

STUDIES IN PACIFIC COAST LEPIDOPTERA

(Continued)

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In the issue of September, 1927, Bulletin, So. Calif. Academy of Sciences, p. 67, was given a description of the egg of *Callipsyche behrii* Edw. An illustration was also included on page 68. This year, in the same district of the Tejon Mountains, in which the eggs were collected, a large number of the larvæ of this species were secured by beating the *Purshia* bushes. This makes possible a description of both the larval and pupal stages.

Larva, when mature, length, 12 mm. Greatest width 3.75 mm. Predominant color green, although a few examples show a rich brown.

There is a narrow whitish mid-dorsal line, poorly defined on the anterior segments, and missing on the caudal segment, but clearly shown throughout the greater part of the body. Lateral to this line, on each of the typical segments, is a reniform dark green spot. External to this is a diagonal series of lines, composed of yellow, white and green elements. These give to each segment, when viewed dorsally, a sagittate appearance. Lateral to this series of diagonal lines occurs a clearly de-

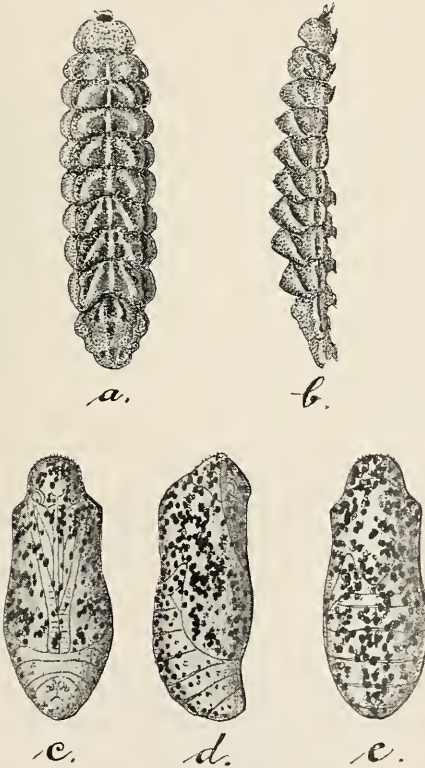


PLATE II.

a. and b.—Larva of *Callipsyche behrii*, dorsal and lateral views, enlarged.
c. d. and e.—Pupa of *Callipsyche behrii*, ventral, lateral and dorsal views, enlarged.

fined sublimatal yellow line, bordered below by a dark green stripe. Inferior to this is a very narrow broken yellow line.

Head, brownish to black. Abdomen and prolegs, green. True legs yellowish.

The entire body is covered with minute short yellowish pile. The protruded segments and depressed intersegmental lines, together with the mottling of yellow and green, are an excellent protective pattern, causing the caterpillar to blend harmoniously with the foliage of its food plant, *Purshia glandulosa*.

Larvæ were found in practically all stages of development, on May 6th, and again on May 20th. Probably the species overwinters as an egg.

Pupa.

Length, average—8 to 9 mm. Greatest width, 3.75 to 4 mm. Ground color light tan, on which blotches of dark brown are irregularly scattered. A few extremely short simple hairs are scattered over the head region and the dorsum, the remainder of the chrysalis being bare. A few examples show a ground color over the dorsum and wing covers that is of an olive shade. The accompanying cut gives the shape more accurately than would a lengthy description.

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The egg of a southern race of *Tharsalea arota* was illustrated in our "Butterflies of California". A large number of larvæ of the typical insect were secured this spring (May 6, 1928) on *Ribes cereum*. From these, the following descriptions were prepared:

Tharsalea arota Bdv. Larva, when mature, 15 mm. Greatest width 5 mm. Slug-shaped as with most Lycaenid larvæ. Ground color, green, a little darker at the head end. Some examples acquire a rosy blush shortly before pupation. Under magnification the dermis is seen to be sprinkled with minute white tubercles, and to be covered with short single yellowish-white vibrissæ arising irregularly from the skin surface, not from the tubercles. These are so short as to be barely discernible with the naked eye on the full grown larvæ.

