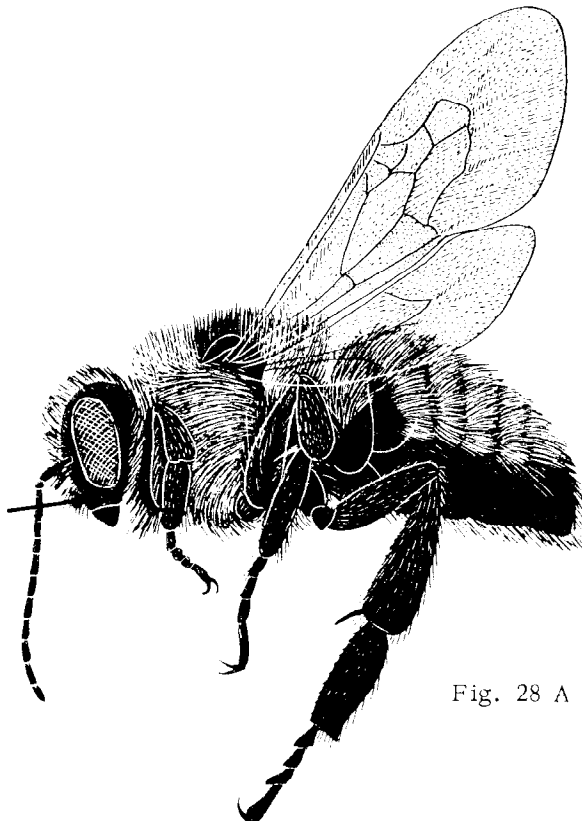


Fig. 28 A

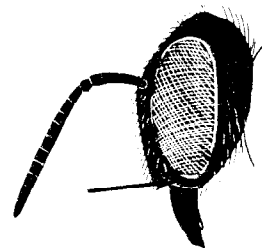
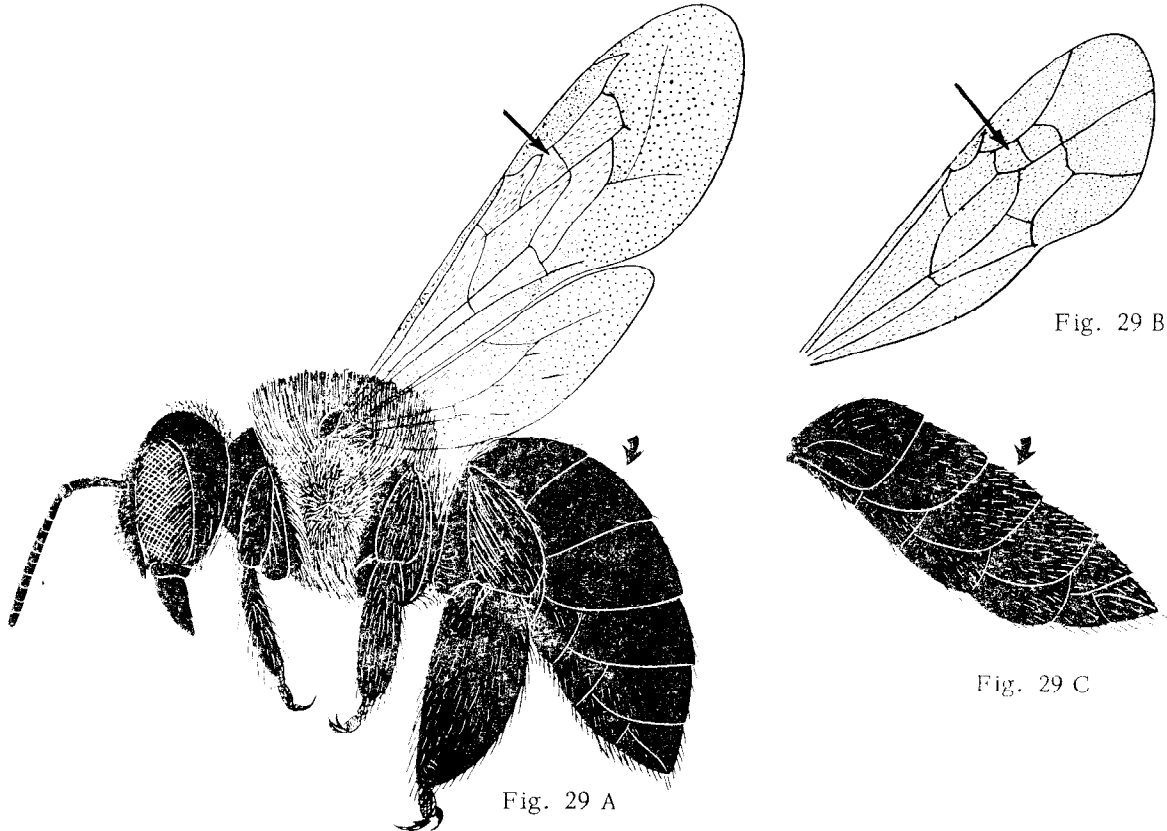


