

STUDIES IN PACIFIC COAST LEPIDOPTERA

(Continued)

DR. JOHN A. COMSTOCK
Associate Director, Los Angeles Museum

ANTHOCHARIS LANCEOLATA AUSTRALIS Grin.

Larva and pupae of this species were illustrated in our "Butterflies of California," and the young larva and ovum were described by Karl Coolidge in the "Canadian Entomologist," Vol. XLII, Sept., 1910. We illustrate the egg of *australis* in Plate 3. This single example measured 1.25 mm. high by .40 mm. broad.

APODEMIA MORMO VIRGULTI Behr.

The early stages of this butterfly were briefly described in the author's "Butterflies of California," and figures of the egg and larva were illustrated. The pupa has not been previously figured, to our knowledge, and a drawing is therefore included of this phase of the metamorphosis of this insect, through the courtesy of Comm. C. M. Dammers.

The specimen from which our figure was drawn pupated March 15th of this year, and emerged April 3rd. See Plate 4.

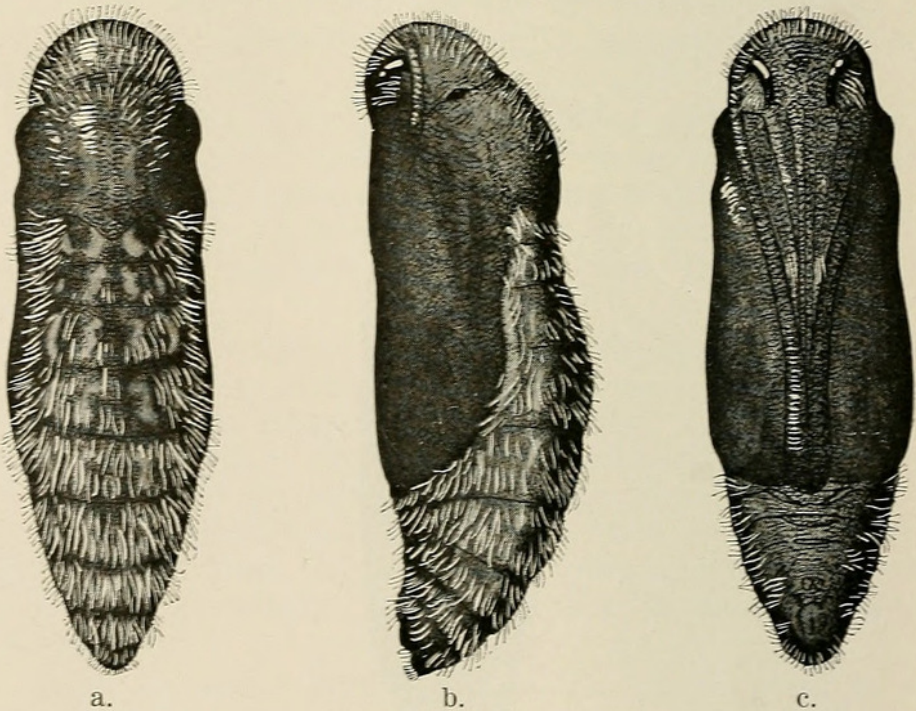


PLATE 4

Pupa of *Apodemia mormo*, enlarged.

a. Dorsal view. b. Lateral view. c. Ventral view.

PLEBEJUS EMIGDIONIS Grin.

A colony of this rare species is established in the Mojave River bottom lands, near Victorville, Calif., where a number of eggs were collected on April 20th of this year. The females were ovipositing on a species of *Atriplex*.

EGG: A flat echinoid. Color: gray-green exactly simulating the leaf of the food plant. Size: .75 mm. broad by about .25 mm. high.

Micropyle small and deeply depressed, with the surrounding surface in one example slightly raised. Three others do not show this character of micropylar ridge. The surface is covered with a fine reticulation of raised walls, enclosing deep pits of irregular triangular or quadrate shape. The walls or partitions show a slight tendency to develop tubercles at their points of juncture, but this character is much less pronounced than in many other Lycaenid eggs, and does not show on superficial examination. See Plate 5.

