

PROVINCE OF BRITISH COLUMBIA

REPORT

OF THE

PROVINCIAL MUSEUM

OF

NATURAL HISTORY

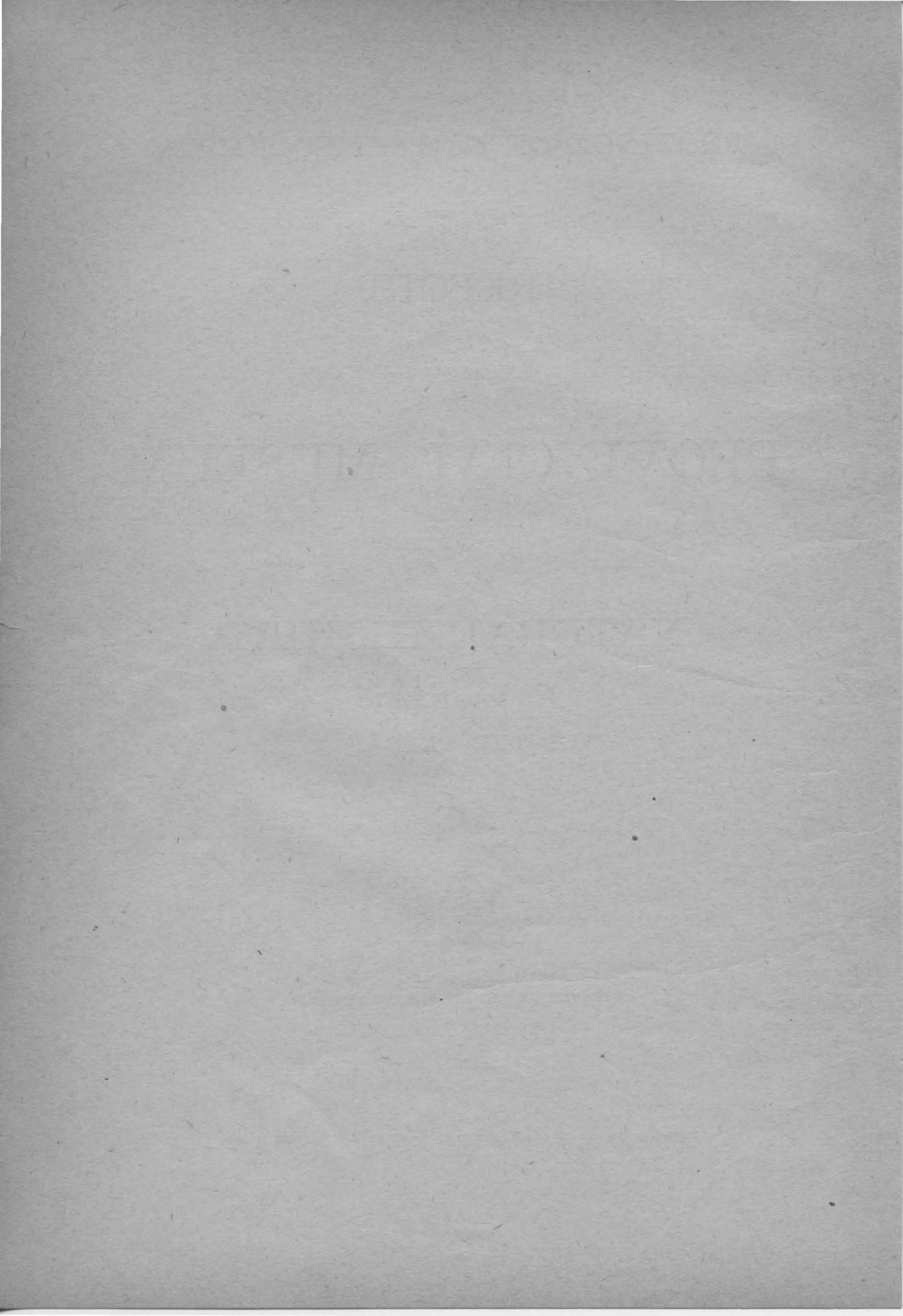
FOR THE YEAR 1919



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VICTORIA, B.C.:

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1920.



*To Colonel the Honourable EDWARD GAWLER PRIOR,
A Member of the King's Privy Council for Canada,
Lieutenant-Governor of the Province of British Columbia.*

MAY IT PLEASE YOUR HONOUR:

The undersigned respectfully submits the Annual Report of the Provincial Museum of Natural History for the year 1919.

J. D. MACLEAN,
Provincial Secretary.

*Provincial Secretary's Office,
Victoria, February, 1920.*

PROVINCIAL MUSEUM OF NATURAL HISTORY,
VICTORIA, B.C., February 24th, 1920.

*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, 1919, covering the activities of the Museum.

I have the honour to be,

Sir,

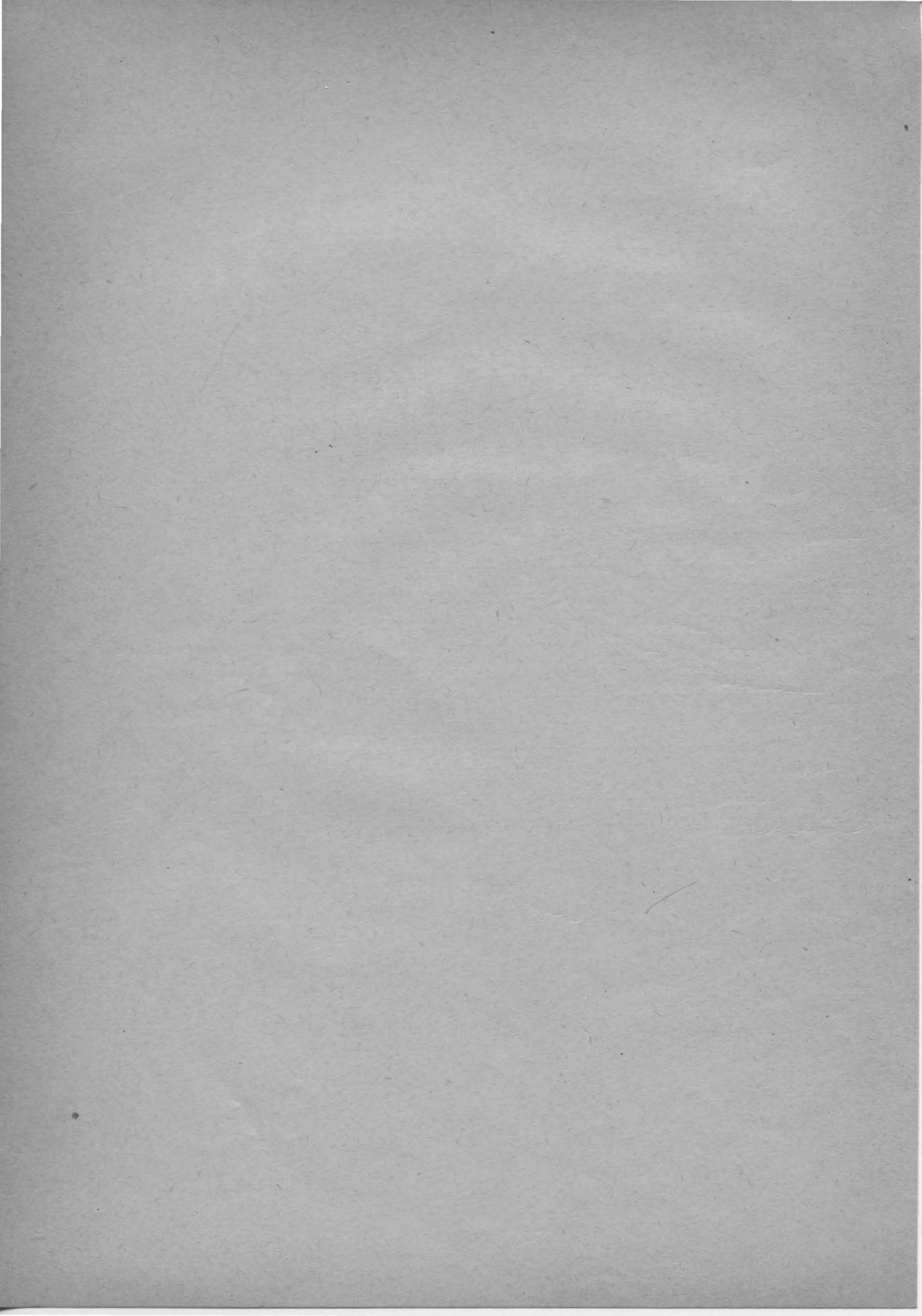
Your obedient servant,

FRANCIS KERMODE,

Director.

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PROVINCIAL MUSEUM REPORT

FOR THE YEAR 1919.

In making the Annual Report for the year it is deemed advisable to give as much as possible of the inception, history, and progress of the Institution.

A museum is an institution for the preservation of those objects which best illustrate Nature and the works of man; the use of these for the increase of knowledge and for the culture and enlightenment of the people; its special functions being to preserve and utilize objects of nature and works of art and industry. It supplies a need which is felt in every intelligent community, which cannot be supplied by any other agency; it does not exist, except among highly enlightened people, and attains its highest development only in great centres of civilization.

The growth of a museum from day to day may seem very small, but, if taken year by year, it shows what is accomplished with hard work and deep study.

It was on December 2nd, 1886, that the Provincial Museum was formally opened in a small room, 20 x 12 feet, in the old Government Building in the City of Victoria. The first Curator was the late John Fannin, who was informed that he would have to make the best of the accommodation until better quarters could be secured; in these quarters the first three years of the life of the Museum was spent.

On the removal of the Supreme Court to a new building, the Provincial Museum was moved into the old Supreme Court Building, and was formally opened to the public on May 24th, 1889, and the work of building up the institution was commenced in earnest. Gradually, but surely, the development of the Museum advanced until again the accommodation was totally inadequate. Then, again, when the present Legislative Buildings were erected, the east wing was allotted to the Provincial Museum, into which building the natural-history specimens were transferred in April, 1898, but the mineral exhibit, which had been part of the Provincial Museum up to this time, was transferred to the old Legislative Building for exhibition, and became part of the Department of Mines. The natural-history collections have now greatly outgrown the present building, which is used for exhibition purposes. All the valuable study series and a mass of material are stored in a wooden frame building at the rear, and cannot be exhibited on account of lack of exhibition space.

The collection is worthy of a large building, and is a credit not only to the Government, under whose direction it is managed, but to the people of the Province, whose individual efforts in the way of contributions have done so much to assist its growth.

The only financial support the institution receives is the annual vote granted by the Legislative Assembly, which is used as economically as possible, so as to get the best results.

It was not until February 21st, 1913, that an Act of Legislature was passed, endorsing the establishment of a Provincial Museum, making it statutory, defining its objects, and making regulations governing the working of the institution. The Department is under the control of the Honourable J. D. MacLean, M.D., C.M., Provincial Secretary and Minister of Education.

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 to the Provincial Museum during the year 1919 has been a slight increase over that of 1918, over 40,000 having signed the visitors' register.

These figures are by no means accurate, as a great many people do not seem to like the idea of recording their names, and no record has been kept of the number of classes from the public schools of the city who, accompanied by their teachers, visited the Museum in connection with their nature-study. There have also been a number of specialists in several branches of natural sciences from some of the large museums of the continent who wished to examine the study series, which are stored in the annex, for which permission was gladly given by the Director.

It will be noticed, by referring to the first register that was kept by the Museum, in 1888, that only 500 people left their signatures. The number of visitors increased year by year until the year 1914, when, on the outbreak of the European war, the tourist travel to the West at that time received a considerable set-back. For about two years this seemed to affect the travel, but from then on, I am pleased to say, the visitors again began to increase not only throughout the summer seasons, but also a great many came from Alberta and Saskatchewan during our winter seasons on account of our milder climate.

ACTIVITIES.

As will be seen by the report in the several branches of natural history, no actual field parties were sent afield during the last summer, but this does not mean that the activities of the Museum were dormant, as considerable work has always to be done in connection with the Museum, in classification and identification of specimens from time to time, to make them more accessible to inspection and for study.

This work is carried on by a very small staff, all scientific work involving upon the Director and the Assistant Biologist, who are assisted by a few personal friends. The invaluable assistance afforded the institution by members of the large institutions of America, more particularly the staff of the Smithsonian Institution and the Biological Survey of the United States National Museum of Washington, D.C. (to whom a large number of specimens are sent for their specialists to identify and verify), cannot be too highly appreciated.

The specific identification of many of our small mammals is a difficult problem, owing to the lack of any large series from many localities, and not having the necessary appliances for the examination of cranial and dental characters, upon which determinations are greatly based.

In many instances it is also necessary to make comparison with type specimens, most of which are to be found in the largest institutions of America and Europe, and for this reason we have to rely greatly on the generosity and kindness of several well-known scientists.

ANTHROPOLOGY.

Very little material has been added to the anthropological collection this year, with the exception of several small specimens.

Mr. G. E. Darby, Medical Superintendent of the Bella Bella Hospital, donated to the Museum a piece of rope made of cedar-bark, which he states was found by an Indian, Moses Knight, who found a considerable quantity of it concealed in a cave on a small island near Bella Bella.

Miss Dorothy Matthews presented an Indian skull which she had found at Patricia Bay, North Saanich, in July, 1917. This skull is typical of the Indians of the Saanich Tribe of the Coast-Salaish Indians.

Mr. J. P. Babcock, the Deputy Commissioner of Fisheries, presented an Indian blanket made from the feet of the grey timber-wolves. This blanket was made by the Babine Indians at Babine Lake, B.C., which tribe of Indians belongs to Athapasean or Déné stock.

MAMMALS.

The Museum has received, through the efforts of Mr. H. W. Dodd, Government Agent at Telegraph Creek, a magnificent pair of locked caribou antlers in a perfect state of preservation. These antlers were found on Cariboo Mountain, West Cassiar, by Mr. W. Beach, of New York City, a big-game hunter, who was hunting at the headwaters of the Stikine in 1918. The battle which caused the death of these animals took place, no doubt, in the month of September, 1917, as traces of the velvet still remain on the antlers. The dimensions of the antlers are:—No. 1: Length of beam, 52 inches; spread, 44½ inches; points, 29 inches. No. 2: Length of beam,

51½ inches; spread, 32 inches; points, 29 inches. These two heads make a magnificent exhibit on the walls of the Museum.

Mr. E. W. Nelson, Chief of the Bureau of Biological Survey, United States Department of Agriculture, Washington, D.C., wrote asking for the loan of our study series of *Ochotona*, commonly called Little Chief Hare, as Mr. A. H. Howell, a specialist in their Department, was working on a revision of this genus, and wished to have specimens from every available portion of the country, so as to assist him in his classification and distribution of this interesting little mammal. Eighteen skins and skulls were loaned by this Department, which in due course were returned.

BOUNTIES ON 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 the Government, for the year 1919, was only called upon to pay the bounty on 100 timber-wolves, the bounty on which was \$10 per head, but was increased by Order in Council to \$15 on September 1st, 1919. 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. Wolves must be getting very rare on Vancouver Island, as the price now offered in the fur market ranges from \$25 to \$40, plus the Government bounty of \$15 per head. This makes the pelts quite valuable, and therefore these animals would not be passed up by any hunter or trapper.

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.

DISTRIBUTION IN BRITISH COLUMBIA OF SOME FAMILIES OF THE ORDER RODENTIA.

Small Mammals.—Animal life is very generously represented in British Columbia, probably due to the varied climate, resulting from the variance of altitude within its borders and a wide range of physiographic conditions. The life-zones range through the Transition, Canadian, and Hudsonian to the Arctic-Alpine zones on the summits of the highest mountain ranges; the Upper Sonoran zone covering a small strip of country in the Southern Okanagan.

Under such conditions it is hardly to be wondered that many of the species overlap in their range of distribution and subspecies become numerous. When the biological research of this Province has been completed, where well-defined races are known to exist in these areas, no doubt many new phases of intergrading will be revealed in the intervening territory.

The series of small mammal-skins in the collection of the Provincial Museum numbers some 1,200 skins; a greater portion of these, however, belong to the order Rodentia, or rodents, and it is proposed here to give a short account of the distribution throughout the Province of some families belonging to this order.

Muridae.

Genus *Peromyscus*.

This genus includes the so-called wood-mice, deer-mice, vesper-mice, or white-footed mice, and is by far the most numerous in species and subspecies of all our small rodents, and in some form or another inhabit almost every portion of North America.

From a large series of skins there might be an unlimited discussion of the variation in *Peromyscus*, and one would deduct from the study of groups of a long series from various localities that intergradation existed more widely than generally supposed; individual variation being greatest in specimens from localities between the ranges of two well-established forms. It would therefore appear certain, with such a wide and frequent distribution, perfect intergradation must take place between related forms of different faunal areas. Classification in such cases would depend largely upon a set standard, and on which side of the fence intergrading specimens belong must remain a matter of individual opinion.

In April, 1909, the Bureau of Biological Survey, United States Department of Agriculture, published a revision of the American genus *Peromyscus* by Mr. Wilfred H. Osgood. This work has made it possible, to a reasonable degree of certainty, to classify, at least geographically, the several species occurring throughout our range, represented by the following:—

Peromyscus maniculatus arcticus (Osgood). Geographically distributed through the interior of North-west Canada, from South-eastern Saskatchewan north along the Mackenzie River, west to the upper waters of the Yukon River, then south to Eastern Alberta, in the Canadian and Hudsonian zones.

The British Columbia specimens identified as this species were taken in the Cariboo and Telegraph Creek Districts.

Peromyscus maniculatus oregonus (Bangs). Type locality, Mount Baker Range, B.C., A. C. Brooks, distributed through the Puget Sound region in the mountains and coast of Western Washington, north to Southern British Columbia, south to the Columbia River.

Peromyscus maniculatus keeni (Rhoads). A small white-footed mouse occurring on the Queen Charlotte Islands, the type of which is from Masset, Graham Island.

Peromyscus maniculatus macrorhinus (Rhoads). On the Coast of the Mainland of Northern British Columbia and Southern Alaska; type collected by the Rev. J. H. Keen at the North Pacific Salmon Cannery, mouth of the Skeena River.

Peromyscus maniculatus artemisiae (Rhoads). Ranges through South-Central British Columbia, south through parts of Washington, Idaho, and Western Montana, in the Transition and Canadian zones; type from Ashcroft, B.C.

Peromyscus maniculatus saturatus (Bangs). Type locality, Saturna Island, Gulf of Georgia, B.C., to which it is entirely confined.

Peromyscus maniculatus austerus (Baird). Geographic distribution over the Coast region of Puget Sound, Washington, north to Southern British Columbia and including Vancouver Island.

Peromyscus silkensis prevostensis (Osgood). So far only recorded from Prevost Island, Queen Charlotte Islands, and Forrester Island, Alaska.

Genus *Microtus*.

Voles, or meadow-mice, occur throughout the greater part of the Northern Hemisphere north of the Tropics, and both species and individuals reach their maximum abundance in the Canadian and Transition zones, a few species occurring to the north in the Hudsonian and Arctic zones, even in the barren grounds north to the Arctic Coast.

They adapt themselves to the most diversified conditions of environment, inhabiting all classes of ground, from dry arid regions to wet swamps, a few species being aquatic in their habits.

The following species are represented in the Province of British Columbia:—

Microtus drummondi (Aud. & Bach.) (Drummond's Vole). Geographically distributed from the Hudson Bay to the west slope of the Rocky Mountains, the type locality being in the vicinity of Jasper House, Alberta.

Microtus townsendi (Bachman) (Townsend Vole). Distributed through the low country west of the Cascades, from Port Moody, B.C., south to the Willamette Valley and to Yaquina Bay, Oregon, in the Transition zone.

Microtus tetramerus (Rhoads) (Vancouver Vole). The distribution of this vole, so far as known, is the southern end of Vancouver Island; type from Beacon Hill Park, Victoria, and described from the type, and seventeen specimens collected near type locality.

Microtus mordax (Merriam). Ranges from latitude 60, Rocky Mountains and outlying ranges, to Northern New Mexico; common in Canadian and Hudsonian zones; specimens recorded from Nelson, Sicamous, Hope, Shuswap, Glacier, Okanagan, and Bennett City.

Microtus serpens (Merriam). Distributed through the low country of Southern British Columbia and Northern Washington between the Cascade Mountains and Puget Sound.

Microtus nanus canescens (Bailey) (Gray Vole). East of the Cascades in Northern Washington and Southern British Columbia; specimens recorded from Okanagan, Vernon, and Ducks, B.C.

Genus *Neotoma*.

The wood-rats of this genus are confined to North America. The bushy-tailed wood-rats occurring in this Province were separated from the round-tailed species, as the genus *Teonoma*, by Gray in 1843; although this name has been regarded by most later authors as only of subgeneric rank.

