The arrangement of the triplet cyclone received from Messrs. Kutzner Bros. is shown in the following illustration (Fig. 63). The nipple, which is designed to enter five sixteenths inch hose, is surmounted by a hemispherical chamber, *b*, which is covered with a milled-edge cap, *a*, which screws into the chamber, *b*. On this cap are mounted at the angles of of a triangle three Riley nozzles. The one to the rear stands higher than the others and delivers its spray straight in front, while the lower ones are respectively freed slightly to the right and left of a direct line. This arrangement secures a broad diverging cloud of spray and very much facilitates the work without in any way detracting from the quality of the spray as is the case when an attempt is made to increase the capacity by enlarging a single nozzle. A disgorger could be easily added to the chambers as here arranged, but as yet we believe no attempt has been made to do so. A screen of fine wire cloth is placed across the hemispherical chamber, thus rendering clogging almost impossible.

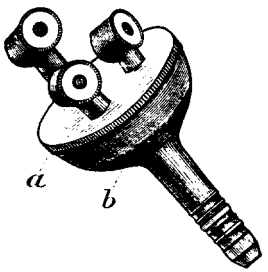

FIG. 63.—The New Zealand Triplet—reduced (Original).

THREE NEW PARASITES OF ICERYA.

BY L. O. HOWARD.

Professor Riley has turned over to me for description three of the parasites reared by Mr. Coquillett, at Los Angeles, from the Fluted Scale (*Icerya purchasi*). These he has referred to by name in his annual report for 1888, and the accompanying figures are from the report. The necessity for condensation, however, rendered it desirable that this descriptive matter should be published elsewhere. Neither of the three species seems to be at all abundant.

THORON OPACUS, sp. nov.

Male.—Length, 0.84^{mm}; expanse, 1.2^{mm}; greatest width of fore wing, 0.163^{mm}; length of antenna, 0.6 ^{mm}. Joint 1 of funicle rather shorter and slightly narrower than pedicel; funicle joints distinctly separated, subequal in length, increasing very slightly in width from 4 to 9, joints 2 and 3 equal in width and slightly slenderer than either 1 or 4; club one-third longer than joint 9 of funicle, ovate, at base of same width as joint 9 of funicle, without a trace of dividing sutures. Metanotal spiracles large, oval; metascutellum with a straight median longitudinal furrow. Abdomen flattened, ovate, rather longer than thorax. General surface of the body with no visible punctation, opaque. Head, antennæ and thorax dark brown; abdomen rather lighter; all legs brown; tarsi nearly white; base of all tibiæ nearly white. Wings hyaline; veins slightly dusky.

Described from 1 ♂ specimen, rather poorly mounted in balsam, reared by D. W.

Coquillett, at Los Angeles, Cal., July 21, 1887, from adult female of *Icerya purchasi*. It was reared in a box containing only three or four of the scales, so there can be lit-

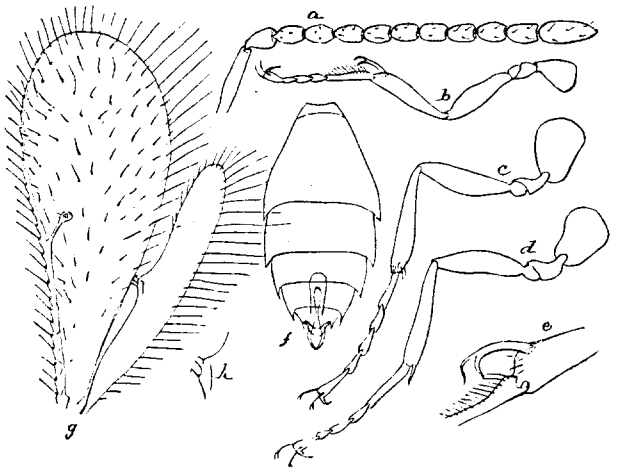

FIG. 64.—*Thoron opacus*. Howard: *a*, antenna; *b*, *c*, *d*, fore, middle, and hind legs; *e*, last tibial and first tarsal joints of fore leg; *f*, abdomen; *g*, wings; *h*, hooks of hind wing—all much enlarged (Original).

tle doubt of its having lived at the expense of one of them. Mr. Coquillett reared another specimen August 29, 1887, but this I have not seen.

COCCOPHAGUS CALIFORNICUS, sp. nov.

Female.—Length, 1.4mm; expanse, 2.1mm; greatest width of fore wing, 0.39mm. Abdomen broader than thorax and one-third longer. Pedicel and joints 2 and 3 of funicle subequal in length; joint 1 of funicle one-third longer. Eyes rather more plainly hairy than usual. General color dark brown, nearly black, no punctation visible. Mesoscutellum lighter in color than rest of thorax except at immediate base, its posterior edge with a narrow band of bright lemon-yellow, extending from one lateral angle around the curved border to the opposite lateral angle, of nearly equal width throughout, at its widest portion measuring .027mm; all coxæ brown; all trochanters yellowish-white; all femora brown, yellow at tip, more yellow at tip of front femora, less at tip of middle, and still less at tip of posterior femora; front tibiæ light yellow, very slightly dusky; middle tibiæ entirely light yellow; hind tibiæ yellowish with a brownish shade near base; all tarsi yellowish-white, last joint

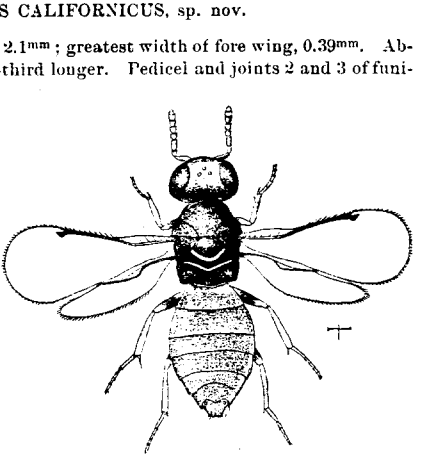

FIG. 65.—*Coccophagus californicus*. Howard—enlarged (Original).

dusky. Wings hyaline, veins light brown, distinct. Described from one female specimen reared from a female *Icerya purchasi* at Los Angeles, Cal., July 6, 1887, by Mr. D. W. Coquillett.

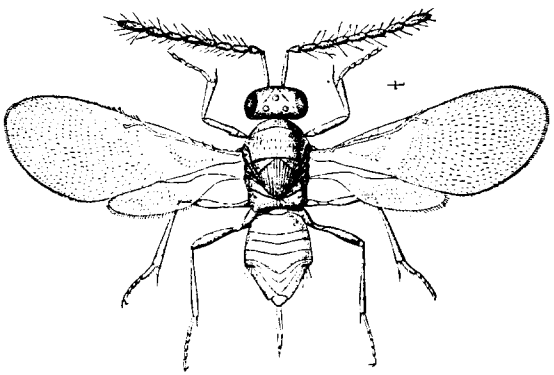

FIG. 66.—*Encyrtus dubius*. Howard—enlarged (Original).

ENCYRTUS DUBIUS, sp. nov.

Male.—Length, 1.2mm; expanse, 2.2mm; greatest width of fore wing, 0.37mm. Scape of antennæ long, thin, cylindrical, together with bulla as long as first three funicle joints; pedicel short, conical; joint 1 of funicle longer than pedicel; joint 2 slightly shorter than joint 1; joints 2 to 6 subequal in length and width, each constricted at either extremity; club ovate, one-third longer than joint 6 of funicle, but not exceeding this in width; funicle and club with hairs at least as long as the joints themselves but not arranged in regular whorls. Marginal vein of fore wings lacking; postmarginal equal in length to stigmal. Head, mesoscutum, and scapulæ very delicately shagreened; mesoscutellum with regular fine longitudinal ridges. Metanotal spiracles circular. Abdomen ovate, slightly longer than thorax, and equal to it in width. General color, brown, glistening; head and mesonotum with greenish metallic luster; antennæ and legs light brown, base of tibiæ whitish. Wings hyaline, veins brown.

Described from one ♂ reared from *Icerya purchasi* at Los Angeles, Cal., September 3, 1887, by D. W. Coquillett, issuing in a box which contained only adult females of the scale.

Differs in antennæ and sculpture of scutellum from any ♂ Encyrtus which I have seen. As the ♀ has not been reared, this may prove to belong to some allied genus, hence the specific name.

A CONTRIBUTION TO THE HISTORY OF THEOPHILA MANDARINA.

BY PHILIP WALKER.

Desiring about two years ago to obtain some information about the wild mulberry-feeding silk-worm of China, the *Theophila mandarina*, which had excited some attention in Europe, the Commissioner of Agriculture requested the Secretary of State to instruct the consul-general of the United States at Shanghai to examine into the matter and obtain sam-