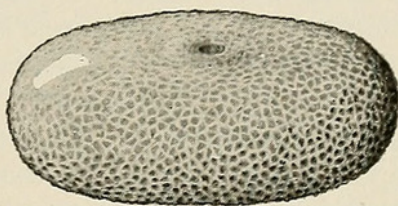


PLATE 5

Egg of *Plebejus emigdionis*, greatly magnified.

PHILOTES SPECIOSA Hy Edw.

This species was plentiful this year at a point on the Mojave Desert, thirty miles north-east of Mojave, on the Randsburg road. Oviposition was occurring on April 19th, the plant of choice being *Oxytheca perfoliata* T. & G.

EGG: A robust echinoid. Color: Cream. Size: .5 mm. in diameter by .25 mm. high. Micropyle only slightly depressed.

The surface of the egg is covered by irregular ridges which show a slight tendency to radiate from the micropyle. These ridges are irregular in height and width, and bear numerous connecting and diverging arms which divide the surface of the egg into numerous shallow pits or depressions of varying sizes and depths. There are no tubercles or protuberances at the junctures of the ridges. The floor of the micropyle is flat, and of a slightly darker shade than the main body of the egg, and the ridges in this area are constricted to narrow low walls of a uniform height, enclosing a series of irregular shallow cells, the centre ones being the smallest. Plate 6 correctly illustrates the egg.

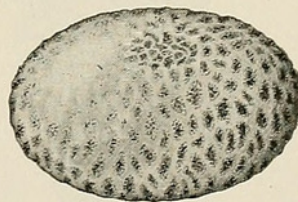
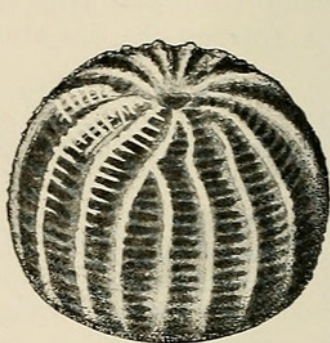


PLATE 6

Egg of *Philotes speciosa*, greatly magnified.

ERYNNIS FUNERALIS Scud. & Burg.

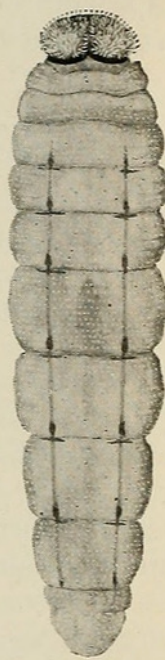
The metamorphosis of this insect has been recorded in detail by Karl Coolidge, in the "Journal of the N. Y. Entomological Society," Vol. 31, p. 175. No illustrations are available, and we are therefore reproducing in Plates 7 and 8 drawings of the egg, larva, and pupa. The examples from which these drawings were made were collected, as ova, on *Hosackia*, by Comm. C. M. Dammers, and were reared by him. One point which he has noted, and which is not mentioned in "Butterflies of California" is that, in the last larval instar, the caterpillar has two large orange-brown spots on the upper side of the head, (one on each side).



a.

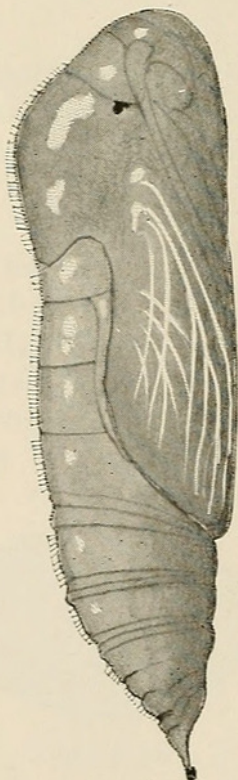
PLATE 7

a. Egg of *Erynnis funeralis*, greatly magnified.

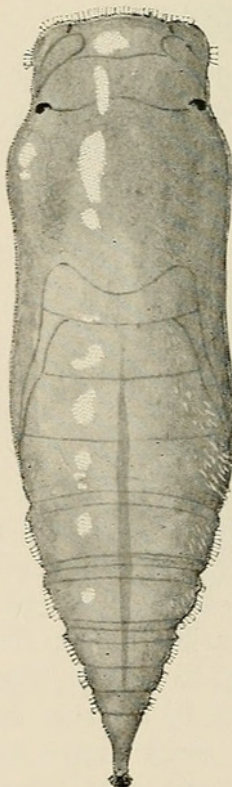


b.