The bushy-tailed wood-rats are confined chiefly to the boreal zones in the Sierra Nevada and Rocky Mountain regions, extending nearly to north latitude 60. They are chiefly found in the mountains, where they dwell and seek protection among the cliffs and caves, being expert climbers. Occasionally we hear of wood-rats in the vicinity of camps and farm-houses, where they appear to develop a fascination of kleptomania, and ludicrous are the stories told of missing knives, forks, spoons, clothing, and other articles too numerous to mention, carried away and added to the nest material. Four ~~now~~ species occur within our limits, none being known on Vancouver Island.

Neotoma cinerea (Ord) (Grey Bushy-tailed Rat). Distributed throughout the Rocky Mountain region in Southern British Columbia, Montana, Idaho, and several adjoining States.

Neotoma cinerea drummondi (Richardson) (Bushy-tailed Wood-rat). Throughout the Canadian zone in the Rocky Mountains of Eastern British Columbia and Western Alberta, north of the range of *N. cinerea*.

Neotoma cinerea sawamans (Osgood) (Osgood Bushy-tailed Wood-rat). Geographic distribution in Northern British Columbia, west of the Rocky Mountains, in the Canadian and Hudsonian zones; limits of range unknown.

Neotoma cinerea occidentalis (Cooper, M.C.) Baird (Western Bushy-tailed Wood-rat). From the Pacific Coast region of South-western British Columbia south to Northern California.

*Leporidae.*Genus *Lepus*.

With the exception of Vancouver Island and most of the smaller islands on the Pacific Coast, hares and rabbits are more or less distributed throughout a greater portion of British Columbia.

Until some ten years ago, when Mr. E. W. Nelson, of the Biological Survey, United States Department of Agriculture, made a revision of the rabbits of North America, very little was known of the number of species and their geographic races.

From an economic view, hares and rabbits of this genus, when numerous in agricultural areas, do considerable damage to gardens, crops, fruit-trees, and young plantations. A peculiarity also is that when they become very numerous an epidemic in the form of disease decimates them, until hardly any can be found, and this state continues for a few years, when for the next few years they again multiply very fast, and once more attain their zenith of abundance. This takes place about every seven years, and up to the present period the exact cause is little understood.

The following species are represented in the Province:—

Lepus campestris townsendi (Bachman) (Western White-tailed Jack-rabbit). It occurs in a narrow tract of land along the Okanagan Valley, terminating at Fairview, also in the Similkameen Valley for twenty miles north of the boundary.

Lepus americanus macfarlani (Merriam) (Mackenzie Varying Hare). Distributed through all the Yukon Territory, Western Mackenzie, and Northern British Columbia; its extreme northern limit coincides with that of the trees.

Lepus americanus columbiensis (Rhoads) (B.C. Snow-shoe Rabbit). Ranges through the Rocky Mountain region of South-eastern British Columbia (except the extreme south-eastern corner), and from Vernon, in the Okanagan, to Jasper House, Alberta.

Lepus washingtoni (Baird) (Washington Varying Hare). This hare occurs on the Coast from the Fraser River Valley to the western slope of the Cascade Mountains, at low altitude.

Lepus bairdi (Hayden) (Rocky Mountain Snow-shoe Rabbit). Distributed through the higher parts of the Rocky Mountains from Idaho south; a series of skins in the collection of the Provincial Museum from Cranbrook, B.C., collected by Mr. C. B. Garrett, are referred to in this species.

Lepus bairdi cascadenis (Nelson) (Cascade Mountain Snow-shoe Rabbit). Ranges from Hope, B.C., on the Fraser River, to the Okanagan, south on the east side of the Cascade Mountains into Washington.

*Ochotonida.*Genus *Ochotona*.

The Pika, or Little Chief Hare, has the appearance of a miniature brown rabbit, although it represents an independent family, being neither a hare nor a rabbit. Its habitat is high up on the mountain ranges of the West, from near timber-line up to the line of perpetual snow.

They live among the caves and crevices of the rock-slides and are to be found sitting on the top of some prominent rock; at the least alarm they give a shrill call and disappear into their retreats, only to appear again to see if the intruder has gone away.

These little animals are very industrious, and work constantly through the day, gathering grass and various alpine plants, which are piled up (like miniature stacks of hay) among the rocks for their winter use.

The series of skins in the collection of the Provincial Museum are all from the Mainland of the Province, and have recently been identified by Mr. Howell, of the Biological Survey, United States Department of Agriculture, Washington, D.C.

So far as is known, there is no record of the genus occurring on Vancouver Island; although it is quite possible that biological research in our Alpine-Arctic zones may add this mammal to the fauna of Vancouver Island.

Species known to occur in British Columbia are as follows:—

Ochotona princeps princeps (Richards). Distributed throughout the Rocky Mountains in British Columbia, northward to the South Branch of the Mackenzie River.

Ochotona collaris (Nelson). This is a northern species found in the mountains from south of Fort Yukon, including Atlin District, Northern British Columbia. The two skins in the Museum collection from White Mountain, Moose Arm, Tagish Lake, Atlin, presented by the late F. H. Mobley, M.P.P., are identified as this species.

Ochotona cuppes (Bangs). Throughout the Gold Range, British Columbia. Type locality, Monishe Divide.

Ochotona feniseæ. Distributed through the Okanagan and Tulameen, the data of skins in the Museum collection recording an altitude of from 3,500 to 4,000 feet.

Ochotona feniseæ brooksi. Skins recorded from Sicamous to Mount McLean, Lillooet. A comparatively new subspecies ranging through the Cascades.

Ochotona minimus (Lord). Distribution in British Columbia near the boundary-line. Limits of range unknown. Type from Ptarmigan Hill, Cascade Range, B.C.

ORNITHOLOGY.

Birds.—In this branch considerable work has been carried on throughout the year with the study series, ten new specimen sectional storage-cases having been added. The collection has been considerably worked over and made more accessible for students, and at the present time we are installing another sixteen sectional cases to take care of the balance of the valuable study skins, which have been stored in boxes and were not very accessible to those persons who wished to consult our large bird-skin collection of the birds of this Province.

Since Mr. J. W. Gibson, the Director of Elementary Education, has inaugurated his nature-study in the public schools of this Province, considerable call has been made on the Museum, more particularly in the study of bird-life. Numbers of classes have been brought here by their teachers, and the Director and his assistants have given all the possible instruction to these young students in their study of ornithology. The Department has also loaned a number of skins to several of the school-teachers upon request, so that they should have them handy for instructions in their nature-study at different times during the school term.

This, however, is not very satisfactory, on account of breaking into the series that should not really be loaned out for this purpose. It would be a capital idea if the Department of Education would take up the matter of having small collections of mounted specimens under their own jurisdiction; these to be sent round from school to school throughout the Province in cities and towns and districts where there are no measures similar to the Natural History Museum in Victoria. This would assist the children greatly in their identification of species, and also give them an idea of what to look for in their rambles throughout the country.

Numbers of requests come from time to time from other museums for the loan of ornithological material for study by specialists who are working out the exact species and subspecies, that vary so in different portions of America, according to geographical conditions.

Mr. J. Grinnell, Director of the Museum of the University of California, wrote this year asking permission of the Provincial Museum to loan to Mr. Harry S. Swarth, ornithologist of their Department, our collection of bird-skins of the genus *Passerella* (fox-sparrows), as he is working on a monograph of this species and is very anxious to secure the specimens from this northern portion of the country. Twenty specimens of this genus were loaned for comparison and have been returned—namely, three *P. i. townsendi*, four *P. i. fuliginosa*, two *P. i. meruloides*, five *P. i. sinuosa*, and six *P. i. altivagans*.

OOLOGY.

During the year the Provincial Museum was very fortunate in having a magnificent collection of birds' eggs presented by Mr. W. F. Burton, of this city.

Mr. Burton is an enthusiastic student of bird-life and a careful collector. He has added a number of sets of eggs not heretofore represented in the Oological division in the Museum. It has been the request of the donor that these specimens be exhibited in a case and kept by themselves as the W. F. Burton collection.

LIST OF EGGS IN THE BURTON COLLECTION.

No. of Eggs in Set.	Set with Nest.	Species.	Common Name.
2	...	<i>Gavia immer</i> (Brunnich)	Loon.
1	...	<i>Gavia stellata</i> (Pontoppidan)	Red-throated Loon.
1	...	<i>Lunda cirrhata</i> (Pallas)	Tufted Puffin.
1	...	<i>Cerorhinca monocerata</i> (Pallas)	Rhinoceros Auklet.
1	...	<i>Ptychoramphus aleuticus</i> (Pallas)	Cassin's Auklet.
1	...	<i>Ethia pusilla</i> (Pallas)	Least Auklet.
2	...	<i>Synthliboramphus antiquus</i> (Gmelin)	Ancient Murrelet.
3	...	<i>Cephus columba</i> Pallas	Pigeon Guillemot.
4	...	<i>Uria troille californica</i> (H. Bryant)	California Murres.
2	...	<i>Rissa brevirostris</i> (Bruch)	Red-legged Kittiwake.
3	...	<i>Larus glaucescens</i> Naumann	Glaucous-winged Gull.
3	...	<i>Larus atricilla</i> Linnæus	Laughing Gull.
3	...	<i>Sterna caspia</i> Pallas	Caspian Tern.
3	...	<i>Sterna hirundo</i> Linnæus	Common Tern.
1	...	<i>Diomedea albatrus</i> Pallas	Short-tailed Albatross.
1	...	<i>Fulmarus rodgersi</i> Cassin	Rodger's Fulmar.
1	...	<i>Puffinus tenuirostris</i> (Temminck)	Slender-billed Shearwater.
1	...	<i>Oceanodroma furcata</i> (Gmelin)	Forked-tailed Petrel.
1	...	<i>Oceanodroma leucorhoa</i> (Vieillot)	Leach's Petrel.
1	...	<i>Oceanodroma melania</i> (Bonaparte)	Black Petrel.
1	...	<i>Oceanodroma socorrænsis</i> C. H. Townsend	Socorro Petrel.
3	...	<i>Phalacrocorax penicillatus</i> (Brandt)	Brandt's Cormorant.
4	...	<i>Phalacrocorax pelagicus robustus</i> Ridgway	Violet-green Cormorant.
3	...	<i>Pelecanus californicus</i> Ridgway	California Brown Pelican.
4	...	<i>Branta canadensis canadensis</i> Linnæus	Canada Goose.
4	...	<i>Botaurus lentiginosus</i> (Montague)	Bittern.
3	...	<i>Ardea herodias fannini</i> Chapman	Northwestern Coast Heron.
3	...	<i>Nycticorax nycticorax nevius</i> (Boddart)	Black-crowned Night Heron.
1	...	<i>Grus mexicana</i> (Muller)	Sandhill Crane.
8	Nest	<i>Rallus virginianus</i> Linnæus	Virginia Rail.
4	...	<i>Recurvirostra americana</i> Gmelin	Avocet.
2	Nest	<i>Gallinago delicata</i> (Ord)	Wilson's Snipe.
3	"	<i>Actitis macularia</i> (Linnæus)	Spotted Sandpiper.
4	"	<i>Numenius americanus</i> Bechstein	Long-billed Curlew.
4	"	<i>Oxyechus vociferus</i> (Linnæus)	Killdeer.
4	...	<i>Ægialitis semipalmata</i> (Bonaparte)	Semipalmated Plover.
11	Nest	<i>Lophortyx californica californica</i> (Shaw)	California Quail.
7	"	<i>Dendragapus obscurus fuliginosus</i> (Ridgway)	Sooty Grouse.
7	"	<i>Bonasa umbellus sabini</i> (Douglas)	Oregon Ruffed Grouse.
2	...	<i>Cathartes aura septentrionalis</i> Wied	Turkey Vulture.
2	...	<i>Elanoides forficatus</i> (Linnæus)	Swallow-tailed Kite.
5	...	<i>Accipiter velox</i> (Wilson)	Sharp-shinned Hawk.
3	...	<i>Buteo borealis calurus</i> Cassin	Western Red-tailed Hawk.
2	...	<i>Buteo lineatus elegans</i> Cassin	Red-bellied Hawk.

