PROVINCE OF BRITISH COLUMBIA

REPORT

OF THE

PROVINCIAL MUSEUM

OF

NATURAL HISTORY

FOR THE YEAR 1917

PRINTED BY
AUTHORITY OF THE LEGISLATIVE ASSEMBLY.

VICTORIA, B.C.:
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1918.

To His Honour Sir FRANK STILLMAN BARNARD, K.C.M.G.,
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 1917.

J. D. MACLEAN,
Provincial Secretary.

Provincial Secretary's Office, Victoria,
March 7th, 1918.

PROVINCIAL MUSEUM OF NATURAL HISTORY,

VICTORIA, B.C., March 7th, 1918.

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, 1917, covering the activities of the Museum.

I have the honour to be,

Sir,

Your obedient servant,

FRANCIS KERMODE,

Director.

PROVINCIAL MUSEUM REPORT

FOR THE YEAR 1917.

Since the last Annual Report of the Provincial Museum it has been found that it was still necessary that the strictest economy must be exercised in the maintenance of public institutions, expending moneys only where it was absolutely necessary, and still keep up to the objects of the "Provincial Museum Act," viz.:—

(*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 to increase and diffuse knowledge regarding the same.

Although quite a large number of specimens have been added to the collection during the year, little actual field-work was undertaken, as at the usual time to start field-work it was not possible to secure the desired assistants.

However, Dr. C. F. Newcombe, who has always been only too willing to assist in building up the collections of the Provincial Museum, offered his services voluntarily, and accompanied the Director on a trip to the Bella Coola District in the month of June.

While in Bella Coola special efforts were made to collect the flora of the district, as this was particularly needed in mapping out the distribution of the different species of plants in this Province. Quite a large representative collection was secured and prepared, of which special mention is made in the botanical report. A number of plants were also collected at Ocean Falls while waiting there for a steamer to Victoria.

Advantage was also taken of the information conveyed to the Director by Mr. W. H. Gibson, the missionary at Bella Coola, that he thought it would be possible to secure a number of old ceremonial masks, which had been in possession of the tribe for a great number of years, from an old Indian chief, "Captain Schooner."

Dr. Newcombe and the Director paid several visits to the old reserve to see the old chief, and after using a great deal of diplomacy and secrecy (which is necessary when dealing with Indians in such matters, especially with chiefs), these ceremonial masks were secured with their stories and legends.

In the month of April the Department was fortunate in purchasing from Lieutenant F. C. Swannell, B.C.L.S., of Victoria, a collection of Indian relics from the Northern Interior of the Province, from which locality the Museum had very little material; these specimens belonged to a number of tribes, which, like others, are fast disappearing. Lieutenant Swannell had collected these specimens several years ago while out with survey parties in the northern portions of the Province.

Two very valuable collections of anthropological material were donated to the Museum, one by Mrs. Gertrude A. Croucher, Yale, B.C., in memory of her much respected husband, the late Rev. Charles Croucher. This collection, numbering 158 specimens, was collected by Rev. Mr. Croucher many years ago, and has been much coveted by a number of the museums of America; but the late reverend gentleman was loyal to this Province, and would not allow his collection to go out of British Columbia, and always said that at his death the specimens were to be donated to the Provincial Museum at Victoria, so that they would be accessible to students in the study of the life-history of the aboriginal races of this North-west Coast of America.

The other anthropological collection, numbering eight specimens, was donated by Mrs. Blanche Dewdney, in memory of her late husband, the Honourable Edgar Dewdney, P.C., ex-Lieutenant-Governor of the North-west Territory and ex-Lieutenant-Governor of the Province of British Columbia. In this collection will be found a valuable set of bone gambling-dice, with sticks as counters, used by the Kootenay Indians. Specimens similar to these are seldom seen in any collection of anthropology.

Early in the month of October, Professor John Macoun, F.R.S.C., Naturalist to the Geological Survey of Canada, Ottawa, who now resides at Sidney, B.C., received permission from the Director of the Geological Survey, Mr. R. G. McConnell, to present to the Provin-

cial Museum his fine collection of the Vancouver Island flora, numbering approximately 900 specimens, all named and classified. The Director undertook to transfer these specimens personally from Sidney to Victoria, so that they would be handled with the greatest care. These specimens have now been deposited in the Herbarium under the supervision of Mr. W. R. Carter, and are now available for reference to those who are interested in the study of botany.

It will be seen in the report on botany that special work has been carried out in this particular branch during the past year, with the assistance of several volunteer collectors, who have helped materially to make the Herbarium the most representative collection in the Province.

The exhibition cases of British Columbia butterflies on the second floor of the Museum have been entirely rearranged by Mr. E. H. Blackmore, of this city, in accordance with the new Check-list of the Lepidoptera of Boreal America, issued by Messrs. Barnes and McDunnough, of Decatur, Ill., in February, 1917. This list is recognized as the standard authority by the Victoria Memorial Museum at Ottawa, and also by the majority of the principal museums in the United States.

The nomenclature has undergone radical changes and the sequence of genera is entirely different to that of Dr. Dyar's catalogue of North America Lepidoptera, published in 1902, which has hitherto been followed. The style of labelling has been altered, the names being typewritten in two colours, the generic and specific names in purple and the author's name in red, thus ensuring greater legibility than was formerly the case in the old hand-written labels. The labels are also placed on the supporting pin at the same height as the insect, thereby rendering them more easily readable to the general public. It is hoped to be able to continue this work on the Museum collection of moths during the coming year.

It is very gratifying to note that a number of teachers, both in public and private schools, are bringing their classes to the Museum in connection with their nature-studies, which I am sure has been greatly appreciated by the scholars, and without doubt has been a great benefit to them individually, judging from the manner in which they have gone around the exhibition halls taking notes. The Director or one of the staff is always on hand to give the young folk all the information possible.

The number of visitors that have signed the register in the entrance hall during the year 1917 was 35,672; this does not give the number of visitors by any means, as the school-children are not asked to register their names, neither are a large number of Orientals and others.

The Director has had a number of requests from other museums, societies, and persons who are interested in the several branches of natural sciences for the loan of specimens for comparison, which has always been willingly granted whenever possible.

By permission of the Honourable Provincial Secretary, the annual meeting of the British Columbia Entomological Society was held in the Botanical Room in the Provincial Museum, when a number of very interesting papers were read by members on systematic and economic entomology.

The Honourable Minister of this Department also gave the Director permission to have the meetings of the Natural History Society held in the Museum on evenings when subjects are being discussed on natural-history specimens that are represented in the collections; this arrangement is most satisfactory, as it saves loaning specimens, and I think is of more interest to members and has been greatly appreciated by the society.

The Director wishes to extend grateful thanks to the following persons that have assisted with the identifications in their respective branches of biology:—

Identification of Botanical Specimens.—Professor J. Macoun, Sidney, B.C.; J. M. Macoun, C.M.G., Chief of Biological Department, Ottawa; C. F. Newcombe, M.D., Victoria; and Professor J. K. Henry, University of British Columbia, Vancouver, B.C.

Identifications in Entomology.—Doctors Barnes and McDunnough, Decatur, Ill.; Professor E. M. Walker, University of Toronto, Ont.; L. W. Swett, Lexington, Mass.; R. S. Sherman, Vancouver, B.C.; and E. H. Blackmore, Victoria, B.C.

Thanks are also extended to a number of persons who have donated specimens.

Botanical specimens have been received from the following: Professor J. Macoun, Sidney; W. B. Anderson, Victoria; Dr. C. F. Newcombe, Victoria; W. R. Carter, Alberni; W. A. Newcombe, Victoria; J. R. Anderson, Victoria; and Professor J. K. Henry, Vancouver.

Notes on bird observations have been received from the following: J. E. Kelso, M.D., and W. B. Johnson, Lower Arrow Lakes; A. H. Palmer, New Westminster; J. A. Munro, Okanagan Landing; and others.

BARE ISLAND BIRD SANCTUARY.

(This island is known as Indian Reserve No. 9, Saanich Tribe, and is situated in Haro Strait about twenty miles north-east of Victoria.)

Owing to certain conditions it was not deemed advisable to place a warden on this island during the last nesting season, and it was expected that after this island had been guarded so closely for the two previous seasons, and persons warned to keep away, no person would go there to molest the gulls, guillemots, puffins, and cormorants that make this island their nesting ground.

But in a report that was sent to me by Mr. Leonard S. Higgs, who lives on one of the neighbouring islands, it seems imperative that a guard must be maintained on Bare Island during the nesting season and continued indefinitely. The following is a quotation from his letter:—

"As perhaps you know, I take a deep interest in the few sea-bird breeding-places in the neighbourhood, and especially in that on Bare Island, which I have visited practically every summer for twenty-five years.

"The policy of the Government in placing a warden on Bare Island for a couple of months during the breeding-season was admirable, and was responsible for raising the number of breeding pairs to at least double what it was two or three years ago. But it is a policy which should be continued indefinitely.

"My experience this summer has been as follows: I visited the island early in June, when the nests were just made, and contained either one or two eggs. I counted over 100 eggs in an area perhaps equal to one-thirtieth of the breeding-ground, taking an average of one egg and a half to each nest at that time. When the full hatches should have been laid, the number of eggs available for hatching should have been 6,000. I called again after an interval of ten days, and should have had difficulty in finding 100 eggs upon the entire island, practically every nest being empty. No bird, however prolific, can stand such treatment."

ANTHROPOLOGY.

ACCESSIONS, 1917.

By Purchase from Lieutenant F. C. Swannell (Nos. 2912-2964).

1. Athabascan. From the Northern Interior of British Columbia. This portion of the collection consists of 100 specimens which were acquired by Lieutenant Swannell at the following localities: Lac la Hache, Chestalla Lake, Fraser Lake, Stuart Lake, Stella Lake, and the Babine River country. It consists principally of articles of stone, such as arrow and spear points, knives, chisels, skin-scrapers, hammers, pipes, and a polished mirror. There are also snow-shoes, bone skin-scrapers, adzes, fish-spears, knives with iron blades, and birch-bark baskets.

2. Salishan. From Lillooet seventeen specimens include a two-handed stone pile-driver of the rare type, illustrated in last year's report. There are also a few specimens from the Lower Fraser River, Victoria, and the Bella Coola region belonging to this stock.

Rev. C. Croucher Collection, mostly from Yale, B.C. (Nos. 2979-3137).

2996 to 2999 and 3137. A remarkable set of carved stone dishes. Of these, No. 2996 is of soapstone in a very fine state of preservation. Like Nos. 2998 and 3000, it represents a seated human figure. No. 2997 is of bird form, and 2999 closely resembles a turtle. No. 3137 is a very large, crudely carved object of animal form.

There are also four small figures of human shape, and a knife-handle of horn, boldly carved to represent certain ancestors of its Indian maker.

The rest of the collection includes stone dishes (some of cigar-holder shape), a stone labret, and a great number of stone chisels, hammers, arrow-points, etc.

Collection presented by Mrs. Dewdney on behalf of the late Edgar Dewdney (Nos. 2904 to 2911).

2904. Salish. Medicine-man's head-dress of two paws of grizzly bear with claws.

2905. Gambling set of four long polished bone, marked with diagonal and circular lines. Set of twelve sticks for counting. Kootenay.

2906. Salish. Spindle-whorl of big maple, carved to show two thunder-birds.

2907. Salish. Tension-ring of wood, a carved bird with ring below, used to cause tension while spinning. Lower Fraser.

2908. Salish. Two mat-creasers of maple, used when making rush mats. Lower Fraser.

2909. Salish. Halibut-hook of hemlock wood, U-shaped, bone barb, spruce-root wrapping lanyard of twisted gut. Lower Fraser.

2910. Salish. Stone chisel. Lower Fraser.

2911. Salish. Spoon of mountain-goat horn, the carved handle riveted to bowl; raven below holding inverted man.

Bella Coola Collection.

From Chief Schooner were purchased the following ceremonial objects:—

1. Nos. 2965 to 2973. Masks used at potlatches and dances and representing crests and legends of the chief's clan.

2965. Eagle mask (TsElkt).

2971. Loon Mask (Squsin). This crest was also observed in the graveyard.

2972. Setting-sun mask (Nothokomai). This is now the property of Schooner's son. It is shown at potlatches over a screen at the back of the dance-house, the wearer himself being out of sight.

2973. Eagle mask. This is one of the chief's principal family crests, and is shown at the same time as—

2969. Raven mask (Qoaxmanikwulla).

2966. Killer-whale mask (Suit). A large mask in three parts which represent the head (enq), the dorsal fins (qutleik), and the tail (sliamont). The story relating how this crest came into the chief's family is, in part, as follows:—

In far-distant days Schooner's ancestors lived in a large chief's house in the sky. The first of them of whom there is still any tradition was named Tamaltsen. This man when he danced used two masks, the eagle and the killer-whale. These were obtained by him at an old village named NuskElste, a place half-way up the River TElntz, which runs past Bella Coola. Of this place it is said that at one time the sea rose so high that it filled up all the streams and reached the tops of the mountains to the west of Bella Coola, driving out all the natives from their houses until they could climb no higher. Just in time to save them from extermination a huge killer-whale swam close up to their last place of refuge on the mountain-tops and most of the people were able to climb inside and so were saved. The whale was as large as a big house and here all were cared for until the waters subsided. When land was seen once more the raven flew up and down croaking joyfully that so many people had escaped from drowning.

2967, 2968. Small masks representing two of the people who were saved.