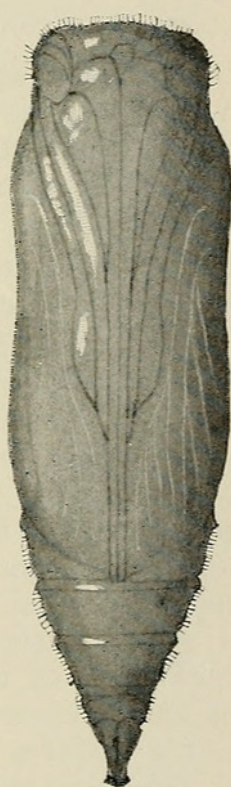
b. Larva of *E. funeralis*, enlarged.



a.



b.



c.

PLATE 8

Pupa of *Erynnis funeralis*, enlarged.

a. Lateral aspect. b. Dorsal aspect. c. Ventral aspect.

AUTOGRAPHA CALIFORNICA Speyer.

The larva of this species is illustrated by Essig in his "Injurious and Beneficial Insects of California," page 161 of the first edition.

I have seen no notes or drawings with reference to the pupa.

A caterpillar of this species was taken on *Viguiera deltoidea*, which constitutes a new food-plant record for it. Incidentally this is the plant on which *Chlosyne californica* Wright feeds, a fact which should have been noted in our paper dealing with that species in the last issue of the "Bulletin."

Pupa: Length, 15.5 mm. Greatest width 4 mm. Color, green, the thoracic portions of a bright shade, the abdomen lighter. There is a discontinuous dark green median line along the dorsum of the abdomen. Two small reddish-brown dots occur close to the scapular region, as shown in the illustration, Plate 9.

The first four abdominal segments bear a number of fine brick-red lines at the segmental junctures, on the dorsum. The fifth juncture has a brownish-red area on its anterior border, and four narrow raised ridges of the same color on its posterior border.

The posterior half of the wing cases are semi-transparent and the abdominal segmental lines are dimly discernible through them.

Stigmata, cream color. Cremaster and anal tip, brown.

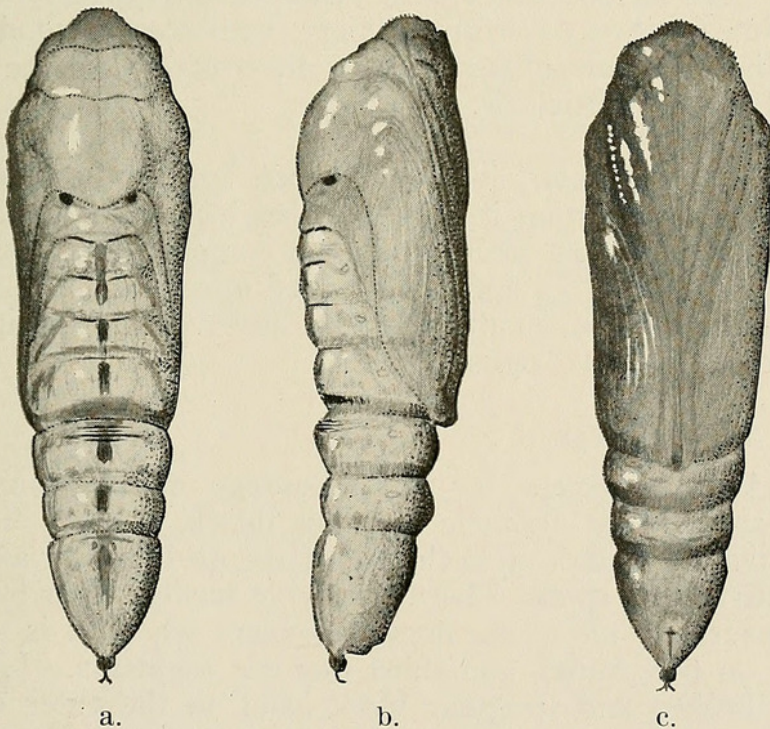


PLATE 9

Pupa of *Autographa californica*, enlarged.

a. Dorsal aspect. b. Lateral aspect. c. Ventral aspect.

