

Hence the exudate, or the plant, strictly speaking, cannot be called "insecticidal" any more properly than "insectivorous." The peculiar attractiveness above noted doubtless serves the plant some special purpose, and until the real nature of this is determined the designation given in the heading must of course be understood as provisional.

Mr. Howard then presented a paper entitled—

THE HYMENOPTEROUS PARASITES OF SPIDERS.

BY L. O. HOWARD.

I have for some time been interested in the subject indicated by the title of this paper and have published several short notes with descriptions of species in the first three volumes of *Insect Life*. Material has accumulated on my hands, however, to such an extent that I have thought it well to bring it all together into convenient and accessible shape. The biological facts here given have been transmitted to Rev. H. C. McCook for publication in the third volume of his large work upon "Spiders and Their Spinning Work." A systematic statement, however, is given below with descriptions of all new species and all of the facts so far connected with their life histories except where previously published. In the latter case references are given. I have followed this statement with a tabular list of the European hymenopterous parasites of spiders so far as I have been able to find them recorded. This list is taken from a manuscript catalogue of the host relations of parasitic Hymenoptera upon which I have been engaged for some time. It should be stated concerning this list that the bibliographical references in the third column do not give in many cases the name of the original observer or even the reference to the first publication, as I have, in order to save time, catalogued mainly published lists of host relations, thus taking advantage of the compilation work done by other workers. As a result Blackwall's rearings, for instance, while not credited in the reference column to that author, may appear under Bridgman or Fitch or some other author, as the case may be. I have confined myself to the consideration of the hymenopterous parasites, although several Diptera are known to infest spiders and their cocoons; thus certain flies of the Muscid genus *Leucopis* are said by Schiner to live in the nests of spiders, while Menge states that the larva of *Oncodes* inhabits the sac of *Clubiona* and devours the spider. Moreover, the curious hypermetamorphoses of *Mantispa* have been proved by Brauer to take place in the egg sacs of spiders of the genus *Lycosa*.

Nos. 17 to 21, inclusive, of the American list, belonging to the Ichneumonid genus *Hemiteles* and the Chalcidid genus *Eupelmus* have been kindly described for me by Prof. Riley, on account of his particular interest in these two genera.

AMERICAN HYMENOPTEROUS PARASITES.

1. *Polysphincta* sp.

A larva which was not reared to the adult, but which probably belonged to *Polysphincta*, was found feeding externally upon *Steadota borealis* Hentz in the District of Columbia. W. H. Fox collector.

See *Insect Life*, Vol. I, p. 42.

2. *Polysphincta* (*Zatytopa*) *dictynæ* How. *Insect Life*, Vol. I, p. 106.

This species was reared from a larva feeding externally upon *Dictyna volupis* by J. H. Emerton, at Waltham, Mass.

3. *Polysphincta* (*Zatytopa*) *strigis* n. sp.

Female.—Length, 5 mm.; expanse, 10 mm. Body black, with delicate whitish pubescence; mesonotum and mesopleura dark honey-yellow, mesoscutum with three dark longitudinal bands; all coxæ and trochanters, front and middle femora, and front tibiæ and tarsi light ochre-yellow; middle tibiæ with a brown band at tip; tarsi brown, except base of first joint; hind femora brown above, whitish below; basal three-fourths of hind tibiæ whitish, apical fourth dark brown, nearly black, with a brownish spot near base above; hind tarsi dark brown except base of first joint, which is whitish; abdomen yellowish below at base; palpi yellowish white; mandibles brown at base and extreme tip, otherwise yellowish; clypeus brown; wing veins dark brown; tegulæ yellowish white. Abdomen nearly smooth; terebra exerted to a length equal to the last three joints of the abdomen. No trace of a cubital cross-vein in the forewings, although the cubital vein is bent at quite a sharp angle. Fifth tarsal joint subtriangular in shape, about as long as third; pulvillus large. Metascutellum with two longitudinal median carinæ, slightly diverting posteriorly.

Described from one female specimen.