Fig. 28 B

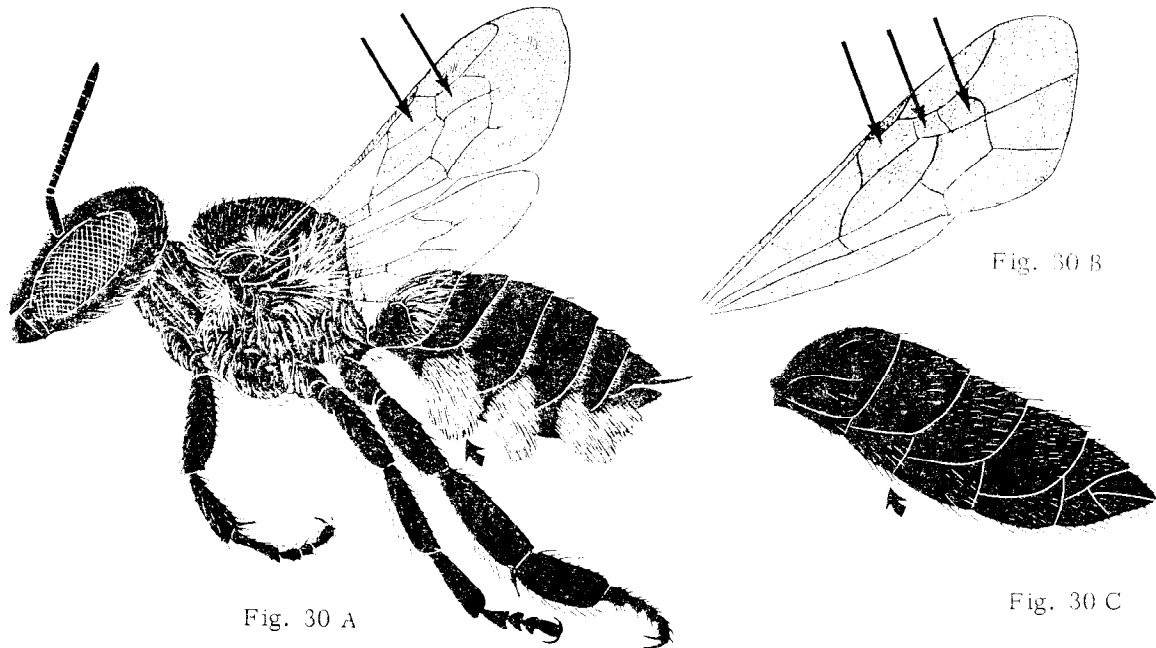
- 29. Very large species 15-25 mm. long with shiny bluish, nearly hairless upper abdomen; second submarginal cell strongly narrowed anteriorly (Fig. 29 A). Nest in holes bored in wood. (*Xylocopa virginica*)..... CARPENTER BEE

Smaller species 2-14 mm. long, usually with some hairs on upper surface of abdomen, shiny greenish species; second submarginal cell not narrowed anteriorly (Fig. 29 B & C)..... 30



- 30. Fore-wing with two submarginal cells; abdomen of female with dense hairy patches on underside (Fig. 30 A). Builds nest out of leaves in tree holes (*Megachile* species)... LEAFCUTTER BEES

Fore-wing with three submarginal cells; abdomen without dense hairy patches on underside (Fig. 30 B & C).....31



- shiny greenish species (Fig. 31 A). Nest in ground. (Augochlora species)..... METALLIC SOLITARY BEES
- duller species (Fig. 31 B). Nest in ground. (Halictus and Andrena species).... SOLITARY BEES



Fig. 31 A



Fig. 31 B

- 32. First (and sometimes second) segment of abdomen node-like (Fig. 32 A). Build colony nests in ground, under stones, in wood, or in buildings (Family Formicidae).....ANTS
- First and second segments of abdomen not node-like (Fig. 32 B)..... 33

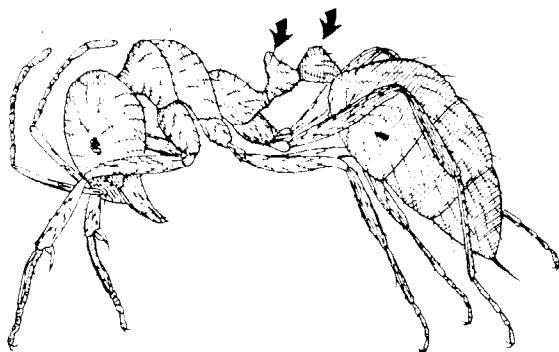


Fig. 32 A



Fig. 32 B

33. Larger species 3-25 mm. long, usually with definite dark and reddish or orange-colored hairs (Fig. 33 A). Parasites of ground-nesting bees and wasps (Family Mutillidae)...VELVET ANTS

Smaller species 1-2 mm. long, with few sparse hairs; body various shades yellowish to brownish (Fig. 33 B). Parasites of wood-boring beetles (Family Bethylidae, Scleroderma species...
.....PARASITIC WASPS

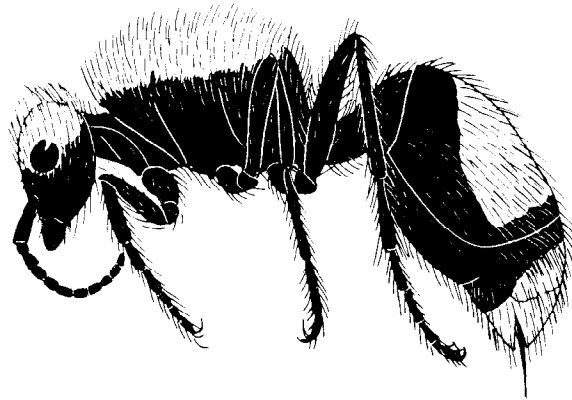


Fig. 33 A

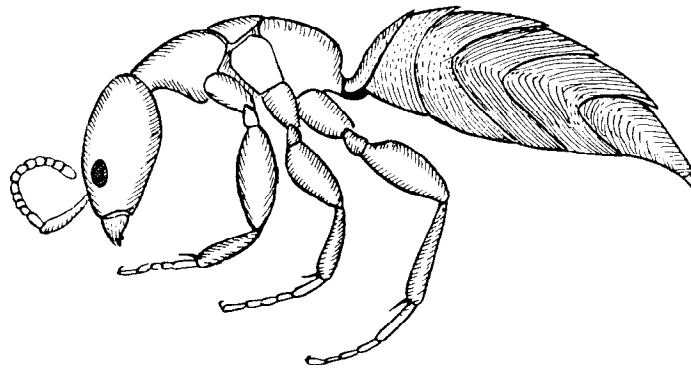


Fig. 33 B

ANTS: KEY TO SOME COMMON SPECIES
Harold George Scott

1. Pedicel ("waist") 1-segmented 2
 Pedicel 2-segmented 4

 2. Petiole (scale on pedicel) poorly developed, hidden beneath abdomen
 (*Tapinoma sessile*) ODOROUS HOUSE ANT
 Petiole well-developed, erect, not hidden beneath abdomen 3

 3. Tip of abdomen without circling of hairs (*Iridomyrmex humilis*) ARGENTINE ANT
 Tip of abdomen with circling of hairs (*Camponotus herculeanus*
 pennsylvanicus) BLACK CARPENTER ANT

 4. Head and thorax with numerous spines (*Atta texana*) TEXAS LEAF-CUTTING ANT
 Head and thorax spineless or with 1 pair of spines on the posterior thorax 5

 5. Thorax and head covered with "fingerprints"; posterior thorax with
 single pairs of spines (*Tetramorium caespitum*) PAVEMENT ANT
 Thorax and head without "fingerprints"; posterior thorax without spines 6
-
6. Antennal club 2-segmented 8
 Antennal club 3-segmented 7

 7. Shiny-black (*Monomorium minimum*) LITTLE BLACK ANT
 Yellowish-red (*Monomorium pharaonis*) PHARAOH ANT

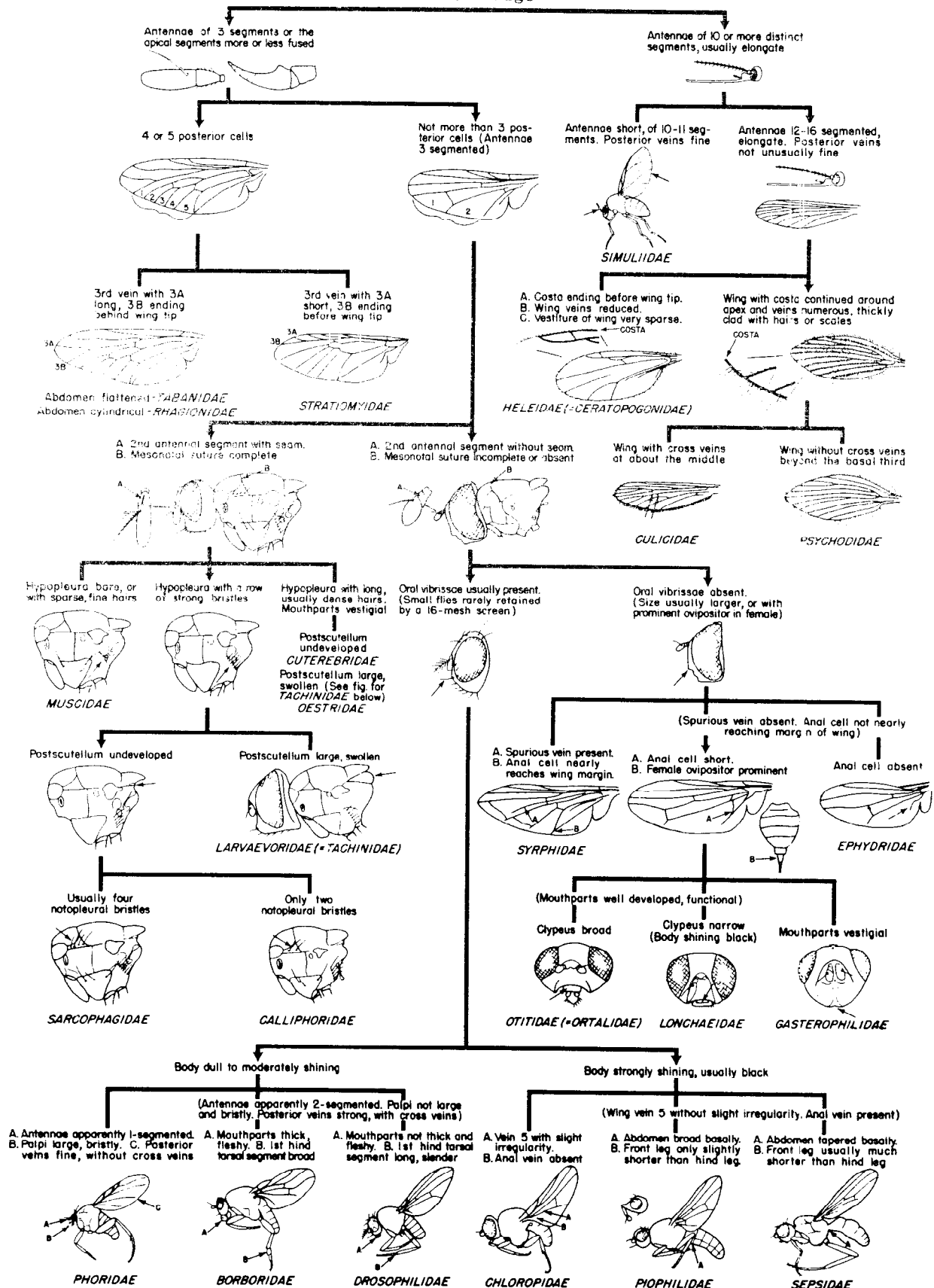
 8. House infesting ants (*Solenopsis molesta*) THIEF ANT
 Outdoor mound-building ants 9