GLOVERIA ARIZONENSIS Pack.

On March 25th, 1929, Commander and Mrs. Dammers found 119 caterpillars hibernating in a hole, on a rocky slope of Whit-water Canyon, Cochella Valley, California. The hole was about as large as a man's head, with an aperture of about $1\frac{1}{2}$ inches. Below the opening there was an accumulation of frass, which gave a clue as to the presence of the larvae within. No vegetation was present in the immediate vicinity.

The larvae were taken to Riverside, and it was noted that, at about 8 o'clock of each evening they became very active. They were offered a great variety of plants, but nothing was found suited to their tastes. Com. Dammers therefore returned them to their native cave, and by observation noted that, in the evening, they all marched to a native juniper which was located some ten feet from their diurnal retreat. Feeding occupied about 15 minutes, after which they returned to their cave.

Subsequently a number of colonies of the same larvae were found on other junipers, and these were not observed to leave the trees during the day, but confined their feeding to the evening hours.

With careful breeding, and mating in captivity, Commander Dammers secured a fine series of *Gloveria arizonensis*. From specimens and data furnished by him, the following notes were compiled. An introduced cypress (Guadeloupe cypress) was substituted for *Juniperus californica* Carr, with equally good results. In handling the caterpillars it was discovered that the bristles produced a mild dermatitis.

Egg: Oval. Color, ivory. Surface apparently smooth, but under high magnification it is seen to be finely pitted. In shape, color and texture this ovum could be compared to a miniature ostrich egg. Size: 1.75 mm. wide by 2.5 mm. long. The eggs are deposited in clusters, on the terminal limbs of the Juniper, and oviposition occurs in August.

LARVA: FIRST INSTAR.

Head black, except for a few orange markings about the mouth parts. First thoracic segment, black, with a diagonally placed olivaceous mark on each side of the median line, and a few minute olivaceous spots. There is a wide median light band running transversely along the dorsum, except where it is obscured by black on the caudal, and third thoracic segments. Lateral to this is a broken and irregular black band, at the outer edges of which are a series of orange spots which give the appearance of an orange line. These spots are lacking on the first thoracic, and last two or three caudal segments.

Latero-inferior to the orange spots is a wider black line, or series of spots, which is considerably broken or irregular on its lower edge. Below this is an olivaceous or creamy area. Abdomen heavily suffused with black.

True legs black, tipped with brownish-orange. Prolegs orange, shading to olivaceous at the base. The caterpillar is covered with a series of long white hairs, arising from rows of nodules. A row of these nodules occurs on each side of the median line at the edge of the light median band. Another row runs substigmatally, with paired nodules above the four prolegs. Three additional nodules occur on each side of the thoracic segments.

