Stage VI. — Head 2.2 mm. Much as before, but more opaque, the skin whitish-green, the dorsal vessel dark and plainly pulsating. Marks as before, the skin finely peppered with white granules; spiracles reddish. Feet about equal, all with broad claspers, but short.

The brown-spotted form occurs also in this stage and in stage V.

Cocoon a small, compact, fairly tough webbed with bits of leaves, bark or other material.

Pupa. — Light brown, smooth, slightly shining; no cremaster, the anal segment slightly bulging and with two short spines above and eight below in a transverse row. The spines resemble setae and arise from small tubercles. Surface slightly shagreened, no punctures. A series of fine waved lines about the first three spiracles. Length 12 mm.; width 3.5 mm.

THE DIPHYLISM OF THE DIURNAL LEPIDOPTERA.

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Having brought my studies of the neurature of the diurnals to a preliminary close, I wish to place on record here the conclusions to which they have led. The diphyly is founded on the following characters:

- A.—Butterflies having a short third anal vein on fore wings, curving downwardly from base to internal margin, and with only one anal vein on hind wings *Papilionides*.
- B.—Butterflies having a fork to the second anal vein of fore wings at base, sometimes incomplete, often disappearing through absorption, and with at least two anal veins on hind wings *Hesperiades*.

The nomenclature of the veins is unsettled. The submedian fold, usually obsolete, is numbered by Comstock, VI.; this would be the first anal vein. Comstock's vein VII. would be the second anal vein, and the curved and shortened vein which follows in the *Papilionides* would be the third. This vein is replaced in the *Hesperiades* by a short vein anastomosing above with the second anal vein (VII.), thus running in an opposite direction to the third anal of the *Papilionides*. This points to a different origin for the two groups. The fork of the *Hesperiades* has faded out in the *Satyrids* and most *Nymphalids*. It is persistent in the other families, with few exceptions in certain genera, e. g., *Leucophasia*.

The rejection of Mr. Scudder's classification of the diurnals is based on the following grounds: The sequence in specialization of the anal

veins is 3 : 2 : 1, the latter shown by the younger forms, as evidenced by Saturniades, in which the more specialized *Attacinae* have only one anal vein left on the hind wings. It is impossible to consider the Papilionides, with only one anal vein in hind wings, as representing in any way a primitive form of any of the Hesperiates. The reverse is, from this point of view, a possibility, although rendered improbable by the different type of neururation shown by the fore wings.

I conclude that a linear sequence of the diurnals, in a catalogue or otherwise, should begin with the Papilionides. The neururation of the Hesperiates offers no objection to a connection with the Agaristid-Noctuid stem of Dr. Dyar's Bombycides. The neururation of the Papilionides offers such weighty objections as to render the connection unlikely in the extreme.

CLASSIFICATION OF THE ENTOMOPHILOUS WASPS, OR THE SUPERFAMILY SPHEDOIDEA.

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(Paper No. 5.)

FAMILY XX. — Philanthidae.

The wasps belonging in this family have a peculiar habitus quite their own. The head *is always wider than the thorax*, the front wings have three cubital cells, while the abdomen, in nearly all the species, has usually a strong constriction between the first and second segments, the first segment being most frequently much narrowed. In only a single genus, *Trachypus*, Klug., is the abdomen distinctly petiolated. The eyes are large and normal, but occasionally exhibit a slight emargination within, and, more rarely, with a distinct emargination, or reniform as in *Trypoxylon* and *Pison*. Most of the species have the abdomen strongly punctured or punctate, and have also a constriction between all the abdominal sutures, although some also have the abdomen smooth and polished, and are without a constriction at the sutures.

All of the wasps in this family are predaceous, the majority of them provisioning their nests with beetles, *Curculionidae*, *Buprestidae*, etc. although a few prey upon the bees, *Halictus*, *Andrena*, etc.

The family is dividable into two distinct groups, which I call sub-families, distinguishable as follows: