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Serials

PROVINCE OF BRITISH COLUMBIA

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REPORT

OF THE

PROVINCIAL MUSEUM

OF

NATURAL HISTORY

FOR THE YEAR 1920



PRINTED BY  
AUTHORITY OF THE LEGISLATIVE ASSEMBLY.

VICTORIA, B.C.:

Printed by WILLIAM H. CULLIN, Printer to the King's Most Excellent Majesty.  
1921.



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*To His Honour* WALTER CAMERON NICHOL,  
*Lieutenant-Governor of the Province of British Columbia.*

MAY IT PLEASE YOUR HONOUR:

The undersigned respectfully submits herewith the Annual Report of the Provincial Museum of Natural History for the year 1920.

J. D. MACLEAN,  
*Provincial Secretary.*

*Provincial Secretary's Office,*  
*Victoria, February, 1921.*

PROVINCIAL MUSEUM OF NATURAL HISTORY,  
VICTORIA, B.C., February 24th, 1921.

*The Honourable J. D. MacLean, M.D.,*  
*Provincial Secretary, Victoria, B.C.*

SIR,—I have the honour, as Director of the Provincial Museum of Natural History, to lay before you the Report for the year ending December 31st, 1920, covering the activities of the Museum.

I have the honour to be,

Sir,

Your obedient servant,

F. KERMODE,

*Director.*

## TABLE OF CONTENTS.

	PAGE.
Objects .....	7
Admission .....	7
Visitors .....	7
Activities .....	7
Accessions .....	8
Bounties .....	9
Mammals—	
Notes on the Occurrence of a Humpback Whale having Hind Legs .....	10
Distribution of Shrews and Shrew-mice in British Columbia .....	11
Distribution of Bats in British Columbia .....	14
Ornithology—	
Notes on the Occurrence of Sabine's Gull ( <i>Xema sabinei</i> ) .....	19
Notes on the Occurrence of the Iceland Gull ( <i>Larus leucopterus</i> ) .....	20
Notes on the Occurrence of the Chinese Starling ( <i>Acridotheres cristatellus</i> ) .....	20
Botany .....	21
Entomology .....	22





REPORT *of the*  
PROVINCIAL MUSEUM OF NATURAL HISTORY  
FOR THE YEAR 1920.

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OBJECTS.

- (a.) To secure and preserve specimens illustrating the natural history of the Province.
- (b.) To collect anthropological material relating to the aboriginal races of the Province.
- (c.) To obtain information respecting the natural sciences, relating particularly to the natural history of the Province, and diffuse knowledge regarding the same.

ADMISSION.

The Provincial Museum is open, free, to the public daily throughout the year from 9 a.m. to 5 p.m. (except New Year's Day, Good Friday, and Christmas Day); it is also open on Sunday afternoons from 1 p.m. to 5 p.m. from May 1st until the end of October.

VISITORS.

The number of visitors who have signed the register of the Provincial Museum during the year 1920 is 25,850. These figures are by no means accurate, as this only includes one person to a line, although many signatures on one line include man, wife, and family. Many other people visiting the Museum do not seem to like the idea of recording their names, and no record has been kept of the children, and also of school classes who are accompanied by their teachers in connection with their nature-studies. If a turnstyle were to be installed we would then be able to record the actual number of attendance daily in the museum. The following figures will give some idea of those who recorded their names during the months of: January, 1,093; February, 1,289; March, 1,348; April, 1,603; May, 1,839; June, 2,287; July, 4,538; August, 5,607; September, 2,838; October, 1,367; November, 1,028; December, 1,023.

ACTIVITIES.

There have been added eighteen ornithological storage (moth-proof) cases to take care of the study series of bird-skins which are stored in the annex, also two walnut, plate-glass exhibition cases for the entomological section.

The Public Works Department has begun excavating the basement in the Provincial Museum, and when this is completed all the valuable study material, ornithological, anthropological, and mammals, which are stored in the wooden annex at the rear, will be removed and placed in the basement, which will be practically free from danger of fire and from probable loss in other ways.

Many applications have been made from teachers throughout the Province for scientific literature to assist them in teaching nature-studies to their pupils. It has been impossible for the Director to supply the same; the only literature we have on hand are the Annual Reports, in which the scientific research-work is noted throughout the year.

During the year the Herbarium has been greatly enriched by a large number of specimens added, which were mentioned in last year's report in the botanical section.

By an agreement between the Director of this Department and Mr. R. G. McConnell, Deputy Minister of the Geological Survey, Ottawa, the collection of Cryptograms made by Professor John Macoun were to be taken over by this Department for storage and safe-keeping, and a division of the same was to be made between the Geological Survey and the Provincial Museum. The division of these specimens has now been completed, and the collection of the Provincial Museum has been enriched by over 4,000 specimens which were collected by Professor John Macoun and named by himself and other authorities. These specimens have now been catalogued and added to the collection, the balance having been turned over to the Geological Survey, Ottawa.

The manuscript for the Check-list of the Flora of Vancouver Island is being completed and it is hoped to have it in the printer's hands within the next few weeks. In this work we have been greatly assisted by the late Professor Macoun and his son, the late J. M. Macoun.

## IN MEMORIAM.

Professor John Macoun, one of the oldest members of the Ottawa Field Naturalists' Club, died at Sidney, Vancouver Island, B.C., on July 18th, 1920, in his ninetieth year. He was born at Maralin, Ireland, about 20 miles from Belfast, on April 17th, 1831. He came to Canada in 1850.

In 1872 Mr. Macoun accompanied Sir Sanford Fleming as Botanist on an expedition to the West to explore and determine the line for the first transcontinental railway, now known as the Canadian Pacific.

In 1875 Mr. Macoun was appointed Botanist to an expedition in the Peace River country under the leadership of the late Dr. Alfred Selwyn, then Director of the Geological Survey, Ottawa, and in 1881 was appointed Botanist to the Dominion Government, although he had, at intervals, been doing work for the Government since 1872.

Perhaps the strongest trait in Professor Macoun's character was a sympathetic understanding of his fellow-men, one that made him hosts of friends and a much-sought adviser in questions of doubt and difficulty. The honesty of his opinion and the straightforwardness with which his advice was given, in conjunction with his sympathetic manner of giving it, secured for him a respect and affection that lasted a lifetime. His wonderful magnetism and ready tact constituted him a leader of men, and had his great abilities turned to statesmanship he would have been a great power for the good of his country. He was a true Imperialist and a firm believer in the strength and integrity of the British Empire.

He had many strong and outstanding personal characteristics. His determination and perseverance are marked through all his early explorations, and many accounts might be related where it was nothing but sheer determination that carried him safely through perilous and exhaustive situations.

The late Professor Macoun was the highest authority on botanical research in Canada. His loss will be keenly felt not only by the Department in Ottawa with which he had been so long connected, but also by the Provincial Museum in Victoria, to which he was a constant contributor and visitor.

## ACCESSIONS.

Leg-bones of humpbacked whale taken at Kyuquot Station and presented to the Provincial Museum by Mr. W. Lawson, Vice-President of the Consolidated Whaling Corporation, Victoria, in January, 1920.

Log of wood, Douglas Fir (*Pseudotsuga mucronata*), showing portion of tree which had been cut into many years ago and how Nature provides for the covering of the hewn part. Presented by Mr. E. W. Haskell, Red Gap, B.C., March, 1920.

Collection of Fungi, Musci, Lichens, Hepaticæ, and Algæ. Collected and presented by Professor John Macoun, Sidney, B.C., April, 1920.

Plants collected and presented by: Dr. C. F. Newcombe, W. B. Anderson, W. R. Carter, W. A. Newcombe, J. G. French, Victoria, B.C.; Professor J. K. Henry, Vancouver, B.C.; and Miss Susan Beaman, Prince Rupert, B.C.

Fork-tailed Gull (*Xema sabinei*), taken at Glacier Point, Sooke, B.C., and presented by Mr. J. G. French, October, 1920.

Log of wood containing larva of Long-horned Beetle (*Prionus californicus*). Presented by Mr. C. R. Pooley, Cobble Hill, January, 1921.

Two specimens of White-winged or Iceland Gull (*Larus leucopterus*), collected by Mr. William McKay, Kildonan, V.I., January and February, 1921.

## PUBLICATIONS OF OTHER INSTITUTIONS.

(Alphabetically arranged.)

American Museum of Natural History, New York City .....	1
Art Institute of Chicago, Illinois .....	7
Alpine Club Journal, Banff, Alberta .....	1
Archæological Society of Ontario, Toronto, Ont. ....	1
British Museum, London, England .....	6
<i>Carried forward</i> .....	16

PUBLICATIONS OF OTHER INSTITUTIONS—*Continued.*

<i>Brought forward</i> .....	16
Brooklyn Institute of Arts and Sciences, Brooklyn, N.Y. ....	1
Bureau of Science, Manila, P.I. ....	2
California Academy of Sciences, San Francisco, Cal. ....	11
California University, Berkeley, Cal. ....	9
Carnegie Museum, Pittsburgh, Pa. ....	2
Charleston Museum, Charleston, S.C. ....	6
Children's Museum of Boston, Boston, Mass. ....	2
City Art Museum, St. Louis, Mo. ....	6
Colorado Museum of Natural History, Denver, Col. ....	1
Dominion Government Publications, Ottawa ....	19
Detroit Institute of Arts, Detroit, Mich. ....	9
Field Museum, Chicago, Ill. ....	5
Grand Rapids Public Library, Grand Rapids, Mich. ....	2
Illinois State Natural History Survey, Urbana, Ill. ....	6
Library of Congress, Washington, D.C. ....	1
Louisiana State Museum, New Orleans, La. ....	2
Manchester Museum, England ....	2
Manx Museum, Isle of Man ....	1
Milwaukee Public Museum, Wisconsin ....	1
Minneapolis Institute of Arts, Minn. ....	9
Minnesota University, Minn. ....	1
Museum of Fine Arts, Boston, Mass. ....	8
Nebraska University, Lincoln, Neb. ....	4
New York Botanical Garden, N.Y. ....	2
Ohio Agricultural Experimental Station, Wooster, Ohio ....	15
Peabody Museum, Salem, Mass. ....	1
Peabody Museum, Yale University, New Haven, Conn. ....	10
Pennsylvania Museum and University ....	5
Philadelphia Academy of Natural Sciences, Pa. ....	2
Roger Williams Park Museum, Providence, R.I. ....	7
Smithsonian Institution, Washington, D.C. ....	34
Staten Island Institute, New Brighton, N.Y. ....	6
Sydney Museum, Australia ....	1
United States Department of Agriculture, Washington, D.C. ....	2
University of Washington, Seattle, Wash. ....	1
Wagner Free Institute of Science, Philadelphia, Pa. ....	1
Zoological Society, New York, N.Y. ....	2
Zoological Society, Philadelphia, Pa. ....	1
Total .....	216

The thanks of the Department are extended to the contributors, also to others who have assisted in the securing of collections and identifications of specimens, namely: Dr. C. F. Newcombe, Victoria, B.C.; Professor J. K. Henry, Vancouver, B.C.; W. B. Anderson, Victoria, B.C.; E. W. Nelson, Chief Biological Survey, Washington, D.C., and staff.

Also to the following scientists, whose names are alphabetically arranged, for the determination of entomological specimens: Drs. W. Barnes and A. W. Lindsey, Decatur, Ill.; Mr. August Busck, Washington, D.C.; Dr. H. G. Dyar, Washington, D.C.; Dr. J. H. McDunnough, Ottawa, Ont.; Dr. R. Ottolengui, New York, N.Y.; Dr. H. Skinner, Philadelphia, Pa; Mr. L. W. Swett, Lexington, Mass.

## BOUNTIES OF WOLVES.

According to the Orders in Council passed under the "Game Protection Act," all applications for bounties on wolves must be sent to the Director of the Provincial Museum for verification.

It is interesting to note that for the year 1920 the Government was only called upon to pay the bounty on 124 wolves, the bounty on which was \$15 per head. It will be noticed that most

of these applications have come from the Northern Coast and Northern Interior of the Province, very few applications for bounties being made south of the main line of the Canadian Pacific Railway, and I have no record of any applications being made on a wolf that was killed on Vancouver Island during the year.

The following is a list of the persons to whom bounties were paid during the year 1920:—

C. B. Cole, Teslin Lake .....	17
C. L. Irvine, Teslin Lake .....	13
I. Director, Prince Rupert .....	13
A. J. Phillipson, Prince Rupert .....	12
R. Boyd Young, Port Simpson .....	12
Hudson's Bay Company (various localities) .....	10
R. Williams, Corridon Bay .....	8
A. C. Christenson, Bella Coola .....	3
R. Wilson, Prince Rupert .....	3
W. Goldbloom, Prince Rupert .....	2
Stephen Cook, Alert Bay .....	2
Walter Scott, Simoon Sound .....	2
A. Enoekson, Prince Rupert .....	2
J. E. Ornheim, Prince Rupert .....	2
W. Flanagan, Rivers Inlet .....	2
J. L. Nygaard, Bella Coola .....	2
G. A. Kelly, Elondin Harbour .....	2
Charles Kilbourne, Simoon Sound .....	1
A. Anderson, Sointula .....	1
Mose King, Simoon Sound .....	1
Herbert Wait, Swanson Bay .....	1
A. Farquharson, Harbledown Island .....	1
Barnett Dopp, Fort St. John .....	1
J. Eklund, Prince Rupert .....	1
Albert Michand, Terrace .....	1
F. Knowles, Hartley Bay .....	1
W. Purl, Port Simpson .....	1
H. Roberts, Vancouver .....	1
A. Muchlbauer, Atlin .....	1
D. Johnson, Swanson Bay .....	1
L. J. Lewis, Marpole .....	1
Charles Bibeau, Stewart .....	1
J. Rogers, Prince Rupert .....	1
P. Brozart, Prince Rupert .....	1
Total .....	124

Several coyotes have been turned in with the timber-wolves by persons making applications for bounty; these, however, have been identified as coyotes, and bounty refused unless the pelts were turned in to the Government to receive the Government bounty, which is only \$2 on this animal.