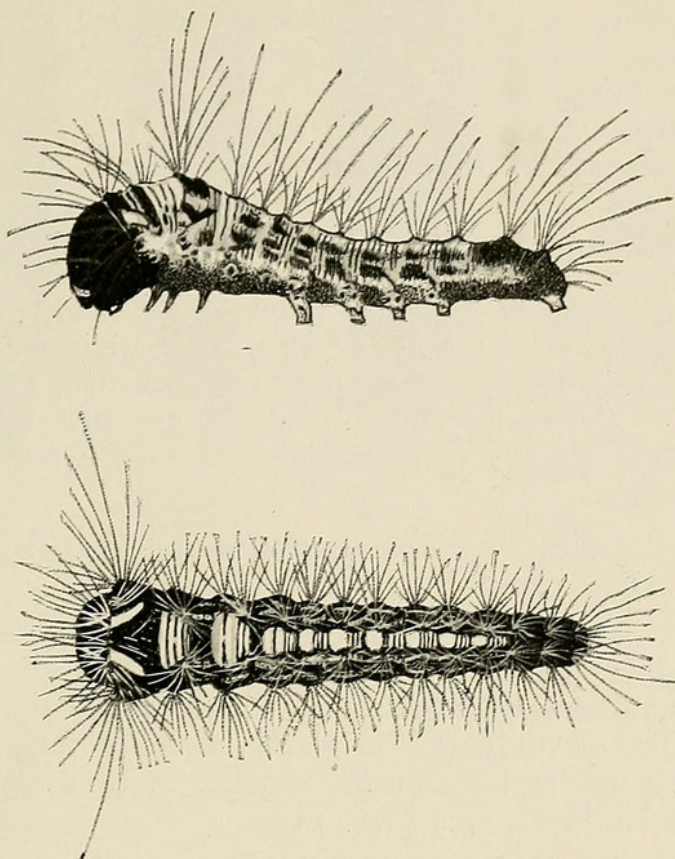


PLATE 10

Larva of *Gloveria arizonensis*, first instar, enlarged.

There is considerable variation in color and pigmentation, some examples showing a light creamy ground color instead of an olivaceous, with all the black areas much reduced. See Plate 10.

MATURE LARVA.

Length: 62. mm.

Ground color, sooty black. A dark gray area occurs in the mid-dorsal region, from which arises tufts of grayish-white hair,

giving the appearance of a light mid-dorsal band. Lateral thereto is an area from which arises reddish-brown hair, suggesting a red-brown lateral band, but the color is in the pile only. On each segment in this area there occur a few small light spots, one or two to a segment. The reddish pile in this area does not take a continuous course antero-posteriorly, but is arranged in diagonal patches on each segment, which follow a course across the segment, beginning at a higher point and extending posteriorly to a lower one, thus giving a diagonally striped segmental appearance.

Latero-inferior to this is an area in which the pile is of the lighter grayish-white color.

Spiracles, elongate, yellowish-gray. Abdomen, greenish gray.

Head: much the color of body, with a lighter colored inverted Y separating the anatomical divisions: covered with long hair. True ocelli, black. Pupation occurs in early August, and the imagos emerge in from 10 to 15 days: See Plate 11.

Pupa: Length, 38. to 40. mm. Greatest width 12. mm. Color: brownish-black to black. Surface strongly pitted. The anterior end is profusely covered with wavy yellow pile. The highest point of the thorax on the dorsal surface bears scattered hairs of the same character, and each segment of the abdomen is thickly covered with similar pile on all surfaces. No pile is present on the wing cases or mouth parts. The shape is accurately pictured in Plate 12.

A loosely woven semi-transparent cocoon is spun before pupation.

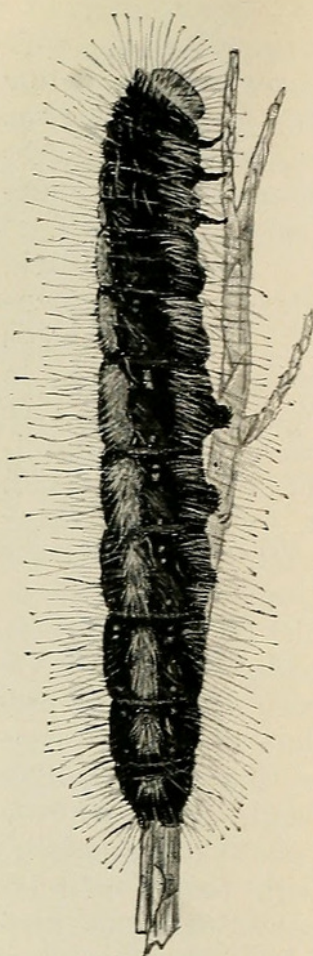


PLATE 11
Larva of *Gloveria*
arizonensis, slightly
enlarged.