 9. Mandibles strongly incurved (*Solenopsis geminata*) TROPICAL FIRE ANT
 Mandibles not strongly incurved 10

 10. Dorsal surface of head with large coarse, scattered punctures
 (*Solenopsis saevissima* var. *richteri*) IMPORTED FIRE ANT
 Dorsal surface of head without punctures (*Solenopsis xyloni*) SOUTHERN FIRE ANT

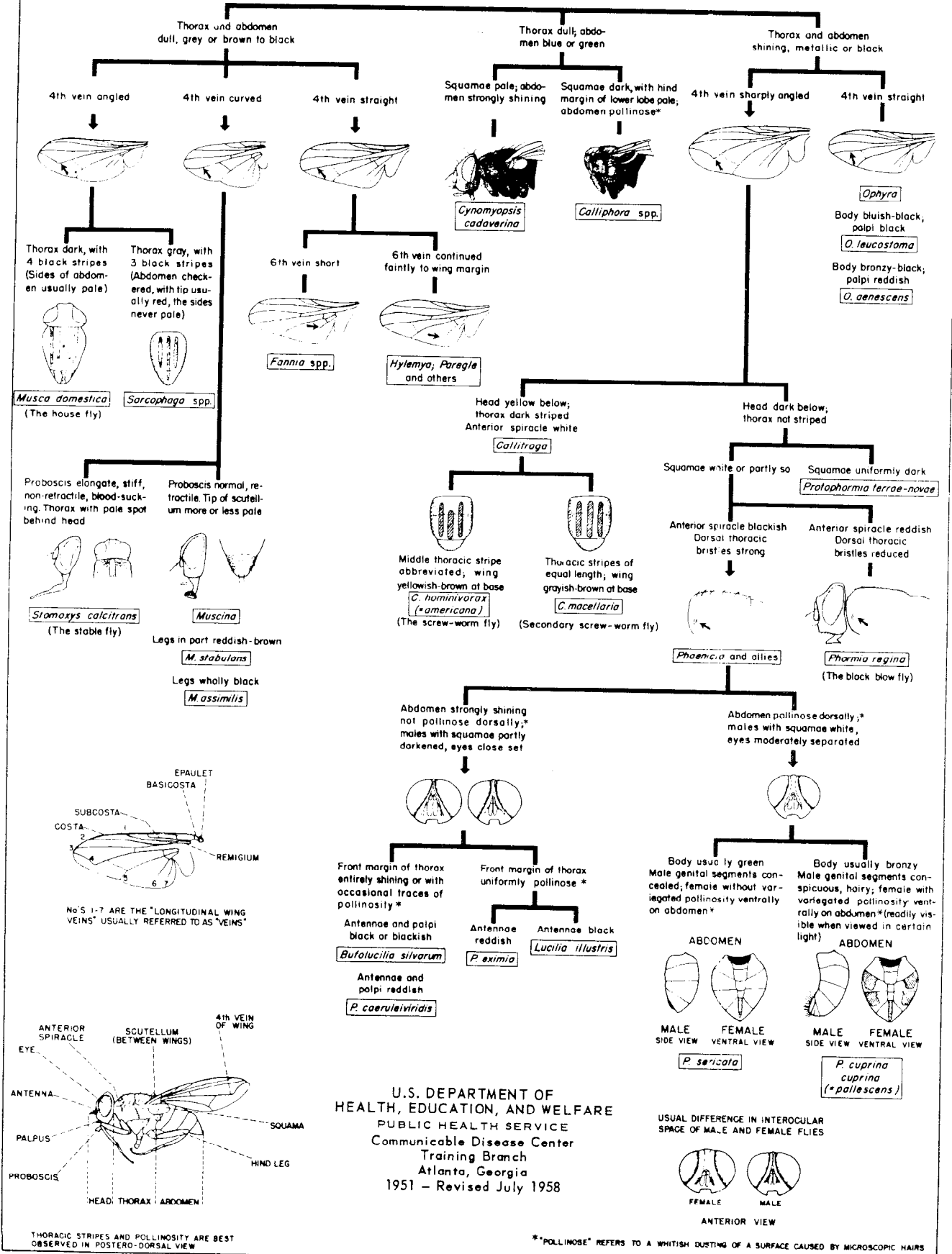
DIPTERA: PICTORIAL KEY TO PRINCIPAL FAMILIES OF PUBLIC HEALTH IMPORTANCE

H. R. Dodge



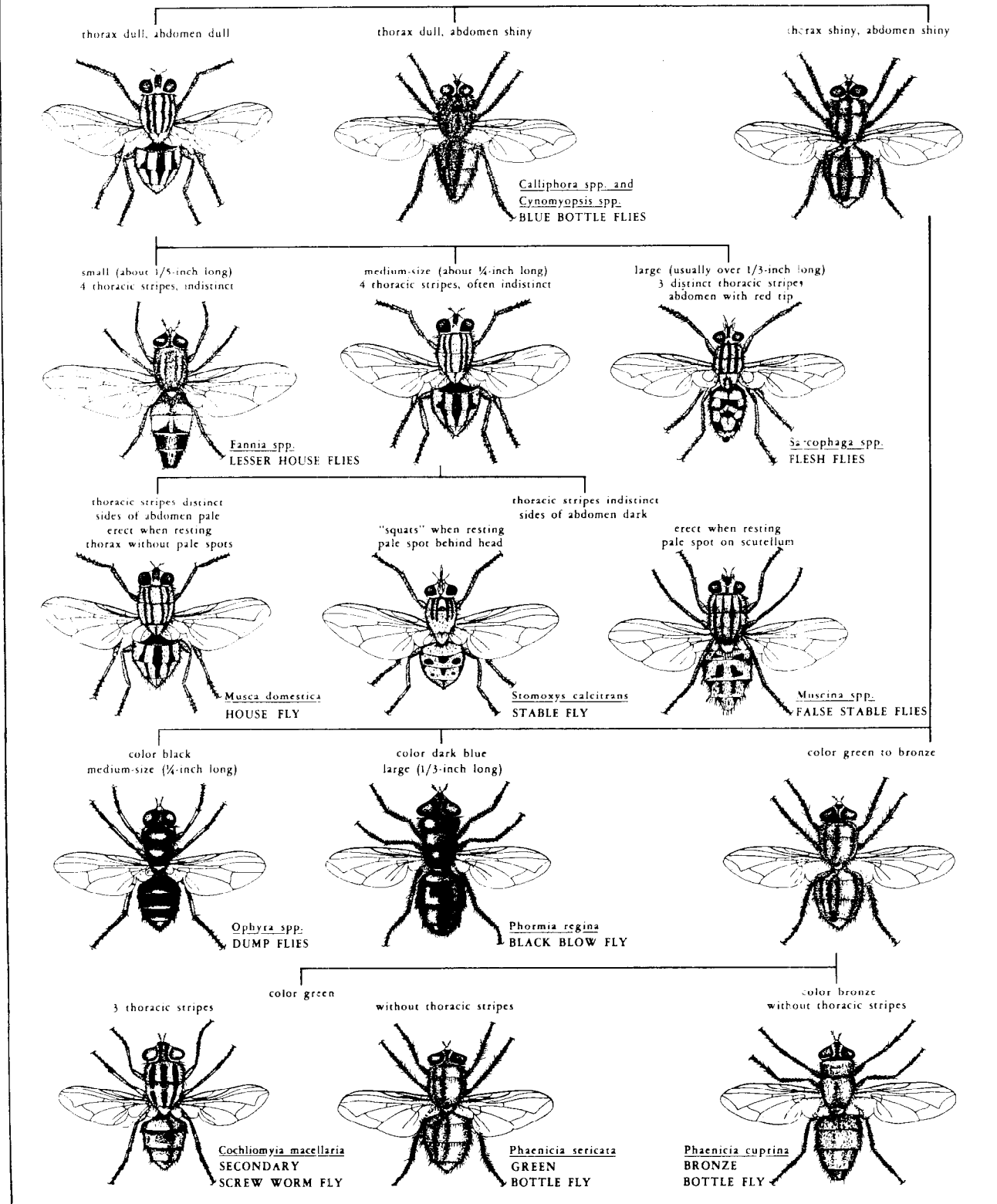
DOMESTIC FLIES: PICTORIAL KEY TO COMMON SPECIES IN THE U.S.

