

or with very little yellow showing. Length of body, .80 mm. to 1 mm.; vertex rather sharply rounded; length of wing, 1.60 mm.; length of antennæ, .80 mm.; joint 3 longest, joints 4 and 5 equal; joint 6, with unguis, of the same length as the two preceding joints; joint 3 with about seven and joint 4 with about one transverse sensoria.

DESCRIPTION OF PLATE.

Phyllaphis Coweni, Ckll.—1, stem-mother; 2, male; 3, oviparous female; 4, antenna of adult stem-mother; 5, antenna of male; 6, antenna of oviparous female. M. A. Palmer, artist.

Figures 1, 2 and 3 are enlarged 30 diameters, and figures 4, 5 and 6 80 diameters.

THE PREPARATORY STAGES OF EUCHLOË SARA, BOISD.

BY KARL R. COOLIDGE AND ERVAL J. NEWCOMER, PALO ALTO, CALIF.

Euchloë sara, with its variety *Reakirtii*, Edwards, is a common and early butterfly in California, flying in the open fields about wild mustard (*Brassica*) and other crucifers. *Reakirtii* may sometimes be seen as early as February, and later, in April and May, *sara* appears, continuing on the wing until October. *Sara* is one of the early Californian pioneers, having been described by Dr. Boisduval in 1852.¹ In 1869 W. H. Edwards² described *Reakirtii*.

Synonymy and Distribution.—*Sara*, with its so-called varieties, is distributed almost everywhere west of the Rocky Mountains, from Arizona to Vancouver. As shown by Edwards (CAN. ENT., XXIV, p. 52), *sara* proceeds from eggs of *Reakirtii*, although some of the pupæ may go over and produce *Reakirtii* in the spring, the dimorphism being that of *Papilio ajax*. *Thoosa*, Scudder, is a synonym of *julia*, Edwards, and *flora*, Wright, and *mollis*, Wright, are but slight modifications of *sara*. *Brown-ingii*, Skinner; *stella*, Edwards, and *julia*, Edwards, we would consider but geographical forms of *Reakirtii*. Both *Sara* and *Reakirtii* are dimorphic, some females being white and others yellow, with all intergradations. The males are only occasionally slightly yellowed. *Reakirtii* may be distinguished from *sara* by its smaller size, and the discal band on primaries is blacker and more waved. Beneath, on the secondaries, the greenish tinge is more pronounced than in *sara*, and the apex and external margin of fore wings is heavier. Henry Edwards, in a letter to W. H.

1. Ann. Soc. Ent. Fr., 2, 10, 285, 1852.

2. Trans. Am. Ent. Soc., 2, 369, 1869.
February, 1909