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Explanations and Plates 1, 2 and 3.

Photographs and drawings by S. Hadwen.

Fig. 1. Eggs of **C. fontinella,** showing canoe-shape.

Fig. 2. Groove on under side of egg.

Fig. 3. The operculum.

Fig. 4. **Cuterebra fontinella,** Clark.

Fig. 5. Ovipositor, ventral view, showing the sternal sclerites, the paired membranous processes and chitinous plate.

Fig. 6. Dorsal view of ovipositor. Tergal sclerite, sternal sclerites, paired membranous processes and chitinous plate.

Fig. 7. Reproductive organs, general view.

NOTES ON THE HABITS OF SOME LEPIDOPTERA.

By J. W. Cockle, Kaslo.

Mr. Treherne (Secretary):

Mr. Cockle was unable to come, and he sent me his paper. It is one of the most gratifying things to me, as Secretary of this Society, to receive papers without any special exertion on my part. In getting up the programme for this meeting, a few weeks before I started I had nothing in mind, but on sending out circulars, these papers came rolling in, and we have more than enough for today's meeting. Two papers from the Upper Country have come in without any solicitation, one of them being Mr. Cockle's. I take pleasure in reading it for Mr. Cockle.

The collector is often at a loss to understand why he is unable to find the gender of a species of which the opposite gender is plentiful, and as an instance of this let me instance **Cyanirus nigrescens** Fletcher. The freshly emerged males may be found in great numbers in almost any damp spot along the roads, but there are no females with them. An excursion into the brush upon a sunny hillside will probably result in finding numbers of females of this species which are flying around or resting on the willow or Coeanothus branches, whilst occasionally a poor battered male will be seen flying amongst them. Very rarely a bright, freshly emerged male will be found consorting with them, but such occurrence is unusual. Not until they are faded and worn do the males seem to become attracted by the females.

The same remarks will apply to **Rusticus anna.**

The habit of some of the Argynids are curious. **Argynis monticolor var rhodope** has a peculiar migratory habit. In the early morning it may be found in abundance along the lower valleys, but as the sun comes out and warms the upper mountain slopes it flies upwards. The whole brood seem to take wing in one direction, always upward towards the snow fields and the grassy slopes lately emerged from their snow covering. Here they disport themselves during the heat of the July days. If they ever return to the lower altitudes again I am unable to record, but some must do so or else there would be no brood in the valley the following years. While speaking of the habit of the high mountain species, allow me to dwell for a moment on the curious habit that all high mountain forms have of laying over on their side when resting. One of my favorite hunting grounds is situated in a low pass between the headwaters of two creeks, which are so located that the west wind will blow up both of them, and when the gust of wind strikes the most westerly it rushes up the creek and blows over the summit towards the east. Whilst the wind continues, nearly all the butterflies will come up over the pass and settle with their wings folded sideways in the direction of the wind. Suddenly the wind, of which the main gust has reached the lower valley of the more easterly creek, comes back up the creek and reverses the direction of the breeze at the summit. Instantaneously almost every butterfly is in the air and will settle again under the shelter of the slope on the opposite side. On a breezy day this change may take place every few minutes, with the resulting migration of the butterflies over the summit. This habit of laying over on their side has been noted by many writers, and it becomes habitual with species inhabiting the high mountain slopes. Even when there is no perceptible wind they invariably assume this position, while even the same species when found in the lower valleys will as invariably be noticed in an upright position. Another peculiar thing that may be noticed in both butterflies and moths when flying over a glacier: The temperature of the air for several feet