#### MAMMALS.

##### NOTES ON THE OCCURRENCE OF A HUMPBACKED WHALE HAVING HIND LEGS.

On January 5th, 1920, the Director took up with Mr. W. Lawson, the Vice-President of the Consolidated Whaling Corporation, Limited, Victoria, B.C., the notes which had appeared in the press in reference to a humpbacked whale having been taken at Kyuquot Station, on the west coast of Vancouver Island, which had leg-bones attached to the lower extremities of the body; this being noted by the Director as a most unusual occurrence; in fact, the first record known of any of these large animals having such an extraordinary growth.

Mr. Lawson presented these bones to the Provincial Museum. The Director received the following data from Mr. S. C. Ruck, who for a number of years was Managing Director of the

Consolidated Whaling Corporation, Limited, but now of the Vancouver Island Whaling Company, which will be of special interest, and is here copied:—

"I enclose herewith three photographs showing the unusual development of the pelvic rudiments in a whale captured at the Kynuquot Station last July, of which you have the bones. It is to be regretted that better pictures in evidence of this unprecedented development were not obtained.

"I have been connected with the whaling industry for twenty-two years, and during my time have come in contact with prominent naturalists, such as Professor True, of the Smithsonian Institution; Professor Lucas, of the Natural History Museum, Brooklyn; and Professor Andrews, of the Natural History Museum, New York; and neither in their experience nor mine have the protrusion of the pelvic bones beyond the body ever been seen or heard of.

"This particular whale was a female humpback of the average length, with elementary legs protruding from the body about 4 feet 2 inches, covered with blubber about  $\frac{1}{2}$  inch thick.

"As shown in the best photograph, these legs protruded on either side of the genital opening; the left leg was cut off by the crew of the vessel and lost, and the point at which it was cut off is clearly shown in the photograph. The end of the leg seen in the picture terminated in a kind of round knob like a man's clenched fist.

"The two bones of the leg which you have are connected by cartilage, which I was informed had shrunk about 10 inches, and possibly more by this time. At any rate, the total length of the leg before it was cleaned of the blubber and flesh was, as before stated, about 4 feet 2 inches from the body.

"S. C. RUCK."

Later, Mr. Roy Chapman Andrews, Assistant Curator of Mammals of the American Museum of Natural History, New York, who had done a tremendous amount of work monographing the whales of the world, heard of these most unusual appendages, and writing the Director of the Provincial Museum, asked for information regarding the same. These specimens were loaned to Mr. Andrews, who is preparing a paper on the same. Extracts from his letters no doubt will be of great interest, and are as follows:—

August 2nd, 1920. "The special excuse for this letter is to ask about some so-called exterior limb bones which were discovered on a humpback whale taken on the west coast of Vancouver Island. My friend, Mr. Sidney Ruck, of the Whaling Company, told me that one of the legs was sent to the Museum, and I shall be interested to know if you have it there; also, what the thing is like. Are there actual bones or is it only tissue and blubber? I am very much interested in the subject, and if you can give me any information I will be very grateful.

"ROY CHAPMAN ANDREWS."

September 20th, 1920. "When I returned from my vacation two days ago I found the whale-bones which you sent awaiting me. I am tremendously interested in them, for they represent a phase in evolution of which I have never seen any evidence in all the whales which I have investigated, and I should greatly like to publish a short paper on the bones, and want to ask whether or not you have any objections to my doing so. Will you not let me know as soon as possible about it, for I want to take up the matter of its preparation immediately if you are willing.

"ROY CHAPMAN ANDREWS."

October 7th, 1920. "Many thanks for your letter of September 27th, giving me permission to publish a paper on the external leg-bones of the humpback whale which you so kindly loaned for our inspection. I will, of course, be glad to acknowledge our indebtedness to Mr. Lawson and Mr. Ruck, and will have a number of separafes sent to you.

"ROY CHAPMAN ANDREWS."

#### INSECTIVOROUS MAMMALS, FAMILY SORICIDÆ.

##### *Distribution of Species occurring in British Columbia.*

Shrews, or shrew-mice, as they are often named from their mouse-like form, belong to the true Insectivores. So like are these animals to mice and rats that they are often erroneously confused with them, although they are easily distinguishable by their long pointed snouts, their rounded ears closely pressed to the sides of the head, and the characteristics of the first pair

of front incisor teeth; those of the upper jaw being long and generally sickle-shaped, with a more or less distinct cusp at the base of their hinder border, while in the lower jaw they are long and project horizontally forwards, in some instances curving upward at the tips, and, with the exception of perhaps one African species, have only six teeth on each side of the lower jaw.

With the exception of a few species which have taken to an aquatic life, the shrews are terrestrial and nocturnal in their habits. Shrews have a wider distribution than any other family of the Insectivores and comprise a far larger number of species.

Until quite recent years there appears to have been a diversified opinion in the nomenclature applied to many of our shrews.

In 1895 three papers by C. Hart Merriam and Gerrit S. Miller, Jr., were published by the United States Department of Agriculture (Division of Ornithology and Mammalogy) in the "North American Fauna," No. 10, revising the shrews of the American genera *Blarina* and *Notiosorex*; the long-tailed shrews of the Eastern United States; and a general synopsis of the American shrews of the genus *Sorex*. From this revision we are able to some extent to classify the shrews occurring within our limits.

From a perusal of these papers it is proposed here to briefly outline the earlier-known history of our shrews, which may be acceptable to some of our readers interested in the study of our smaller mammals.

For a long period the short-tailed shrews of the genera *Blarina* and *Notiosorex*, which so far as we know do not occur within our limits, were included in the genus *Sorex*, and were first separated by Gray in 1838 under the name of *Blarina* proposed as a subgenus; in 1842 *Blarina* was raised to full generic rank by Lesson; Baird in 1857 divided the genus *Blarina* in two sections according to the number of teeth, and Coues in 1877 recognized and named these sections as subgenera, *Blarina* proper with thirty-two teeth and *Soriciscus* with thirty; the reduction being in the unicuspid, of which there are five in *Blarina* proper, as in true *Sorex*, and only four in *Soriciscus*. The lost tooth in the latter subgenus is the second premolar.

The first short-tailed shrews known to naturalists were two specimens secured by Mr. Say, naturalist to Major Long's expedition to the Rocky Mountains in Eastern Nebraska, a few miles north of the present City of Omaha. These two specimens curiously became the types of the largest and smallest species of the genus *Blarina*, and later of the two subgenera into which the genus was split, collected during the winter of 1819-20 and described by Mr. Say in 1823, the larger as *Sorex brevicaudus*, the smaller as *Sorex parvus*.

#### *Long-tailed Shrews of the Genus Sorex.*

The first account of an American marsh-shrew was published in 1828, when Richardson described *Sorex palustris*, an animal he had found frequenting the borders of lakes in the region between Hudson Bay and the Rocky Mountains. In 1857 Baird placed *Sorex palustris* among the species unknown to him, but which he considered as probably worthy of recognition, at the same time describing the new genus *Neosorex* and the species *Neosorex navigator* from Washington.

Our first accurate knowledge of *Sorex palustris* dates from 1890, when Dr. Dobson figured the teeth of the type specimen, and in another paper published the same year discussed the validity of the genus *Neosorex*, coming to the conclusion that *Sorex palustris* and *Neosorex navigator* are the same, and that *Neosorex*, so far from being a genus, cannot even be recognized as a subgenus; a year later Dr. Merriam recorded *Sorex palustris* from Idaho, at the same time remarking that he considered *Neosorex* a very good subgenus.

The type specimen of *Sorex palustris* is in the British Museum; while its condition is such as to furnish no evidence, it was deemed necessary to judge the old descriptions on their own merits, and as all the early accounts of *Sorex palustris* refer to its pale, ash-grey belly, and as the geographical range, indefinite though it is, coincides with that of the Western animal, it is proper to apply the name to the latter.

That the type of *Sorex palustris* is a *Neosorex* and not an *Atophyrax* is shown by the teeth, which are nearly unworn; *Neosorex* is confined to North America, and, although not closely related to the Old World *Crossopus*, shows a remarkable comparison with the latter; both in habits and external appearance, both being aquatic, inhabiting marshes and the borders of streams.

All American shrews have two pelages commonly known as winter and summer coats, and, as is usual among small mammals, the moult takes place at different dates among individuals

of the same species, and it is not uncommon to take specimens in different pelages on the same day in the same locality. The winter pelage is usually plumbeous, dusky or ash grey; the summer pelage, sepia brown or chestnut. In defining the various species, identification has been largely based on cranial and dental characters, such as the size and form of the brain-case, breadth of palate, length and degree of attenuation of the rostrum, and the breadth of the interorbital construction, while size and depth of emargination of the molariform teeth and the proportion of the unicuspidate teeth are the chief factors of dentition.

Comparatively little field-work has been done in British Columbia collecting our smaller mammals, many areas being untouched, where further research may furnish new material and in some instances would undoubtedly extend the geographic distribution known to us at the present time.

The following species occur within our limits:—

*Sorex personatus* Geoffroy St. Hilaire. Type locality, Eastern United States (exact locality unknown). Distributed throughout the Boreal and Transition Zones of North America from New England to Alaska. Specimens identified from Glacier; Field; Cariboo Lake; Sicamous; Mount Baker Range.

*Sorex sphagnicola* Coues. Type locality, vicinity of Fort Laird, B.C., about latitude 60. Geographic distribution, sub-arctic America from extreme Northern British Columbia (and probably Alaska) to Hudson Bay.

*Sorex setosus* Elliot. Type locality, Happy Lake, Clallam County, Olympic Mountains, Washington. Two specimens in the collection of the Provincial Museum from Khatze Inlet, B.C., recently identified, are placed here.

*Sorex vagrans* Baird. Type locality, Shoalwater Bay, Washington. Range, Southern British Columbia, Western Washington and Oregon, and Northern California (south on the coast to Monterey and in the mountains to old Fort Crook and Cassel). Restricted to Lower Boreal and Upper Transition Zones. Specimens identified from Port Moody; Sumas; Mount Baker Range; Okanagan.

*Sorex vancouverensis* Merriam. Type from Goldstream, Vancouver Island, B.C. General characters similar to *S. vagrans*, but larger, with decidedly larger fore feet and much darker coloration. Range, so far as we know, confined to Vancouver Island, where specimens from Victoria and Sahtlam, Parksville, Errington, and Alberni are identified as this species.

*Sorex obscurus* Merriam. Type locality, Timber Creek, Salmon River Mountains, Idaho; altitude, 8,200 feet. Geographic distribution, British Columbia and mountains of Western Washington; Idaho; Montana; Wyoming; Utah and Colorado; south along the high Sierra Nevada in California to Mount Whitney. Restricted to Boreal Zone. Specimens identified from Nelson; Ward; Field; Glacier; Golden; Cariboo Lake; Sicamous; Sumas; Port Moody; also Goldstream and Comox, on Vancouver Island.

*Sorex obscurus longicauda* Merriam. Type from Wrangell, South-east Alaska. *Sorex obscurus* is a strictly boreal species and in the United States it is exclusively a mountain animal, not descending to base-level until British Columbia is reached. In the Puget Sound region, however, and along the coast of Washington and thence northerly to Alaska it sends a representative all the way down to sea-level. This representative is larger, has developed an exceedingly long tail, and has taken on certain peculiarities of coloration, being described by Merriam as a subspecies, in the belief that intergradation with *obscurus* takes place. Three specimens examined from Port Moody, British Columbia, are more or less intermediate between *S. longicauda* and *S. obscurus*.

*Sorex longicauda classodon* Osgood (Queen Charlotte Shrew). Type from Cumshewa Inlet, Moresby Island, Queen Charlotte Islands, British Columbia collected June 13th, 1900, by W. H. Osgood and E. Heller. Specimens taken at Cumshewa; Skidegate; Masset.

*Sorex longicauda prevostensis* Osgood (Prevost Island Shrew). Type from Prevost Island, Queen Charlotte Islands, British Columbia; collected July 3rd, 1900, by W. H. Osgood and E. Heller. Range, only known from Prevost Island, Q.C.I., and differing from the shrews of Graham and Moresby Islands to a greater degree than from the Mainland species *S. longicauda*.

*Sorex trowbridgi* Baird. Type locality, Astoria, Oregon. Ranges throughout Western Washington and Oregon, west of the Cascade Range. Museum specimens taken at Sumas are identified as this species.