The larva of this species was found feeding externally upon *Epeira strix* by Nathan Banks at Sea Cliff, Long Island, May 11, 1891. At the time of capture the parasitic larva was considerably larger than the spider. The larva spun up May 14. When brought to me, May 18, the cocoon was completed in the vial in which Mr. Banks had placed the specimen. The cocoon was of a densely spun yellow-brown silk, 6 mm. long, cylindrical, 2 mm. in diameter, and rounded at both ends. It was suspended by a loose band of darker colored, coarser silk 7 mm. long, and

from the end of this band a few threads reached to the bottom (27 mm.) and sides of the vial. At the opposite end of the cocoon from the supporting band were 7 oblong, black excremental pellets evidently extruded by the larva before closing itself in the cocoon. The abdomen of the spider was reduced to almost nothing, but the cephalothorax and legs remained natural. May 25 the adult issued from the opposite end of the cocoon from the excrement.

The cocoon of *P. dictynæ* mentioned above was of about the same size and had a smaller supporting band, but was composed of white silk and was much more delicate (nearly transparent).

4. *Polysphincta* sp.

Larva not reared. Feeding externally upon the abdomen of *Linyphia communis* Hentz. Collected at Beverly, Mass., August 28, 1869, by J. H. Emerton.

5. *Polysphincta* sp.

Shrunken larva only. Found in cocoon attached to dead spider of the Attid genus *Icius*. Collected at Eastport, Maine, August 18, 1872, by J. H. Emerton.

6. *Polysphincta* sp.

Larva not reared. Collected on the dorsum of *Theridium spirale* (?) by J. H. Emerton. (Neither date nor location.)

7. *Polysphincta* sp.

Known only by the larva, which was found attached to a specimen of *Pardosa luteola* Marx in a collection of spiders from Ounalaska.

8. *Polysphincta theridii* n. sp.

Length, 5.4 mm.; expanse, 8 mm. Belongs to the true genus *Polysphincta* as differentiated from *Zatyptota* Förster, *Oxyrrhexis* Först. and *Zaglyptus* Först. by Schmiedeknecht's tables (*Zool. Jahrbücher* III, 3, 432-3). The cubital cross-vein is represented by a distinct stump closely proximad of the angle of the cubital, which is slightly marked. Metascutellum with two parallel median longitudinal carinæ diverging widely behind and bordering a pentagonal space which is slightly and irregularly longitudinally ridged; first segment of abdomen with two dorsal median longitudinal subparallel carinæ diverging anteriorly and converging at posterior end of segment to form a distinct tubercle; second and subsequent abdominal segments each with a well-defined finely punctate space shaped much like the black markings on the abdomen of *P. (Zatyptota) dictynæ* (See fig. 1). General color dull black; all legs uniform honey-yellow, except that hind tibiae are brown at the tips; scape and pedicel of antennæ honey-yellow; palpi honey-yellow, clypeus darker.

Described from two ♂ specimens received from J. H. Emerton, and each labelled "from cocoon in nest of *Theridium*, Eastport,

Me., August, 1872." Both specimens are in bad condition and are covered with a chalk-like deposit and bits of spider's silk.

9. *Polysphincta (Zaglyptus) koebelei* n. sp.

Female.—Length, 8 mm.; expanse, 11 mm. Resembles quite strongly *P. (Zatyptota) strigis*, except in the main structural character that the cubital cross-vein is plainly represented by a short stump, just proximad of the angle in the cubital. The subparallel metascutellar carinæ are also lacking, this sclerite being marked only by a delicate median longitudinal impression which is lacking on the apical half. The plan of coloration is the same, but the following differences may be noted: hind coxæ black at base; all other crural sclerites uniform honey-yellow; mesonotum of a more uniform and lighter honey-yellow; metascutum honey-yellow.

Described from one female specimen received from A. Koebele, and labelled "Santa Cruz Mountains, Calif." Upon the tag with the specimen is the shrivelled body of a spider upon which it is fair to presume that the parasitic larva had been feeding, the more especially since the spider's abdomen has been destroyed. Attached to the same pin is what is evidently the cocoon of the parasite. It is 7.5 mm. long and 3.8 mm. wide, is rather loosely spun (so as to be translucent) of light brown silk. The spider has been determined from its remains by Dr. Marx as *Epeira strix* or *E. scolopetaria*.

Other references to the interesting external parasites of the *Polysphincta* group will be found under the head of "European Parasites." Still others will be found in the original note in *Insect Life*, Volume I, p 43. It was supposed at the time that this was the first American record of an external spider parasite, but Mr. Schwarz has recently called my attention to a note in the Proceedings of the Boston Society of Natural History for 1871, Volume XIV, p. 388, which reads: "Mr. F. G. Sanborn reported a recent capture of a spider of the genus *Lycosa* (?) upon which was a parasitic larva apparently dipterous."

