

race. It is very common throughout the Province and it occurs all over Canada and the United States: It is often seen hovering over flowers in the twilight and is attracted by light. I have seen dozens of them flying around the arc-lights in the suburbs of Victoria.

(14) 762 *Celerio lineata* Fab. (The Striped Morning Sphinx). This is supposed to be the commonest sphingid in North America and has probably the most extensive range of any of them. Southern British Columbia is probably its northernmost limit; it extends from coast to coast in the United States and ranges southward through Mexico to Central America. In Colorado they swarm about the electric lights in the streets of the cities, literally in hundreds. It is not so common as the preceding species in this Province, but is found in the same localities. The two species resemble each other in colour and markings, but are easily distinguished by *lineata* having six oblique narrow white lines crossing each of the forewings; the thorax is white striped. The larvae of this species show great diversity in markings and are the most variable of all sphingid larvae. It is almost omnivorous—feeding on a great variety of dissimilar plants, including apple, plum, currant, gooseberry, turnip and chickweed. It is closely allied to the Striped Hawk Moth of the Old World (*Celerio livornica*), which has only four white longitudinal stripes on the thorax instead of six as in our species.

EARLY STAGES OF NEPYTIA PHANTASMARIA STRECKER (LEPIDOPTERA)

By Geo. O. Day

A female of this species captured flying at Quamichan, Vancouver Island, on 3rd Sept., 1915, and confined in a chip box, laid 69 eggs in small batches of from two to ten each, the ova securely attached by their sides. Colour a dull light green of a yellowish tinge. Shape bluntly oval—upper and lower sides very slightly flattened—looked at under hand lens no surface markings were visible. Micropylar end of egg rather flat with a central dot. After ten days or a fortnight the colour changed to a purplish gray as if the larva enclosed was in process of formation, but the eggs continued in this condition without hatching. On 17th October I cut one of the eggs open and found it filled with a yellowish green fluid without any sign of larval development. No larvae appeared until the following May, when on the 7th of that month I found two on the lid of the box, evidently just hatched out, and the remainder followed in the course of a few days. Length 3 m.m. Head and claspers wider than the rest of the body; head black. Skin behind the head seemed to fold over it. This fold, and the anal claspers, lighter in colour than the rest of the body, being a watery green. Two

grayish stripes run the length of the body, separated by a black line of equal width, each of the grayish stripes being outwardly edged by black lines along the spiracles, and the black extends to the ventral surface, so that practically, with the exception of the anal claspers and the skin fold behind the head, the larva is striped on the dorsal area with lines of black and gray, the median line being black. On May 16th length $5\frac{1}{2}$ m.m. Head black; the front part of the fold behind the head gray with a dark line behind it; body striped as before, but the colours are dirty green and grayish green. Larvae rather restless in their habits; fed on the tender new growth of Douglas Fir.

On 27th of May length 10 m.m. Head as before. The three pairs of front claspers also jet black. Some of the larvae were still of a dirty green as general tone, but others inclined to plum colour in the darker stripes. The longitudinal lines still distinct, but instead of being about equal breadth, the lighter lines have narrowed, leaving the dorsal central stripe much wider, and also the stripe above the light spiracular stripe slightly wider, in proportion, than before. The dorsal stripe is lighter in colour than the outer ones and is bordered (immediately adjoining the white stripe) with darker, and in this dark edge is situated a dot on each segment.

On 13th June length 18 m.m. The stripes very clearly defined and colours more pronounced. General tone green (simulating the colour of the old spines of the fir), with conspicuous yellow spiracular lines and two other, narrower, light green lines. All the lines (stripes) have dark purplish brown margins. To go more into detail, the central dorsal stripe is broad, bordered by narrow dark lines, then a greenish white stripe again bordered by a dark line throughout its length; between this and the yellow spiracular stripe, the narrow space is occupied by an irregular series of broken dark lines; these dark irregular and slightly wavy lines (5 or 6) are continued all over the ventral area, the ground colour of which is green.

At this stage the head is green, with 14 dark spots. The anus also has black spots.

When eating the larva starts at the outer end of the fir-spine and demolishes it across—not lengthways.

On 3rd July length about 25 m.m. General markings not much changed. Dark spots on head conspicuous. Broken dark lines on the green background not so noticeable.

On 6th July three or four of the most forward larvae had spun a few strands of silk among the pine needles, each making a very flimsy cocoon preparatory to pupating, and on the 7th had changed to a bright green chrysalis with two white stripes down the back, and another stripe on each side extending from the outer margin of the wing-case to the tail. The wing-cases are also white with green veins. The white areas of the wing-cases increase towards the time of emergence,

as if the white wings were showing through. There are a number of dark speckles across each segment. The antennae cases are also green—legs white—proboscis (?) green. Some of the more backward larvae did not pupate until the end of July—not until several imagines from early pupae had emerged.

The first moth (a female) emerged on 25th July, the second (a male) on the 29th, and the third (a female) on the 31st. In all, 29 moths emerged—12 males and 17 females. In the wild state, the moth is sometimes found at rest on the trunks of trees, where it is a conspicuous object; but it is easily disturbed and has a tendency to fly upwards among the branches of the firs.

NOTES ON THE ECOLOGICAL DISTRIBUTION OF SOME ORTHOPTERA FROM THE CHILCOTIN DISTRICT OF BRITISH COLUMBIA

By E. R. Buckell

In British Columbia there are some species of Orthoptera which do not frequent the same type of habitat in different parts of the Province, and the following notes on ecological distribution apply only to the Chilcotin District, and mainly to the Riske Creek Range situated in the angle made by the junction of the Fraser and Chilcotin Rivers.

In dividing a number of species into "groups" or "associations of species" there are a number of plans which might be adopted. In the Chilcotin District, however, the topographical and floral characters lend themselves readily to the formation of four main divisions, populated by fairly distinct groups of species. These may conveniently be called the *campestrian*, *sylvan*, *semi-sylvan* and *hygrophilous* groups. The *campestrian* group may, furthermore, be sub-divided into *phytophilous*, *saxicolous* and *geophilous* species; and the *hygrophilous* group into *humicolous* and *paludicolous* species. These sub-divisions are added to further emphasize the various types of environment chosen by the *campestrian* and *hygrophilous* species for their normal habitat (i.e., the habitat in which they are found in greatest numbers). A short description of the district will further explain the choice of these headings.

The Riske Creek Range is an undulating, triangular, tableland, with an elevation ranging from 3,000 to 3,500 feet. It is bounded on two sides by the river valleys of the Fraser and Chilcotin Rivers, which are approximately 1,500 feet below the level of the main tableland.

The steep river valley slopes and the main tableland are open grass lands bounded on the north by forests of fir, spruce and pine. This open grass covered area contains about 300 square miles and forms the home of the *campestrian* species.