*Sorex palustris navigator* (*Neosorex*) Baird. Type locality unknown, stated to be Fort Vancouver, Washington, but probably northern Idaho. Geographic distribution, the Rocky Mountains and outlying ranges from British Columbia to Southern Colorado and the Sierra Nevada of California, south to the Sequoia National Park. Specimens identified from Nelson; Cranbrook; Lillooet; Atlin; Lake District, near Victoria, Vancouver Island.

*Sorex bendirii* (*Atophyrax*) Merriam. Type, Klamath Basin, Oregon. Range, Klamath Basin, Oregon, northward along east side of Cascade Range to Puget Sound, westward to coast of California and south to Sonoma County. Museum specimens taken at Sumas are referred to this species.

A number of small mammal-skins were sent to Mr. Edward Nelson, Chief, Biological Survey, Department of Agriculture, Washington, D.C., early in the year for identification, and these, having been identified by members of his staff, were returned in April. The identifications of the *Sorex* and *Neosorex* have been made by Dr. Jackson, who is engaged on a critical study of these groups, and the *Peromyscus* by Mr. Howell and Mr. Preble.

The following is the list of mammals sent and identified:—

*Peromyscus.*

(Catalogue No. of Skins with Corresponding Skulls.)

297. <i>Peromyscus maniculatus borealis.</i>	409. <i>Peromyscus maniculatus artemisia.</i>
298. <i>Peromyscus maniculatus borealis.</i>	411. <i>Peromyscus maniculatus artemisia.</i>
299. <i>Peromyscus maniculatus borealis.</i>	452. <i>Peromyscus maniculatus artemisia.</i>
304. <i>Peromyscus maniculatus borealis.</i>	453. <i>Peromyscus maniculatus artemisia.</i>
305. <i>Peromyscus maniculatus borealis.</i>	454. <i>Peromyscus maniculatus artemisia.</i>
308. <i>Peromyscus maniculatus borealis.</i>	457. <i>Peromyscus maniculatus oreas.</i>

*Sorex.*

(Catalogue No. of Skins with Corresponding Skulls.)

922. <i>Sorex v. vagrans.</i>	944. <i>Sorex v. vagrans.</i>
923. <i>Sorex o. obscurus.</i>	947. <i>Sorex o. obscurus.</i>
924. <i>Sorex o. obscurus.</i>	949. <i>Sorex vancouverensis.</i>
925. <i>Sorex p. personatus.</i>	950. <i>Sorex o. setosus.</i>
926. <i>Sorex v. vagrans.</i>	952. <i>Sorex vancouverensis.</i>
931. <i>Sorex v. obscurus.</i>	961. <i>Sorex v. vagrans.</i>
932. <i>Sorex v. obscurus.</i>	962. <i>Sorex v. vagrans.</i>
934. <i>Sorex v. obscurus.</i>	963. <i>Sorex v. vagrans.</i>
938. <i>Sorex v. obscurus.</i>	974. <i>Sorex v. vagrans.</i>
940. <i>Sorex v. obscurus.</i>	

(No. of Skins with no Skulls.)

948. <i>Sorex o. obscurus.</i>	957. <i>Sorex vancouverensis.</i>
951. <i>Sorex o. setosus.</i>	

*Neosorex.*

(Catalogue No. of Skins with Corresponding Skulls.)

977. <i>Neosorex p. navigator.</i>	982. <i>Neosorex p. navigator.</i>
978. <i>Neosorex p. navigator.</i>	983. <i>Neosorex p. navigator.</i>
979. <i>Neosorex p. navigator.</i>	984. <i>Neosorex p. navigator.</i>
980. <i>Neosorex p. navigator.</i>	985. <i>Neosorex p. navigator.</i>
981. <i>Neosorex p. navigator.</i>	

SOME NOTES ON THE EARLIER-KNOWN HISTORY OF THE CHIROPTERA, WITH LIST OF THOSE SPECIES OCCURRING IN BRITISH COLUMBIA.

Of our smaller mammals no order of such magnitude with such a wide geographical distribution produces a greater field for research than the Chiroptera, inhabiting, as it does, the Eastern and Western Hemispheres to the northern and southern limits of tree-growth, extending in the Pacific Ocean from America to Hawaii and the Galapagos Islands, and from Asia to New Zealand, Samoa, the Caroline and Ladrone Islands.



Bats are distinguished from all other mammals by possessing the power of true flight like that of birds, their fore-limbs being specially modified for this purpose, resulting in the order to which they belong being appropriately named Chiroptera, or hand-winged.

Certain other mammals such as the flying squirrels of genus *Sciuropterus* and the flying phalangers have a spurious flight, which is nothing more than an extension of an upward or downward leap by the aid of parachute-like expansions of the skin of the sides of the body, and cannot be extended upward beyond the limits of the impetus of the original leap.

The essential characteristic of all bats is their power of flight, and so far as we know no clue has been discovered by scientists among the extinct fauna of which we have knowledge which in any way connects them with other mammals, but it has been found that, in their essential structure, bats are so closely allied to the Insectivores, such as shrews and moles, that many naturalists express little doubt of their derivation from the ancestral forms of that order, and think it probable that the power of true flight was developed gradually from spurious flight.

Like many of our smaller mammals, classification has been based largely on dental characters, which differ very materially in the genera living on various foods.

The great majority of bats feed solely on insects and have their cheek-teeth furnished with a number of sharp cusps; the fruit-eating bats comprising the so-called flying foxes or fruit-bats of the warmer regions of the Old World, and among them the largest representatives of the order are characterized by the molars having nearly or quite smooth crowns, elongated from back to front and divided by a deep longitudinal groove; while the blood-sucking bats of South America have the front teeth specially modified for piercing the skin of animals.

The bats often locally called "leather-bats" or "flittermice," in which our particular interest is centred, inhabit the temperate regions, are insect-feeding, and belong to the family Vespertilionidæ; these bats, being dependent for their nourishment upon a full supply of insects, must in winter either migrate to warmer regions or hibernate.

To what extent some of our bats migrate appears to be imperfectly understood, but that bats migrate is an established fact; one of the earliest references made on the subject is by our great authority, Dr. Dobson, in his Catalogue of the Chiroptera in the British Museum.

It is claimed that of European species probably with one exception they hibernate, but on the American Continent we find in the "Transaction of the Royal Society of Canada," V., Section V., page 85, where Dr. C. Hart Merriam shows conclusive evidence of two of the American bats, *Lasionycteris noctivagans* and *Lasiurus cinerius*, have regular periods of migration, and Gerrit S. Miller, Jr., in his revision of the North American bats of the family Vespertilionidæ, records his observations at Highland Light, Cape Cod, Massachusetts, during the months of August and September, 1890 and 1891, where he observed the migration of the same two species together with *Lasiurus borealis*. From these and other recorded observations it is fair to assume that the migration of bats is probably as definite as to dates and paths as that of birds.

Bats seldom feed on the ground, most species feeding and drinking on the wing. Dr. Merriam observes that "all North American bats, except when their habits have been modified by proximity to man, may be classed as cave-dwelling or tree-dwelling, according to the places in which they spend the day; as a rule the cave-dwelling species live in large colonies, while the tree-dwelling live singly or in small companies."

It is estimated by the highest authorities that little more than one-half of the living species are known to science at the present time, and it may be interesting to trace to a small extent the history and development of the classification of bats from the earliest naturalists.

Linnaeus in 1758 knew seven bats, all of which he placed in *Vespertilio*, the fourth and last genus of the order Primates. In 1808, as recorded by Tiedemann, the order Chiroptera had been recognized, while with the addition of the flying lemur the genera was only seven and the species fourteen.

The real foundation for our present classification was laid by Gray in 1821, when he published the first of his many papers on bats; Gray excluded the flying lemur, recognized the two main subdivisions of the order made by Goldfuss in 1820, and applied to the names of families the system of nomenclature now in use.

In 1827 Lesson in his "Manuel de Mammalogie" once more associated the flying lemur with the bats, making the group a division of the Carnivores.

A revision of the genera of bats of the family Vespertilionidæ was made by Gray in 1838, where he abandoned his earlier plan and adopted the main divisions introduced by Spix in his "Simiarum et Vespertilionum Brasiliensium Species Novæ," published in 1823.

Peters in 1865 divided the group into 10 families and subfamilies, containing 59 genera.

Dr. Dobson described 401 species, 80 genera, and 14 families and subfamilies when he published his Catalogue of the Chiroptera in the British Museum, 1878.

In 1904 Trouessart recorded 851 species, 122 genera, and 18 families and subfamilies, while Gerrit S. Miller, Jr., whose revision of the North American bats of the family Vespertilionidæ was published by the United States Department of Agriculture (Division of Biological Survey), October 16th, 1897, as "North American Fauna" No. 13, and ten years later while Assistant Curator, Division of Mammals, United States Museum, after examining the material in all the leading museums of Europe and America, wrote his work on the "Families and Genera of Bats," published as Bulletin 57 by the Smithsonian Institute, in which he concluded at that time among the known species at least 173 genera and 36 families should be recognized, being also of the opinion that probably the total number of recognized bats will eventually exceed 2,000 named forms.

The following bats occur in the Province of British Columbia:—

*Corynorhinus macrotis townsendii* Cooper. Type locality, Columbia River, Oregon. Geographic distribution, humid coast district of Oregon, Washington, and Southern British Columbia. Specimens identified from Comox, Vancouver Island.

*Myotis lucifugus alasceus* Miller. Type from Sitka, Alaska? Ranges throughout the humid coast district of Southern Alaska and Northern British Columbia. Specimens identified from Masset, Queen Charlotte Islands. A single specimen taken at Errington, Vancouver Island, August 31st, 1910, has been provisionally referred to this form by H. S. Swarth.

*Myotis yumanensis saturatus* Miller. Type from Hamilton, Washington. Geographic distribution, Transition Zone in Oregon, Washington, and British Columbia. Specimens identified from Shuswap; Kamloops; Kultus Lake (near Chilliwack); Mount Lehman; Port Moody; Sumas.

*Myotis californicus caurinus* Miller. Type from Masset, Queen Charlotte Islands, B.C. Geographic distribution, the humid coast district of British Columbia, Washington, and Oregon. Specimens identified from Port Moody and Masset, Queen Charlotte Islands.

*Myotis subulatus Keenii* Merriam (Keen's Bat). Type locality, Masset, Queen Charlotte Islands, B.C. Geographic distribution at present known from the type locality only. No doubt occurs throughout most of the humid north-west coast district.

*Myotis evotis H. Allen* (Long-eared Bat). Type locality not stated, and no type designated—possibly Monterey, California. Geographic distribution, Austral and Transition Zones from the Pacific Coast to the eastern edge of the Rocky Mountains. Specimens identified from Shuswap; Victoria.

*Lasiorycteris noctivagans* Le Conte (Silver-haired Bat). Type locality, Eastern United States. Geographic range, North America from the Atlantic to the Pacific. Museum specimens from Okanagan and Sahtlam, Vancouver Island, are referred here. A single adult male was taken at Skidegate, Queen Charlotte Islands, B.C., on the evening of June 10th, 1900. (W. H. Osgood, "North American Fauna," No. 21.)

*Vespertilio fuscus* Beauvois (Brown Bat). Type locality, Philadelphia, Pa. Geographic distribution, Austral, Transition, and lower edge of Boreal Zones throughout the United States and British Provinces. Specimens identified from Ashcroft; Okanagan; Errington, Vancouver Island.

*Lasiurus cinereus* Beauvois (Hoary Bat). Type locality, Philadelphia, Pa. Geographic distribution, Boreal North America from Atlantic to Pacific. Museum specimens from Okanagan and Victoria, B.C.

#### THE LIFE-HISTORY AND DISTRIBUTION OF MARMOTS.

True marmots inhabit the northern portions of both the Old and New Worlds; in the southern portions of their range in the Old World these mammals are found only at considerable elevation above sea-level, but in more northern districts like the Siberian steppes they are found on the lowland plains.

The districts inhabited by all the Old World species, being desolate and barren, are usually subject to intense heat in summer and cold in winter.

In North America marmots are found distributed over a greater part of Canada and the United States, having a number of vernacular names by which they are commonly known in their geographic distribution.

In Eastern Canada, especially in the Province of Quebec, they are known by the name "siffleur"; in Ontario we hear of the woodchuck or ground-hog; the yellow-footed marmots of Southern British Columbia are known as woodchucks or rockchucks, while the hoary marmots of the mountains, the largest of our species, comparing favourably in size with the Alpine species of the Old World, are commonly called whistlers.

The name "siffleur," probably taking precedent, was applied to the woodchuck of Eastern Canada by Baron La Hontan in 1703.

In 1743 Catesby described the Eastern woodchuck under the name of "The Monax," while three years later Edwards published a more extended account under the title of "The Monax or Marmotte of America," his description furnishing the basis of the first technical name applied to the species—*Mus monax* Linnaeus.

For the next few years the name given to the genus underwent several changes until Blumenbach in 1779 named the genus *Marmota*; however, this was upset the following year by Schreber, who introduced the name *Arctomys*; while of later date than Blumenbach's, nevertheless received general acceptance and continued in common use for the marmots until the early years of the present century, when the name *Marmota* was restored as the proper appellation of the genus. (Trouessart, E. L. Cat. Mamm. Suppl. 1904, page 343.)

The American marmots are naturally divided into three very distinct groups, as follows:—

*Monax* group: All the Eastern woodchucks, the Canada woodchuck, the British Columbia woodchuck, and the Ochraceous woodchuck of Alaska and Northern British Columbia.