H. R. Dodge



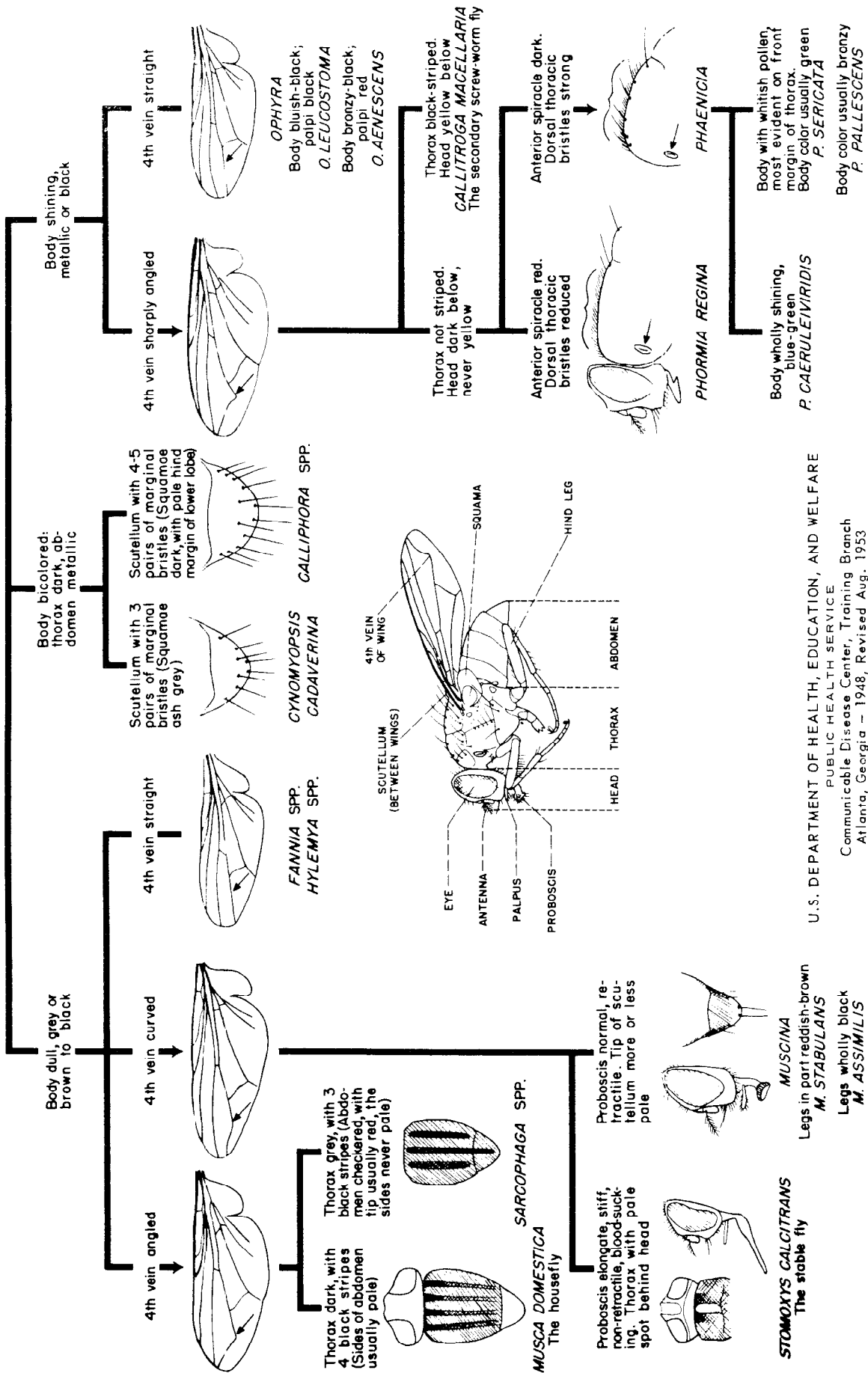
DOMESTIC FLIES: PICTORIAL KEY TO COMMON SPECIES