2. Nos. 2974 to 2976. Masks used in the cannibal winter dance. These are all bird masks with long narrow beaks differing slightly in certain details, and all are called Hauhau, the Bella Coola form of the Kwakiutl Hohok. These are only parts of a complete set belonging to the winter dance, but supplement specimens purchased at Bella Coola some years ago. It was then found impossible to obtain from any one owner a perfect series such as belong to several Kwakiutl chiefs. Chief Schooner's consent had to be obtained in every instance, and he also promptly annexed a large part of the purchase-money, without opposition from the seller. It was stated that outlying parts of the set used in the cannibal dance were held by different individuals belonging to the society and were liable to be called for.

Schooner said that his family came into possession of the cannibal dance in early days. One of his ancestors was walking along the beach near Bella Coola when suddenly there appeared rising out of the sea a large chief's house. Some people came to the door and invited him to go inside. Here he saw, sitting at the far end of the house, a chief whose name was Qomoqoya, who was wearing a ceremonial hat of great size. The visitor at once produced a valuable "copper" and presented it to Qomoqoya.

Two of the ancestor's brothers had been made prisoners and taken to this house, but soon after were drowned. For this reason the use of the cannibal masks was explained to him and the right to use them was granted.

PLATE I.

NOCTUIDÆ NEW TO BRITISH COLUMBIA.

Ufeus electra Sm.
Victoria, B.C. (Blackmore).

Sideridis rosea Harv.
Rossland, B.C. (Danby).

Polia nugatis Sm.
Lillooet, B.C. (Phair).

Lasionycta rainieri Sm.
Lillooet, B.C. (Phair).

Tholera americana Sm.
Lillooet, B.C. (Phair).

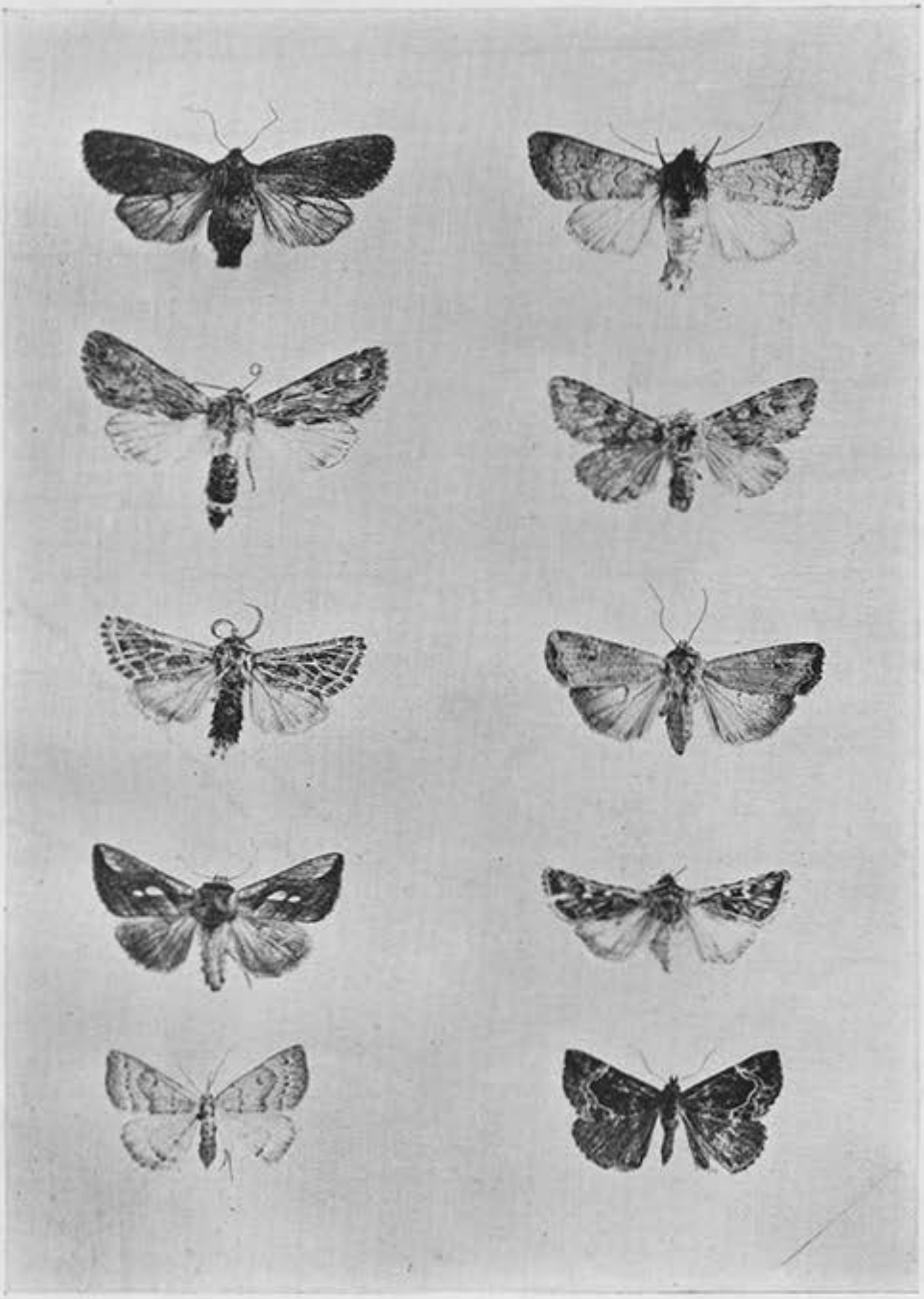
Euxoa ochrogaster race *insignata* Walk.
Victoria, B.C. (Blackmore).

Autographa nicholli Hamp.
Rosedale, B.C. (Blackmore).

Euxoa cinereopallida Sm.
Lillooet, B.C. (Phair).

Chytolita morbidalis Gue.
Cloverdale, B.C. (Blackmore).

Bomolocha abalienalis Walk.
Rosedale, B.C. (Blackmore).



The house was named Nuskoahltnaixsta. Certain important chiefs in it were Smaiyakila, the head: SixsEkilaixla was a brother of the last: Atikuntan and Nunatsonajen were also big chiefs and rulers. These were the spirits who presided over the cannibal dance.

2977. Storage-box (Pilkwa). This is a Bella Bella box.

2978. Spindle-whorl. Bella Coola.

BIRDS AND MAMMALS.

During the early part of the year a collection of bird-skins numbering 68 and mammal-skins numbering 154 were purchased from Mr. J. A. Munro, of Okanagan Landing; these skins are prepared in a most satisfactory manner, a number of them being collected in the Nicola District, from which the Department had very few specimens, thus making them very valuable in mapping out the distribution of species.

The Provincial Game Warden at Vancouver sent to the Museum two skins of wapiti, which had died while being transferred from the Colony Farm to be turned out in the Lillooet District. These animals were unfortunately badly skinned—in fact, ruined entirely for mounting purposes.

The raccoon group (*Procyon lotor*) in a wild crab-apple tree, which have been mounted for a great number of years and had become very much worn and faded, have been replaced by three good specimens, presented by Mr. J. N. Evans, Duncan, B.C.

The Museum was also fortunate in having a (albino) squirrel, "Vancouver Island Chickaree" (*Sciurus hudsonius vancouverensis*), presented by Mr. W. Fairall, which he shot on the Malahat, west side of Saanich Inlet, September 16th, 1917.

ENTOMOLOGY.

By E. H. Blackmore.

The weather conditions of the past season were very similar to those of the previous year, a very wet spring and early summer being followed by a dry hot spell which extended until late in September.

Throughout the valley of the Lower Fraser, the Coast District, and Vancouver Island the heavy rains of the early spring were continued on and off until the end of June. To those insects that in the pupal state pass the winter underground an abnormally heavy rainfall does a great deal of damage, causing many of the pupæ to rot, thereby reducing the number of individuals of those species. It also delays the appearance of many other species which, when they do emerge, are quickly killed off by the cold wet weather. On account of these conditions collecting in the early part of the season was exceedingly poor.

The late summer and early fall were very dry and warm, the sunny days being practically continuous for nearly three months. This continued hot weather brought out in greater numbers species which as a rule are rather scarce.

There was a rather severe outbreak of cutworms in the Victoria and Vancouver Districts during the month of May and the early part of June. A great deal of damage was done to small gardens and cultivated lots; in some instances whole beds of garden produce were completely devastated. The chief offenders were the dingy cutworm (*Feltia ducens* Walk.), the glassy cutworm (*Sideria devastator* Brace), and the caterpillars of *Euxoa messoria* Grote, *Euxoa excellens* Grote, and *Feltia vancouverensis* Grote. This latter species has not hitherto been considered of much economic importance, but I am convinced that it does as much damage as any of the others, with the possible exception of *Sideria devastator*.

During September a particularly bad infestation of shade and ornamental trees occurred in Victoria. This was caused by the larvæ of an undetermined species (*Tenthredo sp.*) of sawfly. In normal years they confine their ravages to the Lombardy poplar (*Populus dilatata* Ait.), which is their natural food-plant, but this year they occurred in such countless numbers that they attacked everything in sight, even invading houses and office buildings. The larvæ when full grown measure from 1¼ to 1½ inches in length and are of a brilliant yellow colour marked with round black spots on each segment. They are generally mistaken for the caterpillars of moths or butterflies, but they can always be distinguished by the fact that they have from six to eight pairs of prolegs; the false legs situated behind the three pairs of genuine legs near the front end of the body, while lepidopterous larvæ never have more than five pairs.

LOWER FRASER VALLEY DISTRICT.

At the request of the Director I made a three-weeks' collecting trip through this district, starting on June 11th and returning July 2nd. Taking into consideration the remarkable scarcity of insects in general up to the end of June, and also the number of wet days that occurred, the total amount of insects taken was very satisfactory; out of a total of nineteen days' actual collecting, there were six days of heavy rain, three days dull and cloudy, and ten days of bright sunshine.

On the rainy days, beating for Geometridæ and searching for Coleoptera was undertaken in the daytime, and at night collecting noctuids by "light" was successful. It was noticeable that more moths came to "light" on the wet nights than on those nights which had been preceded by a bright sunny day.

The localities visited were Vancouver, Cloverdale, and Rosedale. The Vancouver District was not at all productive, although trips were made to all the chief collecting-grounds, including Cauldfield (nine miles west of North Vancouver, on the P.G.E.), the famous Lynn Valley, Stanley Park, and South Vancouver, including the Eburne District.

Three days were spent at Cloverdale, twenty-five miles east of Vancouver, where some good material was taken, including some very interesting geometers taken while "dusking." The best district of all from a collecting point of view was certainly at Rosedale, where some valuable material was taken, some of it new to British Columbia.

Rosedale is situated at the apex of the valley, being about eighty miles from Vancouver, and is on the south side of the Fraser River (nearly opposite to Agassiz, at which place the fine Experimental Farm belonging to the Dominion Government is situated). It is heavily timbered on the north side, but skidways belonging to the shingle-mills in operation there furnished a convenient means of getting into the heart of the woods.

Mount Cheam, rising to a height of 6,925 feet, is situated about two miles away and is a magnificent sight when the rays of the setting sun strike its rugged peaks. An ascent of this mountain was contemplated, as some very desirable alpine species are known to occur there, but owing to the great depth of snow on the trails this was found to be impossible; in some places the snow was estimated as being from 30 to 40 feet in depth; three fresh falls of snow occurred during the nine days spent there. I found out from some of the inhabitants that the ascent to the top cannot be undertaken until the last week in July on account of the snow, and then it is only possible for about three or four weeks.

The total number of insects taken on the trip was 883, made up as follows: Lepidoptera, 589; Coleoptera, 72; Hymenoptera, 105; Diptera, 102; and Odonata, 15. The Lepidoptera were comprised of the following: Butterflies, 55; moths (other than geometers), 170; geometers, 272; and Microlepidoptera, 92.

The nomenclature used is that contained in Messrs. Barnes and McDunnough's Check-list of Lepidoptera of Boreal America, which has been adopted by the Museum, and which will be followed in all future Museum publications.

The scarcity of butterflies seen on the trip was very noticeable, a short series of *Pontia napi marginalis* Scud. being taken, while *Parnassius clodius claudianus* Stich. was captured at North Vancouver and at Rosedale. These were the only two species worthy of mention. Amongst the noctuids a nice series of both *Acronycta hesperida* Sm. and *A. oblinata* A. & S. were taken, most of them being newly emerged. Three specimens of that very desirable species *Autographa nicholla* Hamp. were taken at "light" at Rosedale. Other species of interest were: *Polia lubens glaucopis* Hamp; *Luperina passer* Gue.; and *Hyppa xylinoides* Gue. In the subfamily *Hypeninæ* a number of specimens were taken, including a good series each of *Chytolita morbidalis* Gue. and *Hypena humuli* Harr. Three female specimens of *Bomolocha palparia* Walk. were captured at Rosedale; these are, to my knowledge, the first of this sex recorded for British Columbia, although I took a male specimen at Goldstream on June 16th, 1915; this was figured in the Report of the Provincial Museum, 1916, Plate VII.

A fine male specimen of *Bomolocha abalienalis* Walk. was taken at Rosedale on June 25th. This has never been recorded previously from British Columbia, and is an inhabitant of the Eastern and Middle States.

A nice collection of Geometridæ was made, including a single specimen of *Hydrelia albifera* Walk., at Rosedale on June 26th; this is the first authentic record of this species west of Kaslo.