LIST OF EGGS IN THE BURTON COLLECTION—Continued.

No. of Eggs in Set.	Set with Nest.	Species.	Common Name.
3	...	<i>Archibuteo lagopus sancti-johannis</i> (Gmelin)...	Rough-legged Hawk.
2	...	<i>Aquila chrysaetos</i> (Linnaeus)	Golden Eagle.
2	...	<i>Haliaeetus leucocephalus leucocephalus</i> (Linnaeus)	Bald Eagle.
4	...	<i>Falco peregrinus pealei</i> Ridgway	Peale's Falcon.
5	...	<i>Falco sparverius sparverius</i> Linnaeus	Sparrow Hawk.
3	...	<i>Pandion haliaetus carolinensis</i> (Gmelin)	Osprey.
4	Nest	<i>Otus asio kennicotti</i> (Elliot)	Kennicott's Screech Owl.
3	...	<i>Bubo virginianus pacificus</i> Cassin	Pacific Horned Owl.
4	Nest	<i>Dryobates villosus harrisi</i> (Audubon)	Harris's Woodpecker.
7	"	<i>Dryobates pubescens gairdneri</i> (Audubon)	Gairdner's Woodpecker.
5	"	<i>Sphyrapicus ruber notkensis</i> (Suckow)	Northern Red-breasted Sapsucker.
4	"	<i>Phlaeotomus pileatus abieticola</i> (Bangs)	Northern Pileated Woodpecker.
6	"	<i>Asyndesmus lewisi</i> Riley	Lewis's Woodpecker.
2	"	<i>Calypte costae</i> (Bourcier)	Costa's Hummingbird.
2	"	<i>Scelasphorus rufus</i> (Gmelin)	Rufus Hummingbird.
4	"	<i>Nuttallornis borealis</i> (Swainson)	Olive-sided Flycatcher.
3	...	<i>Empidonax wrighti</i> Baird	Wright's Flycatcher.
5	Nest	<i>Cyanocitta stelleri stelleri</i> (Gmelin)	Steller's Jay.
4	"	<i>Spinus pinus</i> (Wilson)	Pine Siskin.
4	"	<i>Junco hyemalis oregonus</i> (J. K. Townsend)	Oregon Junco.
4	"	<i>Passerella iliaca fuliginosa</i> Ridgway	Sooty Fox Sparrow.
4	"	<i>Pipilo maculatus oregonus</i> Bell	Oregon Towhee.
4	"	<i>Zamelodia melanocephala</i> (Swainson)	Black-headed Grosbeak.
4	"	<i>Passerina amana</i> (Say)	Lazuli Bunting.
4	"	<i>Piranga ludoviciana</i> (Wilson)	Western Tanager.
4	"	<i>Vireosylva gilva swainsoni</i> (Baird)	Western Warbling Vireo.
5	"	<i>Lanivireo solitarius cassini</i> (Xantus)	Cassin's Vireo.
4	"	<i>Vermivora celata lutescens</i> (Ridgway)	Lutescent Warbler.
4	"	<i>Dendroica auduboni auduboni</i> (J. K. Townsend)	Audubon's Warbler.
4	"	<i>Oporonis tolmiei</i> (J. K. Townsend)	Macgillivray's Warbler.
3	"	<i>Wilsona pusilla pileolata</i> (Pallas)	Pileolated Warbler.
5	"	<i>Cinclus mexicanus unicolor</i> Bonaparte	Dipper.
5	"	<i>Thryomanes bewicki calophonus</i> Oberholser	Seattle Wren.
5	"	<i>Nannus hiemalis pacificus</i> (Baird)	Western Winter Wren.
6	"	<i>Certhia familiaris occidentalis</i> Ridgway	California Creeper.
7	"	<i>Sitta canadensis</i> Linnaeus	Red-breasted Nuthatch.
7	"	<i>Sitta pygmaea pygmaea</i> Vigors	Pygmy Nuthatch.
8	"	<i>Penthestes rufescens rufescens</i> (J. K. Townsend)	Chestnut-backed Chickadee.
5	"	<i>Regulus satrapa olivaceus</i> Baird	Western Golden-crowned Kinglet.
5	"	<i>Myadestes townsendi</i> (Audubon)	Townsend's Solitaire.
3	"	<i>Hylocichla guttata guttata</i> (Pallas)	Alaska Hermit Thrush.
3	"	<i>Hylocichla guttata sequoiensis</i> (Belding)	Sierra Hermit Thrush.
4	"	<i>Trooreus naevius naevius</i> (Gmelin)	Varied Thrush.
7	"	<i>Sialia mexicana occidentalis</i> J. K. Townsend ...	Western Bluebird.

FISHES.

Early in February the Director sent a specimen of the broad-fin cod (*Zaniolepis latipinnis*) to Dr. C. H. Gilbert, Department of Zoology, Stanford University, California, for verification. It was a very peculiar fish with the tail lacking.

Later I received from Dr. Gilbert the following: "I have received your specimen sent for identification and return it to-day. It proves to be a mutilated specimen of *Zaniolepis latipinnis*. It seems a marvel that a fish, left apparently without means of locomotion, should be able to make its way in the world and to reach an adult condition as well nourished as this seems to be. I do not recall having seen a similar case in the course of my long experience of fishes."

This peculiar specimen was taken by one of Watson's seine-boats in Stamp Harbour, near Alberni, V.I., and was presented to the Museum by Mr. A. A. Rhoades.

Mr. A. L. Hager, general manager of the New England Fish Company, Vancouver, who has always shown great interest in having his employees look out for rare specimens for the Museum, and through whose efforts several species have been added to the Provincial Museum collection,

wrote to the Director on February 11th, "that Mr. Walter White, for many years employed as a halibut-fisherman on the vessels of the New England Fish Company, and latterly as mate on the S.S. 'Kingsway,' brought to their office a rock weighing about 2½ lb. Mr. White states that he personally took this rock from the stomach of a halibut weighing about 60 lb. The S.S. 'Kingsway' was fishing off Bonilla Island at the time in about 35 fathoms of water. It occurred to us that you might like to receive and preserve this rock."

This rock was eventually sent to the Provincial Museum by Mr. Hager. Later I sent a copy of the letter, as requested by Mr. Hager, to Mr. Will F. Thompson, Assistant in charge of the Long Laboratory, California, for his information.

Mr. Thompson is a well-known fish expert on the halibut fishes, and has done considerable scientific research-work in the Northern British Columbia halibut waters. In reply, Mr. Thompson writes as follows:—

"Many thanks for your letter with the copy of the note on the rock swallowed by the halibut. It is perfectly possible. The halibut are famous eaters of small things, and they pick from the ground, rocks, etc., and all sorts of things, including sea-anemones, clam-siphons, etc., and in the process of doing so they frequently take in many things which are not intended to find a lodging in the stomach of fish. The famous stones which the cod takes in (as ballast) in storms are the results that follow too reckless eating on the part of the cod. The size of the stone, however, is a most surprising thing. It bears witness to the reckless habits of the halibut."

The Museum also received a specimen of a fish, donated by Mr. Harry Pidcock, Quathiaski Cove, B.C., which appears to me to be that of an immature alligator fish (*Podothecus acipenserinus*), but this has not been verified by an authority.

The Department also received a specimen of an immature pipe-fish (*Aulorhynchus flavidus*), presented by Mr. H. A. Cox, Esquimalt, B.C. A small species of fish (*Sebastes* sp.?) was also presented by Mr. A. S. Grice on July 30th, 1919.

This specimen I have not fully identified, and it will have to be sent through to Dr. Gilbert, who has always shown a great interest and is willing to do any work in the identification of fishes for this Department.

BOTANY.

The whole collection in the Herbarium has been numbered consecutively, and all duplicates correspondingly numbered and catalogued. This will eliminate a great disadvantage in connection with any correspondence concerning any particular species.

The number of mounted specimens in the collection of flowering plants at the present time is approximately 6,000. For some time past there have been many requests for a Check-list of the Flora of Vancouver Island, and it was deemed by the Director desirable to prepare the same. This entailed a considerable amount of work in the research of the earliest records of botanical collectors on the Pacific Coast.

The manuscript for this work, which was compiled by Mr. W. R. Carter, has now been completed, and it is to be hoped that the Department will be able to have it in the press before long. This Check-list also includes the plants known to occur on the islands adjacent, together with the Queen Charlotte Group.

Through the kindness of several collectors, a small number of specimens have been added to the collection, and thanks must be extended to the following gentlemen for the same:—

Professor J. K. Henry, for a small series collected in the Sicamous and adjoining districts, including: *Mentzelia albicaulis* Dougl.; *Gilia pharnaceoides* Benth.; *Castilleja lutescens* (Greenman) Rydb.; *Utricularia intermedia* Hayne; *Chanactis Douglasii* H. & A.; *Botrychium lunaria* (L.) Sw.; and *Lotus corniculatus* L. from Elgin, B.C.

Dr. C. F. Newcombe, for several rare specimens from the southern portion of Vancouver Island: *Tissa macrotheca* (Hornem) Britt.; *Ranunculus Lobbii* Gray; *Hosackia gracilis* Benth.; *Limnanthes Macounii* Trelease; also for access to his valuable botanical library in research of data difficult to obtain.