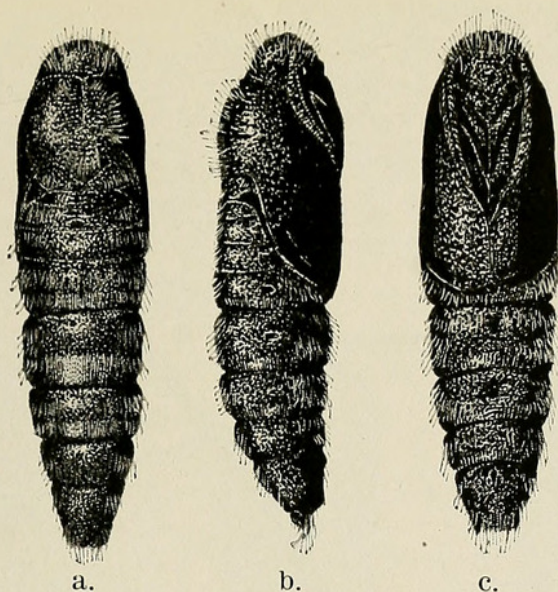


PLATE 12

Pupa of *Gloveria arizonensis*
slightly enlarged.

a. Dorsal aspect. b. Lateral aspect.
c. Ventral aspect.

PERO PEPLARIOIDES Hlst.

Of all the protectively colored caterpillars found in California, the larva of *Pero peplarioides* is, in our estimation, the most perfectly adapted, in form, color, and habit, to its environment.

The following notes and illustrations may therefore be of special interest to students who are interested in examples of adaptation.

EGG. Oval: dark grayish-brown. Texture, smooth or slightly granular. Size: 1. mm. long by .6 mm. wide.

LARVA. First instar. Thread-like, exceedingly active in their characteristic "looping" movements. Color: olive-green, the head and anal segments brownish. Shape, cylindrical. A few short sparse hairs are scattered over the body.

MATURE LARVA: wood-brown, mottled in exact simulation of a twig. Head, flat on anterior surface. Each segment bears a few short bristles: those of the anal region being somewhat shorter and more numerous. All prolegs except the fourth, and anal pair suppressed. The caterpillar remains in a rigid position, its body held almost at right angle to the twig on which it rests. Feeding probably occurs only at night. Plates 13 and 14 illustrate this phase.



PLATE 13

Young larva of *Pero peplarioides* on twig, at left,
compared with natural twigs, at right.