Other desirable species taken at various localities in the valley were: *Cosymbia lumenaria* Hbn.; *Calocalpe undulata* Linn.; *Dysstroma occidentata mutata* Taylor; *Xanthorhœ designata emendata* Pears; *Euphyia multiferata* Walk.; *Epirrhœ alternata* Mull.; *Eupithecia casloata* Dyar; *E. castigata* Hub.; and *Metanema quercivoraria* Gue.

Amongst the micros two of particular interest are *Pyrausta ochosalis* Dyar, taken at Cloverdale (only previous record from Kaslo), and *P. funebris* Strom., captured at Rosedale.

The Coleoptera and Hymenoptera have not been worked over as yet, but some work has been done on the Diptera, many of which, however, await further determination.

ODONATA (DRAGON-FLIES).

A small collection of about forty specimens were recently submitted to Dr. E. M. Walker, of Toronto, for identification. They comprised seventeen species, three of which, it is pleasing to note, are species that have not previously been recorded from British Columbia, viz.:—

Cœnagrion resolutum Hagen. One female taken by W. A. Newcombe at Chilcotin on June 25th, 1915.

Leucorrhinia intacta Hagen. Two males taken by J. A. Munro at Okanagan Landing on July 6th, 1916, and one male taken by W. R. Carter at Alberni on July 29th, 1915.

Leucorrhinia borealis Hagen. One male taken by W. A. Newcombe at Chilcotin on June 22nd, 1915.

Hereunder we publish a list of the remaining fourteen species, with their localities, and hope at some future date to give a complete list of the Odonata of British Columbia, an order which has hitherto been somewhat neglected:—

Enallagma calverti Morse. Vancouver (E. H. Blackmore).
Enallagma cyathigerum Charp. Chilcotin (W. A. Newcombe); Cranbrook (C. Garrett).
Enallagma carunculatum Morse. Alberni (W. R. Carter).
Æshna interrupta nevadensis Walker. Quesnel Forks (Newcombe).
Tetragneuria spinigera Selys. Alberni (Carter).
Cordulia shurtleffi Scudd. Vancouver (Blackmore); Cranbrook (Garrett).
Libellua quadrimaculata Linn. Cranbrook (Garrett).
Libellua lydia Drury. Cloverdale (Blackmore); Rosedale (Blackmore).
Sympetrum scoticum Donovan. Quesnel Forks (Newcombe).
Sympetrum costiferum Hagen. Okanagan Landing (Munro).
Sympetrum decisum Hagen. Okanagan Landing (Munro).
Sympetrum obtrusum Hagen. Okanagan Landing (Munro).
Leucorrhinia glacialis Hagen. Okanagan Landing (Munro).
Leucorrhinia hudsonica Selys. Vancouver (Blackmore); Cranbrook (Garrett).

RARE AND UNCOMMON INSECTS TAKEN IN BRITISH COLUMBIA DURING 1917.

Under this heading we propose to give a list of the rare and uncommon insects which have been taken during the past season at various localities in the Province of which we have any knowledge. Properly authenticated records of these insects from any collection in the Province will be gladly welcomed. It is hoped by this means to get a better knowledge of the distribution and geographical range of our lesser-known species, which in some instances may eventually prove of great economic value.

Victoria.—During the past season the writer, with the assistance of Mr. Edward Cooke and Mr. Arthur Robinson, of this city, has been fortunate in taking many desirable species of noctuids and geometrids.

From a pupa found in the city park I bred a splendid female specimen of *Smerinthus cerisyi opthalmicus* form *pallidulus* Edw. This is a very rare form and is new to British Columbia. The ground colour is of a beautiful pale fawn, in contradistinction to the dark olive-brown colour of typical *opthalmicus*. Amongst the noctuids taken were the following uncommon species: *Euxoa intrita reuda* Streck; *E. terrena* Sm. (very rare); *E. divergens* Walk.; *E. atrifera* (rare); *Matuta apposita* Grt.; *Eriopyga infidelis* Dyar; *Eurotype contadina* Sm.; *Eumichtis loda* Streck; *Septis antennata purpurissata* B. & McD. (rare); *Trachea cinefacta* Grt.; *Ufeus electra*, Sm.; *Luperina passer* Gue. (rare); and *Autographa ampla* Walk. This latter is the first record from Victoria that I know of, although it has previously been taken at Duncan and Wellington.

Several interesting specimens were taken amongst the Geometridæ, including two new to the Province—viz., *Venusia duodecemlineata* Pack. and *Eupithecia borcalis* Hist. The former was taken at rest on an electric-light pole by the writer in April. It is closely allied to *V. pearsalli* Dyar (which is one of our commonest spring species), but can be distinguished by its generally darker colour and the wavy extra-discal line on the forewings. The latter was taken at "light" by Mr. A. Robinson on June 27th, and another specimen was taken by Mr. W. Downes at Oak Bay on the 30th of the same month. This species was originally described from Manitoba.

The other geometers of more than passing interest were: *Lobophora nivigerata* Walk.; this has been an exceedingly rare species until this year, when we had the good fortune to take half a dozen specimens; *Cosymbria dataria* Hist.; *Calocalpe undulata* Linn.; *Nematocampa limbata* Haw. As recorded in last year's Annual Report, this pretty little geometer had not been recorded from this district for twelve years until 1916, when two specimens were captured at "light." This season a special look-out was kept, with the result that a nice series of eleven specimens were taken. It is evidently very local. *Metanema inatomaria* Gue.; a single specimen was taken at "light" in the same locality as the one taken last year. *Pero occidentalis* Hulst.; two males were taken on June 4th and 7th respectively. This is a very interesting record, as it is rather a rare species and not previously known west of Penticton.

We have specimens from the latter locality and also from Rossland. The *Azelina occidentalis* Hulst., given as "generally distributed" in the 1906 Check-list of British Columbia Lepidoptera, is an error, as the species there referred to is *Pero gigantcus* Grossb., which has a known range from Vancouver Island to Kaslo. The chief determining character of *occidentalis* is the dentate antennæ of the male; in the other three species of *Pero* which occur in British Columbia the antennæ are filiform in both sexes.

Mr. W. B. Anderson, Inspector of Indian Orchards, took a single specimen of *Neptyia phantasmaria* Streck in September. This is also an interesting record, as this, together with one taken by the writer in September, 1915, constitutes the only known records of this species in Victoria.

The same collector also took a specimen of *Hæmorrhagia diffinis rubens* Hy. Edw. in his garden at Oak Bay in September. This species is single-brooded and flies about the first week in May; the most probable explanation is that the cocoon, which is generally spun up under fallen leaves, was lying in an exposed place subject to the direct rays of the sun, and consequently brought to maturity at the end of the summer instead of lying dormant until the following May.

The following noctuids, collected by Mr. W. Downes, of Oak Bay, are worthy of mention: *Euxoa catenula* Grt. (new to this district); *E. esta* Sm. (rare); *Polia lubens glaucopis* Hamp.; *Septis multicolor* Dyar (rather rare); *Trachea finitima cerivana* Sm.; and *Autographa celsa* Hy. Edw. He also took a short series of *Eupithecia obumbrata* Taylor on Mount Tolmie in May. This is the first record of this species in Victoria. It is evidently a mountain form, as it has been taken by Mr. Day on Mount Tzouhalem, near Duncan, and also on the mountains at Goldstream.

I nearly forgot to mention that a school-boy captured a specimen of *Pseudohazis eglanterina* Bdv. (the sheep-moth) near the Ross Bay Cemetery. This is the first record of this species that we have from Victoria; it occurs sparingly at Goldstream, Shawnigan, and Duncan.

Goldstream.—On one of the writer's occasional trips to this locality a number of noctuid moths were taken after dark feeding on a large patch of cultivated sunflowers, amongst which were specimens of *Euxoa esta* (rare); *E. tessellata tesselloides* Grt.; and *Rhynchagrotis rufipectus* Morr. On another occasion a beautiful specimen in perfect condition of *Cleora excelsaria* Streck was taken. This is the first capture of this exceedingly rare geometer that has been recorded for about thirteen years. It was taken at rest on a fire-blackened tree-trunk early on the morning of June 4th. An extensive search for further specimens was made, but no others were seen.

A nice series of *Perizoma costiguttata* Hulst. was obtained on the 3rd and 4th of the same month; this species is evidently very local in its habits.

Duncan.—Mr. G. O. Day, of Quamichan Lake, has succeeded in breeding a short series of that uncommon deltoid *Bomolocha torcuta* Grt. The larvæ were found feeding on dogwood in

August of 1916, and the adults emerged at the end of the following May. This is a valuable record, as the knowledge of the food-plants of a great many of our species is very limited.

It is also interesting to note that Mr. Day also took a fine specimen of *Venusia obsoleta* Swett on April 18th. This species was described last year from specimens found in the Harvey and the Museum collections taken in 1908, and was figured in the Provincial Museum Report for 1916 on Plate VIII.

Mr. A. W. Hanham, also of Quamichan Lake, took a beautiful geometer on June 20th, which turned out to be *Stamnoctenis morrisata* Hulst., a species which was described from Arizona and is entirely new to our fauna.

Cumberland.—A few specimens of *Cercyonsis alope ariane* Bdv. were taken in this district in July. This is noteworthy as no species of this genus has ever been recorded from Vancouver Island before. *Boopis* Behr., a form of *ariane* with fewer spots on the under-side, occurs in the Interior from Lillooet to Cranbrook.

Savary Island.—Mr. R. S. Sherman, of Vancouver, who spends his annual vacation on this island, reports that he has seen specimens of *Danaus archippus* Fabr. (the milkweed butterfly) there every year for several years, and that this year he found several patches of milkweed growing there. As this is the natural food-plant of *archippus*, the probabilities are that it breeds on this island, but this fact will have to be proved before it can be accepted as such. This butterfly has a cosmopolitan range, but has not been known to breed in British Columbia, although occasional specimens have been taken in various parts of the Province. He also mentions that *Epargyreus tityrus* Fabr. (the large silver-spotted skipper) was very common in July. It has been previously recorded from Vancouver and doubtfully from Glacier.

Cloverdale.—Mr. Bevan L. Hugh, who collected a number of geometers during the past season, captured a specimen of *Philobia ulsterata* Pearson. This is an exceedingly rare geometer, and is the first taken to my knowledge since 1908, when the late Mr. A. H. Bush took one in Vancouver. Amongst others taken by the same collector was a nice series of *Spargania magnoliata pernotata* Hulst. and a fine specimen of *Scleuia alciphearia ornata* B. & McD.

Quesnel Forks.—While engaged on business connected with the Provincial Fisheries Department in this district in late August and September, Mr. W. A. Newcombe, of Victoria, collected a few insects which proved of great interest, as we had not received any material from this particular district previously. The butterflies taken were *Phyciodes campestris* Behr.; *Polygonia progne* Cram.; and *Aglais J.-album* Bdv. & LeCon.

A short series of *Hypoprepia miniata* Kby. (the scarlet-winged lichen-moth) was obtained; this has previously been recorded from Kaslo. The Noctuidæ comprised *Euxoa mimallonis pagates* Grt.; *Graptolitha georgii* Grt.; *Catocala briseis* Edw. (previously recorded from Kaslo); *Autographa rectangula* Kirby; and *Scoliopteryx libatrix* Linn. The geometers proved scarce, only three species being taken, viz.: *Lygris xylina* Hulst.; *Hydriomena furcata* Thun; and *Ceratodalia gueneata* Pack.

Lillooet.—In the beginning of August Mr. A. W. A. Phair took two or three specimens of a bright coppery-red butterfly which we identified as *Heodes cupreus* Edw. It was taken at Mount McLean at an altitude of 7,000 feet, and is a new record for British Columbia. It is very closely allied to *H. snowi* Edw., which also occurs in British Columbia, but is very rarely taken; *cupreus* is brighter in colour and more heavily spotted than *snowi*. He has kindly donated a pair for the Museum collection.

Mr. Phair, on a recent visit to Victoria, brought with him a large amount of material for identification; as many of the noctuids were new to us, we sent them to Dr. J. McDunnough for determination, with the result that many of them proved new to British Columbia, and materially add to the known lepidopterous fauna of this Province.

The following is a list of those new to British Columbia: *Euxoa cinereopallida* Sm.; *Agrotis piscipellis* Grt.; *Pynchagrotis vittifrons* Grt.; *Lasionycta rainieri* Sm.; *Polia nugatis* Sm.; *Polia farnhami* Grt.; *Tholera americana* Sm.; and *Cerapoda oblita* Grt. Amongst the others were some very desirable species, the following being of special interest as extending our knowledge of their known range; *Euxoa satiens* Sm.; *E. murdocki* Sm.; *Lasiestra phoca luteola* Sm.; and *Pseudanarta flava* Grt.

NEW BRITISH COLUMBIA LEPIDOPTERA.

Under this heading we publish an annotated list of those new species and varieties which have been described during the past season. We believe that this list will be of value to those entomologists in the Province who are unable to keep in touch with all the current literature on the subject, but who are desirous of keeping their collections and check-lists up to date in nomenclature and scientific arrangement.