*Flaviventris* group: All the yellow-footed marmots.

*Caligata* group: The hoary marmot of the mountains, including the species *caligata*, *olympus*, and *vancouverensis*.

Marmots, although chiefly diurnal, are sometimes nocturnal in their habits, feeding mainly on grass, succulent plants, and seeds; the Eastern species often doing considerable damage to cultivated forage-crops both by eating and trampling underfoot, and occasionally much havoc is made by their visits to kitchen-gardens. These marmots, originally living in the woods, prefer open clearings, where they are usually found in pairs or families, having their burrows under rock-piles, stone walls, stumps, roots of trees, and often in open meadows.

The yellow-footed marmots prefer rocky hillsides, in the crevices of cliffs, or under rock-piles in meadows, and are often abundant in the higher part of mountains, where they dwell more or less in colonies, their food being similar to that of the Eastern species, but probably including a greater proportion of native plants. These marmots also, when living at lower altitudes in close proximity to settlement, are exceedingly destructive to cultivated crops.

More gregarious in their habits, like all the Old World species, hoary marmots in the southern part of their range are always found about rock-slides around timber-line, but in Northern British Columbia and Alaska they are frequently found at low altitudes, often making their burrows in open meadows or grassy hillsides; while little is known of their feeding habits, it is generally conceded they feed like the other species.

They are extremely partial to fine weather, feeding during the summer months both early and late, and are extremely fond of sunning themselves on their mounds or projecting rocks where they feel safe from attack, spending a large part of their time during wet, dull, and stormy weather in their burrows. As fall approaches they become less active, often only appearing for a few hours during the hottest part of the day.

When alarmed they rush at once to the entrance of their burrows and sit up on their hind-quarters to survey the scene and detect the danger. Should the enemy approach too close a loud shrill whistle is uttered and they disappear into their burrows, reappearing after a time to see if all danger is passed. The whistling of the hoary marmot, being more pronounced, can be heard for a considerable distance; it is from this habit the name "whistler" has been applied and the name "siffleur" to the woodchuck of Eastern Canada.

Marmots usually produce from four to six at a birth, the young of the Eastern and yellow-footed species appearing about the latter part of May, while the hoary marmots probably breed somewhat later. Little information on this point is at hand. Swarth states "that in Southern Alaska young individuals of *M. c. caligata* were seen running about in the middle of June, but

on Vancouver Island during the first three weeks of July no young ones of *M. vancouverensis* had yet emerged from the burrows."

Laying up no store of food for winter use, all species of these marmots hibernate and become dormant during winter for a period of from four to six months, hibernating from the middle of September or October until the middle or latter part of March. Some of the yellow-footed species have been known to retire as early as the middle of August, when weather is genial and food abundant, the dates varying with the altitude and local condition, those individuals living in the valleys denning up earlier than those living higher up the mountains; in mild winters they occasionally appear at the mouth of their burrows in February, but re-enter their burrows and again become dormant if the temperature falls.

Of extinct and allied forms we know little. Remains of extinct species of *Susliks* occur in the higher Tertiary rocks of Europe, and the Upper Eocene beds of France produce evidence of an extinct but apparently allied genus known as *Plesispermophilus*. More primitive are the forms described as *Plesiarctomys*, which, while showing certain resemblances both to the marmots and squirrels, are found in the middle Tertiary deposits both of Europe and North America.

*Species known to British Columbia.*

*Marmota monax canadensis* (Erxleben). Type locality given as Quebec, Canada. Distribution, greater part of interior of Canada from Great Slave Lake and York Factory, south to Southern Alberta (Red Deer), Central Saskatchewan (Cumberland House), Northern Wisconsin and Michigan, Central Ontario, Southern Quebec, New Brunswick, and Nova Scotia.

"A single young specimen in very worn pelage from near the head of Finlay River, British Columbia, seems referable to *canadensis*, but with more material from this region may necessitate its reference to *ochracea*." (A. H. Howell.)

*Marmota monax petrensis* (British Columbia Woodchuck). Type from Revelstoke, British Columbia; collected May 12th, 1890, by W. Spreadborough. Distribution, interior ranges of Southern British Columbia and adjacent parts of United States; from Barkerville, British Columbia, south to Thompson Pass, Idaho. Specimens identified from Barkerville; Glacier; Revelstoke.

*Marmota monax ochracea* Swarth (Ochraceous Woodchuck). Type locality, head of 40-Mile Creek, Alaska. Distribution, interior mountain ranges of Yukon and Northern British Columbia from 40-Mile Creek south to the Babine Mountains. Specimens identified from Babine mountains; Pike River, Atlin; Takla Lake. A short series of skulls without skins from Stuart Lake is provisionally referred to this race.

Two museum specimens, Nos. 247 and 248, collected at Pike River, Atlin, July 29th, 1914, and identified as this species by Mr. A. H. Howell, Biological Survey, Washington, show two varying phases—No. 247, an immature female, being very dark blackish brown all over, with the exception of a few greyish hairs on nostrils and lower lip. Indians and whites who are well acquainted with this locality state that whole colonies of marmots of this colour have been observed by them. The other, No. 248, also an immature female, is a pale reddish cinnamon tipped with a very pale reddish buff, giving it a bicolor appearance; under-parts cinnamon rufous. With such phases occurring it is very desirable to have a large series of skins with skulls from this particular locality.

According to Mr. Howell in his revision of the genus, published in 1915, "Melanism is most strongly developed in the subspecies *Marmota caligata vigilis*, occupying the region around Glacier Bay, Alaska, and that no purely black specimens of *M. monax* have been seen, but a melanistic phase is rather common in New York and New England."

*Marmota flaviventris avara* Bangs (Pallid Yellow-bellied Marmot). Type locality, Okanagan, British Columbia. Distribution, interior valleys and foot-hills of Southern British Columbia and Eastern Washington and Oregon. Specimens identified from Ashcroft; Cascade; Midway; Nicola Valley; Okanagan; Penticton; Vernon.

*Marmota caligata caligata* (Eschscholtz) (Northern Hoary Marmot). Type locality, Bristol Bay, Alaska. Distribution, Alaska and Yukon from the Portland Canal, north on the coast to Bristol Bay, and in the interior to the Endicott Range and the mountains lying westward of Fort Good Hope, Mackenzie. Specimens identified from Bennett; Cheonee Mountains; Atlin.

*Marmota caligata orytona* Hollister (Robson Hoary Marmot). Type locality, head of Moose Pass, branch of Smoky River, Alberta; altitude, 7,200 feet. Distribution, interior of Northern

British Columbia and Southern Yukon, from Teslin Lake and Laird River south to Barkerville, British Columbia, and the Mount Robson region of British Columbia and Alberta. Specimens identified from mountains near Babine; Barkerville; Finlay River; Laurier Pass; Level Mountain; McConnell Creek; Moose Pass; Moose River (North Fork); Sheslay River; Stuart Lake; Sustut Mountains; Thudade Lake.

*Marmota caligata okanagana* (King) (Okanagan Hoary Marmot). Type locality, Gold Range, British Columbia. Distribution, Gold and Selkirk Ranges, British Columbia, and probably main range of the Rocky Mountains in Alberta from Banff to Henry House; exact limits unknown. Specimens identified from Field; Glacier; Spillimacheen River; Toad Mountain, south of Nelson.

*Marmota caligata cascadenis* Howell (Cascade Hoary Marmot). Type locality, Mount Rainier, Washington; altitude, 6,000 feet. Distribution, Cascade Range at and above timberline from Mount Rainier, Washington, north to Southern British Columbia. Specimens identified from mountains near Chilliwack; Hope; Howe Sound; Mount Baker Range near United States Boundary; Skagit River; Spences Bridge; Tammi Hy Mountain.

*Marmota vancouverensis* Swarth (Vancouver Island Marmot). Type locality, Mount Douglas, near Alberni, Vancouver Island, British Columbia; altitude, 4,200 feet. Distribution, Vancouver Island, British Columbia. Known at present only from the mountains at the head of China Creek, some 20 miles south-east of Alberni, in the Golden Eagle Basin and King Solomon Basin and the surrounding slopes and ridges.

Howell writes in his remarks of this species: "This peculiar marmot, although clearly related to the Mainland species (*Caligata*), has, through isolation, developed striking characters, both external and cranial. The tendency of isolated coastal forms in this group to become brown (shown in a lesser degree by *M. caligata vigilis* and *M. olympus*) has reached the greatest extreme in this species, the black colours of the Mainland forms being entirely lacking and the white reduced to scattering hairs. After a season's exploration of the southern part of Vancouver Island, Swarth came to the conclusion that the species is probably confined to a small area in the vicinity of Mount Douglas." Specimens identified from Golden Eagle Basin; King Solomon Basin; Mount Douglas.

#### ADDENDA.

Omitted in the list of *Microtus* occurring within the Province published in our Annual Report of last year (1919) is:—

*Microtus richardsoni arvicoloides* (Rhoads) (Cascade Water-vole). Type locality, Lake Keechelus, near Snoqualmie Pass, Kittitas County, Washington; altitude, 8,000 feet. Geographic distribution, Boreal Zone of Cascade Mountains in Washington, Oregon, and Southern British Columbia. Museum specimens from Mount Baker Range.

This subspecies, the largest of our voles, appears to be hardly separable from *Microtus r. macropus* of the Boreal Zone of the Rocky Mountains. According to Vernon Bailey in his revision of the genus, a single specimen examined from Glacier, British Columbia, was fairly intermediate between *Microtus richardsoni* (De Kay) and these two southern subspecies.

#### ORNITHOLOGY.

As no field collecting was done by any one of the Department this year, very little ornithological material was secured; however, three species of birds of special interest can be recorded here:—

Sabine's Gull (*Xema sabini*) (Fork-tailed Gull). Although this bird had been on our list of British Columbia birds for a great many years, the specimen secured at the request of the Director by Mr. J. G. French, of Glacier Point, Sooke, B.C., on October 11th, 1920, was the first specimen to be received by the Provincial Museum. The range of this bird is Arctic Seas to Southern America. It breeds on the coast of Alaska from Kuskokwym River to Norton Sound, and in the Northern Mackenzie, Northern Keewatin, and Northern Greenland, and on the Arctic Islands of Europe and Asia; in migration on both coasts of America and casual in the Interior. Winters in Peru. Shortly after Mr. French had secured this specimen the Director and his assistant saw several in the vicinity of Victoria Harbour.

Two other specimens which are of considerable interest were collected for this Department—namely, the Iceland gull (*Larus leucopterus*)—one of which was taken in January, 1921, and the other in February, 1921. These birds were taken at Kildonan, Barkley Sound, B.C., by Mr. W. McKay.

Mr. J. W. Thompson having spoken to the Director of two gulls that had been noticed in the vicinity of Kildonan during the month of December, both pure white (and his description was so definite that they could not be mistaken for any other bird than that of the Iceland gull), the Director requested Mr. Thompson to have some person, if possible, secure these birds for this Department.

The birds are pure white throughout, about the size of the glaucous-winged gull, but having no pearl-grey mantle, being finely streaked with a very light-greyish tinge. The primaries are white throughout. Total length of the bird is about 24 inches. The feet are flesh-coloured; bill, flesh-coloured with black tip; the iris is yellow. The range of this bird, according to the A.O.U., is given as Arctic regions. Breeds from Victoria Land (Cambridge Bay) and Boothia Peninsula to Central Greenland and east to Nova Zembla; winters from Southern Greenland south to Long Island; casual on the Great Lakes; accidental in Nebraska and Maryland; in Europe south to the British Isles, Scandinavia, and Baltic Sea.

Another very peculiar-looking gull was seen by the Director and members of his staff on the lawn in front of the Parliament Buildings, Victoria, from October 13th to 25th, 1920, at intervals during these days on the arrival of the C.P.R. steamers.

This bird appeared after the arrival of one of the boats that plies on the triangular route between Victoria, Seattle, and Vancouver. It would arrive about 3 p.m. with the boat, and when the same boat was leaving at 4.30 p.m. the bird would disappear. It appeared to be following this particular boat for some time in and out of Victoria harbour. The following is a description of the gull noted by the Director:—

Back of head and nape, creamy white; bill, yellowish, bright-red spot on lower mandible like a herring-gull; well-defined collar on the neck of umber brown; throat and abdomen uniform dark brownish; wings pearly grey with black primaries and white spots. Mantle showing pearl grey intermixed with brown umber; tail, white.

#### NOTES ON THE CHINESE STARLING (*ACRIDOTHERES CRISTATELLUS*).

Many inquiries have been made from time to time in regard to a bird which is found in the heart of Vancouver City. This bird is about the size of our red-winged blackbird; is a bird that is uniform black throughout, with the exception of a dirty white spot in the primaries which is seen very distinctly in the primaries and secondaries when in flight. It has a small crest on the head; the bill is whitish horn colour; feet, yellow horn colour; iris, yellow. On the end of the tail there is a narrow band of a dirty greyish white.

