

PROVINCE OF BRITISH COLUMBIA
DEPARTMENT OF EDUCATION

PROVINCIAL MUSEUM
of NATURAL HISTORY
and ANTHROPOLOGY

Report for the Year 1948



VICTORIA, B.C.:

Printed by DON McDIARMID, Printer to the King's Most Excellent Majesty.
1949.

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Department of Education

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To His Honour C. A. BANKS,
Lieutenant-Governor of the Province of British Columbia.

MAY IT PLEASE YOUR HONOUR:

The undersigned respectfully submits herewith the Annual Report of the Provincial Museum of Natural History and Anthropology for the year 1948.

W. T. STRAITH,
Minister of Education.

*Office of the Minister of Education,
Victoria, B.C.*

PROVINCIAL MUSEUM OF NATURAL HISTORY
AND ANTHROPOLOGY,

VICTORIA, B.C., August 15th, 1949.

*The Honourable W. T. Straith,
Minister of Education, Victoria, B.C.*

SIR,—The undersigned respectfully submits herewith a report of the activities of the Provincial Museum of Natural History and Anthropology for the calendar year 1948.

I have the honour to be,

Sir,

Your obedient servant,

G. CLIFFORD CARL,

Director.

DEPARTMENT OF EDUCATION.

The Honourable W. T. STRAITH, *Minister.*

F. T. FAIREY, B.A., LL.D., *Deputy Minister and Superintendent.*

PROVINCIAL MUSEUM OF NATURAL HISTORY AND ANTHROPOLOGY.

Staff:

G. CLIFFORD CARL, Ph.D., *Director.*

GEORGE A. HARDY, *General Assistant.*

A. E. PICKFORD, *Assistant in Anthropology* (to June 30th).

CHARLES J. GUIGUET, *Assistant in Biology* (from May 1st).

MARGARET CRUMMY, B.A., *Secretarial Stenographer.*

BETTY C. NEWTON, *Artist.*

SHEILA GRICE DAVIES, *Typist.*

ARTHUR F. COATES, *Attendant* (on leave from September 1st).

E. J. MAXWELL, *Attendant* (from September 1st).

PROVINCIAL MUSEUM OF NATURAL HISTORY AND ANTHROPOLOGY.

OBJECTS.

(a) To secure and preserve specimens illustrating the natural history of the Province.

(b) To collect anthropological material relating to the aboriginal races of the Province.

(c) To obtain information respecting the natural sciences, relating particularly to the natural history of the Province, and to increase and diffuse knowledge regarding the same.

(Section 4, "Provincial Museum Act," R.S.B.C. 1936, c. 231.)

ADMISSION.

The Provincial Museum is open to the public, free, weekdays, 9 a.m. to 5 p.m.; and on Sunday afternoons, 1 p.m. to 5 p.m.

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DEPARTMENT OF EDUCATION

The Honorable W. T. STANLEY, Minister

F. T. FAIRY, B. A., LL.B., Deputy Minister and Superintendent

PROVINCIAL MUSEUM OF NATURAL HISTORY AND ANTHROPOLOGY

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REPORT OF THE PROVINCIAL MUSEUM FOR THE YEAR 1948.

REPORT OF THE DIRECTOR.

The following is a brief account of the activities carried on by the Provincial Museum during the calendar year 1948.

EXHIBITION AND PREPARATION.

Few changes were made in the permanent exhibits during this period. Chief addition is a display demonstrating the location of raised beaches in the Victoria area, featuring a map showing the areas inundated during interglacial periods and the types of fossils laid down. A diagrammatic model explaining the life-history of the fairy-ring mushroom has been prepared by Mr. Hardy and installed in the display featuring the fungi.

A colony of bees was again contributed by Dr. J. B. Munro, Deputy Minister of Agriculture, but the insects did not thrive well this year, presumably because of the widespread use of insecticides in the vicinity of the Legislative Buildings.

The display of living animals was augmented by the addition of several rattlesnakes, fence lizards, and one pond turtle; these continue to be of great interest, especially to children.

SPECIAL EXHIBITIONS.

The Seventh Annual Exhibition of British Columbia Indian Arts and Crafts was held in the Museum from June 8th to 19th under the sponsorship of the British Columbia Indian Arts and Welfare Society. The display, which was officially opened by Col. F. T. Fairey, Deputy Minister of Education, included entries from the Alberni Residential School and the Songhees Day School at Craigflower. The material on view was augmented by examples of work from the Inkameep School and St. George's School at Lytton. The memorial art scholarship offered by the society was again won by Miss Judith Phillis Morgan, of the Alberni Residential School.