Glaucopsyche lygdamus columbia Skin. This new race of *lygdamus* was described by Dr. Henry Skinner in the Ent. News for May, 1917. The type and paratypes are from Port Columbia, Wash. Amongst other localities mentioned for this species is Corfield, Vancouver. We presume this is meant for Corfield, near Duncan, on Vancouver Island. This pretty blue butterfly is fairly common all over the Island about May, and has been going under the name of *G. lygdamus behrii* Edw. (*vide* Report, Provincial Museum, 1916). The true *behrii* is a California race of *lygdamus*, with San Francisco as its probable nimotypical locality; *columbia* differs from *behrii* in being of a much deeper shade of blue and the spots on the under-side of the wings being larger.

In Vol. III., No. 4, Cont. Lept. No. Amer., March, 1917, Messrs. Barnes and McDunnough describe a number of new species and varieties of Geometridæ, amongst which are eight new to British Columbia. As these "Contributions" were published subsequent to the issuance of their new check-list, the following additions must be made to it:—

Trichodesia albovittata tenuifasciata B. & McD. This form was described from Spirit Lake, Idaho. In the Barnes collection there were specimens from Wellington, B.C., and the writer has a specimen taken by Mr. W. H. Danby at Ymir in 1900. In this variety the white band of primaries is much narrower, being only 1 mm. in width.

Thera georgii benesignata B. & McD. This racial name has been given to the Vancouver Island form on account of its larger size, paler colour, and the strong contrast between the brown median and basal areas and the ground colour. Typical *georgii* is now restricted to the Nevada species. The types of *benesignata* are from Wellington and the paratypes from Duncan.

Mesoleuca gratulata latialbata B. & McD. Described from three specimens from Plumas County, Cal. In this form the median white band is strongly constricted centrally below the cell, due to an outward bulge in the dark basal area and a strong inward bend below vein 4 of the outer dark area. I have a specimen from Kaslo which Dr. McDunnough considers this form, although the basal line is not quite typical.

Epirrhœ plebeculata vivida B. & McD. This is the species hitherto known as *Rheumaptera rubrosuffusata* Pack., which occurs commonly throughout the Island and Lower Mainland. *Rubrosuffusata* has been found to be a synonym of *plebeculata*, which was described by Guenee, from California, and the racial name of *vivida* is proposed for our Vancouver Island form on account of the coloration being much better defined.

In describing a new species, *Phasiane ponderosa*, Messrs. Barnes and McDunnough mention a variety of it under the form name of *demaculata*, in which the cross-lines tend to become obsolescent, especially in the females. The types are from Calgary, Alta., but one of the female paratypes is from Field, B.C. We have two rather worn females, one from Atlin, taken by E. M. Anderson, and one from Chilcotin, taken by W. A. Newcombe, so that although uncommon it is widely distributed.

Itame plumosata B. & McD. This pretty yellow and brown geometer was described from specimens taken in various localities in Arizona and Utah. We have a male specimen from Mount McLean near Lillooet, taken in July, 1916, by E. M. Anderson. It is rather remarkable that this species should turn up here, as it is a long way from its nimotypical locality; it is apparently a high altitude species and may turn up on any of the high mountains in the intervening country.

Cleora satisfacta B. & McD. Described from one male and one female taken at Kaslo. This is closer in general habitus to *excelsaria* Streck and *albescens* Hulst, than to any other *Cleora* that occurs in the Province.

Æthaloptera anticaria fumata B. & McD. This is the insect from Kaslo that has been previously known as *Æ. intextata* Walk. Dr. McDunnough states that *anticaria* should be used for the common Eastern species instead of *intextata*, and proposes the name of *fumata* for the

PLATE II.

GEOMETRIDÆ.

Cleora excelsaria Streck.
Goldstream, B.C. (Blackmore).
(Very rare.)

Stamnoctenis morrisata Hulst.
Duncan, B.C. (Hanham).
(New to British Columbia.)

Xanthorhœ blackmorei Swett.
(Paratype male.)
Victoria, B.C. (Blackmore).
(New to science.)

Xanthorhœ blackmorei Swett.
(Paratype female.)
Victoria, B.C. (Blackmore).
(New to science.)

Xanthorhœ macdunnoughi Swett.
(Allotype female.)
Victoria, B.C. (Blackmore).
(New to science.)

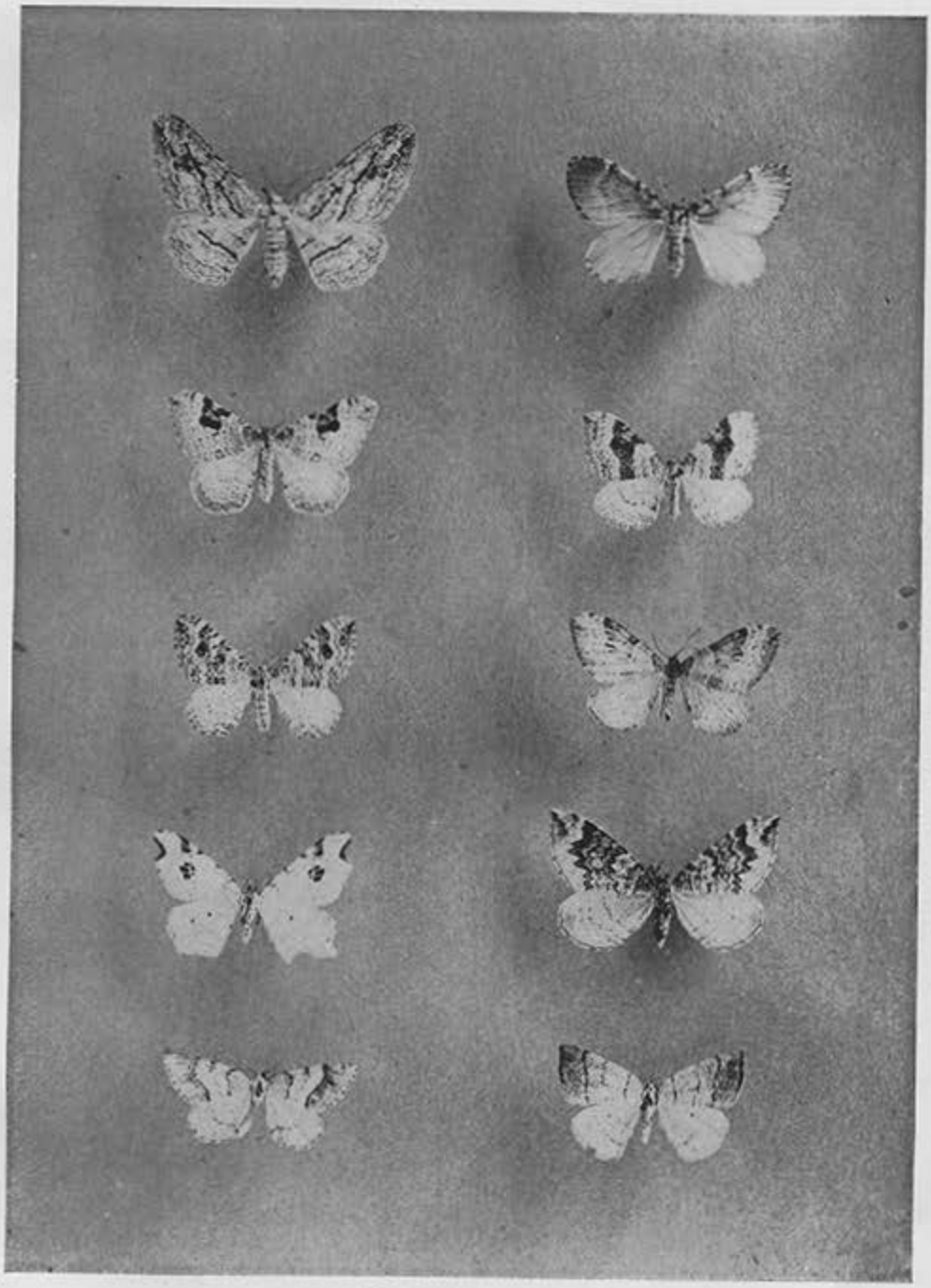
Xanthorhœ atlinensis Swett.
(Paratype male.)
Atlin, B.C. (Anderson).
(New to science.)

Philobia ulsterata Pears.
Cloverdale, B.C. (Bevan Hugh).
(Very rare.)

Lygris destinata race *schistacea* Warr.
Kaslo, B.C. (Cockle).
(New to British Columbia.)

Itame plumosata B. & McD.
Armstrong, B.C. (Downes).
(New to British Columbia.)

Drepanulatrix carnearia Hulst.
Rossland, B.C. (Danby).
(New to British Columbia.)



Kaslo race, which is more evenly suffused with smoky brown and with the lines more or less obsolescent. The types are six males from Kaslo, presumably taken by Mr. J. W. Cockle. This locality is the only one from which we have any record of this species.

In addition to the foregoing, it is as well to note that Messrs. Barnes and McDunnough have given the study of *Sicya macularia* Harris and its various races considerable attention, with the result that *crocearia* Pack. is rescued from the synonymy and applied to the form that occurs in the Great Basin Region of the United States, and also to a similar form occurring on Vancouver Island. For the benefit of those collectors who may think that they have two different varieties of this species, it is as well to add that this form is sexually dimorphic. In a long series taken by the writer it is noticeable that while the females in general are much scarcer than the males, the dimorphic female is far more prevalent than the typical one.

In Cont. Lep. No. Amer., Vol. IV., No. 1, May, 1917, Messrs. Barnes and McDunnough have revised the whole of the genus *Hydriomena*. Many radical changes have been made and new species added, some of which refer to our British Columbia forms, so that it will be advisable for collectors to alter their check-lists accordingly.

Hydriomena albifasciata victoria B. & McD. This has always been listed as *reflata* Grt. in British Columbia collections, but this name has been restricted to an Arizona race of *albifasciata*, and the name *victoria* has been given to the Vancouver Island form; the types being three males and two females from Victoria.

Hydriomena exculpata tribulata B. & McD. This is a grey form of *exculpata*, a new species described from Ketchikan, Alaska. The localities given for the form *tribulata* are Oregon, Colorado, and Kaslo, B.C.

Hydriomena perfracta exasperata B. & McD. The race *exasperata* was described from two specimens taken by the late Rev. G. W. Taylor, one at Departure Bay, near Nanaimo, and the other at Wellington. It is evidently very rare. One male specimen was taken by the writer at Victoria on May 19th, 1914.

Hydriomena renunciata columbiata form *pernigrata* B. & McD. The types of this form came from Glacier National Park, Montana; the paratypes, one male and one female, from Skagit Basin, B.C.; and one male from Stikine River, B.C. The latter probably collected by Theodore Bryant, of Ladysmith, who collected in that district when with a survey party.

Hydriomena edenata grandis B. & McD. The racial name of *grandis* has been given to our Vancouver Island form, which has been previously known as *edenata* Swett. Typical *edenata*, which was described from Eden Valley, Monterey County, Cal., is very much smaller than the one we get here and is shaded with a warm brown, while our form is tinged with green.

The genus *Xanthorhœ*, which contains several distinct groups of species, has been badly mixed up in the past, and much misidentification of species has ensued.

As it was also felt that there were several species, or at least good varieties, going under the same name, the writer collected extensively in this genus for several years, with the result that Mr. L. W. Swett, the well-known geometridist, described several new forms of the *defensaria* group, which were illustrated in the Annual Report of the Provincial Museum for the year 1915, Plate VII., Figs. 5 to 12.

In the *pontiaria-fossaria* group Mr. Swett has just described the following three new species in the Can. Ent., Vol. 50, No. 1, p. 17 *et seq.*:—

Xanthorhœ macdunnoughi Swett. This occurs all over the southern portion of Vancouver Island, but it is not common by any means. The types are from specimens taken by the writer at Victoria. Paratypes of each sex have been placed in the Museum collection.

Xanthorhœ atlinensis Swett. This species was taken at Atlin by E. M. Anderson in 1914, and was described from eight specimens, all male. It is close to *fossaria* Taylor, which was described from Mount Cheam. Paratypes are in the Museum collection.

Xanthorhœ blackmorei Swett. Described from material taken by the writer at Goldstream and Victoria. This species is very distinct, as in most cases the blackish median band becomes obsolescent below the median vein. A male paratype has been placed in the Museum collection. Illustrations of these new species will be found in an accompanying plate.

BOTANY.

During the season of 1917 there have been numerous accessions to the Herbarium of the Provincial Museum, notably the presentation of a large collection of plants of Vancouver Island,

collected, mounted, and named by Professor John Macoun since he has resided at Sidney, B.C., together with a collection of Musci and Lichens made by him on Vancouver Island and a portion of the Mainland of this Province. This collection, made and named by so eminent a botanist, will be a valuable acquisition as a source of reference in the identity and for determination of other specimens.

Mr. W. B. Anderson, of Victoria, has contributed a large number of plants, collected in his leisure hours, from the Interior, which cover many localities, from Fort George to Penticton and extending through West Kootenay. This collection will undoubtedly add much new material to the Herbarium, especially as regards distribution.

The Fort George specimens cover a new area not hitherto represented in the collection. A few of the plants from the various localities mentioned are as follows:—

Chenopodium botrys.
Axyris amarantoides.
Calochortus elegans.
Melampyrum lineare.
Anemone virginiana.
Chrysothamnus nauseosus.
Chimaphila menziesii.
Antennaria rosea.
Anthriscus sativa.
Gilia aggregata.
Physostegia parviflora.
Orthocarpus luteus.
Potentilla flabelliformis.
Galeopsis tetrahit.
Crepis tectorum.
Echium vulgare.
Hieracium scouleri var. *cynoglossoides.*
Erigeron acris var. *drœbachiensis.*
Senecio balsamitæ var. *thomsoniensis.*

Among these *Axyris amarantoides* L. and *Crepis tectorum* L., introduced plants, appear to be additions to the flora of British Columbia.