10. *Pimpla rufopectus* Cresson. *Trans. Am. Ent. Soc.* III, p. 148.

Three female specimens reared from spider's egg-bag (probably Epeirid), Alameda county, Cal., June 10, 1887, by A. Koebele. (See *Insect Life*, Vol. III, p. 461.) Also reared by W. H. Patton in Connecticut, in May, from the cocoon of an Epeirid spider. Also two females reared in the District of Columbia by O. Heidemann. Three female specimens reared from an egg-bag of *Argiope riparia*, February 22, 1889. Received from H. C. Wells, Short Hills, N. J. (See *Insect Life*, Vol. I, p. 324, where it is named *P. inquisitor*.) This is also the species referred to by Dr. Burt G. Wilder in the Proceedings of the A. A. A. S. for 1873, p. 257, and also in a popular article in *Harpers'*

Magazine for March, 1867. I have not seen the adult insect, but Dr. Wilder a number of years ago sent me the cocoons.

11. *Pimpla scriptifrons* Cresson. *Trans. Am. Ent. Soc.*, III, p. 148.

Eleven males and one female reared from white cocoons in the egg-sac of *Argiope riparia*, District of Columbia, April, 1889. (See *Insect Life*, Vol. III, p. 462.)

12. *Pimpla japonica* Ashm. mss.

One specimen reared from spider's egg from Japan. (See *Insect Life*, Vol. III, p. 463.) This may be a Japanese species.

13. *Pimpla aquilonia* (?) Cresson. *Trans. Am. Ent. Soc.*, III, p. 145.

One female specimen of what may be this species reared from eggs of *Epeira angulata*, by Dr. A. Davidson, at Los Angeles, Cal. Cresson's species was described from the male sex only and from Maine. It is, however, the only described species which Dr. Davidson's specimen resembles, and although the localities are separated by the entire continent they may prove identical.

14. *Pezomachus unicolor* Cresson. *Can. Entom.*, Vol. IV, p. 64.

One female specimen collected on a fence across a meadow with many spiders, at Dedham, Mass., November 9, 1873, by J. H. Emerton. I think this species was not actually reared, but there is little doubt but that it is a spider parasite.

15. *Pezomachus obscurus* Cresson. *Can. Entom.*, Vol. IV, p. 62.

Four female specimens reared by F. M. Webster, at Columbus, Ohio, from the cocoons of a species of *Micaria*.

16. *Pezomachus micariæ* n. sp.

Female.—Length, 5 mm; ovipositor nearly as long as last three abdominal segments; antennæ short, stout, not longer than head and thorax together. General color dull rufous, basal five joints of antennæ lighter; sutures of thorax and dorsum of abdomen behind the petiole black, the second, fifth, sixth, and seventh abdominal segments edged with rufous behind, the band on the second segment widest; mandibles yellow at base. Head, thorax, and abdomen very finely shagreened, shining.

Male.—Length, 6 mm.; expanse, 12.4 mm. The rufous color applies to entire abdomen and all legs, as well as to mandibles and mouth-parts. Head and thorax dull black and delicately shagreened, except metanotum, which is finely rugose and furnished with delicate irregular carinæ forming a wide reticulation.

Described from one male and one female, each reared from an egg cocoon of *Micaria*, by J. H. Emerton, at Salem, Mass.

17. *Hemiteles prothesimæ* Riley sp. n.

Male.—Length, about 5.5 mm. *Head* black, opaque, densely but finely granulate, and with a fine, short pubescence; eyes large, convex; ocelli in a triangle, pale; clypeus smooth, not distinctly separated at base;

mandibles and palpi pale ferruginous; antennæ long, black, the basal two joints ferruginous, the first being sub-globose and obliquely truncate at apex. *Thorax* black, sculptured and pubescent like the head; mesonotal furrows only slightly indicated anteriorly; scutellum smoother than the surrounding surface, shining, in marked contrast to the mesonotum, with a transverse fovea at base; the long, lateral foveæ of the postscutellum crenate or striate at bottom; metathorax distinctly areolated, the central or middle area hexagonal; the surface of the petiolar area and the lateral area transversely rugulose; spiracles small, oval; mesopleura with a series of ridges below tegula and smooth toward the posterior margin, shining, with a deep fovea at the middle; wings hyaline; tegulæ and a spot at the base of the stigma whitish, the nervures ferruginous, the stigma fuscous, third discoidal cell more than twice the length of the second, the discoidal nervure simple, not broken by a stump of a cubital nervure; transverse median nervure in hind wings broken very near the base; legs rufous. *Abdomen*, with the petiole black except toward posterior border, the spiracles placed behind the middle; the other joints rufous, smooth, impunctate; joint 2 one-half longer than 3.