A small exhibition case has been devoted to the display of models, drawings, and lino-cuts prepared by the junior group of the Victoria Natural History Society.

FIELD-WORK.

A great deal more field-work was made possible in 1948 through the services of Mr. Charles Guiguet, who joined the staff at the beginning of the summer season. With his assistance and through collaboration with the Department of Zoology, University of British Columbia, a joint project was carried out during May through August in the Goose Island area of the Coast, details of which are given in another section of this Report.

July 10th to 13th was spent by Carl, Hardy, and Forbes in the Jordan Meadows area at the headwaters of the Jordan and Leech Rivers, where a survey was commenced by Hardy in 1946. Further collections of plants and small mammals were made, and other pertinent information was gathered during this period.

The fortnight commencing July 18th was spent by Carl in the company of Guiguet and P. W. Martin (Department of Zoology, University of British Columbia), who were surveying Goose Island and neighbouring areas to the south-west of Bella Bella.

On August 1st and 2nd Carl visited the whaling-station at Coal Harbour and, on August 3rd, Fort Rupert Indian village near Port Hardy.

During the fall Guiguet made several trips to the Cowichan Bay area and Malahat district for the purpose of collecting birds.

At intervals during the year Hardy was able to carry on his ecological study of the Lost Lake area, a project commenced some years ago.

In early June, Pickford spent several days at Lillooet where he carried out an excavation of an old Indian burial-site. A few artifacts were collected and photographs were taken of the bones in situ.

PUBLICATIONS.

The following publications have originated from the Museum during 1948:—

By G. Clifford Carl—

“An Unusual Abundance of *Vellela vellela* Linne (Coelenterata: Siphonophoræ) in Inshore Waters.” Canadian Field-Naturalist, Vol. 62, No. 5; pp. 158, 159; 2 figs.; 1948.

By G. Clifford Carl and W. A. Clemens—

“The Fresh-water Fishes of British Columbia.” B.C. Provincial Museum Handbook No. 5; pp. 1–132; 7 coloured plates, 62 figs.; Sept., 1948.

By George A. Hardy—

“Bird Notes from Saanich, Southern Vancouver Island, British Columbia.” Murrelet, Vol. 28, No. 3; pp. 37, 38; Sept.–Dec., 1947.

“Some Beetles of the Families Cerambycidae and Buprestidae from Manning Park, British Columbia.” Proceedings, Entomological Society of B.C. (1947), Vol. 44; pp. 31–34; 1948.

“A Measure of the Fungi.” Victoria Naturalist, Vol. 5, No. 4; pp. 40–43; 1948.

“Report of the Fifth Annual Fungus Foray.” Victoria Naturalist, Vol. 5, No. 6; p. 66; 1948.

By A. E. Pickford—

“Archæological Excavation of Indian Middens.” Report of the Provincial Museum for 1947; pp. 20–28; 4 figs.; 1948.

By Charles J. Guiguet—

“Dabblers and Divers.” Victoria Naturalist, Vol. 5, No. 6; pp. 69, 70; 1948.

MOTION PICTURES.

Two films have been completed during the year: one, a 400-foot reel with titles, featuring the fur-seals on the Pribilof Islands; the other, an 800-foot film on the native eulachon-fishery, designed to illustrate a lecture. In time, prints will be made available for general use.

From time to time further film material has been added to the collection for future use. This includes about 400 feet of colour film on fishes and other marine animals obtained at the Tacoma Aquarium through the kind co-operation of the Director, Mr. John W. Slipp, and several hundred feet of film taken at the Western Whaling Corporation Station at Coal Harbour showing steps in the processing of a whale. We are indebted to Mr. D. W. Souter and Mr. William Glass, of this company, for making it possible to obtain these pictures.

While at Goose Island, additional material on porpoises, sea-lions, and other marine animals was obtained, to be incorporated in the film on marine mammals now being prepared.

Copies of motion-picture films made in former years have now been deposited in the library of the Visual Education Branch in Vancouver and are available to all schools.

We are indebted to Mr. C. A. Harwell, of Berkeley, Calif., western representative of the National Audubon Society, for the gift of several hundred feet of film featuring British Columbia wildlife which he took while gathering material for a Canadian film.

EDUCATION.

MUSEUM LECTURES.