Mr. W. A. Newcombe has also donated a representative collection made in the vicinity of Quesnel Lake and a portion of the Chilcotin country during the seasons of 1916 and 1917; amongst the rarer species and some not previously reported from these regions are the following:—

CHILCOTIN, 1916.

Stephanomeria minor.
Calochortus macrocarpus.
Solidago decumbens.
Mentzalia lævicaulis.

QUESNEL LAKE, 1917.

Epipactis repens var. *ophioides.*
Habenaria orbiculata.
Parnassia palustris.
Rubus strigosus.
Spiræa menziesii.
Dracocephalum parviflorum.
Stephanomeria minor.
Alnus tenuifolia.
Mitella nuda.
Ribes glandulosum.
Ribes oxyacanthoides.
Vaccinium canadense.
Hieracium umbellatum.
Senecio eremophilus.

In this as in Mr. Anderson's collection there are a number of doubtful specimens, which have been forwarded to Mr. J. M. Macoun, Chief of the Division of Biology, Geological Survey, Ottawa, and Professor J. K. Henry, of the University of British Columbia, for comparison with authenticated specimens and identification, and until such time as this work has been completed no adequate list can be chronicled.

Specimens of two additions to the flora of Vancouver Island, *Arnica cordifolia* and *Romanzoffia unalaschensis*, collected by Dr. C. F. Newcombe, of Victoria, have been donated by him to the collection in the Herbarium.

On June 16th, 17th, and 18th, Mr. F. Kermode, Director, accompanied by Dr. F. C. Newcombe, of Victoria, made a small collection of the more uncommon plants growing around Bella Coola; the following, which are usually plants growing at much higher altitude, were collected on the river-bottom, a little above sea-level:—

Epilobium latifolium.
Mimulus lewisii.
Pentstemon diffusus.

In the matter of distribution the following interesting species were collected in close proximity to salt water:—

Trautvetteria grandis.
Ranunculus orthorynchus var. *platyphyllus.*
Hemieva ranunculifolia.
Corydalis sempervirens.
Aralia nudicaulis.
Senecio balsamitæ var. *thomsoniensis.*

The Director and his assistant made a small collection on August 1st and 2nd of the more interesting plants of Mount Arrowsmith, undoubtedly one of the richest floral fields of Vancouver Island. The following specimens were collected, which appear to be additions to the flora of Vancouver Island not hitherto recorded:—

Oxyria digyna.
Lewisia pygmæa.
Saxifraga lyallii.
Antennaria rosea.
Draba nivalis.
Silene acaulis.
Osmorrhiza purpurea.
Agoseris glauca.

Other species of interest were:—

Lewisia columbiana.
Erysimum elatum.
Saxifraga punctata.
Potentilla dissecta var. *glaucophylla.*
Lomatium martindalei var. *augustatum.*
Cladothamnus pyrolæflorus.
Mimulus alpinus.
Pedicularis ornithorhyncha.
Arnica amplexicaulis.
Ranunculus eschscholtzii.
Saxifraga bronchialis.
Saxifraga tolmiei.
Potentilla villosa.
Epilobium anagallidifolium.
Dodecatheon pauciflorum.
Phyllodoce glanduliflorus.
Arnica latifolia.
Senecio triangularis.

A few plants were also collected in the vicinity of Long Beach, on the west coast of Vancouver Island, the latter part of September, including:—

Polypodium scouleri.
Carex macrocephala.
Listera caurina.
Gentiana douglasiana.
Stachys ciliata var. *pubens.*
Botrychium silaifolium.
Hydastylus brachypus.
Empetrum nigrum.
Franseria bipinnatifida.

A large number of specimens have been mounted by Miss H. J. Hendry, now in charge of the office of the Museum, and placed in the collection of the Herbarium; a card-index has been completed of the mounted specimens, and the whole have been arranged in their systematic order of families, according to the check-list of the plants of Gray's Manual.

A record has also been made of all duplicates and unmounted material, and the same placed in genus-covers and arranged in the same systematic order.

The nucleus of the Herbarium, the original collection loaned by the Department of Agriculture, and made by Mr. J. R. Anderson at the time he was Deputy Minister of Agriculture, has been rearranged and placed in the accepted order; this collection still remains in its original genus-covers and is in an excellent state of preservation, due to the great care Mr. Anderson took in preparing his specimens, many of which were collected twenty years ago.

From an educational standpoint the collection now in the Herbarium is available to teachers and other students of botany, and should prove a great facility to them for comparison in identifying any plants they do not know. A number of the latest and most authentic books on our flora are also at hand for reference; these will be found in the office of the Museum.

LIST OF VANCOUVER ISLAND PLANTS COLLECTED AND PRESENTED TO THE PROVINCIAL MUSEUM.

By Professor John Macoun, of Sidney, B.C.

Polypodiaceæ.

Adiantum pedatum L.
Aspidium spinulosum (O. F. Müller) Sw., var. *dilatatum* (Hoffm.) Hook.
Asplenium felix-fœmina (L.) Bernh.
Cystopteris fragilis (L.) Bernh.
Cryptogramma acrostichoides R. Br.
Lomaria spicant Desv.
Polypodium occidentale (Hook.) Maxon.
Polystichum braunii (Spenner) Fée, var. *andersoni.*
Polystichum munitum (Kaulf.) Presl.
Pteris aquilina lanuginosa Bong.
Woodwardia radicans (Smith), var. *americana* Hook.

Ophioglossaceæ.

Botrychium simplex Hitchc.
Botrychium silaifolium Presl.
Botrychium virginianum (L.) Sw.

EQUISETACEÆ.

Equisetum arvense L.
Equisetum sylvaticum L.
Equisetum telmateia Ehrh.

LYCOPODIACEÆ.

Lycopodium clavatum L.
Lycopodium lucidulum Michx.

SELAGINELLACEÆ.

Selaginella wallacei Hieron.

ISOETACEÆ.

Isoetes echinospora Durieu.

TAXACEÆ.

Taxus brevifolia Nutt.

PINACEÆ.

Abies grandis Lindl.
Chamæcyparis nootkatensis (Lamb.) Spach.
Juniperus scopulorum Sarg.
Picea sitchensis Carr.
Pinus contorta Dougl.
Pinus monticola Dougl.
Pseudotsuga taxifolia Britt.
Thuja plicata Donn.
Tsuga heterophylla (Raf.) Sarg.

TYPHACEÆ.

Typha latifolia L.

SPARGANIACEÆ.

Sparganium americanum Nutt., var. *androcladum* Engelm.
Sparganium simplex Huds.

GRAMINACEÆ.

Agropyron pseudorepens var. *magnum* Scribn. & Smith.
Agrostis alba L.
Agrostis alba L., var. *stolonifera*.
Agrostis exarata Trin.
Agrostis hyemalis (Walt.) Tuckerm.
Agrostis microphylla Steud.
Agrostis vulgaris (With.) Thurb.
Aira caryophyllea L.
Aira precox L.
Alopecurus californicus Vasey.
Alopecurus geniculatus L., var. *fulvus* (Smith) Sonder.
Alopecurus pratensis L.
Anthoxanthum odoratum L.
Arrhenatherum avenaceum Boiss.
Avena fatua L., var. *glabrata* Peter.
Bromus carinatus hookerianus (Thurb.) Shear.
Bromus commutatus Schrad.
Bromus glabrescens (Coss.) Shear.
Bromus hordeaceus L.
Bromus marginatus Nees.
Bromus maximus Desf.
Bromus pacificus Shear.
Bromus secalinus L.
Bromus sitchensis Bong.
Bromus sterilis L.
Bromus tectorum L.
Bromus vulgaris Shear.
Cinna latifolia (Trev.) Griseb.
Cynosurus cristatus L.
Cynosurus echinatus L.
Dactylis glomerata L.
Danthonia americana Scribn.
Danthonia spicata (L.) Beauv.
Deschampsia cæspitosa (L.) Beauv.
Deschampsia calycina Presl.
Deschampsia elongata (Hook.) Munro.
Elymus arenarius L.
Elymus borealis Scribn.
Elymus glaucus Buckl.
Elymus glaucus Buckl., var. *hirsutus* Malte.
Elymus vancouverensis Vasey.
Festuca bromoides L.
Festuca elatior L.
Festuca megalura Nutt.
Festuca occidentalis Hook.
Festuca pacifica Piper.
Festuca rubra L.
Festuca subuliflora Scribn.
Festuca subulata Trin.
Glyceria borealis (Nash) Batchelder.
Glyceria nervata Trin.
Glyceria nervata Trin., var. *elata* (Nash) Piper.
Glyceria pauciflora Presl.
Glyceria scabra Malte., *sp. nov.*
Holcus lanatus L.
Hordeum nodosum L.
Hordeum murinum L.
Kœleria cristata (L.) Pers.
Lolium multiflorum Lam.
Lolium perenne L.

Phalaris arundinacea L.
Phalaris canariensis L.
Phleum pratense L.
Phragmites communis Trin.
Poa annua L.
Poa compressa L.
Poa confinis Vasey.
Poa howellii Vasey.
Poa pratensis L.
Poa sandbergii Vasey.
Poa triflora Gilib.
Poa trivialis L.
Polypogon monspeliensis (L.) Desf.
Polypogon littoralis (With.) Smith.
Puccinellia lemmoni Vasey.
Puccinellia distans (L.) Parl.
Stipa minor (Vasey) Scribn.
Stipa nov. sp. Malte.

CYPERACEÆ.

Carex arcta Boott.
Carex athrostachya Olney.
Carex aurea Nutt.
Carex bolanderi Olney.
Carex canescens L.
Carex cryptocarpa C. A. Mey.
Carex deweyana Schwein.
Carex diandra Schrank, var. *ampla* Bailey.
Carex dives Holm.
Carex festiva Dew.
Carex festiva pachystachya (Cham.) Bailey.
Carex furva (Bailey).
Carex hendersoni Bailey.
Carex howellii Bailey.
Carex laeviculmis Meinsch.
Carex leptalea Wahl.
Carex mirata Dew.
Carex œderi Retz.
Carex pennsylvanica Lam., var. *vespertina* Bailey.
Carex phæocephala Piper.
Carex pratensis Drejer.
Carex rossii Boott.
Carex stellulata Good. var. *cephalantha* Bailey.
Carex stipata Muhl.
Carex teretiuscula ramosa Boott.
Carex utriculata Boott.
Carex vulgaris lipocarpha Holm.
Dulichium arundinaceum (L.) Britt.
Eleocharis palustris (L.) R. & S.
Scirpus americanus Pers.
Scirpus microcarpus Presl.
Scirpus occidentalis (Wats.) Chase.
Scirpus riparius (R. Br.) Spreng.
Scirpus robustus Pursh.
Scirpus validus Vahl.

ARACEÆ.

Lysichiton camtschatcensis (L.) Schott.

LEMNACEÆ.

Lemna trisulca L.
Spirodela polyrhiza (L.) Schleid.

JUNCACEÆ.

Juncus balticus Willd.
Juncus bufonius L.
Juncus columbianus Coville.
Juncus effusus L., var. *brunneus* Engelm.
Juncus effusus gracilis Hook.
Juncus effusus L., var. *pacificus* F. & W.
Juncus ensifolius Wiks.
Juncus falcatus E. Meyer.
Juncus falcatus var. *alaskensis* Coville.
Juncus gerardi Loisel.
Juncus lescurii Boland.
Juncus occidentalis (Coville) Wiegand.
Juncus tenuis Willd.
Luzula campestris (L.) DC.
Luzula campestris (L.) DC., var. *subsessilis* Wats.
Luzula comosa E. Meyer.
Luzula comosa E. Meyer, var. *macrantha* Wats.
Luzula parviflora (Ehrh.) Desv.
Luzula spicata (L.) DC.

LILIACEÆ.

Allium acuminatum Hook.
Allium cernuum Roth.
Allium geyeri Wats.
Camassia leichtlinii (Baker) Coville.
Camassia quamash (Pursh) Coville.
Disporum oreganum (Wats.) B. & H.
Erythronium giganteum Lindl.
Fritillaria lanceolata Pursh.
Hookera hyacinthina (Lindl.) Kuntz.
Lilium parviflorum (Hook.) Holzinger.
Maianthemum bifolium dilitatum Wood.
Smilacina amplexicaulis Nutt.
Smilacina sessilifolia Nutt.
Stenanthium occidentale Gray.

Streptopus amplexifolius (L.) DC.
Toficidia intermedia Rydb.
Trillium ovatum Pursh.
Veratrum viride Ait.
Zygadenus venenosus Wats.

IRIDACEÆ.

Hydastylus borealis Bicknell.
Olsynium grandiflorum (Dougl.) Raf.
Sisyrinchium birameum Piper.
Sisyrinchium idahoënse Bicknell.
Sisyrinchium macounii Bicknell.

ORCHIDACEÆ.

Calypso bulbosa (L.) Oakes.
Corallorrhiza maculata Raf.
Corallorrhiza mertensiana Bong.
Corallorrhiza stricta Lindl.
Habenaria dilitata Hook.
Habenaria elegans Boland.
Habenaria gracilis Wats.
Habenaria leucostachys (Lindl.) Wats.
Habenaria unalaschensis (Spreng.) Wats.
Listera caurina Piper.
Listera convallarioides (Sw.) Torr.
Peramium decipiens (Hook.) Ames.
Spiranthes romanzoffiana Cham.