The first record I have of this bird was a specimen collected by the Director in November, 1904, in the heart of Vancouver City between the old Court-house which stood on Hastings Street and the public school. My attention was first drawn to this bird by the Hon. Mr. Justice Martin. The specimen secured was at that time not known to the Director, and was sent to Washington D.C., for verification, and was identified as *Acridotheres cristatellus*, a native of Southern China, and had been reported from the Island of Luzon, in the Philippines. There were very few of these birds in Vancouver at this time, although Mr. V. W. Mitchell, of Vancouver, recently informed me that he had first noticed the bird in the year 1897, only seeing two pairs. These birds have increased considerably the last few years, and appear to make their main roost on the corner of Carrall and Cordova Streets, roosting on the sides of the buildings on ledgings under the large overhanging cornices. These roosts now contain approximately 1,200 birds. They leave their roosts in the early morning and fly off into the adjacent surroundings to fields and gardens for food. These birds are very noticeable in the afternoons about one hour before dusk, when they fly back to this roost for the night; they make a considerable noise, chattering and whistling until darkness, drawing the attention of many passers-by.

I have no record of these birds doing any harm to agricultural interests, but they should be watched and observed very closely in regard to agriculture. Mr. W. B. Anderson, Dominion Inspector of Indian Orchards, informs me he has two authentic records of these birds from persons who have observed them destroying the tent-caterpillar, which has become a considerable pest in Vancouver City.

It might be of interest here to note an extract from a Bulletin published by Richard McGregor, Ornithologist to the Bureau of Science, Manila, where this bird had been imported to the Island of Luzon, in the Philippine Islands, many years ago, which is quoted below:—

“The next bird that will be noted even by those who are not devoted to ornithology is a slate-grey starling, *Æthiopsar cristatellus* (Linnaeus), about the size of an American robin. When this bird flies a white band across the primary quills is conspicuously displayed. The feathers of the frons are long and erect or strongly antrorse, giving the head a curious profile view. The larger tail-feathers are tipped with white. For several years there was a roost of these starlings in the trees in front of the Lumeta Police Station, on Bagumbayan Drive, where their chatter was very noticeable at dusk. A closely related species, *Acridothores tristis* (Linnaeus), was introduced into Hawaii, where it is well established; I found it extremely abundant on Maui Island in 1900. Both of these species are natives of Southern Asia.

“*Æthiopsar cristatellus* appears to have been introduced by the Spanish Government about 1850 with the hope that it would reduce the number of locusts, which were and still are a very serious pest to the agriculturist.

“A quotation in Blair and Robertson indicates that at least three attempts, 1849 to 1852, were made to introduce and establish a species of martin (probably one of the starlings) in the Philippines. Foreman says:—

“‘In 1851 the Government imported some martins from China with the hope of exterminating the locusts. When the birds arrived in the Port of Manila they were right royally received by a body of troops. A band of music accompanied them with great ceremony to Santa Mesa, where they were set at liberty, and the public were forbidden to destroy them under severe penalties.’

“‘Martin’ as a Spanish word, is correctly applied to birds called ‘starlings’ in English, and is not equivalent to ‘martin’ (species of Hirundinidae). I have been under the impression that the bird introduced into the Philippines received its local name from Juan Antonio Martinez, Governor from 1822 to 1825, but this Governor left the Philippines twenty-five years before the arrival of *pajaros martines*. Casto de Elera gives the name *martin langostero* for *Acridothores cristatellus*.”

There is no record of any definite data as to how this Chinese starling came to be found in the vicinity of Vancouver; it is presumed that this bird was probably brought here direct from the Orient by one of the Oriental liners, and that it escaped or was liberated.

The Provincial Museum now has three specimens which have recently been collected.

#### BOTANY.

While no field collecting was undertaken by any of the staff of the Provincial Museum, the Herbarium collection is steadily growing, for which appreciation must be extended to Mr. W. B. Anderson, Dr. C. F. Newcombe, and others for the donation of a number of interesting specimens not hitherto in the collection.

Mr. Anderson's contributions are desirable and extensive, covering a large range of territory within the Province, including Anaham, Hazelton, and districts adjacent to Fort George, the Columbia River Valley, and Southern Okanagan.

Many of these plants have been mounted and placed in the Herbarium collection, among which are to be found the following of special interest:—

<i>Adiantum-Capillus-Veneris</i> L.	<i>Phlox Douglasii</i> Hook.
<i>Pellaea occidentalis</i> (Nels.) Rydb.	<i>Castilleja lutescens</i> (Greenman) Rydb.
<i>Calla palustris</i> L.	<i>Orthocarpus luteus</i> Nutt.
<i>Lilium montanum</i> (A. Nels.).	<i>Orthocarpus tenuifolius</i> Benth.
<i>Peramium repens</i> Salish.	<i>Pentstemon pinctorum</i> Piper.
<i>Salix</i> sp. <i>fluvialis</i> Nutt.	<i>Pentstemon Richardsonii</i> Dougl.
<i>Comandra livida</i> Richards.	<i>Lobelia Kalmii</i> L.
<i>Rosa Woodsii</i> Lindl.	<i>Crepis elegans</i> Hook.
<i>Astragalus tenellus</i> Pursh.	<i>Circium</i> sp. <i>foliosus</i> Hook.
<i>Hedysarum boreale</i> Nutt.	<i>Ratibida columnaris</i> (Sims) D. Don.
<i>Hedysarum sulphurescens</i> Rydb.	<i>Solidago corymbosa</i> Nutt.
<i>Oxytropis monticolor</i> Gray.	<i>Solidago decumbens</i> Greene.
<i>Clarkia pulchella</i> Pursh.	<i>Tetradymia canescens</i> DC.



There are also several asters and species of Compositæ not yet determined.

Plants collected in the vicinity of Victoria and presented by Dr. C. F. Newcombe:—

<i>Brasenia Schreberi</i> Gmel.	<i>Orobanche comosa</i> Hook.
<i>Platyspermum scapigerum</i> Hook.	<i>Artemisia canadensis</i> Michx.
<i>Lupinus lepidus</i> Dougl.	<i>Agoseris laciniata</i> (Gray) Greene.

Further additions are:—

*Loisclcuria procumbens* Desv. From the vicinity of Prince Rupert; presented by Miss Beaman.

*Potentilla paradoxa* Nutt. Collected at Spences Bridge, B.C., August 6th, 1920, and presented by Mr. W. A. Newcombe.

*Carex Crawci* Dewey. Collected at Golden, B.C., June 20th, 1920, and presented by Professor J. K. Henry.

*Hydrophyllum tenuipes* Heller; *Calamagrostis alcutica* Trin. Vancouver Island specimens presented by Mr. J. G. French.

*Gentiana propinqua* Richardson. Collected at Cameron Lake, V.I., August 6th, 1916, by Mr. W. R. Carter and identified by Professor C. V. Piper, this being a new addition to the Vancouver Island flora.

Among these contributions the following appear to be new additions to the flora of British Columbia:—

*Carex Crawci* Dewey.

*Potentilla paradoxa* Nutt.

During the season a large number of plants have been identified for children attending some of the Victoria City schools and others residing in several districts of Vancouver Island. These plants were brought in by Miss M. Lawson, of the *Colonist* staff, who gave up a great deal of time and work in the interests of the children by publishing a list weekly in the Sunday edition of the *Daily Colonist*. This created a marked competition between the collectors, and, besides keeping up their individual interest, was decidedly effective as an educational lesson in nature-study by teaching them the names of some of their native flora.

Some of the plants received were in such poor condition that identification was impossible, and it is desirable, should this work be continued, that some simple methods be followed in collecting and preparing specimens which would be beneficial to all concerned.

It is worthy of mention that among the plants received were two (both introduced plants and probably garden escapes), which, so far as we know, have not been previously recorded in British Columbia, growing in a wild state, namely:—

*Borago officinalis* L. Collected at William Head by Miss Barbara Cox.

*Nothoscordum bivalve* (L.) Britton. Collected on Foul Bay Road, Victoria, by Master Jack Miller.

#### ENTOMOLOGY.

BY E. H. BLACKMORE, F.E.S.

In my remarks in the Provincial Museum Reports for the years 1918 and 1919 special mention was made of the scarcity of insects in general and noctuids in particular, thinking that we had reached the limit in this respect, but from a collecting standpoint neither of those years was as bad as the season just past. The weather conditions were somewhat abnormal, the total rainfall for this year being 3 inches above the annual average, eight months out of the twelve being above the average precipitation; this, together with a great deal of cool weather in the early spring, made collecting conditions very unsatisfactory.

The fall collecting was also exceedingly poor, as it started to rain on September 8th and continued more or less until the end of the collecting season. Notwithstanding these drawbacks, some very interesting material was taken during the season, and it only goes to prove that if continuous and persistent collecting is carried on one can always turn up some rare and uncommon species, however unfavourable the season may be from weather conditions or other causes.

Some two or three years ago, on looking over the list of Microlepidoptera as recorded in the 1906 Check-list of British Columbia Lepidoptera, I was very much struck with the comparatively few species listed from Vancouver Island (excepting Wellington), and especially from Victoria.



Upon making a list of the localities given, I found that out of 278 species recorded from British Columbia 168 have been taken at Kaslo and 94 were listed from Wellington. The number of species recorded from other localities are as follows: Vancouver Island, 24 (no specific localities given); Victoria, 16; Vancouver, 7; and Atlin, 3. Some of the species were naturally recorded from several localities, but the large majority of species were either taken by Mr. J. W. Cockle at Kaslo or Mr. Theodore Bryant at Wellington. It is very evident from these figures that, outside of the above-named gentlemen, very little collecting of these small but interesting moths had been undertaken in any part of the Province. During the past few years, however, Messrs. Day and Hanham, of Quamichan Lake, near Duncan, have added a number of new species, and Mr. Cockle has considerably augmented his earlier list.

With the idea of extending our knowledge of the "Micro" fauna of the southern portion of Vancouver Island, the writer devoted most of his time during the past season to the acquisition of material in this group, but owing to illness was not able to get into the field until June. From then until October I made collections at Maillardville, Goldstream, Mount Newton, and many points in the vicinity of Victoria. Mr. W. R. Carter, of the Museum staff, also assisted in the work and brought in some good material. I was fortunate in securing the co-operation of Mr. L. E. Marmont, of Maillardville, who collected extensively in that district. The material sent in by him was very desirable, as it contained several species new to British Columbia, besides a number of species previously recorded from the Interior.

From the material collected during the season the writer was enabled to mount over 1,200 specimens, comprising some 145 species; amongst these were four new to science, one new to North America, and about thirty new to British Columbia. We have also verified a number of species already listed and have added considerably to our knowledge of the known range of a great many species.

We hope during the coming season to continue this work and would be glad to hear from any collectors who would be willing to send in specimens in series, as there are without doubt a large number of species occurring in the Province of which we have no record at present.

Appended is a list of the species of Microlepidoptera taken at Victoria, Goldstream, and Maillardville during the past season which are not included in the 1906 Check-list of British Columbia Lepidoptera. Many of these are new records for the Province.

(Arranged according to Barnes & McDunnough's Check-list of the Lepidoptera of North America.)

## PYRAUSTINÆ.

4992. *Evergestis insulalis* B. & McD. Goldstream.  
5144. *Pyrausta perrubralis* Pack. Goldstream.

## SCOPARIINÆ.

5245. *Scoparia torniplagalis* Dyar. Goldstream.

## CRAMBINÆ.

5347. *Crambus bidens* Zell. Maillardville.  
5349. *Crambus dissectus* Grt. Victoria.  
5364. *Crambus innotatellus* Wlk. Maillardville.  
5446. *Dicymolomia metalliferalis* Pack. Victoria; Goldstream.

## PHYCITINÆ.

5615. *Meroptera unicolorella* Hulst. Maillardville.

## PTEROPHORIDÆ.

5858. *Oxyptilus delawareicus* Zell. Maillardville.

## GELECHIIDÆ.

- Recurvaria nanella* Hub. Victoria.

## CÆCOPHORIDÆ.

- Carcina quercana* Fab. Victoria.

## EUCOSMIDÆ.

6790. *Bactra furfurana* Haw. Maillardville.  
 6821. *Argyroploce nimbatana* Clem. Victoria; Goldstream; Maillardville.  
 6836. *Argyroploce galaxana* Kearf. Goldstream.  
 6862. *Argyroploce instrutana* Clem. Victoria.  
 6867. *Argyroploce dealbana* Wlk. Victoria; Goldstream.  
 6931. *Eucosma rorana* Kearf. Victoria.  
 7009. *Eucosma johnsonana* Kearf. Victoria.  
 7010. *Eucosma hopkinsana* Kearf. Victoria.  
 7030. *Eucosma solandriana* Linn. Victoria; Goldstream.  
 7113. *Protopteryx emarginana* Wlsh. Victoria.  
 7162. *Enarmonia plumbolicana* Kearf. Goldstream.  
 7170A. *Tmetocera ocellana* D. & S. race *lariciana* Hein. Victoria.  
 7263. *Hemimene britana* Busck. Victoria.

## TORTRICIDÆ.

7309. *Sparganothis inconditana* Wlsh. Victoria.  
 7313. *Sparganothis tunicana* Wlsh. Victoria; Goldstream.  
 7333. *Pandemis canadana* Kearf. Victoria; Goldstream.  
     *Cacocia hewittana* Busck. Victoria.  
     *Tortricodes fragariana* Busck. Victoria.  
 7370. *Tortrix lomonana* Kearf. Victoria.  
 7374. *Tortrix peritana* Clem. Victoria; Goldstream.  
     *Tortrix invidana* B. & B. Victoria.  
 7416. *Peronea cervinana* Fern. Goldstream; Maillardville.  
     *Peronea marinana* B. & B. Goldstream; Maillardville.