Mr. J. R. Anderson, for a large collection of plants, a few of which have made appreciable additions to the Herbarium, especially *Abronia acutalata* Standley and *Achillea californica* Poll., the latter a new record for Vancouver Island.

Among this collection were a number of specimens collected by his brother, Mr. W. B. Anderson, in various portions of the Province, which include: *Beckmannia erucaeformis* (L.) Host.; *Chenopodium urbicum* L.; *Thelypodium integrifolium* (Nutt.) Endl.; *Gilia Hookeri*

Benth.; *Lupinus ornatus* Dougl.; *Pentstemon ovatus* Dougl.; *Anogra pallida* (Lindl.) Britt.; *Sphaeralcea munroana* (Dougl.) Spach.; and *Tetradymia canescens* DC.

During the last summer a collection of plants was donated to the Museum by the authorities of the Mount Tolmie University School. This collection had belonged to the late Captain R. V. Harvey, who was one of the founders of the school. These plants, while mounted on small-size sheets, and in most instances showing little more than the inflorescence, can hardly be looked upon as Herbarium specimens.

Professor J. Macoun, senior Botanist of the Geological Survey of Canada, who has always taken a great interest in the Provincial Herbarium, and several years ago added to our collection over 900 named and classified specimens, mostly of the flora of Vancouver Island, has continued his great support to this division, and has made an offer to the Provincial Museum, subject to the approval of Mr. R. G. McConnell, Deputy Minister of Geological Survey, Ottawa, of a collection of Cryptogammes upon which he has been working and classifying for a considerable time.

The idea is for the Provincial Museum to take over for the time being the whole of his collection, with the understanding that a division be made on some future date (as there are a number of duplicates of each species) between this Department and the Department at Ottawa.

Both Professor Macoun and J. M. Macoun, C.M.G., Chief of the Biological Division of the Department of Mines, Ottawa, have always shown a great interest in the Provincial Museum, and have done a great deal of work, more particularly in the Botanical section, in the identification of plants from every section of this Province.

Mr. J. M. Macoun has also been filling in blanks in our collection from time to time from the Ottawa collection and from a number of plants that both he and his revered father have collected throughout British Columbia in their botanical survey of Canada. The Provincial Museum has at different times sent many specimens (of which a number at present are still there) to Ottawa to be verified by Mr. Macoun. These specimens, it is to be hoped, will be returned in due course.

IN MEMORIAM.

Mr. J. M. Macoun, C.M.G., Chief of the Biological Survey Department, Ottawa, died on January 8th, 1920. The late Mr. Macoun was one of the highest authorities on botanical research in Canada. He was a faithful and courageous public servant and a man of high standing in scientific research. His loss will be keenly felt not only by the Department with which he had been so long connected, but also by the Provincial Museum in Victoria, to which he was a constant visitor when on the Pacific Coast.

ENTOMOLOGY.

The Museum collection during the year has been greatly enriched by the donation of the valuable collection of the late Captain R. V. Harvey, which was donated by the authorities of the Mount Tolmie University School. This collection is especially rich in Diptera, of which the late Captain Harvey was a recognized authority in British Columbia.

The Coleoptera and Hymenoptera collections are also particularly acceptable, and, as they are representative of the whole of Southern British Columbia, they will enable us to enlarge and extend our own collections in these orders. Provision is being made for the incorporation of these collections with those already existing in the Museum, and when finally installed they will prove of incalculable value to students.

The thanks of the Department are due to Mr. E. H. Blackmore, President of the British Columbia Entomological Society, for his valuable services, which were instrumental in securing this highly desirable collection for this institution.

Mr. Blackmore has always done considerable work in the Entomological division of this Department, both in identification and arranging the collection for study and inspection, and he has also written the following paper on entomology.

ENTOMOLOGY.

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

Practically no entomological field-work of any description was undertaken by any of the Museum staff during the past season, and therefore there is not so much as usual to write about in connection with the actual work of the Museum. I have, however, been able to gather a few

PLATE I.
LYCAENIDÆ, HESPERIIDÆ, AND ARCTIIDÆ.

Plebeius icarioides blackmorei B. & McD.
(Male paratype.)
Goldstream, B.C. (E. H. Blackmore).
(New to science.)

Plebeius icarioides blackmorei B. & McD.
(Female paratype.)
Goldstream, B.C. (E. H. Blackmore).
(New to science.)

Plebeius icarioides blackmorei B. & McD.
(Under-side male.)
Goldstream, B.C. (E. H. Blackmore).

Plebeius icarioides pembina Edw.
(Under-side male.)
Rossland, B.C. (W. H. Danby).

Heodes cupreus Edw.
Lillooet, B.C. (A. W. A. Phair).
(New to British Columbia.)

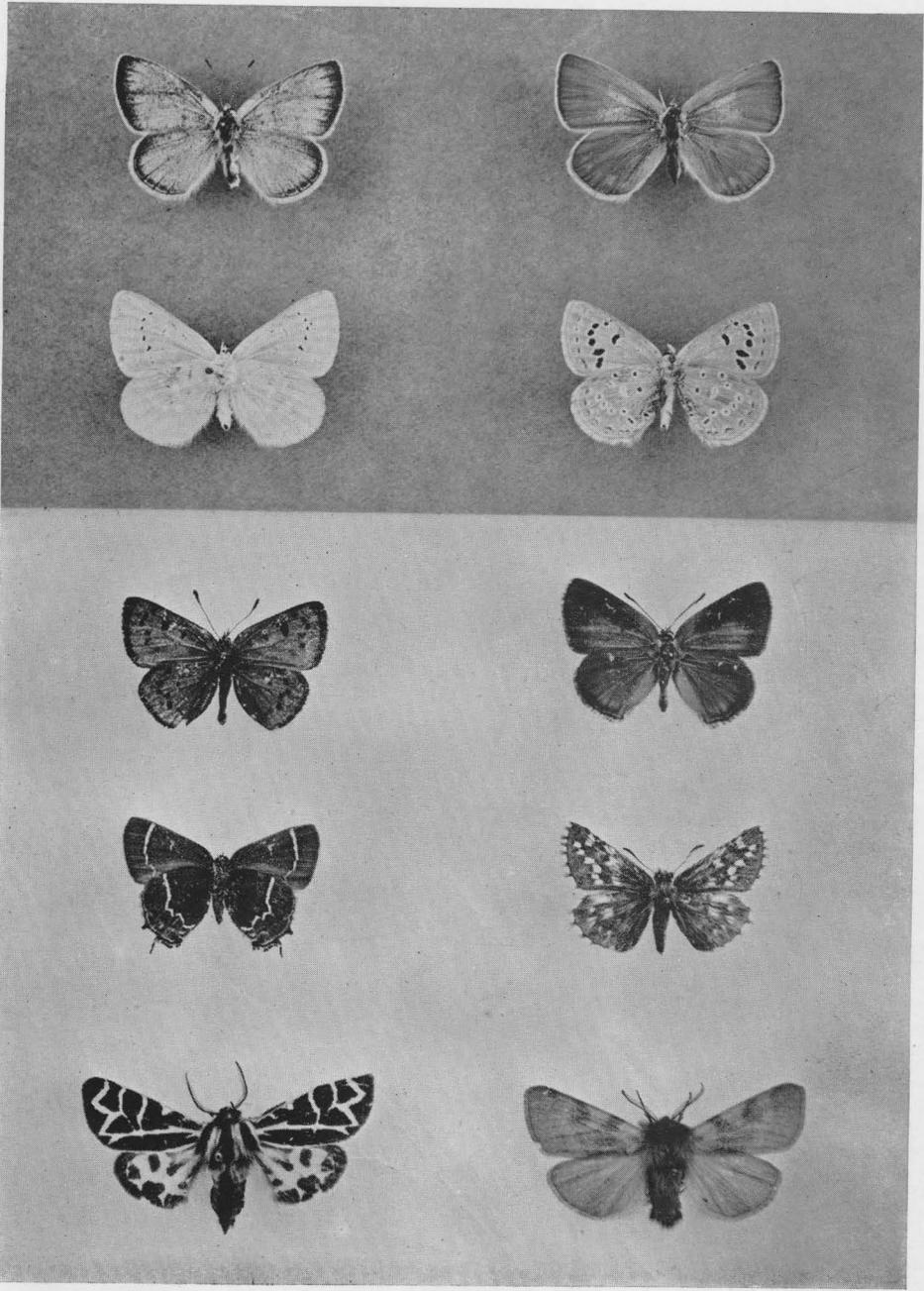
Callipsyche behri Edw.
Osoyoos, B.C. (W. B. Anderson).
(Very local.)

Mitoura spinctorum Bdv.
Fairview, B.C. (W. B. Anderson).
(Very rare.)

Hesperia centaurea Ramb.
Atlin, B.C. (E. M. Anderson).
(New to British Columbia.)

Apantesis blakei diecki Neum.
Lillooet, B.C. (A. W. A. Phair).
(New to British Columbia.)

Neoarctia beani Neum.
Kaslo, B.C. (J. W. Cockle).
(New to British Columbia.)



interesting facts from other workers in the Province; a little more previously undetermined material has been worked over; and these, together with some of my own captures, will enable us to present a fairly comprehensive account of the work done in the Province in this particular branch of science during the year 1919.

In last year's report mention was made of the remarkable scarcity of noctuids during that year, but this past season was far worse. In fact, this scarcity extended to all orders of insects, and was not confined to any particular district, but was noticeable in every section of the Province. There is no reasonable explanation that can be given of this sudden diminution of numbers, and even of species.

As usual, there were a few exceptions to the general rule, one of them being our old friend (?) the forest tent-caterpillar (*Malacosoma pluvialis* Dyar). The larvæ of this moth were particularly numerous in the early spring, even worse than the year previous, but fortunately before they became "full-fed" they were attacked by a disease—of a fungoid or bacterial origin—which killed them off in thousands.

In the south-eastern part of the Province, especially along the border, a great deal of damage was done by several species of locusts—one of the worst invasions we have had for many years. Mr. E. R. Buckle, of the Provincial Department of Agriculture, has been working in the infected area during the season, studying the conditions and using remedial measures with a view to preventing the occurrence of a further outbreak.

