BULLETIN

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THE COMING SEASON.

As the season here practically opens in March, when the sallow bloom attracts the early noctuid, many of our members will doubtless have their setting-boards in full swing ere this issue appears. There is indeed no close season for entomologists on the coast, for insects may be taken every month of the year.

Now is the time, however, to decide upon the scope and aim of our endeavours. It may not be out of place to indicate some questions which require further study. Among the butterflies, for example, the determination of our Sulphurs and some of the Blues and Checker-spots is not altogether satisfactory. There seems also to be some confusion in our collections among the Theclas, especially the species going under the names—**nelsonii, blenina, and johnsonii.**

In Coleoptera we have an offer from Professor H. F. Wickhan, of Iowa City, to name our Cerambycidae, and a box of "longhorns" has already been despatched to him.

Our Diptera are in the able hands of Professor J. S. Hine, of Columbus, Ohio, except the Syrphidae, which are being worked over by Professor R. C. Osburn, of New York.

NOTES ON THE DISTRIBUTION OF INSECTS IN BRITISH COLUMBIA.

By R. V. Harvey. (Continued).

The second fact to which I wish to call attention is that the general trend of human exploration from Europe across the Atlantic westward is apt to blind us to the possibility that in past geological ages the tide of immigration may have been in a contrary direction; nor does the occasional interchange of species by the way of Greenland, mostly birds, afford even presumptive proof that the Neartic Region received, say in Miocene times, any considerable influx of animals from Europe by this route, or vice-versa. In the Miocene, or better in the Pliocene age, there is ample evidence to prove that the climate of the northern hemisphere was very much more equable than it is now, and, further, that there was almost, if not quite, continous land round the North Polar Regions. This region is sometimes called Arctogaea.—"the Northland."

The fact that the mastodon appears in Eurasia in middle Miocene times, while it is not found in America until the Pliocene age, points to the fact that it came over where the Behring Straits are now; similar facts could be adduced to show that the bears, deer and tapirs originated in Eurasia, whence they migrated to the New World, probably by the same route. (Wallace).

But when we come down to more recent geological times, the Post-Pliocene or Pleistocene period, in which the species are practically the same as those which now exist, we are confronted with an event, the importance of which in regulating the present dispersal of our animals can hardly be overestimated. I refer to the Glacial Period.

There is no longer room for doubt that in the Pleistocene Epoch, the whole of northern Europe and Asia, all Canada and a large part of the northern United States, were in the condition at present existing in Greenland, namely, covered with an immense ice-sheet out of which only the tops of the highest mountains protruded. Nor can there be any doubt that the parts lying to the south of this area were very seriously affected in their climate by the presence of this ice-sheet.

We must imagine that, in the period immediately preceding the Ice-Age, a climate comparatively temperate existed round the Pole, in what is called the "Holarctic Region," which was consequently peopled by a strictly temperate fauna and flora, the ancestors of the animals and plants which now inhabit the North Temperate Zone.

On the approach of the period of cold, a southward movement must necessarily have begun, which can only have ended when the ice-sheet reached its extreme southern limit. By this time the whole of southern Eurasia, and the greater part of the

United States, at least as far south as Colorado, would be populated by an Arctic fauna of nearly the same species on both sides of the Atlantic Ocean.

We may further take it as at least highly probable that it was about this time that the isolation of America from Europe on the one side, and from Asia on the other, by impassable ocean barriers, took place. There has thus been ample time for the species on each side to develop such differences as we see at the present time.

But oceans are not the only barriers to the dispersal of animals. Those species which spread southward over the United States found themselves divided into two camps, which could never re-unite, by the great mass of the Rocky Mountains. This enables us to account as no other theory can do for the fact of the existence of well-marked geographical races of the same species on either side of the continent.

Now whether this period of enforced exile from their northern homes were long or short matters little for our purpose; we cannot doubt that, as soon as the ice began to retreat and the temperature to rise, a general movement northward would necessarily begin. It may be well to call attention at this point to the fact of the strong tie which connects the natural history of insects with that of plants. Flowering plants depend upon insects for the fertilization of their blossoms, while insects are no less dependent upon plants as food for themselves or their larvae. Consequently, even though insects can be proved incapable of enduring considerable fluctuations of temperature, so long as they depend upon plants which have not the same power, they must change their habit if their food-plant becomes extinct in their locality.

So, then, the procession of exiles (I am speaking highly metaphorically) started for the north once more. But few of them ever got to their original starting-point. They found changed conditions at almost every step, and we can hardly doubt that some species which found a congenial home on the west of the mountains would perish miserably on the bleak plains of Manitoba.

This question of climate is of the greatest importance, for, once we grant the common origin of our fauna and flora with that of Eurasia, it is easy to understand why, after the Glacial Period, there should be a body of genera and species in our province similar to those of Europe, but more or less unlike those of Eastern Canada.