## GLYPHIPTERYGIDÆ.

7631. *Glyphipteryx bifasciata* Wlsh. Victoria.

## PLUTELLIDÆ.

7639. *Euceratia castella* Wlsh. Victoria; Goldstream; Maillardville.  
 7641. *Abebwa subsylvella* Wlsh. Victoria.

## YPONOMEUTIDÆ.

7703. *Argyresthia conjugella* Zell. Victoria.

## HAPLOPTILIDÆ.

7820. *Batrachedra praeangusta* Haw. Victoria.

## GRACILARIIDÆ.

- 804Sc. *Gracilaria alnivorella* Cham. race *sanguinella* Beut. Victoria.

## TINEIDÆ.

8242. *Monopis crociapitella* Clem. Victoria.

## ·RARE AND UNCOMMON INSECTS TAKEN IN BRITISH COLUMBIA DURING 1920.

Notwithstanding the unfavourable climatic conditions during the past season, we are able to report more rare insects than we have in preceding years. Many collectors have sent in reports of their captures, accompanied in most cases with specimens for identification.

Victoria.—Mr. W. R. Carter took some interesting noctuids "at sugar" in the fall, which included *Euxoa obeliscoides* Gue.; *Agrotis ypsilon* Rott.; *Rhynchagrotis sambo* Sm.; *R. scopeops* Dyar; *Trachea cincta* Grt.; and *Eremobia claudens albertina* Hamp. A specimen of *Ipimorpha pleonectusa* Grt. was taken "at light," the first recorded for several years. The same collector picked up a dead specimen of *Oligia violacea* Grt. outside his house on August 21st. This was a most remarkable find, as it is the second specimen that we have any record of taken in British Columbia. The first one was captured at Clayoquot, on the west coast of



PLATE I.  
SATURNIIDÆ AND NOCTUIDÆ.

*Coloradia pandora* Blake.  
Victoria, B.C. (M. Brinkman).  
(New to Canada.)

*Oncocnemis hayesi* Grt.  
Kaslo, B.C. (J. W. Cockle).  
(Very rare.)

*Trachea separans* Grt.  
Maillardville, B.C. (L. E. Marmont).  
(Very rare.)

*Oncocnemis atrifasciata* Morr.  
Mount MeLean, B.C. (A. W. Hanham).  
(New to British Columbia.)

*Eremobia claudens albertina* Hamp.  
Goldstream, B.C. (E. H. Blackmore).  
(Uncommon.)

*Oncocnemis barnesi* Sm.  
Trail, B.C. (W. H. Danby).  
(Very rare.)

*Hyppa brunneicrista* Sm.  
Kaslo, B.C. (J. W. Cockle).  
(Rather rare.)

*Acronycta strigulata* Sm.  
Lillooet, B.C. (A. W. A. Phair).  
(New to British Columbia.)

*Feralia columbiana* Sm.  
Vancouver, B.C. (R. V. Harvey).  
(Not common.)

*Feralia deceptiva* McDun.  
Victoria, B.C. (E. H. Blackmore).  
(New to science.)

*Schinia separata* Grt.  
Spences Bridge, B.C. (W. A. Newcombe).  
(New to British Columbia.)





Vancouver Island, some eighteen years ago. Mr. A. L. Meugens took a beautiful specimen of *Polia restora* Sm.; this is a rather uncommon species. He also captured a specimen of *Autographa metallica* Grt., the second recorded from Victoria, the writer taking the first in 1918. Amongst the geometrids taken by Mr. Meugens was a series of *Nemora unilinearia* Tayl. "at light" and a single specimen of *Dysstroma ethela* Tayl. taken on June 24th. This is rather a rare geometer and is the first specimen taken in Victoria.

Amongst the geometrids taken by the writer during the season the following are of more than ordinary interest: *Dysstroma occidentata* Tayl. (uncommon); *D. sobria subumbrata* Swett. (the first specimen taken since the type specimens in 1915); *Hydriomena manzanita* Tayl. (rare in Victoria); *Entephria multivagata* Hulst. (first record for Vancouver Island); and *Nematocampa limbata* Haw. (uncommon).

*Mount Newton*.—This locality is about 15 miles north of Victoria on the Saanich Peninsula and attains an elevation of 700 feet. On August 1st, at the invitation of Mr. John Dean, who has an ideal place situated about half-way up the mountain, the writer spent the day collecting, and amongst many good things taken were *Dysstroma sobria ochrofuscaria* Swett. (the first for several years); *Enyppia packardata* Tayl.; and *Nepytia umbrosaria nigrovenaria* Pack. (the first specimen that I have taken).

*Goldstream*.—The writer collected extensively in this locality during the season and obtained many good things, the following being of special interest: *Euxoa brunneigera* Grt. (very rare); *Agrotis esurialis* Grt. (uncommon); *Parastichtis puta dusca* Sm. (rare); *Chlorosea neadaria* Pack.; *Lygris atrifasciata* Hulst (first record from Vancouver Island); *Dysstroma truncata* Hufn.; *D. sobria* Swett (the first specimen captured since the unique type was taken in 1914); *Phengommataca edwardsata* Hulst (first specimen I have taken and first record from this locality); *Cleora albescens* Hulst (first recorded capture since 1911; very rare, vide Rep. Prov. Mus. Nat. Hist., B.C., 1918); and *Cleora latipennis* Hulst (very uncommon).

Mr. H. McKnight, who resides at Goldstream, took a number of noctuids in September, feeding on hops. On the front verandah of his house a large hop-vine is trained, and after it gets dark the noctuids begin to arrive and with the aid of a lantern are readily bottled. The moths are not easily disturbed and seem reluctant to leave the hops. Amongst the noctuids taken by him the following are of interest: *Euxoa brocha* Morr. (not previously recorded from Goldstream); *Mythimna olivata* Harv. (uncommon); *Matuta apposita* Grt.; *Rhynchagrotis sambo* Sm. (uncommon); *Graptolitha patefacta* Wlk.; *G. ferrealis* Grt.; *Eremobia claudens albertina* Hamp. (rare); and *Gortyna pallescens* Sm. (a very worn specimen, but undoubtedly this species).

*Departure Bay*.—While on a collecting trip to this district last July, Mr. E. P. Van Duzee, of the Californian Academy of Sciences, San Francisco, took a beautiful specimen of that rare geometer *Caripeta acqualaria* Grt. at rest on the under-side of a leaf. He also took a fine specimen of *Synaxis jubararia* Hulst. This is rather a remarkable capture, as this geometer makes its appearance early in October as a rule—my earliest date being September 26th. Why it should be on the wing in July is a mystery.

*Alberni*.—Amongst a collection of Lepidoptera made by Mr. John Redford, a resident of the district, we note the following: *Gortyna pallescens* Sm. (the second specimen taken in this locality); *Autographa rectangula nargenta* Ottol. (uncommon); *Plusia arcoides* Grt. (uncommon); *Drepana bilineata levis* Hud. (rare); *Enyppia packardata* Tayl.; *Nematocampa limbata* Haw. (uncommon); and *Evergestis straminealis* Hub.

*New Westminster*.—Mr. A. B. Baird, of the Dominion Entomological Branch, took several specimens of a medium-sized white moth which was identified by Dr. J. H. McDunnough, of Ottawa, as *Liparis salicis* Linn. (the satin-moth). This is a new moth to Canada and was probably imported on nursery stock from England. It feeds on Lombardy and other poplars and may turn out to be of economic importance. It is excessively abundant in England.

*Maillardville*.—Mr. L. E. Marmont, who collected persistently in this district in spite of the bad weather, took a number of very interesting insects, many of them rare and some of them new to the Lower Fraser Valley fauna. The following noctuids are worthy of more than passing mention: *Agrotis cynica perumbrosa* Dyar (previously known from Kaslo and Vernon); *Agrotis flavotincta* Sm. (uncommon); *Polia grandis* Bdv. (previously recorded from Kaslo); *P. nimbosea* Gue.; *Graptolitha thaxteri* Grt. (rare); *Trachea sepcrans* Grt. (previously known

only from Windermere); *Acronycta minella* Dyar (known only from Kaslo and the Okanagan District); *A. innotata griseor* Dyar (not previously recorded from other than Kaslo, the nymotypical locality); *Arzama obliqua* Wlk. (rare), and *Panthea portlandia* Grt. (this specimen taken on earliest known date—i.e., April 14th; regular date of emergence is in July).

The geometrids taken included *Lygris harveyata* Tayl. (very rare); *Hydriomena renunciata columbiata* Taylor (uncommon); *Euphyia multiferata* Walk. (several specimens of this uncommon species taken at light); *Philobia ulsterata* Pears (Mr. Marmont reports this species common at light; it has previously been regarded as rather rare); and *Euchlaena tigrinaria sirenaria* Strecker (uncommon).

*Hagensborg*.—This locality is about 12 miles from Bella Coola and is in a very wet district. Mr. W. A. Sykes sent some material down that he had collected late in the season, but owing to the abnormal rainfall very little was taken. However, we were pleased to receive it, as scarcely any collecting has been done in this vicinity. The species received were: *Polygonia satyrus* Edw.; *P. faunus rusticus* Edw.; *Aglais J. album* B. & Le C.; *A. antiopa* Linn.; *Enargia citrata* Linn.; *D. citrata immanata* Haw.; *Ellopiia somnaria* Hulst. (this record extends its known distribution); *Ennomos magnarius* Gue.; and *Synaxis jubararia* Hulst.

*Lillooet*.—Mr. A. W. Hanham, of Duncan, spent a week in this locality during the latter part of August. Most of his collecting was done on Mount McLean at altitudes varying from 3,000 to 6,500 feet. Some valuable material was taken, amongst which we note the following: *Argynnis hydaspe sakuntula* Skin. (a new locality for this form); *Euphydryas anicia* D. & H. (not previously known from here); *Plebeius scudderi* Edw. (known only from Atlin, vide Pro. B.C. Ent. Soc., No. 14, page 7, 1919); *Lasionycta sedilis* Sm. (previously known from Kaslo only); *Oncocnemis atrifasciata* Morr. (new to British Columbia); *Carsia paludata* Thun. (rare); *Itame epigenata* B. & McD. (new to British Columbia); *Pyla rainierella* Dyar (Mount Cheam only previous record); *Eucosma stygiana* Dyar (rare); and *Hepiatus pulcher macglashani* Hy. Edw. (very local—we have no other record than Mount McLean). Mr. A. W. Phair has also taken it.

Amongst some material sent to us for identification by Mr. Phair the following are of special interest: *Euroa andera* Sm. (rare and a new locality); *E. quinquelinea* Sm. (rare); *Septis barnesi* Sm. (not previously known from here); *Acronycta strigulata* Sm. (new to British Columbia); *A. moesta* Dyar (uncommon); *Andropolia theodori epichysis* Grt. (uncommon); *Catocala nevadensis montana* Beut. (rare); and *Eosphropteryx thyaliroides* Gue. (very rare).

*Enderby*.—Mr. J. Wynne, who resides in this district, reports the capture of *Polia assimilis pulverulenta* Sm. and *Cirphis commoides* Gue. Both are good records. The former adds to our knowledge of the distribution of this rather rare noctuid, as our previous records are from widely distant localities—viz., Vancouver Island, Northern British Columbia (Taku River), and Kaslo. The latter (*commoides*) is also rare, our only records being from Kaslo and Penticton.

*Kaslo*.—A long list of captures has been sent in by Mr. J. W. Cockle, one of the oldest and most enthusiastic entomologists in British Columbia. The following are of special interest: *Aplectoides occidentis* Hamp. (very rare); *Perigrapha achsha* Dyar (rare); *Platyperigea anotha* Dyar (rare); *Arzama obliqua* Wlk. (uncommon); *Panthea portlandia* Grt. (the third specimen taken in this district); *Autographa orophila* Hamp. (rare); *A. flagellum* Wlk. (second specimen taken at Kaslo); *A. sansoni* Dod (new to British Columbia); *Eupithecia tenuata* Hulst. (uncommon); *Macaria purcellata* Tayl. (rare); *Caripeta angustiorata* Wlk. (new to British Columbia); *Cleora satisfacta* B. & McD. (rare); *Gabriola dyari* Tayl. (rare in this district until this season, when Mr. Cockle captured five males and one female); and *Erannis vancouverensis* Hulst. (rare—one male taken, the first specimen taken since 1904).

*Elko*.—Mr. W. B. Anderson, Dominion Inspector of Indian Orchards, while on an inspection trip in this district took a short series of *Itame occiduaria* Pack. This geometer is rather rare in British Columbia collections, as it evidently is a Rocky Mountain species, our previous record being Cranbrook.

*Sheep Creek, Kootenay-Columbia Valley*. A nice series of *Eurymus alexandra emilia* Edw. was taken by Mr. Anderson in the latter part of July. He also took a specimen each of *Lygris atrifasciata* Hulst. and *Euchlaena astylusaria* Wlk. Mr. Anderson, whose duties take him over a large portion of the Province, reports that climatic conditions were bad in most localities and insect-collecting poor.





PLATE II.  
GEOMETRIDÆ.