Harold George Scott and Margery R. Borom

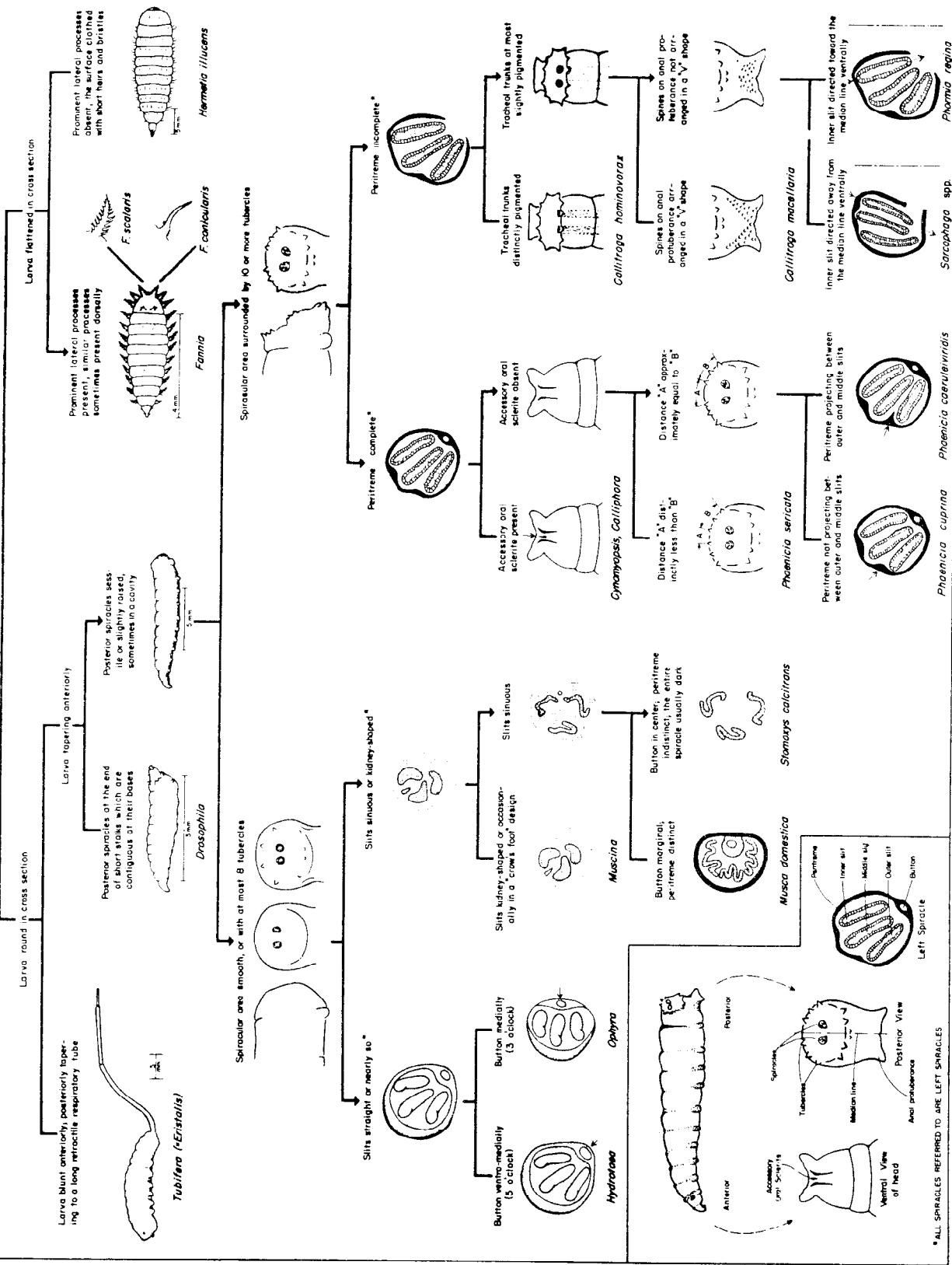


DOMESTIC FLIES: PICTORIAL KEY TO COMMON SPECIES IN SOUTHERN U.S.

H. R. Dodge



FLY LARVAE: PICTORIAL KEY TO SOME COMMON SPECIES — J. M. Seago



U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
 PUBLIC HEALTH SERVICE, Communicable Disease Center, Training Branch, Atlanta, Georgia — 1952—Revised 1953

FLY LARVAE: KEY TO SOME SPECIES OF PUBLIC HEALTH IMPORTANCE

Chester J. Stojanovich – Harry D. Pratt – Elwin E. Bennington

- 1. Larva with a definite, hard, sclerotized head capsule (Fig. 1 A).....2
- Larva without a definite, hard, sclerotized head capsule (Fig. 1 B).....3

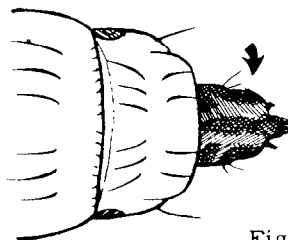


Fig. 1 A

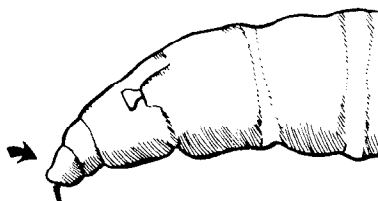


Fig. 1 B

- 2. Body flattened; large larvae 12-20 mm. long (Fig. 2 A)... (Hermetia illucens) SOLDIER FLY
- Body cylindrical with spiracles opening in a tubular segment at posterior end of body, last segment modified into a sclerotized air tube (Fig. 2 B).....
- (Genus Psychoda & allies) FILTER FLIES

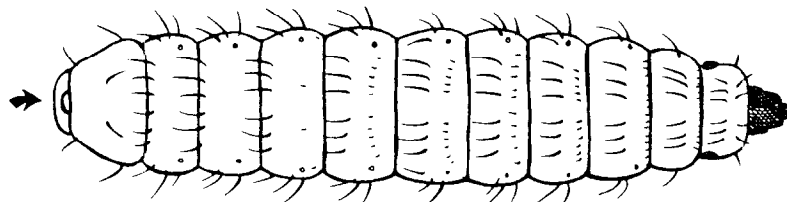


Fig. 2 A

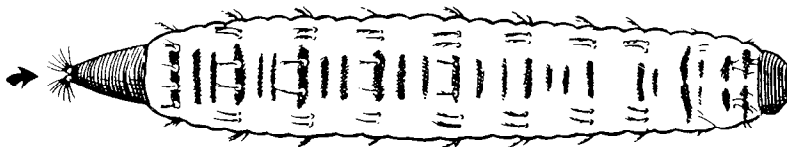


Fig. 2 B

- 3. Body with spine-like dorsal and lateral processes on each segment; posterior spiracles on small elevations (Fig. 3 A)..... (Genus Fannia)... 4
- Body smooth, or with short spines, but no long lateral processes (Fig. 3 B)..... 5