SALICACEÆ.

Populus tremuloides Michx.
Populus trichocarpa T. & G.
Populus vancouveriana Trelease.
Salix geyeriana Anderss.
Salix geyeriana Anderss, X *sitchensis*.
Salix hookeriana Barratt.
Salix lasiandra Benth.
Salix sitchensis Sanson.
Salix scouleriana Barratt.

MYRICACEÆ.

Myrica gale L.

BETULACEÆ.

Betula occidentalis Hook.
Alnus oregona Nut.

FAGACEÆ.

Quercus garryana Dougl.

URTICACEÆ.

Ulmus campestris L.
Urtica lyallii Wats.

ARISTOLOCHIACEÆ.

Asarum caudatum Lindl.

POLYGONACEÆ.

Polygonum amphibium L.
Polygonum aviculare L.
Polygonum aviculare L., var. *vegetum* Ledeb.
Polygonum convolvulus L.
Polygonum erectum L.
Polygonum fowleri Robinson.
Polygonum hydropiperoides Michx.
Polygonum lapathifolium L.
Polygonum minimum Wats.
Polygonum paronychia Cham. & Schlecht.
Polygonum persicaria L.
Polygonum spergulariæforme Meisn.
Rumex acetosella L.
Rumex conglomeratus Murr.
Rumex crispus L.
Rumex obtusifolius L.
Rumex obtusifolius L., var. *discolor*.
Rumex occidentalis Wats.
Rumex persicarioides L.
Rumex pulcher L.

CHENOPODIACEÆ.

Atriplex patula L.
Atriplex patula L. var. *hastata* (L.) Gray.
Chenopodium album L.
Chenopodium humile Hook.
Chenopodium leptophyllum (Moq.) Nutt.
Salicornia ambigua Michx.
Suæda maritima (L.) Dumort.

AMARANTHACEÆ.

Amaranthus retroflexus L.

NYCTAGINACEÆ.

Abronia latifolia Esch.

CARYOPHYLLACEÆ.

Arenaria macrophylla Hook.
Arenaria serpyllifolia L.
Cerastium campestre Greene.
Cerastium viscosum L.
Dianthus armeria L.
Lychnis vespertina L.
Sagina crassicaulis Wats.
Sagina occidentalis Wats.
Saponaria officinalis L.
Silene anglica L.
Silene antirrhina L.
Silene gallica L.
Silene menziesii Hook.
Silene noctiflora L.
Silene scouleri Hook
Spergula arvensis L.
Spergula sativa Boenn.
Spergularia marina (L.) Griseb.
Spergularia rubra radicans Presl.
Stellaria borealis Bigel., var. *alpestris* (Fries) Britt.
Stellaria brachypetala Bong.
Stellaria crispa Cham. & Schlecht.
Stellaria longipes Goldie.
Stellaria media (L.) Cyrill.
Stellaria nitens Nutt.

PORTULACACEÆ.

Calandrinia caulescens menziesii Hook.
Claytonia dichotoma Nutt.
Claytonia howellii (Wats.) Piper.
Claytonia linearis Dougl.
Claytonia parviflora Dougl.
Claytonia parviflora Dougl., var. *depressa* Gray.
Claytonia parvifolia Moc.
Claytonia perfoliata Donn.
Claytonia sibirica L.
Claytonia spathulata Dougl.

NYMPHÆACEÆ.

Brasenia schreberi Gmel.
Nymphæa polysepala (Engelm.) Greene.

RANUNCULACEÆ.

Anemone lyallii Britt.
Anemone hudsoniana (DC.) Richards.
Anemone oregana Gray.
Anemone multifida Poir.
Aquilegia formosa Fisch.
Delphinium ajacis L.
Delphinium menziesii DC.
Myosurus apetalus lepturus Gray.
Ranunculus acris L.
Ranunculus aquatilis L.
Ranunculus aquatilis pantothrix (Brot.) Piper.
Ranunculus aquatilis L., var. *trichophyllus* Gray.
Ranunculus bongardi Greene.
Ranunculus bongardi Greene, var. *douglasii* Howell.
Ranunculus cymbalaria Pursh, var. *saximontana* Fernald.
Ranunculus flammula reptans (L.) Schlecht.
Ranunculus flammula (L.), var. *unalaschensis* (Bess.) Ledeb.
Ranunculus flammula (L.), var. *intermedius* Hook.
Ranunculus occidentalis Nutt.
Ranunculus orthorhynchus Hook.
Ranunculus othorhynchus Hook., var. *platyphyllus* Gray.
Ranunculus repens L.
Thalictrum occidentale Gray.

BERBERIDACEÆ.

Achlys triphylla (Smith) DC.
Berberis aquifolium Pursh.
Berberis nervosa Pursh.

PAPAVERACEÆ.

Eschscholzia californica Cham.
Papaver dubium L.
Papaver somniferum L.

FUMARIACEÆ.

Dicentra formosa DC.

CRUCIFERÆ.

Alyssum alyssoides (L.) Gouan.
Arabis hirsuta (L.) Scop.
Arabis glabra (L.) Bernh.
Arabis perfoliata Lam.
Brassica campestris L.
Cakile edentula (Bigel.) Hook.

Camelina sativa (L.) Crantz.
Capsella bursa-pastoris (L.) Medic.
Cardamine oligosperma Nutt.
Cardamine pennsylvanica Muhl.
Coronopus didymus (L.) Smith.
Dentaria tenella Pursh.
Draba verna L.
Erysimum occidentale (S. Wats.).
Hesperis matronalis L.
Lepidium menziesii DC.
Lepidium sativum L.
Lepidium strictum Rattan.
Neslia paniculata (L.)
Nasturtium palustre DC., var.
Radicula curvisiliqua (Hook.) Greene.
Radicula obtusa (Nutt.) Greene.
Radicula pacifica (Howell) Greene.
Raphanus sativus L.
Sisymbrium altissimum L.
Sisymbrium officinale L.
Sisymbrium officinale (L.), var. *leiocarpum* DC.

CRASSULACEÆ.

Sedum spathulifolium Hook.

SAXIFRAGACEÆ.

Heuchera cylindrica Dougl.
Heuchera micrantha Dougl.
Leptaxis menziesii (Pursh.) Raf.
Mitella pentandra Hook.
Ribes bracteosum Dougl.
Ribes divaricatum Dougl.
Ribes lacustre (Pers.) Poir.
Ribes lobbii Gray.
Ribes nigrum L.
Ribes sanguineum Pursh.
Saxifraga bongardi Presl.
Saxifraga integrifolia Hook.
Saxifraga rufidula (Small) Piper.
Tellima bulbifera Rydb.
Tellima grandiflora (Pursh) Dougl.
Tellima parviflora Hook.
Tiarella laciniata Hook.
Tiarella trifoliata L.

ROSACEÆ.

Alchemilla occidentalis Nutt.
Amelanchier florida Lindl.
Cotoneaster pyracantha (L.) Spach.
Crataegus brevispina (Dougl.) Heller.
Crataegus oxycanthoides L.
Drymocallis wrangeliana (Fisch. & Lall.) Rydb.
Fragaria bracteata Heller.
Fragaria crinita Rydb.
Fragaria cuneifolia Nutt.
Fragaria helleri Holzinger.
Geum macrophyllum Willd.
Geum oregonense Scheutz.
Osmaronia cerasiformis (T. & G.) Greene.
Physocarpus opulifolius (L.) Maxim.
Potentilla anserina L.
Potentilla dichora Rydb.
Potentilla gracilis Dougl.
Potentilla monspeliensis L.
Potentilla palustris (L.) Scop.
Potentilla recta L.
Prunus demissa (Nutt.) Dietr.
Prunus emarginata (Dougl.) Walp.
Prunus emarginata villosa Sudw.
Pyrus diversifolia Bong.
Rosa gymnocarpa Nutt.
Rosa nutkana Presl.
Rosa pisocarpa Gray.
Rosa rubiginosa L.
Rubus chamæmorus L.
Rubus laciniatus Willd.
Rubus leucodermis Dougl.
Rubus macropetalus Dougl.
Rubus parviflorus Nutt.
Rubus spectabilis Pursh.
Sanguisorba occidentale Nutt.
Spiræa discolor Pursh.
Spiræa douglasii Hook.
Spiræa menziesii Hook.

LEGUMINOSÆ.

Cytisus scoparius (L.) Link.
Hosackia bicolor Dougl.
Hosackia denticulata Drew.
Hosackia parviflora Benth.
Lathyrus latifolius L.
Lathyrus maritimus (L.) Bigel.
Lathyrus nuttallii Wats.
Lathyrus pauciflorus Fernald.
Lupinus bicolor Lindl.
Lupinus lepidus Dougl.
Lupinus littoralis Dougl.
Lupinus micranthus Dougl.
Lupinus microcarpus Sims.
Lupinus nootkatensis Donn.
Lupinus polyphyllus Lindl.
Medicago apiculata Willd.
Medicago hispida Gaertn.
Medicago lupubina L.
Medicago sativa L.
Melilotus alba Desr.

Melilotus indica (L.) All.
Melilotus officinalis (L.) Lam.
Psoralea physodes Dougl.
Robinia pseudo-acacia Dougl.
Trifolium albopurpureum T. & G.
Trifolium cyathiferum Lindl.
Trifolium dubium Sibth.
Trifolium fimbriatum Lindl.
Trifolium hybridum L.
Trifolium incarnatum L.
Trifolium microcephalum Pursh.
Trifolium microdon Hook & Arn.
Trifolium oliganthum Steud.
Trifolium pratense L.
Trifolium procumbens L.
Trifolium repens L.
Trifolium tridentatum Lindl.
Trifolium variegatum Nutt.
Ulex europæus L.
Vicia americana Muhl.
Vicia americana truncata (Nutt.) Brewer.
Vicia angustifolia (L.) Reich.
Vicia gigantea Hook.
Vicia hirsuta (L.) S. F. Gray.
Vicia sativa L.
Vicia tetrasperma (L.) Moench.

GERANIACEÆ.

Geranium bicknellii Britt.
Geranium carolinianum L.
Geranium dissectum L.
Geranium molle L.
Geranium pusillum Burm.
Erodium cicutarium (L.) L'Her.
Erodium moschatum (L.) L'Her.
Euphorbia peplus L.
Euphorbia serphyllifolia Pers.

ACERACEÆ.

Acer douglasii Hook.
Acer macrophyllum Pursh.

RHAMNACEÆ.

Ceanothus sanguineus Pursh.
Ceanothus velutinus Dougl.
Rhamnus purshiana DC.

MALVACEÆ.

Malva moschata L.
Malva parviflora L.
Malva rotundifolia L.
Malva sylvestris L.
Sidalcea hendersonii Wats.

VIOLACEÆ.

Viola adunca Smith.
Viola glabella Nutt.
Viola howellii Gray.
Viola macloskeyi Lloyd.
Viola nuttallii præmorsa (Dougal.) Wats.
Viola palustris L.
Viola retroscabra Greene.
Viola sarmentosa Dougl. Macoun
Viola sempervirens Greene.
Viola tricolor L.

ELÆAGNACEÆ.

Shepherdia canadensis (L.) Nutt.

ONAGRACEÆ.

Boisduvalia densiflora (Lindl.) Wats.
Circæa pacifica Asch & Magn.
Epilobium adenocaulon Haussk.
Epilobium anagallidifolium Lam.
Epilobium angustifolium L.
Epilobium minutum Lindl.
Epilobium paniculatum Nutt.

ARALIACEÆ.

Fatsia horrida (Smlth) B. & H.

UMBELLIFERÆ.

Angelica genuflexa Nutt.
Anthriscus sativa L.
Carum gairdneri (Hook. & Arn.) Gray.
Caucalis microcarpa Hook.
Cicuta douglasii (DC.) C. & R.
Cicuta purpurea Greene.
Cicuta vagans Greene.
Conioselinum gmelini (Cham. & Schlecht.) C. & R.
Conium maculatum L.
Daucus carota L.
Daucus pusillus Michx.
Heracleum lanatum Michx.
Hydrocotyle ranunculoides L.f.
Leptotænia dissecta Nutt.
Lomatium lævigatum (Nutt.) C. & R.
Lomatium nudicaule (Pursh) C. & R.
Lomatium utriculatum (Nutt.) C. & R.

Œnanthe sarmentosa Presl.
Osmorhiza divaricata Nutt.
Osmorhiza leibergii (C. & R.) Suksdorf.
Pastinaca sativa L.
Sanicula arctopoides H. & A.
Sanicula bipinnatifida Dougl.
Sanicula howellii C. & R.
Sanicula menziesii Hook. & Arn.

CORNACEÆ.

Cornus canadensis L.
Cornus nuttallii Audubon.
Cornus occidentalis (T. & G.) Coville.

ERICACEÆ.

Allotropa virgata T. & G.
Arbutus menziesii Pursh.
Arctostaphylos tomentosa (Pursh) Dougl.
Arctostaphylos uva-ursi (L.) Spreng.
Chimaphila ubellata (L.) Nutt.
Gaultheria ovatifolia Gray.
Hypopitys hypopitys (L.) Small.
Kalmia glauca Ait.
Pterospora andromedea Nutt.
Pyrola aphylla Smith.
Pyrola bracteata Hook.
Pyrola elata Nutt.
Pyrola picta Smith.
Pyrola picta dentata Smith.
Pyrola picta integra Gray.
Vaccinium cæspitosum Michx.
Vaccinium cuneifolium Nutt.
Vaccinium oxycoccus intermedius (Gray) Piper.