Hab.—Salem, Mass.

Described from a single male specimen reared April 19, 1872, by J. H. Emerton, from a cocoon of *Prothesima furcata*.

This species comes nearest to *H. townsendi* Ashm. in size and color, but is different in sculpture and in the venation of hind wing. The surface of *H. townsendi* is smooth, shining, sparsely punctate, the transverse median vein in hind wing being broken a little below the middle, while in *H. prothesimæ* the surface is closely, densely granulate, the transverse median nervure in hind wing being broken very close to the base.

18. *Hemiteles micarivora* Riley sp. n.

Male.—Length, 4 mm. *Head* black, opaque, densely, closely granulate, with a few large sparse punctations, and with a fine, short pubescence; the clypeus distinctly separated and sculptured as the face; mandibles rufous; antennæ as in *H. prothesimæ*; also the scutellum and the metathorax, except that the surface of all the areas is rugulose and the dorsulum of postscutellum is striate. *Thorax* colored and sculptured like the head; wings with the venation darker than in *prothesimæ*, although the tegulæ and a spot at the base of stigma are white; third discoidal cell only about twice as long as the second; discoidal nervure broken by a stump of a cubital nervure; legs obscure rufous, the tarsi slightly fuscous, as also the knee and terminal part of tibiæ in hind pair. *Abdomen* smooth, rufous, posterior part of fourth and all of following joints black; joint 2 not quite one-half longer than 3; petiole faintly striate, the spiracles near anterior third.

Hab.—Washington, D. C.

Described from one specimen reared, by O. Heidemann, from the cocoon of a species of *Micaria*.

In the color of the abdomen and in having a distinct stump of a cubital nervure, this species is distinct from all others in our fauna, but otherwise it closely resembles *H. drassi*, described below.

19. *Hemiteles drassi* Riley sp. n.

Male.—Length, 4.5 mm. Agrees with *H. micarivora* except as follows: The face has no large punctations; mandibles are piceous; palpi white; dorsulum of postscutellum closely punctate; not striate; posterior tibiæ and tarsi fuscous; the second and third abdominal segments and the extreme apex of petiole and base of fourth segment are rufous; the rest of the abdomen black; while the discoidal nervure is simple and not broken by a stump of a cubital nervure.

Hab.—Columbus, Ohio.

Described from two male specimens reared, by F. M. Webster, from cocoons of a Drassid spider.

The three species of *Hemiteles* above described by Mr. Howard's desire occur, unfortunately, in the male sex only, and on account of the divergence which often occurs between the two sexes in this genus it will be difficult to connect the females with them until they have been reared together. It seems desirable, however, to characterize the species in this connection, even though the characterization be necessarily incomplete. [C. V. R.]

20. *Eupelmus piceus* Riley sp. n.

Female.—Length, 3.1 mm.; ovipositor, 0.80 mm.; width of head, 1 mm. Æneous-black, with bronzy and metallic reflections. Head and thorax above (except the mesonotal depression, which is smooth and shining) finely shagreened; lower part of face and cheeks metallic green, the cheeks below the eye finely striolate; trochanters, anterior and middle femora, tibiæ and tarsi *beneath*, posterior femora at tip and the ovipositor, ferruginous; femora and posterior coxæ with a metallic æneous tinge, the latter with some silvery-white hairs, while the rest of the legs are blackish. Wings hyaline, with a large, fuliginous discal blotch below the marginal nervure; tegulæ large, dull fuscous; mesopleura blue-black, finely and longitudinally aciculate toward posterior margin. Head very broad, wider than the thorax across the wings, fully three times as wide as long antero-posteriorly, the occipital region broad, slightly and roundedly emarginate; ocelli triangularly arranged, face broad, flat, without a trace of the antennal furrow; eyes large, elliptic, divergent anteriorly, the face, in consequence, being wider below than above; anterior edge of clypeus and the mandibles ferruginous; palpi blackish. Antennæ widely separated at base, inserted just above the clypeus, slender, the flagellum about twice