above the snow is low enough to produce torpidity. The passage of even a light, fleecy cloud over the sun is sufficient to cause them to instantly settle on the snow, where they will remain in a torpid condition until the sun's rays again warm them into activity. I have several times seen the snow literally covered with all kinds of insects which had migrated with the wind and had been caught by the cold of the snow field. In many cases where there has not been a recent rain or snowfall, many of such specimens may be secured in perfect condition. A very curious thing has often occurred to me in reference to **Euvanessa antiopa.** It is well known that this species hibernates and often lives long into the succeeding summer, in fact I have seen one instance where freshly emerged specimens were seen in late August in company with poor, bedraggled hibernated specimens; but the fact that I wish to describe alludes to their habit of remaining in the vicinity of their growing brood of larva. They keep up a short flight along the road for a distance of from three to five hundred feet on either side of the brood, and, when approaching the location of the feeding larvae, will rise and fly round over them several times before proceeding past them in the opposite direction. We all know how animals will protect their young from attack; also we have the case of the English Stickleback and the American Black Bass as two cases where fish are known to protect their young brood, and it has often occurred to me that this peculiarity of **antiopa** might in some way be a like example in the case of insects. Does **antiopa** keep watch over the brood to drive away **Ichmeumonidae** or other insects which might be parasitic on her brood? One fact may also be mentioned, and that is that by far the greater majority of larvae are free from the attack of Ichmeumonidae while they are feeding in colonies than may possibly be found in the case of any other species having the community instinct. The question remains to be solved, why is **antiopa** given the gift of the longest life of any of the North American butterflies, and for what reason does the female remain in the vicinity of her brood during the early stages?

The article by F. H. Wolley Dod in Canadian Entomologist, dealing with the habit of flying over water of **Smerinthus cerisii,** also applies to **S. opthalmicus.** Of the **Saturnidae** I have already published in the annual reports of the Canadian Entomologist Society for 1906 some notes on the spinning methods of **Telea polyphoemus** in the west, showing how they invariably attach their cocoon by a silk thread to a limb instead of allowing it to fall as described by eastern writers. I wish, however, to refer only briefly to the method of **Samia rubra.** The larva of this species usually selects the ridge of a sunny bank facing the south on which to pupate. I am inclined to attach some significance to the height at which the cocoons are attached on the brush as relative to the amount of snow during the following winter, i.e., that when the snow is liable to be deep the cocoon may be spun high up on the brush, whereas

when the snowfall is liable to be shallow over the spot selected for pupation, the cocoons may be spun very near the ground. This must reasonably be considered as only a circumstance and not as an invariable rule.

Pseudohazis shastaensis lays its eggs round a small twig in regular rows. These emerge the following spring and pupation takes place in the fall, the imago not emerging until the second year after.

Diacrisia kasloa. The males only of this species are attracted by light. I have never taken a female excepting in flight at dusk.

Some of the genus **Shizura** when at rest fold their wings very close to their body with the head downward, the hairs on the thorax standing out straight all round, giving the moth a most peculiar appearance; it is so unlike a moth that it may easily be passed unnoticed. Among the Geometers the genus **Eupithecia** is not largely represented amongst collections. This may be accounted for by the unfamiliarity of collectors with its habits. When at rest, all the **Eupithaciae** spread their wings out flat and attach themselves to the underside of a leaf, or in case where they are attracted by light they will rest on the ceiling overhead; a small, inconspicuous patch on the darkened ceiling is readily passed unnoticed. A good place to find this genus is on a board fence which has cross rails. These afford an excellent resting place for them, more especially if the fence is surrounded by brush. If during the previous night there has been a heavy rain storm, a visit to the fence the following day will often produce a good catch. Beside looking for them on the underside rails of the fence, a sharp blow with a club will often disturb them and cause them to take wing. Many of the **Eustroma, Hydriomena** and allied genus rest during the day under roots, and a particularly favorite place to find them is under the overhanging foliage on a cut bank on the side of a road. Here they rest, away from the glare of the sunlight, cooled by the moist earth. Another favorite place is on the underside of an overhanging rock bluff.

In conclusion, I trust that I have not trespassed too long on the time of the meeting, and that at least some of the members of our Society will find something of interest which will help them in their work amongst the Lepidoptera.

Mr. Tom Wilson: Mr. Chairman, I think that the Entomological Society can compliment themselves on having a member who is not only able but does exercise his powers of observation the same as our friend Mr. Cockle has done. When he speaks about the Mountain Forma, I can vouch for him, for I remember once when I was out hunting in the Nicola country, on a sunny morning, there was a flock of insects I had been taking notice of. A few minutes after there was a clap of thunder and they all settled at once and every one of them was lying on its side. They were all in flight when I saw them first, but immediately the thunder came, they settled on their sides.