In the Report of the Provincial Museum, 1918, on page 12, is a note on the occurrence of *Hemerocampa vetusta gulosa* at Chase, B.C., in which the writer stated that the insect was double-brooded. This I find is not the case, as in a subsequent letter from Mr. R. C. Treherne, Dominion Field Officer for British Columbia, he remarks that from the data in his possession he is quite satisfied that this destructive insect is only single-brooded. It is interesting to note in this connection that Mr. W. B. Anderson found a slight outbreak at Armstrong during the past year in addition to the one reported from Chase the year previously, which latter had spread much farther than when first noted.

RARE AND UNCOMMON INSECTS TAKEN IN BRITISH COLUMBIA DURING 1919.

Owing to the dearth of insects in the Province during the past season, it would be only reasonable to suppose that this section of our report would be smaller than usual; nevertheless, quite a few items have been reported which are of more than passing interest.

Victoria.—In late May two worn specimens of that rather rare Spingidae, *Proserpinus clarkii* Bdv., were taken at rest on a peach-tree at Swan Lake. A very fine specimen of *Polia variolata* Sm. was taken by Mr. W. R. Carter on July 11th; this capture is exceedingly interesting in view of the facts set forth in last year's Museum Report, wherein this species was figured. The same collector also took a nice specimen of *Ipimorpha nanaimo* Barnes, to which, curiously enough, the same remarks apply.

In addition to the specimen of *Cucullia omissa* Dod, which is figured on Plate II., another specimen was taken in the Hollywood District by David Livingstone, a young and enthusiastic collector, who has kindly donated it to the Museum collection.

A male specimen of *Erebus odora* Linn. was captured the first week in October by Mr. W. R. Nairnes, of this city. It was taken about 4 o'clock in the afternoon of an exceedingly windy day, and at first sight Mr. Nairnes thought it was a large leaf being blown about. This is the first capture of this Florida "migrant" we have heard of for several years.

Goldstream.—The writer spent a few hours at the Goldstream Flats on July 20th, and amongst other interesting material obtained was a short series of *Epirrhæ alternata* Mull., a pair of *Dysstroma occidentatâ* Tayl., and a single specimen of *Stammodes blackmorci* Swett.

Fitzgerald.—This station is situated about eleven miles north of Goldstream and is in the midst of a mountainous district. Mr. W. R. Carter, of the Museum staff, spent many week-ends in the locality and obtained many desirable species. Amongst the Diurnals several specimens were taken of both sexes of that rather uncommon little skipper, *Euphyes vestris* Bdv. The most interesting noctuids were *Euxoa ochrogaster gularis* Grt.; *Feltia herilis* Grt.; *Zosteropoda hirtipes* Grt.; *Septis multicolor* Dyar; and *S. plutonia* Grt. Amongst the geometers the following were of special interest: *Cosymbia lumenaria* Hbn.; *Diactinia silaceata albolineata* Pack.; *Eupithecia cretacea* Pack.; *Drepanulatrix fœminaria* Gn.; and *Sericosema juturnaria* Gn. We are glad to have this last record, as very few specimens have been taken on Vancouver

Island, and this is the most southerly point yet recorded. Mr. A. W. Hanham, in a recent letter, tells me that he has a specimen given him by the late Rev. G. W. Taylor, labelled Cameron Lake, July 23rd, 1903, and Mr. G. O. Day writes me that he took one specimen at Cowichan Bay, July 7th, 1915. The date of the Fitzgerald specimen is June 15th. On the Mainland, anywhere from Lillooet to the Kootenays, this particular geometer is very abundant, some years being a perfect nuisance.

Maillardville.—This small settlement is about a mile from Fraser Mills and some five miles from New Westminster. Mr. L. E. Marmont, the Reeve of the district and an old-time entomologist, has taken some very interesting species there. The most desirable of the Noctuidæ are *Rynachgrotis gilvipennis* Grt.; *Trachea impulsa* Gn.; and *Bomolocha palparia* Wlk. (uncommon).

Mention must be made of two remarkable aberrations; one of *Namagana præacuta* Sm. is a peculiar melanic form, the ground colour of the primaries being of a dark sooty brown, with the orbicular, reniform, and s.t. line of a light-ash colour and standing out in startling relief. The other one is *Zale minera norda* Sm., and in place of the usual mottled appearance, with its abundance of fine wavy lines, the whole of the wings are light brown, being only relieved by a wide black i.p. line, black discal mark, and black basal area. Amongst the geometers taken, *Philobia ulsterata* Pears. is very uncommon, and we were glad to get the record of *Caripeta æqualitaria* Grt., taken on May 17th. This latter seems to be exceedingly rare, as we have very few records of its capture.

Lillooet.—During the first week in July Messrs. Day & Hanham, of Duncan, made a collecting-trip to Lillooet, and, although owing to the poor season the general result was rather disappointing, a few good specimens were taken, especially in the Geometridæ. Amongst some of the latter submitted to us for identification we noted the following: *Drepanulatrix unicalcararia* Gne. and its form *cervinicolor* Hlst.; *D. feminaria* Gne.; and *D. carnearia* Hulst. The latter is an exceedingly good capture and is the first male and the third record we have from the Province, the other two being a female from Kaslo and another female from Ymir.

A single specimen was taken of *Dysstroma formosa* Hulst. This is the first record we have had of this for three years, Mr. A. W. Phair having taken a single specimen at the same place on June 23rd, 1916.

On looking over some material recently sent by Mr. Phair, we found a nice specimen of *Smerinthus cerisyi ophthalmicus* form *pallidulus* Edw., taken on August 16th, 1919. This is the latest date we have of this form, although Mr. Cockle reports one taken at Kaslo on August 9th, 1901. Amongst the Noctuidæ, *Rynachgrotis vittifrons* Grt. and *cerapoda oblita* Grt. are the best. Up to the present we have no record of either of these species being taken in any other locality.

Spences Bridge.—Mr. W. A. Newcombe, who is connected with the Provincial Department of Fisheries, spent the latter part of August in this district, and in his spare time collected a little material, some of which was very desirable, noticeably *Euxoa costata idahænsis* Grt.; *Rhizagrotis flavicollis* Sm.; and *Lycophotia nigra* Sm. The latter name has been used in many British Columbia collections for a somewhat similar species—*L. stricta subjugata* Dyar. The only other authentic records of *nigra* that we have besides this are from Armstrong, Rosslund, and Kaslo. Only one geometer was taken, *Itame matilda* Dyar.

Quesnel Dam.—During September Mr. Newcombe spent a few weeks in this locality, but as the season was getting late nothing much was taken; however, we are always pleased to get material from here, as very little collecting has been done in this district. *Polygonia satyrus* Edw., *P. faunus rusticus* Edw., *Aglais j-album* Bdv. and Le C., were the only Diurnals taken. A short series of *Agrotis inopinatus* Sm. was captured, the only noctuid observed. Geometers were also scarce, three specimens of *Dysstroma* being all that were seen. Two of these belong to the *citrata* group, the other one being *D. formosa boreata* Tayl., which is a very rare form and one that we are pleased to receive.

Osoyoos.—In addition to the Diurnals mentioned under the heading of "Illustrated Lepidoptera," Mr. W. B. Anderson succeeded in getting a few specimens of *Marmopteryx marmorata* Pack. This is an exceedingly pretty geometer on the under-side, the marbled effect being especially striking. The first specimens we saw of this species were a pair collected by Mr. E. M. Anderson on May 7th, 1913, at Vaseaux Lake, just south of Penticton.

Fort Steele.—Mr. W. B. Anderson took the first specimen of *Euptoieta claudia* Cram. recorded from British Columbia on September 23rd, 1919. This is a most interesting record, and we are glad that Mr. Anderson, who is a most indefatigable worker, has added this to our list of

British Columbia butterflies. It belongs to the family Nymphalidæ and is closely allied to the genus *Argynnis*. It has a wide distribution throughout the United States and South America, being essentially a southern insect.

NEW BRITISH COLUMBIA INSECTS.

The following ten insects have been described as new to science during the year 1919, and comprise seven species of Lepidoptera, two species of Diptera, and one of Thysanoptera.

Lepidoptera.

Plebeius icarioides blackmorci Barnes & McDunnough is described in the Can. Ent., Vol. 51, p. 92, April, 1919, from a number of specimens taken by the writer at Goldstream on May 31st, 1918. More extended remarks on this new race will be found under the heading of "Illustrated Lepidoptera."

In the Journal New York Ent. Socy., Vol. XXVII., Nos. 2 and 3, June and September, 1919, Dr. R. Ottolengui describes several new species and races of the genus *Autographa* (Noctuidæ), amongst which are two from British Columbia. *Autographa magnifica* described from a single female taken at Ucluelet, on the west coast of Vancouver Island. It was taken by a member of the Forestry Branch of the Dominion Department of Agriculture. The type is in the Canadian National Museum at Ottawa.

The other is *Autographa rectangula nargenta* and was described from material belonging to Mr. J. W. Cockle, of Kaslo, B.C., and Mr. A. W. Hanham, of Duncan, B.C. This is the *rectangula* of our check-lists, which is really an Eastern species.

The chief distinguishing characteristic of this new race is the transverse posterior line, which is distinct and geminate, the space between being filled with silver.

In the Lepidopterist, Vol. 3, No. 2, p. 105 *et seq.*, July 15th, 1919, Messrs. Swett & Cassino describe four species of geometers belonging to the genus *Eupithecia*. Two of these are from British Columbia, viz.: (1) *Eupithecia probata*, described from specimens taken at Duncan and Victoria, and (2) *Eupithecia moirata*, taken by E. M. Anderson at Penticton in 1913. Both these new species will be treated of more fully under the same heading as the preceding.

Microlepidoptera.

In the Proc. Ent. Socy. Wash., Vol. 21, No. 3, March, 1919, under the title of "Two Microlepidoptera injurious to Strawberry," Mr. August Busck describes two new "Micros" from specimens taken by Mr. W. Downes, Dominion Junior Entomologist at Victoria, B.C. The first is *Tortricodes fragariana*, and, according to the author, is the first published record of this genus in North America. Mr. Downes says that this species breeds commonly in the buds at the head of the crowns of strawberry.

The second is *Aristotelia fragaria*, and, according to Mr. Busck, is the so-called "strawberry-crown borer," on which there is considerable economic literature, but which had not previously received a specific name. The first species belongs to the family Tortricidæ and has the fore wings brownish fuscous in colour, overlaid with black and reddish scales; the hind wings are much lighter, being a silvery grey. It is a small moth measuring 17 mm. in alar expanse. The second species, *Aristotelia fragaria*, is a member of the family Gelechiidæ and is a much smaller insect, being only 12 mm. in width when spread. In colour it is dark brown, with the hind wings lighter.

Diptera.