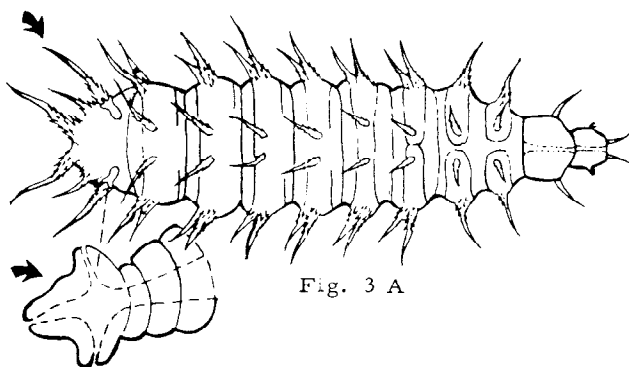


Fig. 3 A

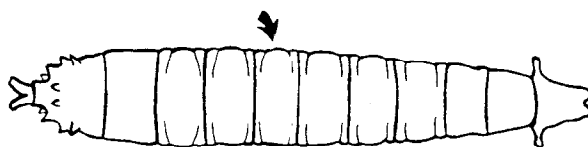


Fig. 3 B

4. Processes branched or feathery (Fig. 4 A).....(Fannia scalaris) LATRINE FLY
 Processes without branches, spiny (Fig. 4 B)..(Fannia canicularis) LESSER HOUSE FLY

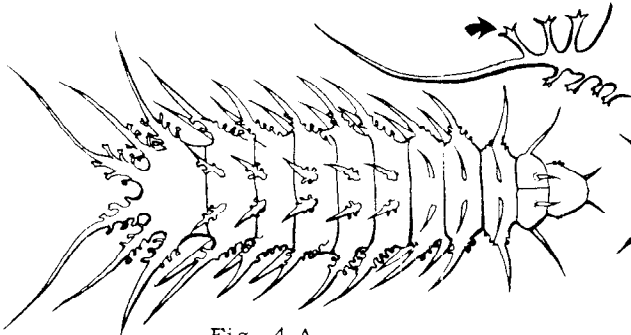


Fig. 4 A

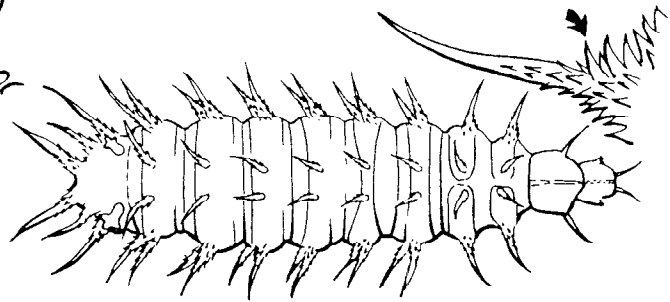


Fig. 4 B

5. . Posterior spiracles on peg-like tubercles or cones; smaller larvae, usually 6-9 mm. long (Fig. 5 A)..... 6
 Posterior spiracles not on peg-like tubercles; larger larvae, usually 9-18 mm. long (Fig. 5 B)..... 7

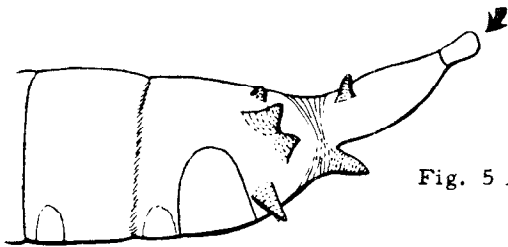


Fig. 5 A

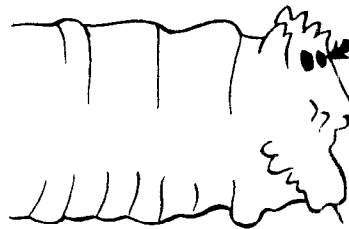


Fig. 5 B

6. Posterior spiracles at ends of long tubercles (Fig. 6 A).....
 (Genus Drosophila) VINEGAR FLIES
 Posterior spiracles on short cones, last segment with short finger-like lateral process (Fig. 6 B).....(Piophila casei) CHEESE SKIPPER

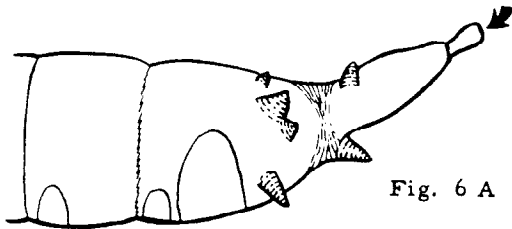


Fig. 6 A



Fig. 6 B