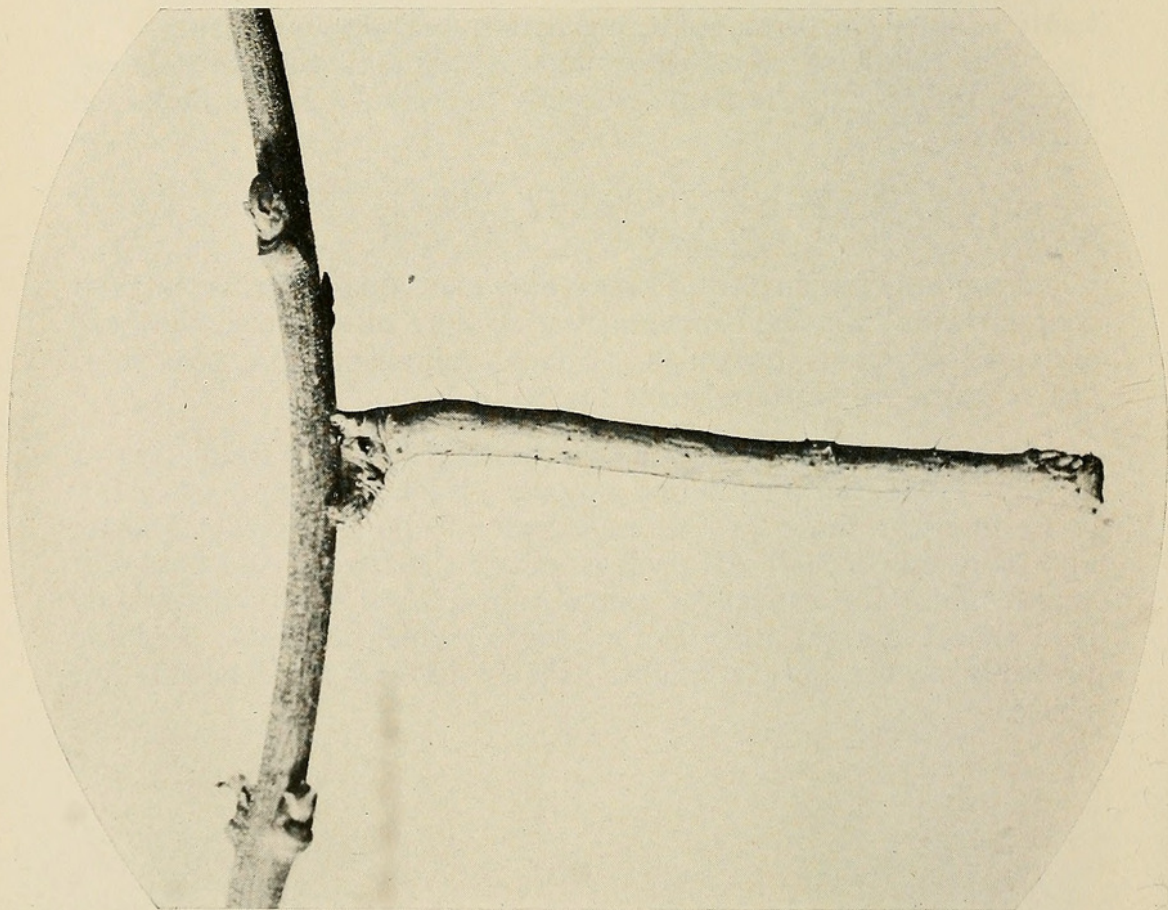


PLATE 14. Larva of *Pero peplarioides* on twig, enlarged.

PUPA: blackish-brown, the surfaces deeply pitted, and free of pile. Terminal segment reduced to a small button and bearing cremaster formed in two small recurved hooks. The segment anterior to this has, on its dorsal surface, close to its anterior juncture, a row of small tubercles. Further description seems unnecessary in view of the accompanying illustration, Plate 15.

The larva were fed to maturity on Privet, but this is probably not their chosen food-plant.

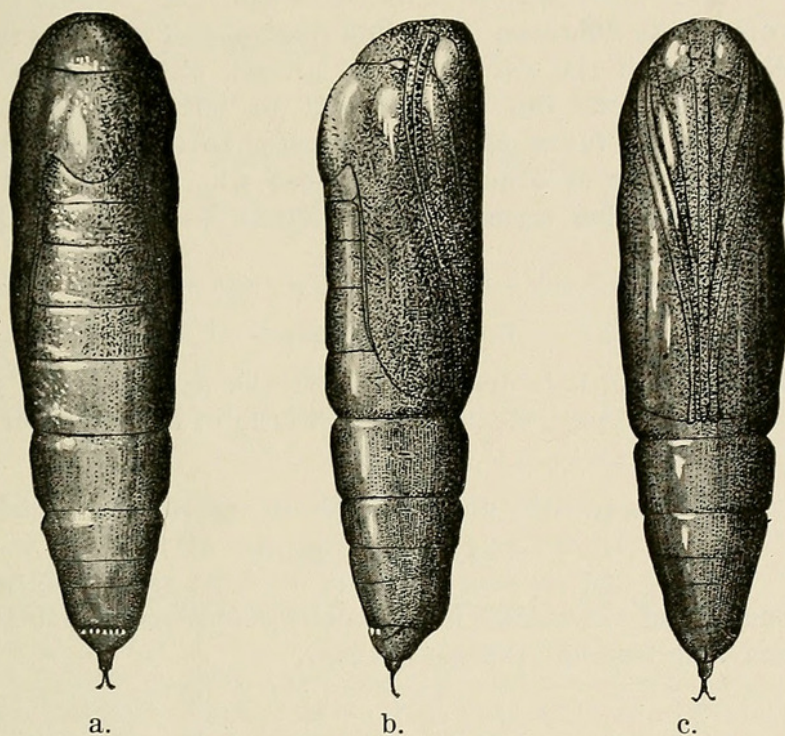


PLATE 15

Pupa of *Pero peplarioides*, enlarged.

a. Dorsal aspect. b. Lateral aspect. c. Ventral aspect.



1930. "Studies in Pacific Coast Lepidoptera (continued)." *Bulletin of the Southern California Academy of Sciences* 29, 22–31.

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