In an article on "The Streptocera Group of the Dipterous Genus *Tipula* Linn.," Annals Ent. Socy Amer., Vol. 12, No. 2, p. 84, June, 1919, Dr. W. G. Dietz describes some half-dozen new species, one of which is recorded from Victoria, B.C., under the name of *Tipula tryptophora*. It is described from nine specimens, two males and seven females, all from Victoria, and apparently on the same date, July 6th, 1912, but who the captor was is not stated. This is one of the crane-flies.

Mr. Jas. S. Hine, in an exhaustive review of the "Robber-flies of the Genus *Erax*" (*idem*, p. 103), describes quite a number of new species in the various groups of this genus.

One amongst them is particularly interesting to us, as the two specimens from which they were described were taken by the late Captain R. V. Harvey at Vernon in August, 1904. The

species, which belongs to "The Aridus Group," has been named by Mr. Hine *Erax harveyi* in honour of its collector.

Thysanoptera.

In a very interesting article on "Western Thysanoptera" by R. C. Treherne, Dominion Assistant Entomologist for British Columbia, in *Can. Ent.*, Vol. 51, p. 181, August, 1919, a new species of Thrips is described from this Province under the name of *Ælothrips auricestus*. The type material consists of nine macropterous females taken by the author from the western wild rye-grass (*Elymus condensatus*) at Vernon and Kelowna in July, 1917. The author of the above article is to be congratulated for the able and painstaking manner in which he has collected and presented the known facts, augmented with his own observations, of the different species belonging to this order occurring in British Columbia, some of which are of great economic importance. The paper is illustrated with two plates, which add greatly to its usefulness.

ILLUSTRATED LEPIDOPTERA.

In continuation of the idea expressed last year, of describing more fully the insects illustrated in the Annual Report, we are acting in accord with the declared wishes of the active entomologists of this Province, as the commendatory letters we have received during the past year fully testify. As stated in last year's Annual Report, the numbers appearing before each name correspond with a similar number in Messrs. Barnes & McDunnough's Check-list of North American Lepidoptera, February, 1917. Those with a star prefixed to them have been described during the year 1918.

Diurnals (Plate. I.).

372. *Mitoura spinetorum* Bdv. This is one of our butterflies which appears to be more or less local. Until quite recently only two or three specimens had been taken in the Province—two, I believe, at Fairview and one at Kaslo. In a recent letter, Mr. J. W. Cockle, of the latter place, remarks that he has taken a second specimen. Mr. Walter B. Anderson, Dominion Inspector of Indian Orchards, while on a trip in the Boundary country early last June, took a short series at Fairview and a few days later took two more at Penticton. It is an easily recognized insect, as on the upper side it is nearly black in colour, with the basal half of the wings shot with bluish-green. The under-side is reddish-brown, with the contrasting white lines which is characteristic of this subfamily. A figure is given of the under-side, showing the arrangement of the lines, which differ somewhat from its close ally, *Mitoura nelsoni*, which occurs on Vancouver Island and the Lower Fraser Valley.

394. *Callipsyche behri* Edw. is apparently more local than the preceding one, and so far has only been taken in one district in the Province—namely, the Osoyoos District. There is a strip of land extending from the boundary-line to Penticton (and including Osoyoos, Fairview, Dog Lake, and Vaseaux Lake) which is the extreme tip of the Upper Sonoran fauna, and many insects are taken in this district which do not occur in any other part of the Province.

It is rather a pretty butterfly, its colour on the upper side being a bright fulvous, with wide black-brown marginal bands. The specimen figured was taken by Mr. Anderson at Osoyoos in the first week in June. It is an inhabitant of Northern California and Oregon, extending eastward to Colorado.

411. *Heodes cupreus* Edw. Passing mention was made of this beautiful butterfly in the Report of the Provincial Museum, 1917, page 13. It was only recently that we were able to secure a good specimen for photographic purposes, and we are glad to illustrate this species, as it is entirely new to British Columbia, and, as far as the writer knows, has only been taken on Mount McLean, near Lillooet, at an altitude of between 7,000 and 8,000 feet. It was taken by Mr. A. W. A. Phair, an enthusiastic collector of Lillooet, who has done much to extend and enlarge our knowledge of the fauna of that district. It is a gorgeous little butterfly, being a bright coppery red, spotted with black. It is exceedingly rare, and previous to 1892 had been recorded from two localities only—namely, Mount Shasta, California, and Oregon. In that year Mr. W. G. Wright took three or four specimens at a high altitude in the Sierra Nevadas of California. It is closely allied to *Heodes snowi* Edw., which is duller in colour and not so heavily spotted. This latter is taken at Laggan, Alberta, in the Canadian Rockies, and also in the high mountain ranges of Colorado. We also have a specimen of this species in the Museum collection, taken at "Boom Pass"; this locality being a local name cannot definitely be placed, but is probably in the vicinity of Revelstoke.

PLATE II.
NOCTUIDÆ AND GEOMETRIDÆ.

Cucullia omissa Dod.
Victoria, B.C. (E. H. Blackmore).
(New to Vancouver Island.)

Cucullia florea Gue.
Rossland, B.C. (W. H. Danby).
(New to British Columbia.)

Stretchia plusiaformis Hy. Edw.
Rossland, B.C. (W. H. Danby).

Stretchia muricina Grt.
Victoria, B.C., (E. H. Blackmore).

Cerma cuerva Barnes.
Victoria, B.C. (E. H. Blackmore).
(Very rare.)

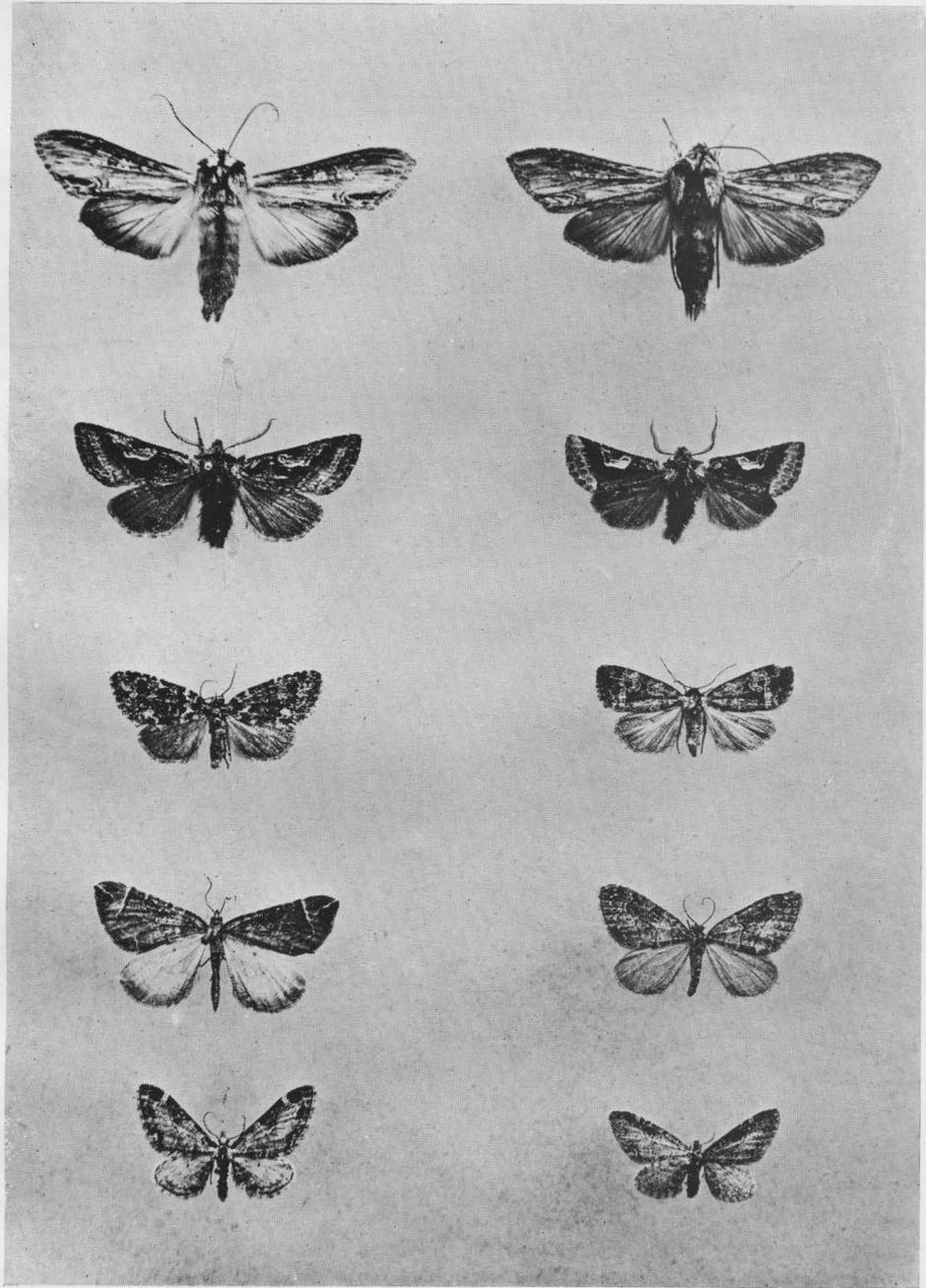
Monodes festivoides Gue.
Lillooet, B.C. (G. O. Day).
(Very rare.)

Lygris testata Linn.
Quesnel Dam, B.C. (W. A. Newcombe).
(New to British Columbia.)

Thera otisi Dyar.
Kaslo, B.C. (J. W. Cockle).
(Very rare.)

Eupithecia probata Swett & Cassino.
Victoria, B.C. (E. H. Blackmore).
(New to science.)

Eupithecia moirata Swett & Cassino.
Penticton, B.C. (E. M. Anderson).
(New to science.)