*Lobophora simsata* Swett.  
(Male paratype.)  
Victoria, B.C. (E. H. Blackmore).  
(New to science.)

*Carsia paludata* Thun.  
Mount McLean, B.C. (A. W. Hanham).  
(Rare.)

*Drepanulatrix quadraria* Grt.  
(Male.)  
Mount McLean, B.C. (G. O. Day).  
(New to British Columbia.)

*Drepanulatrix quadraria* Grt.  
(Female.)  
Mount McLean, B.C. (G. O. Day).  
(New to British Columbia.)

*Itame epigenata* B. & McD.  
Mount McLean, B.C. (A. W. Hanham).  
(New to British Columbia.)

*Marmopteryx marmorata* Pack.  
(Under-side.)  
Vaseaux Lake, B.C. (W. B. Anderson).  
(Local.)

*Metarranthis septentrionaria* B. & McD.  
Lillooet, B.C. (W. B. Anderson).  
(New to British Columbia.)

*Cleora satisfacta* B. & McD.  
Kaslo, B.C. (J. W. Cockle).  
(Local.)

MICROLEPIDOPTERA.

*Tortrix invidana* B. & B.  
Victoria, B.C. (E. H. Blackmore).  
(New to science.)

*Scoparia torniplagalis* Dyar.  
Goldstream, B.C. (E. H. Blackmore).  
(New to British Columbia.)

*Carcina quercana* Fab.  
Victoria, B.C. (E. H. Blackmore).  
(New to North America.)

*Sparganothis tunicana* Wlshn.  
Goldstream, B.C. (E. H. Blackmore).  
(New to British Columbia.)

*Crambus bidens* Zell.  
Maillardville, B.C. (L. E. Marmont).  
(New to British Columbia.)

*Cacarcia hewittana* Busek.  
Victoria, B.C. (E. H. Blackmore).  
(New to science.)

*Eucosma hopkinsana* Kearf.  
Victoria, B.C. (W. R. Carter).  
(New to British Columbia.)

*Peronca maximana* B. & B.  
Maillardville, B.C. (L. E. Marmont).  
(New to science.)

*Eucosma johnsonana* Kearf.  
Victoria, B.C. (W. R. Carter).  
(Rather rare.)





## NEW BRITISH COLUMBIA INSECTS.

The following seventeen insects from British Columbia have been described as new to science during the year 1920. They comprise twelve species of Lepidoptera, one species of Coleoptera, two species of Hymenoptera (Parasitic), and two species of Diptera.

*Lepidoptera.*

Of the twelve species of Lepidoptera, two belong to the family Noctuidæ, one to the Lasiocampidæ, five to the Geometriidæ, one to the Pyralidæ, and three to the Tortricidæ. They are as follows:—

*Noctuidæ.*

*Feralia deceptiva* McDunnough. Described in the Can. Ent., Vol. 52, page 165, June and July, 1920, from two male specimens taken at Vancouver. This species had been previously associated with *Feralia columbiana* Smith. Further notes on both species will be found under the heading of "Illustrated Lepidoptera," with illustrations of both of them on Plate I.

*Cænurgis crechitea* Cram. form *parva* Blackmore. Described in Can. Ent., Vol. 52, page 226, Dec. 1920, from specimens of both sexes taken by the writer at Victoria.

*Lasiocampidæ.*

*Tolype dayi* Blackmore. Described in Can. Ent., Vol. 52, page 226, from seven specimens taken on Vancouver Island—Quamichan Lake (G. O. Day); Sluggett's (W. Downes); Victoria (E. H. Blackmore).

*Geometriidæ.*

*Lobophora simsata* Swett. Described in The Lepidopterist, Vol. 3, page 123, Feb., 1920, from fourteen specimens taken by the writer at Victoria. A figure of this species will be found on Plate II. and more extended remarks upon it under the heading of "Illustrated Lepidoptera."

*Eustroma nubilata* Pack. form *macdunnoughi*, Blackmore. Described in Can. Ent., Vol. 52, page 267, Dec., 1920, from twelve specimens taken on Vancouver Island and the Lower Fraser Valley—Duncan (E. M. Skinner); Vancouver (R. V. Harvey); Fraser Mills (L. E. Marmont); Chilliwack (W. B. Anderson); Goldstream, Vancouver, Cloverdale, Rosedale (E. H. Blackmore).

*Dysstroma sobria* Swett form *swetti* Blackmore. Described in Can. Ent., Vol. 52, page 268, Dec., 1920, from ten specimens taken by the writer at Victoria. This large and handsome geometer was figured under the name of *mullcolata* Hulst in Rep. B.C. Prov. Mus. Nat. Hist., 1916, Plate VIII. In the light of later research *mullcolata* is considered to be the smaller white-banded form, which is in some years very abundant on Vancouver Island in the month of August; *swetti* occurs in normal years in mid-June and is rather uncommon.

*Anthorhœ incursata* Hub. race *lagganata* Swett & Cassino. Described in The Lepidopterist, Vol. 3, page 131, Feb., 1920, from two specimens taken by the late F. H. Wolley Dod. The male holotype was taken at Laggan, Alberta, and the female allotype at Field, B.C., on July 3rd, 1907.

*Eulype albodecorata* Blackmore. Described in Can. Ent., Vol. 52, page 269, Dec., 1920, from a long series of both sexes taken by the writer at Goldstream, B.C. This species is apparently distinct from *hastata* Linn., with which it flies, the latter, however, being from a week to ten days later putting in an appearance. In a long series of both species I have not known them to intergrade, although they are subject to a certain amount of variation within certain limits. On the other hand, *gothicata* Gue., which occurs sparingly at various points on the Mainland, shows considerable intergradation with *hastata*. Until these various forms are bred from the egg to the imago our proper understanding of this group will remain incomplete.

*Pyralidæ (Pyralinæ).*

*Herculia florenccalis* Blackmore. Described in Can. Ent., Vol. 52, page 270, Dec., 1920, from a single female taken by the late W. H. Danby at Rossland, B.C.

*Tortricidæ.*

The following three species were described by Messrs. Barnes & Busck in Cont. Lepid. No. Amer., Vol. IV., No. 3, page 215 *et seq.*, March, 1920:—

*Tortrix dimorphana* Barnes & Busck. Described from specimens taken at Duncan, B.C. (A. W. Hanham), and Victoria, B.C. (collector's name not given).

*Tortrix invidana* Barnes & Busck. Described from specimens taken at Duncan, B.C. (A. W. Hanham), and Victoria, B.C. (collector's name not given). During the past season the writer was fortunate in capturing four specimens of this new species, one of which is figured on Plate II.

*Peronea maximana* Barnes & Busck. Described from specimens taken at Duncan, B.C. (A. W. Hanham), and Victoria, B.C. (A. J. Croker). The writer has also taken this species at Goldstream, and Mr. L. E. Marmont took a nice series at Maillardville, B.C., one of these being figured on Plate II.

#### Coleoptera.

*Aphodius canadensis* Garnett. Described in Can. Ent., Vol. 52, page 139, June and July, 1920, from six specimens taken by Mr. C. B. Garrett at Cranbrook, B.C. (five), and Crowsnest, B.C. (one). This species is a small shiny black beetle about a quarter of an inch in length and belongs to the family Scarabidæ.

#### Hymenoptera (Parasitic).

*Arotcs maurus* Rohwer. Described in Pro. U.S. Nat. Mus., Vol. 57, page 517, 1920, from two females taken at Mission, B.C. (collector's name not mentioned). This species belongs to the tribe *Acoenitini* of the family Ichneumonidæ. This new species of ichneumon-fly measures about three-quarters of an inch in length, with slightly yellowish hyaline wings with dark-brown veins.

*Platycampus victoria* MacGillivray. Described in Can. Ent., Vol. 52, page 59, March, 1920, from specimens bred by Mr. W. Downes at Victoria, B.C. This is the adult of the orange and black larvæ which are so destructive to the Lombardy poplar in Victoria during September. Reference was made by the writer in Rep. Prov. Mus. Nat. Hist., B.C., 1917, page 9, to a particularly bad infestation during that year. As the larvæ are so well known to the average Victorian, a short description of the adult insect taken from specimens bred by the writer several years ago may prove of interest. Head and thorax glossy black; body deep yellow, with two pairs of transparent, iridescent wings. On the front margin of the first pair of wings, two-thirds out from the body, is a blackish mark called the stigma. The antennæ or feelers are yellowish in the male and blackish in the female; the three pairs of legs are yellow. It measures about a third of an inch in length and four-fifths of an inch from tip to tip of the wings when spread out. My bred specimens emerged in the first week of June. This species belongs to the family Tenthredinidæ. They are popularly known as sawflies from the fact that the abdomen of the female is furnished with a pair of saws which can be pushed out and moved up and down. They are used for making slits in leaves or other vegetable tissue in which the eggs are laid.

#### Diptera.

*Melina palustris* Melander. Described in the Annals Ent. Socy. Amer., Vol. 13, page 316, Sept., 1920, from over 100 specimens ranging over a wide territory, including Idaho, Wyoming, Montana, Washington, and British Columbia. The specific locality in British Columbia is Nelson, where the specimens were collected by Mr. Melander. This is a small fly measuring about a fifth of an inch in length, with hyaline wings, a blackish body, and a greyish thorax. The flies belonging to this family are generally found on the borders of streams and in marshy places.

*Euparyphus pretiosa* Banks. Described in Can. Ent., Vol. 52, page 65, March, 1920, from a single female taken at Vancouver, but the name of the collector is not stated.

#### ILLUSTRATED LEPIDOPTERA.

Under this heading we hope to continue to illustrate species which have been recently described from British Columbia; those of rare and uncommon occurrence and those which have been confused with other species. Many of the species are here illustrated for the first time.

We have not illustrated in this report the six species described by the writer in Can. Ent., Vol. 52, page 266 *et seq.*, Dec., 1920, as an excellent plate accompanied the above article figuring each of the species described.

The number appearing before each name corresponds with a similar number in Messrs. Barnes and McDunnough's Check-list of North American Lepidoptera, 1917. Those with an asterisk prefixed to them have been described since the above "List" was issued.

*Saturniidae (Plate 1).*

782. *Coloradia pandora* Blake. This is rather a remarkable capture, as it is, I believe, the first record in Canada of this southern species. This specimen was taken by Mr. M. Brinkman in the early morning of July 18th at rest on the ground beneath an electric-light pole in Victoria West. It is a male and is in fine condition, with the exception of the scaling on the veins in the median area of the primaries, which is a little rubbed. The fore wings are brown in colour, with the extra discal line and the basal area of a darker brown; the transverse lines are edged with grey. The hind wings are somewhat translucent, with a dark extra-discal line and a dusky sub-marginal band. The inner margin is of a distinctly rosy hue. The antennae are pale yellow, heavily pectinated, with the pectinations strongly curved, which is a characteristic of this group. There is a large round solid black dot on each wing.

This species belongs to the family Saturniidae and is closely allied to *Pseudohazis eglanterina* Bdr. (the sheep-moth). It is an inhabitant of Colorado and has also been recorded from Nebraska, Arizona, and New Mexico, and in some years it is reported as being very common at Fort Klamath, in Southern Oregon. As the particular part of Victoria West in which it was captured is adjacent to a railway-yard where "foreign" cars stand until unloaded, it is reasonable to suppose that this specimen came in its pupal state in one of these cars and emerged upon or soon after its arrival here.

*Noctuidae (Plate 1).*

1160. *Schinia separata* Grt. This exceedingly pretty noctuid was taken by Mr. W. A. Newcombe at Spences Bridge on August 19th, 1919. This is the first record of this species in British Columbia and is also the first representative of the genus known to occur here. The genus *Schinia* contains a large number of species, most of them small and rather pretty. They are particularly abundant in the South-western States. Dr. J. B. Smith (Trans. Am. Ent. Soc., Vol. X., page 229, 1883) made *separata* a synonym of *acutilinea* Grt., but more recently it has been raised to its former status as a separate species. The ground colour of *separata* is light fawn marked with darker shades of the same colour, with the transverse lines white, narrowly edged with black. *Acutilinea* is a darker insect with the transverse lines more emphasized.

2018. *Oncocnemis hayesi* Grt. This is rather a rare insect, as, in fact, are all the species of this genus in this Province, with the possible exception of *O. chandleri* Grt. The localities given in "Dyar's List" (Bull. 52, U.S.N.M.) are Colorado, California, and British Columbia. As far as our records show, Kaslo is the only locality in the Province in which it has been taken. The specimen figured was taken by Mr. J. W. Cockle in August, 1913.

2061. *Oncocnemis atrifasciata* Morr. This is another new record for British Columbia and was taken by Mr. A. W. Hanham on Mount McLean, near Lillooet, B.C., at an altitude of 4,000 feet. It is an inhabitant of the Atlantic States, but has been taken in Manitoba and Alberta. It differs somewhat from Manitoban specimens in the dark-grey colour of the primaries and in the collar being tipped with white. It is also a trifle larger, and when a series can be secured it may prove to be a good geographical race. The date of capture was August 20th, 1920.

2062. *Oncocnemis barnesi* Smith. This striking species was described from Wyoming in Jour. N.Y. Ent. Soc., Vol. VII., page 37. It is exceedingly rare, the specimen figured being taken by the late Mr. W. H. Danby at Trail on June 30th, 1900. Mr. Cockle, of Kaslo, has also taken a specimen. The primaries are of a beautiful dove-grey, crossed by two distinct black lines, the veins on the outer margin being narrowly outlined in black.