the length of the scape, very slightly thickened and obliquely truncate at tip, black; the scape is cylindrical, slender, pale ferruginous, and does not reach beyond the anterior ocellus. Collar triangular, the posterior margin emarginate; prosternum rhomboidal with a central impressed line; mesonotum impressed, trilobed, of the usual shape in the genus, the middle lobe convex, terminating at two-thirds the length of the mesonotum, shagreened, the lateral lobes carinate, the depressed space between and the posterior edge of middle lobe smooth, shining, impunctate; scutellum large, subconvex, rounded, the lateral pieces at base triangular; metathorax obliquely sloping with a deep central channel, the metapleura smooth with the spiracles elliptic and placed at their base. Abdomen ovate, truncate behind, flat above, boat-shaped beneath, the first segment the longest, segments 2 to 5 shorter, about equal, the following retracted or shortened.

Male.—Length, 2.1 mm. Agrees with the ♀ in color, except that the legs are not ferruginous beneath and the middle and posterior tarsi are white; wings clear hyaline, with the nervure pallid. It differs structurally in not having the mesonotum impressed, but showing only slight impressions between the middle and lateral lobes; eyes finely pubescent; the mesopleura have a distinct femoral furrow or impression; middle tarsi not dilated and combed or pectinate beneath, the posterior tibiæ being compressed.

Hab.—California.

Described from 1 ♂ and 2 ♀ specimens received from Dr. H. C. McCook, reared July 27, 1891, from the eggs of a spider, *Argiope argentata*.

In the very wide head, the absence of antennal furrows, the widely separated antennæ, and the flat hind tibiæ of the ♂, this species is easily separated from any described Eupelmid. It comes nearest to *Metapelma* Westwood, but in this genus the posterior tibiæ and tarsi in both sexes are broadly dilated, the middle legs being normal, while there are other characters that separate it.

21. *Eupelmus drassi* Riley n. sp.

Female.—Length, 3 mm. Head golden green, closely punctate; thorax at sides and beneath, and legs, light brown or brownish yellow; the upper concave surface of the collar violaceous; mesoscutum blue-green, sparsely covered with a short, whitish pubescence; scutellum metallic brown; axillæ reddish yellow; metathorax greenish; the metapleura distinctly violet; mesopleura posteriorly dusky; middle tibiæ, except distal ends, and the hind legs, except the coxæ behind and on the knees, fuscous; hind coxæ behind black; all tarsi, except the last joint, yellowish.

Antennæ (broken after the third joint) with the scape brownish yellow, the joints of the flagellum which are left brown. Front wings, except the basal one-third which is hyaline, fuscous with an interrupted transverse band beyond the middle, composed of two large oblong white spots that

start from each margin behind the base of the stigmal vein, and are obliquely directed toward the basal middle of the wing, but do not quite meet each other; marginal vein very long, fully as long as the submarginal, the stigmal vein small, only about one-third the length of the postmarginal; hind wings hyaline. Abdomen clavate, broadened behind, scarcely two-thirds the length of the thorax, blue-black, the first or basal segment pale, the venter somewhat greenish, the ovipositor not exerted, only the tip slightly exposed and that is white.

Described from one ♀ specimen reared by Miss Mary E. Murtfeldt, September 21, 1891, from a spider's nest which Dr. Marx identifies as probably belonging to a *Drassus* sp.

This belongs to *Antigaster* Walsh. [C. V. R.]

22. *Holcopelte nitens* n. sp.

Female.—Length, 1.6 mm.; expanse, 2.6 mm.; greatest width of forewing, 0.8 mm. Head delicately shagreened, with a smooth spot between ocelli and one just before anterior ocellus; mesonotum also finely shagreened; metanotum with three median longitudinal carinæ, the middle one flattened on top and smooth and glistening, and a smooth space laterad of each of the outer carinæ; abdomen smooth, glistening. Bristles of thorax black; pile of head and abdomen whitish; eyes with close whitish pile. General color black, shining, with metallic reflections, those of head, mesoscutum, and metanotum greenish, those of scutellum bluish; abdomen glistening but without colored reflections, all coxæ metallic, all other sclerites of all legs pale, whitish, almost translucent; antennal scape whitish, concolorous with all femora, tibiæ, and tarsi; rest of antenna metallic with close whitish pile.