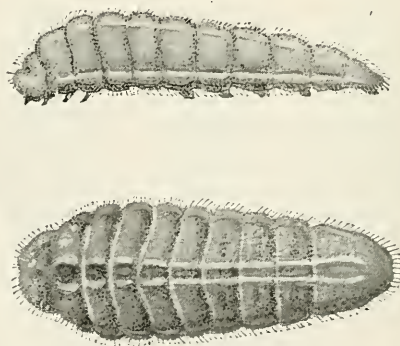


PLATE III.

Larva of *Tharsalea arota*, dorsal and lateral view, much enlarged.



PLATE IV.

a, b, c—Ventral, dorsal and lateral views, d—Minute hair-like process occurring on chrysalis; much enlarged.

A double whitish line occurs dorsally, from the second dorsal segment almost to the anal extremity. This is broken at the first three segmental junctures, but is practically continuous from then on. A fine single yellowish line also occurs laterally.

Head, yellowish-green, except for a slight brownish tinge about the mouth parts. True ocelli black. Abdomen green. True legs green except for the tips, which are brown. Prolegs green.

The same color and pattern occurs on a larva only 7 mm. long, probably in the second instar.

Chrysalis. Length, 9.5 mm. Greatest width, 4.75. Ground color of newly formed chrysalis, olive green, changing to a brown or mottled yellowish-brown. On the dorsum there is a faint suggestion of a double broken transverse line of a dirty white, over which the brown blotchings are absent. In the mid dorsal area, between these lines there is a slight intensification of the brownish mottling. There is also a suggestion of a light sub-stigmatal line on the sides of the abdomen.

Under low magnification the surface of the chrysalis appears to be finely pitted with translucent white points, but higher magnification shows these to be minute hair-like processes with flaring trumpet-shaped termini, as shown in the illustration. These are not present on the wing covers, or along the abdominal surface. They are particularly numerous anteriorly and on the dorsum of the abdominal segments.

As the chrysalis nears maturity the dark blotchings become heavier and darker. There is, however, great variation in the color, some examples being very light, others almost black.

A delicate silken loop is formed by the caterpillar, for suspension over the thorax. A few examples fail to show this, pupation with these occurring in the debris at the bottom of the breeding cage.

Plebejus melissa Edw. is one of the widely distributed blues of western North America, occurring from Kansas to the Pacific Coast. In spite of this extensive range and comparative abundance, almost nothing is known of the early stages. In the mountains of southern California, *melissa* is well represented by the race *lotis* Liut. An example of this race was observed in the act of ovipositing, and a few specimens of the eggs secured for purposes of illustration. The single female under observation laid most of her eggs on small pebbles close to the base of a lupine, or on small leaves of the main stem near its juncture with the ground.

Egg. Color, light green; shape, echinoid, the top flattened, micropyle depressed, the area around it slightly raised. The surface is covered with a reticulation of raised ridges which help to form depressed pits disposed in irregular pattern over all exposed surfaces. Where the ridges meet there are protruding points. The floor of each pit is finely perforated. Those pits which occur within the micropyle are very minute, while those around the micropyle, though slightly larger are of lesser size than on other surface areas. These pits grow progressively larger as the outer surface is reached.

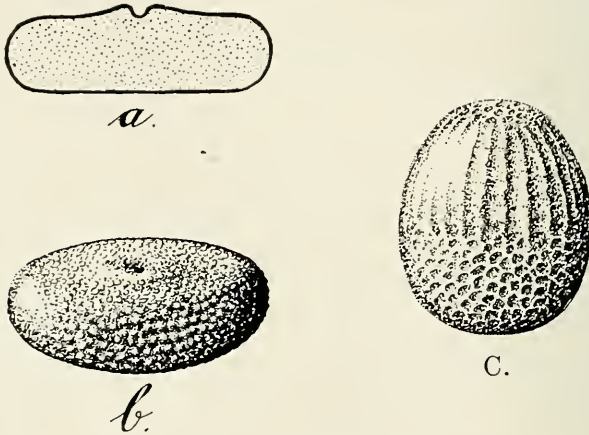


PLATE V.

a, b—Egg of *P. melissa*, highly magnified, the upper cut representing a cross section.
c.—Egg of *Mel. neumoegeni*, highly magnified.