The comparison of climates involves a consideration of two points,—mean annual temperature, with special reference to range of temperature in winter and summer, and mean annual rainfall. The latter affects the dispersal of insects chiefly indirectly by limiting the range of their food-plants.

Now we shall see that the coast of British Columbia has a climate remarkably like that of the British Isles. The January temperature here—32 to 40 degrees—, corresponds with that of the east of Great Britain and that of central Europe, while eastern Canada is as cold as southern Greenland, Lapland and central Russia. On the other hand our July temperature is the same as that of the British Isles generally, but eastern Canada experiences the same heat as the south of France.

Our rainfall, as is only natural in a province of this size, varies enormously at different points; thus:—Princeton 5 inches, (dry belt); Victoria 31 inches; Vancouver 61 inches; Rivers Inlet 105 inches. In England the range is from 25 to 40 inches, except in the mountainous districts of the west, where 60 inches is not uncommon, and some places have a rainfall of over 100 inches annually.

These facts will explain why any plant growing in England can be readily acclimatised here; yet ivy cannot be made to grow in the East on account of the cold, and the holly will not flourish in California for lack of moisture.

OUR LIBRARY.

The following books have been presented to the Society by the Smithsonian Institution; they are in charge of Mr. Harvey, and may be inspected by members.

LEPIDOPTERA.

Catalogue of N. American Lepidoptera	Dyar	1902
Catalogue of N. America Noctuidae	Smith	1893
Synopsis of N. Am. Lepidoptera, Part 1	Morris	1862
Revision of Deltoid Moths	Smith	1895
Bibliography of described transformations of Lepidoptera	H. Edwards	1889
Revision of Agrotis	Smith	1890
New Noctuidae	Smith	1887
New Tineina from Florida	Busck	1900
Revision of the Gelechidae	Busck	1903
Revision of Depressaria	Busck	1902
Revision of the Cochlidiidae	Dyar	1905
New species of Euerythra and Callimorpha	Smith	1887
New Tortricidae from N. Carolina	Kearfott	1905

COLEOPTERA.

Catalogue of N. Am. Coleoptera	Melsheimer	1853
New Scarabaeidae	Linell	1896
Maternal Solicitude in Rhynchota	Kirkaldy	1904

DIPTERA.

Catalogue of N. Am. Diptera	Osten Sacken	1878
Catalogue of N. Am. Diptera	Aldrich	1906
Monographs of Diptera, Part 1	Loew	1862
Mosquitoes of California	Dyar	1907
Synopsis of the Syrphidae	Williston	1886
The so-called "Bugonia"	Osten Sacken	1894
New Diptera	Coquillett	1901
New Diptera	Coquillett	1902
Revision of the Empidae	Coquillett	1896

HYMENOPTERA.

Monograph of N. Am. Proctotrypidae	Ashmead	1893
New Ichneumonidae	Ashmead	1890
New Braconidae	Ashmead	1888
Bees and Flowers	Bouvier	1905
Psychical faculties of Ants	Forel	1904
Wing Venation of the Tenthredinoidae	MacGillivray	1906

ORTHOPTERA.

Catalogue of N. Am. Orthoptera	Scudder	1868
New Acridiidae	Bruner	1889
Revision of Trimerotropis	McNeill	1901
Two new Orthoptera	Caudell	1904
Orthoptera from Arizona	Caudell	1905

OTHER ORDERS, AND GENERAL PAPERS.

Directions for collecting Insects	Riley	1902
Directions for collecting Scale-insects	Cockerell	1892
Directions for collecting Dragon-flies	Needham	1899
Observations on Termites	Haviland	1902

And 38 other papers, mostly on Exotic Insects.

THE BRITISH COLUMBIA LIST

DIPTERA.—Family Asilidae.

The Robber-flies are rather large flies, with a long slender body. The head is hollowed out on top between the eyes, the face is usually bristly, and there is a strong pointed proboscis. These flies are very predaceous, feeding on other flies as well as bees, beetles and dragon-flies. Most of the larvae are also predaceous, but of little economic importance.

Scleropogon Loew

256 **helvolus Loew** ..... Victoria.

Stenopogon Loew

256 **inquinatus Loew** ..... Victoria, Vernon.
256 **modestus Loew** ..... Victoria, Cherry Ck., Similkameen.

Dicolonus Loew

258 **simplex Loew** ..... Victoria.

Dioctria Meig

259 **albius Walk** ..... Victoria, Wellington, Hope Mts.
259 **nitida Will** ..... Hope Mts. (Sherman).