Male.—Length, 1.3 mm.; expanse, 2.6 mm.; greatest width of forewing, 0.5 mm. Differs from female only in usual sexual differences in this genus, except that the metallic colors are brighter and the dorsal surface of abdomen has bright golden reflections.

Described from two male and five female specimens reared from egg-bag of *Epeira* at Washington, D. C., by Nathan Banks. This species is without much doubt hyper-parasitic, primarily infesting some Ichneumonid in the spider cocoon.

23. *Mestocharis wilderi* n. sp.

Female.—Length, 1.5 mm.; expanse, 2.7 mm.; greatest width of forewing, 0.56 mm. Front delicately transversely shagreened; occipital ridge elevated and acute; occiput densely punctulate; mesoscutum densely and finely punctulate; mesoscutellum longitudinally shagreened; metascutum with a small, deep, nearly round, central fovea; median longitudinal carina of metascutellum well marked and dividing just beyond middle of sclerite into two latero-caudally directed arms; dorsum of petiole markedly punctate; remaining abdominal tergites very faintly granulate. General

color shining black; head and thorax with greenish-blue reflections; first, second, and third tarsal joints of all legs light yellowish.

Male.—Closely resembles female except in ordinary sexual differences of antennæ and abdomen. The head and thorax, however, have a bright coppery or golden lustre.

Of this species I have several male and female specimens reared by Dr. B. G. Wilder, at James Island, S. C., from the cocoons of *Pimpla*—probably *rufopectus*—within the egg-cocoons of *Epeira riparia*, collected between March 21 and April 2. Also four male specimens reared by Col. Nicholas Pike, at Brooklyn, N. Y., 1880, from cocoon of *Argiope riparia*. Also many male and female specimens reared, by Nathan Banks, at Sea Cliff, L. I., from cocoons of the same spider. Also 11 male and female specimens reared from a parasitized cocoon of an Epeirid collected at Washington, D. C., by the writer. Also 5 male specimens reared from cocoon of *Epeira angulata* infested by *Pimpla aquilonia* (?) at Los Angeles, Cal., by Dr. A. Davidson.

24. *Tetrastichus banksii* n. sp.

Female.—Length, 1.8 mm.; expanse, 3.1 mm.; greatest width of forewing, 0.6 mm. Head and face with coarse punctures, which on the face are arranged in four rows, one down each side of antennal groove and one down the border of each eye; mesonotum delicately longitudinally striate, median furrow of mesonotum sharp and continuous with a faintly indicated median longitudinal furrow of the scutellum; just mesiad of the parapsidal furrows of the mesoscutum is a row of deep, large punctures, which is continuous with the impressed lateral furrows of the scutellum; these lateral scutellar furrows are continuous but seem composed of a chain of punctures; metascutum impressed in centre, the impression bearing a central papilla; meta-scutellum with a median longitudinal carina, each side of which is a strongly rugose surface; pro-, meso-, and meta-pleura closely punctate; abdomen smooth, shiny, concave above behind the second segment through drying. General color black, with faint greenish metallic reflections; scape of antennæ honey-yellow; mandibles honey-yellow; all coxæ and femora metallic, yellowish at joints; all tibiæ and tarsi light-brown with a darker shade above at base of tibiæ.

Described from three female specimens reared from egg-bag of an Epeirid at Washington, D. C., by Nathan Banks, together with seven specimens of No. 22—*Holcopelte nitens*. This species is undoubtedly hyperparasitic, but whether it is primarily parasitic upon *Holcopelte*, or upon some Ichneumonid, the *Holcopelte* being then parasitic upon the *Tetrastichus*, is uncertain.

25. *Bæus americanus* How. *Insect Life*, Vol. II, p. 270.

Several male specimens reared from Epeirid eggs by Col. Nicholas Pike, Brooklyn, N. Y. Also several males and one female

from spider's eggs in an orange cocoon collected by J. H. Emerton in 1871. (See *Insect Life*, Vol. II, p. 359.)

26. *Acoloides saitidis* How. *Insect Life*, Vol. II, p. 270.

Nine males and one female reared from the eggs of *Saitis pulex*, by Lawrence Bruner, at Lincoln, Neb. Also 12 females reared from a spider egg-sac at Oxford, Ind., October, 1884, by F. M. Webster. (See *Insect Life*, Vol. II, p. 359.) Also 11 specimens reared in September, by Prof. C. V. Riley, from eggs of *Phydippus morsitans*, Washington, D. C.