2098a. *Feralia columbiana*. This species was described in Can. Ent., Vol. 35, page 9, Jan., 1903, from two males, one of which was taken at New Westminster by Dr. Fletcher in 1896. It is a most beautiful insect, the ground colour being a bright blue-green with heavy, black markings, some of which are edged with white. The specimen illustrated was taken by the late Captain R. V. Harvey at Vancouver on April 30th, 1904. It has also been taken sparingly at Victoria, Duncan, and Wellington, and recently I have identified a specimen from Mr. Cockle, of Kaslo, as this species.

\* *Feralia deceptiva* McDunnough. Described in Can. Ent., Vol. 52, page 162, June and July, 1920, from two males taken at Vancouver by the late Arthur Bush. This is very close to the preceding species and is the same in coloration, but the maculation of the primaries is different, while the secondaries are darker, being wholly smoky-brown. A reference to the figures will show the differences between the two species.

This newly described species has also been taken at Victoria and Duncan, and is probably the same insect that was listed in the 1906 B.C. Check-list as *Momophana comstocki* Grt. They are closely related, but the latter is only known from the Atlantic States.

2288. *Trachea separans* Grt. This is a most remarkable capture, as the only previously recorded locality for this species in British Columbia is Windermere, in the foot-hills of the Rockies. It was recorded under the name of *ferens* Sm. by the late Wolley Dod in the Bull. B.C. Ent. Soc., April, 1908; *ferens* has now been made a synonym of *separans*. The specimen figured was taken by Mr. L. E. Marmont at Maillardville on July 10th, 1920.

2359A. *Eremobia claudens albertina* Hamp. In Cont. Lepid. No. Amer., B. & McD., Vol. II., No. 1, Plate XIII., Fig. 4, is illustrated a specimen of *albertina* from Duncan, V.I. In the latter part of May, while studying the splendid collection of noctuids belonging to Mr. G. O. Day, of Duncan, the writer recognized several specimens of this rather rare noctuid from the above-mentioned figure. A day or two later I found two or three more specimens in the collection of Mr. A. W. Hanham, which were taken in the same district. Strange to say, the species turned up in Victoria this season, Mr. W. R. Carter securing a specimen "at sugar" on August 21st. The writer also took a specimen in good condition at Goldstream "at light" on September 7th, and Mr. H. McKnight, of Goldstream, took another on September 26th, the latter, however, being rather worn.

2458. *Acronycta strigulata* Sm. This species is a new record for British Columbia and was taken by Mr. A. W. A. Phair, of Lillooet, B.C., on July 27th, 1920. It is interesting to note in this respect that, while Mr. Phair is an extremely busy man and does not find much time for collecting, he always manages to take each season one or more species new to the Province. The specimen is not in the best of condition, but we are glad to figure it as a new record. The species was originally described from Colorado (Ent. News. Vol. VIII., page 150, 1897).

2532. *Hyppa brunneicrista* Sm. The specimen figured was taken by Mr. J. W. Cockle, of Kaslo, on June 1st, 1914. We are very glad to have seen this specimen and to be able to figure it, as it has cleared up all doubts as to its presence in British Columbia.

In the 1906 Check-list both *brunneicrista* and *xylinoides* were listed from Wellington, Vancouver, and Kaslo. In Bull. B.C. Ent. Soc. No. 9, April, 1908, Wolley Dod states: "I believe this record (*brunneicrista*) to be entirely erroneous. The species I saw rather commonly in British Columbia collections under this name is the Pacific Coast form of *xylinoides* Grt." In a continuation of the same article (*Ibid.* No. 10, June, 1908), and under the heading of *Hyppa indistincta* Sm., he says: "Dr. Dyar records this from Kaslo, but I believe him to be wrong in referring *brunneicrista* Sm. to the synonymy. I have a specimen from Kaslo and took one at Laggan last July which agree with the figure and description of *indistincta*, and are, in my opinion, distinct from *brunneicrista*."

Recently Mr. Cockle has sent us specimens of all three species for examination, and while *indistincta* and *xylinoides* are close to each other, *brunneicrista* is abundantly distinct from both of them. It may be easily separated by the following characters: (a) The pectinations of the male antennæ are longer than in the other species; (b) the thorax laterally is solid reddish-brown; (c) the posterior thoracic tuft is distinctly rusty-brown; (d) a rusty-brown streak in the s.t. space near the anal angle. The general appearance of the insect also seems much darker.

#### *Geometridæ (Plate II).*

3939. *Marmopteryx marmorata* Paek. Mr. W. B. Anderson was fortunate enough to secure several specimens of this fine geometer at Vaseaux Lake, B.C., on May 25th, 1920. They had evidently newly emerged and were in perfect condition. A figure of the under-side is given to show the beautiful marbled effect on the hind wings. The ground colour is white with reddish-brown and dark-brown markings. A reference to this species was made in the Rep. Prov. Mus. Nat. Hist., B.C., page 18, 1919.

3945. *Carsia paludata* Thun. This species is one of the rarest geometers that we have and is a high-altitude species. The first record that we had of this species was a specimen taken by the late Mr. R. V. Harvey on the Hope Mountains on July 19th, 1906. No further record was obtained until last year, when amongst some geometrids sent to the writer for determination by Mr. J. W. Cockle, of Kaslo, another specimen of this species was found. Mr. A. W. Hanham, while collecting on Mount McLean last August at an altitude of 6,500 feet, captured several specimens, one of which we figure.



\* *Lobophora simsata* Swett. This new species was described from a long series taken by the writer between May 5th and 10th, 1918. During the six years previous to that date the writer had only taken odd specimens; i.e., one in 1913, one in 1914, two in 1916, and four in 1917, all of which were taken in the suburbs of Victoria. Three of those taken in the latter year were brought to me by Mr. A. Robinson, who stated that he had taken them at rest on the side of his house. The following spring I asked him to keep a good look-out for them, and one day in early May he informed me that there were a number of small moths flying at sundown on a vacant lot adjoining his house which appeared to be the species that I wanted. Upon going over there the following evening I found to my great delight that this was the case, and, although a cool wind was blowing, I managed to net sixteen specimens. The weather conditions were not very favourable during the next few evenings, but with hard work and a great amount of beating nearly forty specimens were taken between us. Owing probably to the extreme wet weather, none were seen in 1919. That winter the ground was cleared and ploughed over for cultivation and I have not seen a specimen since.

4326. *Drepanulatria quadraria* Grt. This is a new record for British Columbia and was taken by Mr. G. O. Day while on a collecting-trip at Lillooet in July, 1919. It was described in Can. Ent., Vol. XIV., page 185, 1882, and the localities given for it are California, Colorado, and Nevada. The sexes are dissimilar and we have figured a specimen of each.

\* *Itame epigenata* B. & McD. This species was described from Truckee, Calif., in Cont. Lepid. No. Amer., Vol. III., No. 4, page 238, March, 1917. The specimen figured was taken by Mr. A. W. Hanham in August last on Mount McLean at an altitude of 6,000 feet and is a new addition to our list.

It also occurs at Kaslo, as the writer has recently seen a specimen taken by Mr. Cockle which agrees very well with the Lillooet specimen. This is probably the same species as Dr. Dyar records (Lepid. Koot. Dist., 1904) under the name of *bitactata* Wlk. from Sandon (one) and Kaslo (one). The two species are closely allied, but it is more reasonable to suppose that *epigenata* would extend its range northward from California than that *bitactata* would extend westward and cross the Rocky Mountains.

*Cleora satisfacta* B. & McD. This is also a new addition to our list, having been described (Cont. Lepid. No. Amer., Vol. III., No. 4, page 244, March, 1917) from a pair taken by Mr. Cockle at Kaslo, B.C. This is a rather rare geometer at Kaslo and very few specimens have been taken until this season, when Mr. Cockle had the good fortune to secure three of them. We are glad to be able to figure this species, as we have previously figured the other two British Columbia species of this group; i.e., *excelsaria* Streck, Rep. Prov. Mus., 1917, Plate II., and *albescens* Hulst., *ibid.*, 1918, Plate II.

Dr. J. H. McDunnough has recently revised the whole of the genus *Cleora* (Studies in North American Cleorini, Bull. 18 (Tech.), Dept. Agric., Ottawa, No. V., 1920) and has erected many new genera, including *Stenoporpiia*, which receives the three above-mentioned species.

*Metarranthis septentrionaria* B. & McD. This species was described in Cont. Lepid. No. Amer., Vol. III., No. 4, page 257, March, 1917, from specimens taken at various points in Manitoba. The specimen illustrated was taken by Mr. W. B. Anderson at Lillooet on May 19th, 1918. It is closely allied to *duaria* Gue., but is separated from that well-known species by the ruddy-brown shading on the median area, which causes the latter to stand out as a dark band. There are also differences in the course of the extra and intra-discal lines.

The genus *Gonodontis* has been separated into two groups on account of the differences in the male genitalia, *duaria* and its allies being placed in Warren's genus *Mctarranthis*.

#### *Microlepidoptera (Plate II).*

5245. *Scoparia torniplagalalis* Dyar. This rather well-marked scoparid was taken by the writer at Goldstream on August 12th. It is a new accession to the list and must be somewhat rare, as out of a large number of specimens of this genus taken during the past season only three proved to be of this species.

*Carcina quercana* Fabr. This is rather a remarkable capture, as it is a new record for North America. It is fairly common in some parts of England and has an extended distribution throughout Europe, but has never before been recorded from any part of North America. The writer was fortunate in securing seven specimens during the past season, the dates being as

follows: July 16th (one); July 29th (two); August 4th (one); August 10th (two); and August 12th (one). Strange to relate, six of the seven specimens were taken in my own garden.

It is a very pretty moth, the ground colour of the primaries being of a dull pink, with an oblong yellow patch on the costa, and the long fringe of the outer margin is also yellow. It belongs to the family Cecophoridae. In a recent letter Mr. A. Busck, of the United States National Museum, states that we should find the larva spinning a flat web on the under-side of oak, apple, or willow.

5347. *Crambus bidens* Zell. This is an unexpected record, as its habitat is Eastern Canada and the New England States. A nice series of this pretty crambid was taken by Mr. L. E. Marmont at Maillardville. It was on the wing from the end of July until the middle of August, but was extremely local. It is very closely allied to *pasqueillus* Linn., with which species it is liable to be confused.

7009. *Eucosma johnsonana* Kearf. This exceedingly pretty species was described in Trans. Am. Ent. Soc., Vol. 33, page 36, Jan., 1907, from five specimens, which included a female from Victoria (Rev. G. W. Taylor) and a male from Vancouver Island. According to Mr. Busck this species is rather rare in collections. Mr. W. R. Carter, however, secured three nice specimens during the past season, the best of which, taken on July 29th, is figured.

When in good condition it is a very pretty insect, presenting a rosy-pink appearance. The upper portion of the primaries are salmon-pink, with the lower half of the basal area a deep rose-pink, bordered by a narrow band of blackish scales.

7010. *Eucosma hopkinsana* Kearf. This is another of Mr. Carter's captures and is apparently new to British Columbia. It was described (*ibid.*, page 37) from two specimens taken at Hoquiam, Wash. Four specimens were taken by Mr. Carter during August, one of which is illustrated. The primaries are of a light green, marked with lines and shades of black and fuscous.

7313. *Sparganothis tunicana* Wlsh. A short series of this pretty brown and yellow tortricid was taken by the writer at Victoria and Goldstream during July and August. Mr. Busck considers this species to be an extreme variety of the immaculate *inconditana* Wlsh. Two specimens of the latter were also taken by me at Victoria in July last.

\* *Cacocia hewittana* Busek. This species was described in Can. Ent., Vol. 52, page 125, June and July, 1920, by August Busck from a large series bred from raspberry at Sydney, Nova Scotia. It is evidently a general feeder, as the writer bred a long series from larvæ feeding on apple, pear, cherry, and laurel. The adults began to emerge on July 4th and continued doing so until about the 15th. They are very variable in the coloration of the fore wings, the ground colour ranging from light ochreous, reddish ochreous, to fawn and dark brown.

It is rather surprising to see this species here in such numbers and it evidently has a wide distribution. Mr. Busck informs me that he also has the species from Toronto.

\* *Tortrix invidana* Barnes & Busek. The writer took several specimens of this new species in August and September, one of which proved to be a male. This is the first male recorded, the type specimens being all females. The ground colour is sordid white, with grey bands and markings edged narrowly with black. It is rather uncommon.

\* *Peronea maximana* Barnes & Busek. This is one of the largest of our British Columbia tortricids and is rather a handsome moth. Mr. Marmont took a long series at Maillardville from the middle of September and extending away on into October. The ground colour varies from a very light grey to dark grey, with a series of reddish-brown markings on the costal edge of the fore wing. The amount of reddish-brown scaling is also very variable, some of the specimens having comparatively little, while others are heavily strigulated. Mr. Marmont's specimens were all taken at rest in a grove of second-growth alders a short distance away from his home, and this is probably their food-plant.

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VICTORIA, B.C.:

Printed by WILLIAM H. CULLIN, Printer to the King's Most Excellent Majesty.

1921.