In Vol. 22 of the "Bulletin" p. 69, a number of notes were given concerning the early stages of *Melitaea neumoegeni* Skin. During March of this year we were fortunate enough to observe the ovipositing of this species, which thus completes the description of the life cycle, except for detailed observations of all the larval moults.

Egg. Light green, exactly harmonizing with the foliage. Measures about $\frac{1}{2}$ by $\frac{3}{4}$ mm. Micropyle not depressed; finely pitted. Upper half of egg covered with raised longitudinal ridges, about twenty in number. Lower half finely pitted.

The female approached the foodplant (*Aster tortifolius*) by dropping to the ground near it, and then crawling into the bush. The eggs were deposited in a mass, on the under surface of a small leaf, low down in the bush. There were 97 eggs in the cluster, deposited irregularly, and close together, the centre of the mass being three deep. Approximately half an hour was consumed in the act of laying. Eggs laid March 26th; emerged April 5.

The larvæ, when newly hatched are covered with long dark single hairs, sparsely scattered over the surface. Head, blue-black. True legs, sooty black. Body, yellowish white—also prolegs.

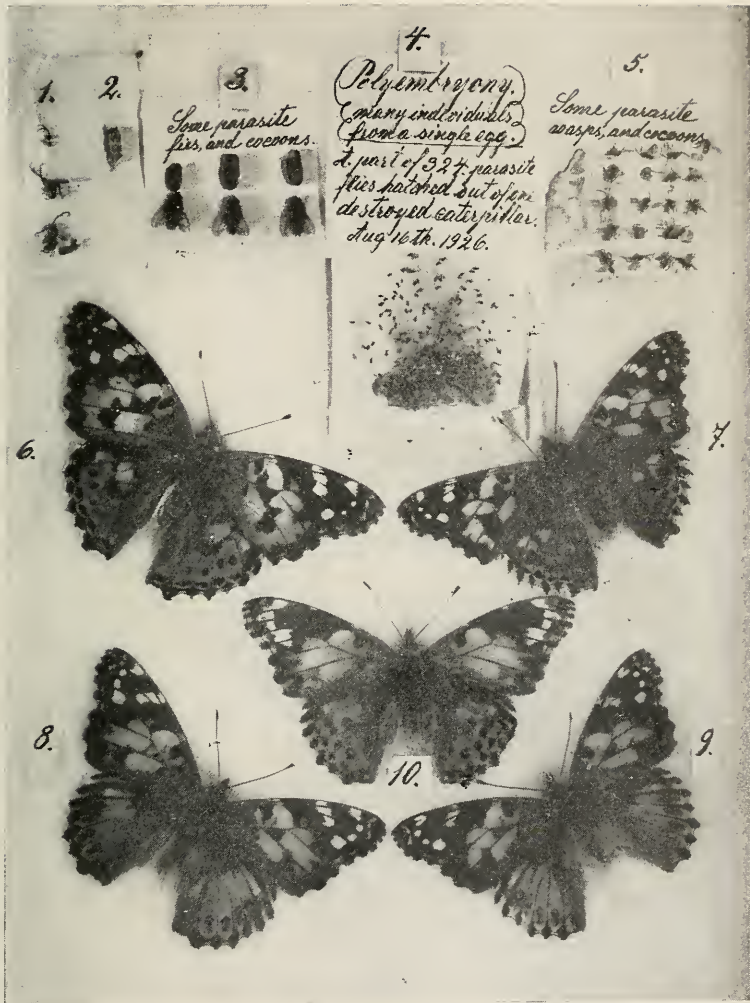


PLATE VI.