27. *Acoloides emertonii* How. *Insect Life*, Vol. IV, p. 202.

Seven female specimens reared, by J. H. Emerton, from egg-cocoon of an unknown spider.

28. *Acolus zabriskiei* Ashmead ms.

Two males of an undescribed species to which Mr. Ashmead will give this name were reared by Rev. J. L. Zabriskie at Flatbush, L. I., from the small orange-colored cocoon of an unknown spider.

EUROPEAN HYMENOPTEROUS PARASITES.

<i>Parasite.</i>	<i>Host.</i>	<i>Reference.</i>
Hemiteles similis.....	Epeira diadema.	Giraud et Laboulbène, Liste d'éclosions d'insectes, <i>Ann. Soc. Ent. France</i> , 1877, 402. J. B. Bridgman, <i>The Entomologist</i> , XVI, 106.
Hemiteles similis.....	Spider's nest.....	Bridgman, <i>loc. cit.</i>
Hemiteles melanarius..	Spider's eggs.....	Bridgman, <i>loc. cit.</i> , 108.
Hemiteles palpator.....	Aranea	Ratzeburg, <i>Ichn. d Forst insecten</i> , Wirths-System.
Hemiteles palpator.....	Spider's egg-bag	Bridgman, <i>loc. cit.</i>
Hemiteles fasciipennis.	Spider cocoons.....	Brischke, <i>Allgemeine Wirths-System.</i>
Hemiteles rufocinctus.	Aranea	Ratzeburg, <i>loc. cit.</i>
Hemiteles formosus....	Agalena brunnea	Bridgman, <i>loc. cit.</i>
Hemiteles fulvipes.....	Aranea	Ratz., <i>loc. cit.</i>
Hemiteles fulvipes	Spider's eggs.....	Bridg., <i>loc. cit.</i> , ^o Kirchner, <i>Cat. Hym. Eur.</i> , 65.
Hemiteles fasciatus.....	Spider's eggs.....	Kirch., <i>loc. cit.</i>
Hemiteles tristator.....	Epeira diademata eggs....	Brischke, <i>loc. cit.</i> ; Bridg.; <i>loc. cit.</i> , 107.
Hemiteles tenerrimus..	Agalena brunnea nests...	Bridg., <i>loc. cit.</i> , 108.

<i>Parasite.</i>	<i>Host.</i>	<i>Reference.</i>
Hemiteles tenerrimus..	Pedunculate spider co- coons.....	Giraud et Laboulbène, <i>loc. cit.</i>
Hemiteles araneorum..	Agalena brunnea nests...	<i>Ibid.</i>
Hemiteles fragilis..	..... Spider cocoons.....	Brischke, <i>loc. cit.</i> Bridg., <i>loc. cit.</i>
Hemiteles, 3 spp.....	Spiders' nests.....	Bridg., <i>loc. cit.</i> , XV.
Mesochorus araneorum	White spiders' nests	Kirchner, <i>loc. cit.</i> , 97.
Mesochorus araneorum	Aranea	Rtz., <i>loc. cit.</i>
Cryptus titillator.....	Spider cocoon.....	Snellen van Vollenhoven, Pinacographia, 10; Bridg., <i>loc. cit.</i> , XVI, 35; Kirch., <i>loc. cit.</i> , 56; Ratz., <i>loc. cit.</i> ; Brischke <i>loc. cit.</i>
Cryptus annulitarsis...	Spider cocoons.....	Brischke, <i>loc. cit.</i> , 166.
Pimpla rufata.....	Spider cocoons	Ratz., <i>loc. cit.</i> . Gir. et Lab., <i>loc. cit.</i> , 410; Kirch., <i>loc. cit.</i> , 106.
Pimpla angens.....	Spider cocoons.....	<i>Do.</i> all refs.
Pimpla scanica.....	Spider cocoons.....	Brischke, <i>loc. cit.</i>
Pimpla brevicornis	Spider cocoons.....	Brischke, <i>loc. cit.</i>
Pimpla ornata.....	Spider cocoons.....	Brischke, <i>loc. cit.</i>
Pimpla ovivora.....	Spider cocoons.....	Snellen, <i>loc. cit.</i> , 34; Brischke, <i>loc. cit.</i>
Pimpla oculatoria.....	Spider cocoons.....	Snellen, <i>loc. cit.</i>
Pimpla oculatoria.....	Epeira diadema eggs.....	Gir. et Lab., <i>loc. cit.</i> , 409.
Polysphincta boops.....	Spider	Brischke, <i>loc. cit.</i>
Polysphincta boops....	Theridion sp.....	E. A. Fitch, <i>The Ento- mologist</i> , 40.
Polysphincta boops....	Epeira diademata	<i>Ibid.</i>
Polysphincta carbona- tor ...	..... Aranea	Ratz., <i>loc. cit.</i>
Polysphincta carbona- tor	Miranda (Epeira) cucurbi- tina	Fitch, <i>loc. cit.</i>
Polysphincta carbona- tor	Epeira antriada	<i>Ibid.</i>
Polysphincta carbona- tor .....	..... Epeira diademata.....	<i>Ibid.</i>
Polysphincta carbona- tor .....	..... Spider's eggs (?).....	Kirchner, <i>loc. cit.</i>
Polysphincta rufipes....	Spider cocoons (?).....	Brischke, <i>loc. cit.</i>
Polysphincta rufipes....	Epeira diademata	Fitch, <i>loc. cit.</i>