Cyrtopogon Loew

259 **aurifex O.S.** ..... Victoria, Hope Mts.
259 **callipedilus Loew** ..... Victoria.
259 **dasylloides Will** ..... Victoria, Kaslo.
260 **leucozona Loew** ..... Vernon (Venables).
260 **montanus Loew** ..... Vernon, Hope Mts.
260 **nebulo O.S.** ..... Vancouver, Vernon.
260 **positivus O.S.** ..... Port Renfrew.

Lasiopogon Loew (Daulopogon)

260 **bivittatus vittatus Loew** ..... Hope Mts. (Sherman).

Pycnopogon Loew

262 **sensilis Bigot** ..... Hope Mts. (Sherman).

Heteropogon Loew

263 **lautus Loew** ..... Wellington (Harvey).
263 **ludius Coq** ..... B. C. (Aldrich).

Pogonosoma Rond

269 **dorsatum Say** ..... Victoria, Goldstream, Shawnigan.

Dasyllis Loew

271 astur O.S. ..... gen. distributed.
271 columbia Walk ..... Vancouver Island (Aldrich).

Laphria Meig

272 canis Will ..... Hope Mts. (Sherman).
272 ferox Will ..... Vancouver, Kaslo.
272 pubescens Will ..... Vancouver, Hope Mts.
273 vivax Will ..... Kaslo (Cockle).
273 vultur O.S. ..... gen. distributed.

Proctacanthus Macq

274 philadelphicus Macq (?) ..... Vernon.

Erax Scopoli

278 varipes Will ..... Vernon.

Stilpnogaster Loew

auriannulatus Hine ..... Hope Mts.

SOME OF OUR NOCTUIDAE.

By R. V. Harvey.

1. Xylomiges.

This genus is remarkably well represented in British Columbia. Out of fifteen North American species we have certainly ten, if not eleven species, here.

They are among the earliest of the noctuids, and may be taken at sallow bloom in March, at cherry in April, and at lilac in May, besides flying freely to light. With the exception of X. patalis, which is in many respects abnormal, none of my specimens were caught later than May 11th.

Most of them have white secondaries, and there is generally a reddish tinge in or round the reniform spot. The male antennae are usually more or less pectinated, except in patalis.

1. **Xylomiges hiemalis Grote.** Thorax dark gray. Primaries brown, darker at the base; spots and lines distinct; orbicular spot open at the top, reniform reddish, Secondaries smoky-white, with a faint line, and distinct discal dot. This moth is generally distributed through the province, but I have not found it common.
2. **Xylomiges simplex Walker.** Thorax pale gray, with a black line on the collar, another down each side, and often a dorsal streak. Primaries pale bluish gray, spots and lines obsolete; a black streak from the mid-costa to the reniform; a sub-marginal row of black streaks between the veins. Reniform indistinct, tinged with yellow; secondaries white. Common everywhere.
3. **Xylomiges perlubens Grote.** Thorax dark gray. Primaries warm gray; a red flush round the reniform spot. Orbicular conspicuous, white, oval, upright. Secondaries nearly white. Generally distributed; common at cherry in 1906.
4. **Xylomiges rubrica Harvey.** Thorax buff to gray. Primaries buff, margin darker, a red flush round reniform. Orbicular conspicuous, narrow, oblique. Base of wing hardly darker, with a black streak. Secondaries yellowish white. Fairly common in most localities.
5. **Xylomiges pulchella Smith.** Much resembles rubrica, but has conspicuously darker markings. Base of primaries dark brown, contrasting. Heavy black marks round the spots; orbicular as in rubrica. These two species seem to intergrade to some extent. They are found in the same places, and are about equally common.
6. **Xylomiges candida Smith.** Thorax ash-gray, immaculate. Primaries ash-gray with black markings, especially in the middle. Spots faint; hardly a trace of red. Secondaries pure white. Seems to be common on the Island only.
7. **Xylomiges pallidior Smith.** Resembles simplex, but is more gray than blue; the markings are heavier, and the inner transverse line generally complete; little or no yellow in the reniform spot. Common everywhere.
8. **Xylomiges cognata Smith.** Thorax yellowish-white, black-powdered. Primaries yellowish-white, maculation brown, very distinct. A tinge of yellow gives the whole wing an olive appearance. Orbicular large, concolorous, blackringed. Secondaries yellowish-white. Recorded from Victoria.
9. **Xylomiges patalis Grote.** The smallest of our species (1 1¼ inches), and the only one with simple male antennae. Thorax blue-gray. Primaries blue-gray, median space darker, V-shaped, enclosing the spots, which are concolorous and often touching each other. Secondaries smoky, with broad, darker margin. Patalis is the last of the genus to make its appearance, not being on the wing till nearly June. It is generally distributed.
10. **Xylomiges dolosa Grote.** Recorded from Kaslo, but unknown to me. It is described as a dull lustreless black species, and seems to frequent high altitudes and mountainous regions.