PLUMBAGINACEÆ.

Statice armeria L.

PRIMULACEÆ.

Anagallis arvensis L.
Centunculus minimus L.
Dodecatheon latifolium (Hook.) Piper.
Dodecatheon vulgare (Hook.) Piper.
Glaux maritima L.
Lysimachia thyrsiflora L.
Trientalis arctica Fisch.
Trientalis latifolia Hook.

GENTIANACEÆ.

Centaurium centaurium (L.) W. F. Wight.
Gentiana acuta Michx.
Gentiana sceptrum Griseb.
Menyanthes trifoliata L.

APOCYNACEÆ.

Apocynum androsæmifolium L.

CONVOLVULACEÆ.

Convolvulus arvensis L.
Convolvulus sepium L.
Cuscuta squamigera Engelm.
Cuscuta arvensis Beyrich.
Cuscuta epithymum Murr.

POLEMONIACEÆ.

Collomia heterophylla Hook.
Collomia grandiflora Dougl.
Gilia achilleæfolia Benth.
Gilia bicolor (Nutt.) Piper.
Gilia gracilis (Dougl.) Hook.
Gilia squarrosa H. & A.

HYDROPHYLLACEÆ.

Nemophila parviflora Dougl.
Nemophila sepulta Parish.
Phacelia linearis (Pursh) Holzinger.
Romanzoffia sitchensis Bong.

BORAGINACEÆ.

Allocarya plebeia Greene.
Amsinckia intermedia Fisch & Meyer.
Amsinckia lycopsoides Lehm.
Myosotis arvensis (L.) Hill.
Myosotis laxa Lehm.
Myosotis versicolor (Pers.) J. E. Smith.
Plagiobothrys tenellus (Nutt.) Gray.

VERBENACEÆ.

Verbena hastata L.

LABIATÆ.

Lamium amplexicaule L.
Lycopus Americanus Muhl.
Lycopus uniflorus Michx.
Marrubium vulgare L.
Mentha arvensis L., var. *canadensis* (L.) Briquet.
Mentha spicata viridis L.
Micromeria chamissonis (Benth.) Greene.
Nepeta hederacea (L.) Trevisan.
Prunella vulgaris L.
Scutellaria galericulata L.
Stachys ciliata Dougl.

SOLANACEÆ.

Solanum nigrum var. *villosum* L.

SCROPHULARIACEÆ.

Castilleja angustifolia bradburii (Nutt.) Fernald.
Castilleja levisecta Greenman.
Collinsia grandiflora pusilla Gray.
Collinsia tenella (Pursh) Piper.
Limosella tenuifolia Wolf.
Linaria vulgaris Hill.
Mimulus alsinoides Dougl.
Mimulus grandiflorus Howell.
Mimulus langsdorfii Donn.
Mimulus moschatus Dougl.
Mimulus nasutus Greene.
Orthocarpus attenuatus Gray.
Orthocarpus bracteosus Benth.
Orthocarpus hispidus Benth.
Orthocarpus pusillus Benth.
Rhinanthus crista-galli L.
Veronica arvensis L.
Veronica americana Schwein.
Veronica peregrina L.
Veronica serpyllifolia L.
Veronica scutellata L.
Veronica tournefortii C.C. Gmel.

LENTIBULARIACEÆ.

Utricularia vulgaris L., var. *americana* Gray.

OROBANCHACEÆ.

Orobanche uniflora L.
Orobanche comosa Hook.
Orobanche pinetorum Gray.

PLANTAGINACEÆ.

Plantago bigelovii Gray.
Plantago lanceolata L.
Plantago macrocarpa Cham. & Schlecht.
Plantago major L.
Plantago major L., var. *asiatica* (L.) Dene.

RUBIACEÆ.

Galium aparine L.
Galium aparine L., var. *vaillantii* (DC.) Koch.
Galium boreale L.
Galium trifidum pacificum Wiegand.
Galium triflorum Michx.
Sherardia arvensis L.

CAPRIFOLIACEÆ.

Linnæa americana Forbes.
Lonicera ciliosa (Pursh) Poir.
Lonicera hispidula Dougl.
Lonicera involucrata Banks.
Sambucus callicarpa Greene.
Sambucus glauca Nutt.
Symphoricarpus mollis Nutt.
Symphoricarpus racemosus Michx.

VALERIANACEÆ.

Valerianella anomala Gray
Valerianella congesta Lindl.

CUCURBITACEÆ.

Echinocystis oregana T. & G.

CAMPANULACEÆ.

Campanula scouleri Hook.
Specularia perfoliata (L.) A. DC.

COMPOSITÆ.

Achillea lanulosa Nutt.
Achillea millefolium L.
Adenocaulon bicolor Hook.
Agoseris grandiflora Nutt.

Agoseris laciniata (Nutt.) Greene.
Anaphalis margaritacea (L.) B. & H.
Anaphalis margaritacea occidentalis Greene.
Anaphalis margaritacea subalpina Gray.
Antennaria concolor Piper.
Antennaria howellii Greene.
Anthemis arvensis L.
Arctium minus Bernh.
Arctium minus Bernh., var. *tomentosum* Mill.
Arnica amplexicaulis Nutt.
Arnica latifolia Bong.
Artemisia suksdorfii Piper.
Aster douglasii Lindl.
Aster foliaceus.
Balsamorhiza deltoidea.
Bellis perennis L.
Bidens amplissima Greene.
Cichorium intybus L.
Chrysanthemum leucanthemum L.
Chrysanthemum parthenium (L.) Pers.
Cirsium arvense (L.) Scop.
Cirsium edule Nutt.
Cirsium lanceolatum (L.) Scop.
Cotula coronopifolia L.
Crepis capillaris (L.) Wallr.
Crocidium multicaule Hook.
Erigeron canadensis L.
Erigeron philadelphicus L.
Eriophyllum lanatum (Pursh) Forbes.
Franseria bipinnatifida Nutt.
Gnaphalium purpureum L.
Gnaphalium palustre Nutt.
Gnaphalium microcephalum Nutt.
Grindelia integrifolia DC.
Helenium autumnale grandiflorum (Nutt.) Gray.
Hieracium albiflorum Hook.
Hypochaeris glabra L.
Hypochaeris radicata L.
Lactuca scariola integrata Gren. & Godr.
Lactuca spicata (Lam.) Hitchc.
Lapsana communis L.
Luina hypoleuca Benth.
Madia exigua (Smith) Greene.
Madia racemosa (Nutt.) T. & G.
Madia sativa Molina.
Matricaria matricarioides (Less.) Porter.
Petasites speciosa (Nutt.) Piper.
Prenanthes alata (Hook.) Gray.
Senecio vulgaris L.
Senecio sylvaticus L.
Silybum marianum (L.) Gaertn.
Solidago elongata Nutt.
Solidago glutinosa Nutt.
Solidago lepida DC.
Sonchus asper (L.) Hill.
Sonchus oleraceus L.
Tanacetum vulgare L.
Taraxacum officinale Weber.
Tragopogon porrifolius L.

LIST OF MUSCI COLLECTED AND PRESENTED TO THE PROVINCIAL MUSEUM.

By Professor John Macoun.

Sphagnaceæ.

Sphagnum acutifolium Russ & Warnst.
Sphagnum cuspidatum Russ & Warnst.
Sphagnum fuscum Von Klinggraeff.
Sphagnum papillosum Lindb.
Sphagnum squarrosum Pers.

Andreæaceæ.

Andreæa petrophila Ehrh.

Dicranaceæ.

Dicranella heteromalla Schimp.
Dicranum congestum Brid.
Dicranum fuscescens Turn.
Dicranum howellii.
Dicranum scoparum Hedw.
Dicranum strictum Drumm.
Dicranum subpalustre C. M. & Kindb.
Dicranum sulcatum Kindb.

Ceratodonteæ.

Ceratodon purpureus Brid.
Distichium capillaceum Brunch & Schimp.

Pottieæ.

Leptotrichum flexicaule Hampe.
Barbula convoluta Hedw.
Barbula leptotricha C. M. & Kindb.
Barbula megalocarpa Kindb.
Barbula mucronifolia Bruch & Schimp.
Barbula ruralis Hedw.
Barbula subulata Beauv.
Barbula vinealis Braun.

GRIMMIEÆ.

Scouleria muelleri Kindb.
Racomitrium canescens Brid.
Racomitrium criocoides Bruch & Schimp.
Racomitrium heterostichum Brid.
Racomitrium varium.
Hedwigia ciliata Ehrh., var. *leucophæa* Schimp.
Braunia californica Lesq.
Braunia californica var. *pilifera* Lesq. & James.

ORTHOTRICHEÆ.

Amphoridium californicum Lesq. & James.
Ulota phyllantha Mitt.
Orthotrichum lyellii Hook & Tayl.
Orthotrichum pucheilum Brunton.
Encalypta streptocarpa Hedw.

PHYSCOMITRIEÆ.

Funaria hygrometrica Sibth., var. *calvescens* Bruch & Schimp.

BARTRAMIEÆ.

Bartramia pomiformis Hedw.
Philonotis macounii Lesq. & James.
Philonotis fontana Brid.
Philonotis marchica Brid.

BRYEÆ.

Leptobryum pyriforme Schimp.
Webera albicans Schimp.
Webera nutans Hedw.
Bryum capillare Linn.
Bryum cirrhatum Hoppe. & Hornsch.
Mnium affine Bland.
Mnium glabrescens.
Mnium inclinatum Lindb.
Mnium insigne Mitt.
Mnium menziesii C. Muell.
Mnium spinulosum Bruch. & Schimp.
Mnium venustrum Mitt.

AULACOMNIUM.

Aulacomnium androgynum Schwaegr.
Aulacomnium palustre Schwaegr.

TIMMIEÆ.

Timmia austriaca Hewd.

GEORGIACEÆ.

Georgia genuflexa.

POLYTRICHEÆ.

Atrichum undulatum Beauv.
Catharinea undulata (L.) Web. & Mohr.
Pogonatum alpinum Roehl.
Pogonatum alpinum var. *septentrionale* Brid.
Polytrichum commune Lindb.
Polytrichum juniperinum Willd.
Polytrichum piliferum Schreb.
Polytrichum strictum Banks.

FONTINALCÆ.

Fontinalis antipyretica Linn.
Fontinalis chrysaphylla Card.
Fontinalis kindergii Can. Musc.
Fontinalis patens.
Dichelyma cylindricarpum Aust.

NECKEREÆ.

Alsia abictina Sulliv.
Neckera douglasii Hook.
Neckera douglasii Hook., var. *macounii* Kindb.
Neckera menziesii Drumm.
Homalia macounii C. M. & Kindb.

LEUCODONTEÆ.

Antitrichia californica Sulliv.

HYPNEÆ.

Heterocladium heteroptoides Best.
Heterocladium heteroptoides var. *flicens* Best.
Thuidium crispifolium (Hook.) Kindb.
Camptothecium nuttallii Kindb.
Camptothecium lutescens Bruch. & Schimp.
Brachythecium albicans Bruch. & Schimp.
Brachythecium asperrimum Mitt.

Brachythecium rivulare Bruch. & Schimp.
Brachythecium rutabulum Bruch. & Schimp.
Brachythecium salebrosum Bruch. & Schimp.
Scleropodium cæspitosum Bruch. & Schimp.
Scleropodium calpophyllum.
Scleropodium obtusifolium Kindb.
Isothecium cardoti Kindb.
Isothecium brevcerianum Lesq. & James.
Isothecium lentum Lesq. & James.
Isothecium myurellum Kindb.
Isothecium nuttallii.
Isothecium stoloniferum Brid.
Eurynchium stokesii Bruch. & Schimp.
Eurynchium semiasperum C. M. & Kindb.
Raphidostegium roellii Ren. & Card.
Thamnium liebergii.
Plagiothecium denticulatum Bruch. & Schimp.
Plagiothecium crichapherum.
Plagiothecium sylvaticum Bruch. & Schimp.
Plagiothecium undulatum Bruch. & Schimp.
Amblystegium serpens Bruch. & Schimp.
Amblystegium riparium Bruch. & Schimp.
Hypnum circinale Hook.
Hypnum curvifolium Hedw.
Hypnum cohcarens.
Hypnum filicinum Linn.
Hypnum kneiffii Bruch. & Schimp.
Hypnum kneiffii var. *gracilescens* Bruch. & Schimp.
Hypnum palustre Huds.
Hypnum robustum Hook.
Hypnum subimponens Lesq.
Hypnum vernicosum Lindb.
Hylocomium splendens (Hedw.) Schimp.

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Ext. Proc. No. 2166, Vol. 51—Summary of the Mollusks of the Family Alectrionidæ of the West Coast of America. William Healey Dall.

Ext. Proc. No. 2165, Vol. 51—A New Species and Three New Species of Parasitic Isopod Crustaceans. W. P. Hay.

Ext. Proc. No. 2172, Vol. 51—New Species and Varieties of Foraminifera from the Philippines and Adjacent Waters. Joseph A. Cushman.

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Ext. Proc. No. 2175, Vol. 52—The Birds of Bawean Island, Java Sea. Harry C. Oberholser.