<i>Parasite.</i>	<i>Host.</i>	<i>Reference.</i>
Polysphincta tuberosa.	Spider.....	<i>Ibid.</i>
Acrodactyla degener....	Two sp. of spider.....	O. P. Cambridge, <i>The Entomologist</i> , XV.
Pezomachus corruptor.	Agalena brunnea nests...	Gir. et Lab., <i>loc. cit.</i> , 402.
Pezomachus cursitans.	Spider cocoons.....	Brischke, <i>loc. cit.</i>
Pezomachus fasciatus..	Spider cocoons.....	<i>Ibid.</i> , Kirch., <i>loc. cit.</i> , 59.
Pezomachus fasciatus..	Agalena brunnea nests...	Gir. et Lab., <i>loc. cit.</i> , Snellen, <i>loc. cit.</i> , 20, Kirchner, <i>loc. cit.</i> , 61.
Pezomachus fasciatus..	Theridion sp.....	.....Cambridge, <i>loc. cit.</i> , XIV, 137.
Pezomachus instabilis.	Aranea ..	.....Ratz., <i>loc. cit.</i>
Pezomachus proximus.	Agalena brunnea cocoons	Gir. et Lab., <i>loc. cit.</i>
Pezomachus vagans....	Spider's nest.....	.....Bridg., <i>loc. cit.</i> , XV.
Pezomachus zonatus....	Agalena brunnea cocoons	Gir. et Lab., <i>loc. cit.</i> , 403.
Pezomachus zonatus....	Spider cocoons.....	Brischke, <i>loc. cit.</i>
Macrocentrus linearis..	Spider cocoon.....	Gir. et Lab., <i>loc. cit.</i> , 412.
Microgaster araneorum	Aranea ..	.....Ratz., <i>loc. cit.</i>
Microgaster perspicuus	Aranea ..	.....<i>Ibid.</i>
Microgaster deprimator	Spider cocoon.....	Brischke, <i>loc. cit.</i>
Pteromalus ater.....	Aranea ..	.....Ratz., <i>loc. cit.</i>
Pteromalus punctatus.	Aranea ..	.....<i>Ibid.</i>
Entomacis, 2 spp.....	Spider's cocoon.....	A. Förster, Hymenop- terologische Studien, II, 123.

EXPLANATION TO PLATE.

- Fig. 1. *Polysphincta (Zatyfota) dictynæ* How.: *a*, adult; *b*, larva attached in natural position to spider—enlarged (from *Insect Life*).
- Fig. 2. *Bæus americanus* How.; female—greatly enlarged (same source).
- Fig. 3. *Acoloides sailidis* How.; female, enlarged, showing wing veins, ♂ antenna and side view of meso- and metanotum—still more enlarged (same source).

Mr. Ashmead remarked that he had seen mites of the genus *Bryobia* in spider cocoons, but did not know whether they were there as parasites or hibernating. Mr. Howard thought that they must be hibernating, as *Bryobia* is a vegetable feeder. Mr. Marlatt said that *Bryobia* could not be a parasite, but crowded into any convenient place to hibernate. He further remarked that he had often opened spider cocoons soon after they were