Plebeius icarioides blackmorci B. & MD. This new race was described by Messrs. Barnes & McDunnough in the *Canadian Entomologist*, April, 1919, page 92, from twenty-six specimens of both sexes sent to them by the writer, and taken at Goldstream on May 31st, 1918. In June, 1916, I captured about six specimens, mostly females, on a small hill some 700 or 800 feet high about three miles south of Goldstream; they were new to me, but later I found a pair in the Museum collection under the name of *Cupido pheres* and three specimens in the collection of Mr. A. J. Croker under the name *Cupido icarioides*. Upon further comparison I found that they were all conspecific and sent them to Messrs. Barnes & McDunnough for their opinion. Dr. McDunnough stated in his reply that it might prove a good geographical race, but would need a good series of both sexes to make sure. In June, 1917, I was collecting in the Lower Fraser Valley, and was therefore unable to be at Goldstream at the time of their emergence. The last two weeks of May, 1918, were extremely windy, and after waiting a whole week in vain for the wind to abate I decided to chance it, and in company with Mr. Arthur Robinson, of this city, went to Goldstream. Upon our arrival there the wind was blowing as furiously as ever, and the chances of capturing our prized "blue" seemed very remote. However, as we had come so far, we decided to walk the remaining three miles to the hill where I had taken them two years before. On the top of this elevation is an area of about an acre in extent, totally devoid of trees, and covered with blue lupines (*Lupinus columbianus* Heller), on which plant the larvæ of this butterfly feed. Upon reaching this spot the wind was still blowing hard, and the lupines were bent over at an angle of 45 degrees; the outlook was very discouraging, as we had had a long walk, and naturally there was nothing flying in such a wind. After being there a few minutes I noticed a "blue" butterfly hanging on for dear life to the stalk of a lupine that was swaying violently in the wind, and to my great delight it was the one we were looking for. We then commenced a diligent search, and in the course of an hour and a half "bottled" over forty specimens. This spot seems to be the headquarters of this species, as, although I have taken it in two other places in the general vicinity, it has only been very sparingly. On the Malahat, some eight miles north of Goldstream, on the side of a small mountain of some 1,200 feet elevation, there were acres and acres of this blue lupine, over which "blue" butterflies were swarming, and out of over a hundred that were captured only six proved to be this species. *Cupido pheres*, under which name this insect has gone for a number of years, is only known from the San Francisco Bay region and typical *icarioides* from the mountains of California.

433E. *Plebeius icarioides pembina* Edw. This is another of our blues that has been misidentified in British Columbia collections for many years, it having passed under the name of *fulla* in the 1904 Check-list, and under the name of *ardea* in Check-list issued in 1906. *Ardea* is now regarded as a race of *icarioides* from the Great Basin region (*vide* Cont. Lepid. No. Amer., Barnes & McDunnough, Vol. III., No. 2, page 114).

ARCTIIDÆ (PLATE I.).

946. *Neoarctea beani* Neu. This species is a new record for British Columbia, and was taken at "light" by Mr. J. W. Cockle at Kaslo on August 20th, 1919. This is one of the most interesting finds of recent years, as, although it was described over twenty-eight years ago (Can. Ent., Vol. 23, p. 123, June, 1891), I believe that this is the second specimen taken in the adult state. It was originally described from Laggan, Alberta, where Mr. T. E. Bean bred several specimens from estray larvæ which he had picked up in a full-fed state. During the four years that Mr. Bean spent in that district he only took one adult specimen, a male, on July 2nd, 1888, all the others being bred from estray larvæ, which he found feeding on willow, exclusively. In the Can. Ent., Vol. 36, p. 350, December, 1904, Wolley Dod writes of having a single specimen from Mr. Dean, dated July 9th, 1900; this was also bred from a larva found on willow. The only other record I can find of this species is in Gibson's Entomological Record for 1908, where he states that Mr. N. B. Sanson, of Banff, had sent him a larva of this species, found on Sulphur Mountain, the resulting imago emerging at Ottawa on June 15th. Mr. Cockle's specimen is a male in fine condition, and we are glad to be able to illustrate this, as he has done so much to work up the fauna of the Kootenay country; his untiring efforts for so many years have given us a large amount of knowledge which we otherwise would not possess.

987c. *Apantesis blakei diecki* Neu. The specimen illustrated was taken by Mr. A. W. Phair at Lillooet, but unfortunately bears no date. In Dr. Dyar's "List" (Bull. 52, U.S.N.M.) *diecki* is placed as a synonym of *determinata*, which is a race of *williamsi* Dodge, but in Cont. Lepid.

No. Amer., Barnes & McDunnough, Vol. III., No. 3, p. 159, the authors believe that *diecki*, along with our other British Columbia form *superba* Stretch, should be treated as a race of *blakei* Grt.

Unfortunately, very little material in this group is available from British Columbia, and until these various races can be bred from larva to imago, with notes on their larval and pupal stages, they cannot be definitely placed. *Diecki* was described in Amer. Ent., Vol. VI., p. 62, 1890, from Spences Bridge, B.C.

NOCTUIDÆ (PLATE II.).

1869. *Stretchia murician* Grt. We have illustrated this species, as it has been misidentified in nearly all British Columbia collections, and is generally placed under the name of *S. plusiæformis* Hy. Edw. The probable reason for this may lie in the fact that in Dr. Dyar's Catalogue (Bull. 62, U.S.N.M.) *muricina* is listed as a synonym of *plusiæformis*. There is a certain superficial resemblance between them, but they are easily separable by the following differences in maculation: In *muricana* the pale terminal area of the primaries is sharply divided from the chestnut-brown of the rest of the wing, while in *plusiæformis* the bluish-grey outer area merges imperceptibly with the brown median band of the fore wing. Also the basal area of the latter species is of somewhat the same shade of grey as the outer area, while in *muricina* it is concolorous, with the rest of the wing, excepting the pale terminal area. In *plusiæformis* the thorax is light grey, with a distinct black collar; in *muricina* the thorax is light brown, with the patagia pale, and a narrow dark-brown colour; also in the former the fringes of the primaries are far more heavily checkered.

1871. *Stretchia plusiæformis* Hy. Edw. The specimen figured was taken by Mr. W. H. Danby at Rossland some twenty years ago, and a comparison of the two figures will show the differences that I have pointed out above. In our previous Check-lists *plusiæformis* is listed as being "generally distributed," but so far I have only seen the species from Rossland. It most likely occurs throughout the whole of that region and should be taken at Kaslo. *Variabilis* Sm., listed from Kaslo only, may be this species, but this I have not as yet seen; it was described from Colorado. *Muricina* was described from Oregon and should occur throughout British Columbia as far east as the Okanagan, but our material only indicates points on Vancouver Island and the Lower Fraser Valley.

1999. *Cucullia florea* Gn. This is another of Mr. Danby's captures from Rossland, and has not hitherto been recorded from British Columbia. The species in this genus have at all times been very difficult to separate satisfactorily, as many of them are closely allied, and although, as a rule, the species are rather uncommon, especially in the West, they have a very wide range. *Florea* is an Atlantic Coast species, its habitat being given as New York and New Jersey.

In the 1906 Check-list *obscurior* Sm. is listed from Kaslo and the Coast region. This species is now regarded as a race of *florea*. It is decidedly smaller and has much the same type of maculation, or lack of it, and is of a more even colour. We have only seen the species from Penticton and Lillooet, although Dr. Dyar records it from Kaslo in his "Kootenai" List, Proc. U.S.N.M., Vol. 27, p. 871.

2001. *Cucullia omissa* Dod. This species has been recorded from a greater number of localities in British Columbia than any other species of this genus, but the specimen illustrated is the first record of its being taken in Victoria. It was taken by the writer on June 27th, 1919, at rest on an electric-light pole and was in beautiful condition. This species was described by the late Wolley Dod in the Can. Ent., Vol. 48, p. 58, February, 1916. The type material came from a number of localities, including Nelson and Windermere, in British Columbia.

This species had been confused with *postera* Gue. (to which it is closely allied) for a number of years, and was listed from Kaslo under this name in previous British Columbia Check-lists. The known range of *omissa* in British Columbia is from Vancouver Island to the Rocky Mountains, and we have records from many intermediate points, including Princeton, Merritt, Kamloops, and Kaslo.

2412. *Cerma cuerva* Barnes. This is apparently a rather rare species. The writer has only taken two specimens in eight years—one on August 25th, 1916 (the specimen figured), and another one in rather poor condition some two or three years previous. As far as can be ascertained, it has not been taken at any other locality besides Victoria. It was described by Dr. W. Barnes (Can. Ent., Vol. 39, p. 10, January, 1907) from a single male specimen taken by Mr. A. W. Hanham in this city. It is rather a pretty insect, the fore wings being a dark

brown with an olive-green tinge, sprinkled with black and white scales. There is a specimen of this species in the Provincial Museum collection labelled *Cerma olivacea* Sm., and under which name it is listed in the British Columbia Check-list.

2608. *Monodes festivooides* Gn. This is another uncommon species as far as British Columbia is concerned. The specimen illustrated was taken by Mr. G. O. Day, of Duncan, while on a collecting-trip at Lillooet last July. It is recorded from Wellington and Kaslo, and I have not heard of it from any other locality. I have seen the Wellington specimen, and it is in a very ragged condition. It was taken on June 18th, 1904. Holland, in his "Moth Book," remarks that it is not uncommon in the Eastern States.

GEOMETRIDÆ (PLATE II.).

3979. *Lygris testata* Linn. This geometer is new to British Columbia and was taken by Mr. W. A. Newcombe at Quesnel Dam on September 2nd, 1919. This is a European insect, but occurs throughout the Atlantic States; it has also been reported from Calgary, Alberta, by Wolley Dod. In the U.S. Geo. Survey, Vol. 10, 1876, "Monograph of the Geometrid Moths," Packard gives Victoria, B.C., as a locality, which is evidently an error, as *propulsata* Walk. is the only species of this genus occurring on Vancouver Island.

3990. *Thera otisi* Dyar. The specimen figured is from the nymotypical locality and was taken by Mr. Cockle on August 27th, 1919. This is not by any means a common species, and even at Kaslo is not of regular occurrence. It is reported from Cameron Lake, but this, I believe, is meant for Mount Arrowsmith, as I have seen three or four specimens (in a very poor condition) taken by Mr. Theo. Bryant many years ago and labelled from that locality. I also have a note that I saw a specimen from Lillooet a year or so ago.

**Eupithecia probata* Swett & Cassino. This pretty little geometer was described from material collected by the writer at Victoria, B.C. This species is rather uncommon and has previously gone under the name of *nevadata* Pack., with which it has been confused for many years. It is one of the earliest of our "pugs" and is generally found in company with *E. ravocostaliata* Pack., appearing about the last week in March. I have never seen them on the wing, but have generally found them in the early morning at rest on electric-light poles. In eight years' collecting I have taken but ten specimens of this species; on the other hand, its congener, *ravocostaliata*, is fairly common.

**Eupithecia moirata* Swett & Cassino. This species had been previously identified by Mr. Swett as *implorata* Hulst, but a careful study of Hulst's type by the senior author has proved that this species is new, although closely allied. It differs from *probata* in its smaller size and dark fuscous wings. It was described from specimens taken by Mr. E. M. Anderson at Penticton on April 17th and 18th, 1913. It is evidently local, as I have not seen any other specimens since, although I have examined considerable material from there during the last three years.

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