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Ext. Proc. No. 2181, Vol. 52—New Tertiary Insects. T. D. A. Cockerell.

Ext. Proc. No. 2182, Vol. 52—New Species of South Dakota Cretaceous Crabs. Mary J. Rathbun.

Ext. Proc. No. 2183, Vol. 52—Diagnoses of New Species of Marine Bivalve Mollusks from the West Coast of America in the Collection of the United States National Museum. William Healey Dall.

Ext. Proc. No. 2186, Vol. 52—A New Species of Polychætous Annelid from Panama, with Notes on a Hawaiian Form. Aaron L. Treadwell.

Ext. Proc. No. 2187, Vol. 52—Notice of a New Paleocene Mammalma, Possible Relative of the Titanotheres. J. W. Gidley.

Ext. Proc. No. 2188, Vol. 52—Mammals collected on the Chain of Islands lying off the Western Coast of Sumatra, with Descriptions of Twenty-eight New Species and Subspecies. Dr. W. L. Abbott and Marcus Ward Lyon, Jr.

Ext. Proc. No. 2189, Vol. 52—New Species of Fossil Beetles from Florissant, Colorado. H. F. Wickham.

Ext. Proc. No. 2190, Vol. 52—Rotatoria of Los Angeles, California, and Vicinity, with Descriptions of New Species. Frank J. Myers.

Ext. Proc. No. 2191, Vol. 52—On certain Secondary Sexual Characters in the Male Ruddy Duck, Erismatura jamaicensis (Gmelin). Alexander Wetmore.

Ext. Proc. No. 2203, Vol. 53—A New Species of Bear-Naimalcule from the Coast of North Carolina. W. P. Hay.

Ext. Proc. No. 2210, Vol. 53—Some Fossil Insects from Florissant, Colorado. T. D. A. Cockerell.

Ext. Proc. No. 2212, Vol. 53—Description of New Species of Extinct Horse, Equus lambei, from the Pleistocene from the Yukon Territory. Oliver P. Hay.

Ext. Proc. 2144, Vol. 51—New Brachiopods of the Genus Spirifer from the Silurian Maine. Henry Shaler Williams.

Ext. Proc. 2160, Vol. 51—A New Mollusk of the Genus Pisidium from Alaska, with Field Notes. G. Dallas Hanna and Victor Sterki.

Ext. Proc. No. 2162, Vol. 51—A Contribution to the Fauna of the Oligocene Beds of Flint River, Georgia. W. H. Dall.

Ext. Proc. No. 2169, Vol. 51—Mollusks from the Type Locality of the Choctawhatchee Marl.

Ext. Proc. No. 2170, Vol. 51—The Californian Land Shells of the Epiphragmophora Traskii Group. Paul Bartsch.

Ext. Proc. No. 2193, Vol. 52—Descriptions of New West American Marine Mollusks, and Notes on Previously Described Forms. Paul Bartsch.

Ext. Proc. No. 2196, Vol. 53—Some Effects of Environment and Habit on Captive Lions. N. Hollister.

Ext. Proc. No. 2198, Vol. 53—Description of a New Species of Mastodon, Gomphotherium elegans, from the Pleistocene of Kansas. Oliver P. Hay.

Ext. Proc. No. 2194, Vol. 53—North American Parasitic Copepods belonging to the Lernæidas, with Revision of the Entire Family. Charles Branch Wilson.

Ext. Proc. No. 2209, Vol. 53—New and Little Known Species of South American Fresh-water Mussels of the Genus Diplodon. William B. Marshall.

Ext. Proc. No. 2214, Vol. 53—Descriptions of a New Species of Crab from the California Pleistocene. Mary J. Rathbun.

Ext. Proc. No. 2215, Vol. 53—Fossil Remains of what appears to be a Passerine Bird from the Florissant Shales of Colorado. R. W. Shufeldt.

Ext. Proc. No. 2217, Vol. 53—Notes on the Shells of the Genus Epitonium and its Allies of the Pacific Coast of America. William Healey Dall.

Ext. Proc. No. 2225, Vol. 54—Nuculites from the Silurian Formations of Washington County, Maine. Henry Shaler Williams.

Ext. Proc. No. 2226, Vol. 54—Altitudinal Distribution of Entomostraca in Colorado. Gideon S. Dodds.

Ext. Proc. No. 2232, Vol. 54—Birds collected by Dr. W. L. Abbott on Various Islands in the Java Sea. Harry C. Oberholser.

Ext. Proc. No. 2207, Vol. 53—A Monograph of West American Malanellid Mollusks. Paul Bartsch.

Ext. Proc. No. 2218, Vol. 53—Fossil Echini of the Panama Canal Zone and Costa Rica. Robert Tracy.

Ext. Proc. No. 2223, Vol. 54—Chitons taken by the United States Fisheries Steamer "Albatross" in the North West Pacific in 1906. S. Stillman Berry.

Contributions, Vol. 35, No. 3—To the Comparative Histology of the Femur. J. S. Foote, M.D.

Contributions, Vol. 20, No. 1—The Mexican and Central American Species of Ficus. Paul C. Standley.

Contributions, Vol. 20, No. 2—The Middle American Species of Lonchocarpus. Henry Pittier.

Contributions, Vol. 18, Part 6—New and Noteworthy Plants from Colombia and Central America. Henry Pittier.

Contributions, Vol. 18, Part 7—Grasses from the West Indies. A. S. Hitchcock and Agnes Chase.

Contributions, Herbarium, Vol. 17—Systematic Investigations in Lichens and Ferns, Grasses, and other Phanerogams. Maxin, Hasse, Hitchcock, Hitchcock and Chase, Standley and Cook.

Bulletin No. 71, U.S. Nat. Museum—A Monograph of the Foraminifera of the North Pacific Ocean. Joseph Augustine Cushman.

Bulletin No. 95, U.S. Nat. Museum—The Fishes of the West Coast of Peru and the Titicaca Basin. Barton Warren Evermann and Lewis Radcliffe.

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Bulletin No. 101, U.S. Nat. Museum—The Columbian Institution for the Promotion of Arts and Sciences. Richard Rathbun.

Bulletin No. 102, U.S. Nat. Museum—The Mineral Industries of the United States. Joseph E. Pogue.

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Misc. Collections, Vol. 66, No. 18—On the Occurrence of Benthodesmus atlanticus, Goode and Bean, on the Coast of British Columbia. Dr. C. H. Gilbert.

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Misc. Collections, Vol. 67, No. 2—The Albertella Fauna in British Columbia and Montana. Charles D. Walcott.

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4th Ser., Vol. VII., No. 1, pp. 1-31—Archaelogical Notes on Western Washington and Adjacent British Columbia. Albert B. Reagan.

4th Ser., Vol. VII., No. 2, pp. 33-39—Concerning the Origin of the Soft-shelled Turtle, Aspidonectes californiana Rivers.

4th Ser., Vol. VII., No. 3, pp. 33-39—Notes on the Herpetology of Guam, Mariana Islands. John Van Denburgh.

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4th Ser., Vol. IV., No. 4, pp. 41-124—Stratigraphic and Faunal Relations of the Martinez to the Chico and Tejon of Southern California. Clarence A. Waring.

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4th Ser., Vol. V., No. 5, pp. 125-156—The Fauna of a Medial Tertiary Formation and the Associated Horizons of North-eastern Mexico. Roy E. Dickerson and W. S. W. Kew.

4th Ser., Vol. VII., No. 6—Climate and its Influence upon the Oligocene Faunas of the Pacific Coast, with Descriptions of some New Species from the Molopophorus lincolnensis Zone.

4th Ser., Vol. VII., No. 7—Climatic Zones of Martinez Eocene Time.

4th Ser., Vol. VII., No. 8—Ancient Panama Canals. Roy E. Dickerson.

4th Ser., Vol. VII., No. 9, pp. 207-227—Geology of a Portion of the McKittrick District, a Typical Example of the West Side San Joaquin Valley Oil Fields, and a Correlation of the Oil Sands of the West Side Fields. G. C. Gester.

4th Ser., Vol. VI., No. 8—Report of the President of the Academy for the year 1916. C. E. Grunsky.

4th Ser., Vol. VI., No. 9—Report of the Director of the Museum for the Year 1916.—Barton Warren Evermann.

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Vol. 13, No. 13—The Inheritance of Extra Bristles in Drosophila melanogaster Meig. Edna M. Reeves.

Vol. 15, No. 2—Continuation of Hydrographic, Plankton, and Dredging Records. Ellis L. Michael and George F. McEwen.

Vol. 15, No. 3—Summary and Interpretation of the Hydrographic Observations. George F. McEwen.

Vol. 16, No. 18—The Anatomy of Heptanchus maculatus. J. Frank Daniel.

Vol. 16, No. 19—Some Phases of Spermatogenesis in the Mouse. Harry B. Yocom.

Vol. 16, No. 20—Specificity in Behaviour and the Relation between Habits in Nature, and Reactions in the Laboratory. Calvin O. Esterly.

Vol. 16, No. 21—The Occurrence of a Rhythm in the Geotropism of Two Species of Plankton Copepods when certain Recurring External Conditions are absent. Calvin O. Esterly.

Vol. 17, No. 7—The Subspecies of Sceloporus occidentalis, with Description of a New Form, from the Sierra Nevada, and Systematic Notes on other California Lizards. Charles Lewis Camp.

Vol. 17, No. 8—Osteological Relationships of Three Species of Beavers. F. Harvey Holden.

Vol. 17, No. 9—Notes on the Systematic Status of the Toads and Frogs of California. Charles Lewis Camp.

Vol. 17, No. 10—A Distributional List of the Amphibians and Reptiles of California. Joseph Grinnell and Charles Lewis Camp.

Vol. 16, No. 22—On some New Species of Aphroditidæ from the Coast of California. Christine Essenberg.

Vol. 16, No. 17—Distribution of the Land Vertebrates of South-eastern Washington. Lee Raymond Dice.

Vol. 16, No. 23—Notes on the Natural History and Behaviour of Emerita analoga (Stimpson). Harold Tupper Mead.

Vol. 16, No. 24—Ascidians of the Littoral Zone of Southern California. William E. Ritter and Ruth A. Forsyth.

Vol. 18, No. 1—Mitosis in Giardia microti. William C. Boeck.

Vol. 18, No. 3—Description of some New Species of Polynoidæ from the Coast of California. Christine Essenberg.

Vol. 18, No. 4—New Species of Amphinomidæ from the Pacific Coast. Christine Essenberg.

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Bulletin Nos. 1 and 2—Scripps Institution for Biological Research.

Bulletin No. 3—Scripps Institution for Biological Research of the University of California: Modern Conceptions of Heredity and Genetic Studies at the Scripps Institution. Francis B. Summer.

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Memoir 84—An Exploration of the Tazin and Taltson Rivers, North West Territories. Charles Camsell.

Memoir 88—Geology of Graham Island, British Columbia. J. D. MacKenzie.

Memoir 89—Wood Mountain-Willowbunch Coal Area, Saskatchewan. Bruce Rose.

Memoir 91—The Labrador Eskimo. E. W. Hawkes.

Memoir 92—Part of the District of Lake St. John, Quebec. John Dresser.

Memoir 93—The Southern Plains of Alberta. D. B. Dowling.

Memoir 94—Ymir Mining Camp, British Columbia. Chas. Wales Drysdale.

Memoir 96—Sooke and Duncan Map-areas, Vancouver Island. G. H. Cooke and H. G. Clapp.

Memoir 97—Scroggie, Barker, Thistle, and Kirkham Creeks, Yukon Territory. D. D. Cairns.

Memoir 98—Magnesite Deposits of Grenville District, Argenteuil County, Quebec. M. E. Wilson.

Memoir 101—Pleistocene and Recent Deposits in the Vicinity of Ottawa, with the Descriptions of the Soil. W. A. Johnston.

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Bulletin No. 303—Annual Report, 1915.
Bulletin No. 306—Liming and Lime Requirements of Soil.
Bulletin No. 307—The Lesser Peach Tree Borer.
Bulletin No. 309—Spray Calendar, with Seed, Soil, and Disinfection Treatment Methods.
Bulletin No. 310—The Soldier Bug.
Bulletin No. 312—Soy-beans: their Culture and Use.
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Bulletin No. 311—Distribution of the Ohio Broods of Periodical Cicada with Reference to Soil.
Bulletin No. 314—Ohio Weather for 1916.
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Bulletin, Vol. XXXVII., Art. XVIII.—The American Museum Congo Expedition Collection of Bats. J. A. Allen, Herbert Lang, and James P. Chapin.
A Check List of Mammals of the North American Continent, the West Indies, and the Neighbouring Seas. D. G. Elliot, D.S.C.

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Antiquities of the St. Francis, White, and Black Rivers, Arkansas. Moore.
Certain Mounds of Arkansas and of Mississippi. Moore.
Moundville Revisited; Crystal River Revisited; Mounds of the Lower Chattahoochee and Lower Flint Rivers.
Notes on the Ten Thousand Islands, Florida. Moore.
Some Aboriginal Sites on Mississippi River. Moore.
Some Aboriginal Sites on Green River, Kentucky.
Some Aboriginal Sites on Lower Ohio River.
Additional Investigation on Mississippi River. Moore.
Some Aboriginal Sites on Red River. Moore.
Antiquities of the Ouachita Valley. Moore.
Report on an Additional Collection of Skeletal Remains from Arkansas and Louisiana. Dr. Ales Hrdlicka.

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