Commencing February 14th the following programme of Saturday morning lectures was presented to school-children of the Greater Victoria area:—

Date.	Topic.	Speaker.
February 14..	" Travellers of the Skies ".....	Dr. Kenneth O. Wright, Dominion Astrophysical Observatory, Victoria, B.C.
February 21..	" Spider Land ".....	Mr. George A. Hardy, Provincial Museum, Victoria, B.C.
February 28..	" A Pencil in your Pocket ".....	Mrs. Barbara Woodward, F.Z.S., Victoria Natural History Society.
March 6.....	" Oil is where you find it ".....	Dr. T. B. Williams, Controller, Coal, Petroleum, and Natural Gas, Department of Lands and Forests, Victoria, B.C.
March 13.....	" Are you a Weather Watcher? ".....	Mr. E. D. M. Williams, Assistant Meteorologist, Patricia Bay, B.C.
March 20.....	" Mute Messages from Masks ".....	Mr. A. E. Pickford, Provincial Museum, Victoria, B.C.

Total attendance, 2,227.

It is a pleasure to be able to thank again the various outside speakers who contributed their time and talent to this series and also the British Columbia Electric Railway Company for again granting special travelling privileges to school-children attending the lectures.

A series of motion pictures was again presented for the general public on Sunday afternoons during February and March. About 900 persons attended six presentations.

OTHER LECTURES.

During the year 1948 lectures and film-shows were given by members of the Museum staff to the following organizations: Brechin Parent-Teacher Association and Brechin School (Nanaimo, three lectures), Salvation Army Youth Group (two lectures), Mount St. Mary Hospital, James Island Parent-Teacher Association, Oak Bay Kiwanis Club (three lectures), Pacific Northwest Bird and Mammal Society (Seattle), Lake Cowichan Fish and Game Association, Victoria Electric Club (two lectures), Victoria Natural History Society, Dominion Fisheries Officers (Nanaimo), Ladysmith Fish and Game Association (two lectures), Ladysmith School, Victoria Toastmistress Club, The Victoria Sixty-up Club, Victoria High School High-Y, Cloverdale Parent-Teacher Association, Camp 3 (Youbou), Victoria Horticultural Society, Royal Oak Parent-Teacher Association, Royal Oak School, Victoria White Cane Club (three lectures), Canadian Pacific Railway Veterans, Victoria Y.M.C.A. So-Ed Group (three lectures), St. Michael's School (two lectures), Victoria West Parent-Teacher Association, Vancouver Institute, Victoria Round Table Club, St. George's Church Men's Club, Victoria Amateur Movie Club, Victoria Y.M.C.A. Phalanx Club, Oak Bay Gyro Club, Vancouver Natural History Society, Victoria Kiwanis Club, Quadra School, Victoria Rotary Club, Victoria Rock Garden Society.

In addition to these, lecture-demonstrations were presented to the visual-education class of the Summer School session, the visual-education group of the Vancouver Island teachers' convention, the playground supervisors' summer school, and the Margaret Jenkins Parent-Teacher Association Fair.

Some instruction in modelling and other demonstrations was given to the junior group of the Natural History Society, mainly by Miss Betty Newton of the Museum staff. These children met each Saturday morning throughout the fall and winter in a corner of the Museum specially fitted up for their use.

Throughout the year, especially in the fall months, a considerable number of local school classes were conducted through the Museum, various members of the staff acting as guides. The majority of the visits were arranged by the Audio-Visual Department of the Greater Victoria School Board. Other groups to whom staff members gave explanatory lectures included the British Columbia Trades and Labour Council on October 15th and members and guests of Kiwanis International on October 5th.

During July and August conducted tours through the Museum galleries were given daily by Mr. Coates and Miss Charles, in the interests especially of out-of-town visitors.

SCHOOL LOAN MATERIAL.

The limited supply of cardboard dioramas depicting Indian life has scarcely been adequate to satisfy the demand on the part of teachers in many parts of the Province. In time it is planned to have sufficient copies made so that all requests can be met.

Other visual aids, including several portable displays, a collection of marine shells, a collection of local bird skins and a model Indian long-house, are on loan to the Audio-Visual Education Department of the Greater Victoria School Board and are being circulated through local schools under supervision of Mr. Denis W. Brown, Director.

RESEARCH.

Early in June Mr. Pickford spent several days carrying out an archæological project in the Lillooet area. During this period a grave-site was uncovered, and skeletal remains with associated artifacts were photographed in situ.

During May, June, July, and August Mr. Guiguet carried on a study of the ecological association to be found on an offshore island in the area south-west from Bella Coola, as recorded in more detail elsewhere.

Commencing in November a duck-banding project was carried on in Beacon Hill Park, Victoria, where many wild fowl spend the winter. Up until the end of the year, when cold weather forced most of the birds to open water elsewhere, forty-six widgeon and fourteen mallard were taken and banded. The co-operation of the City Parks officials and of the park staff has been much appreciated throughout this project.

The study of the Lost Lake area undertaken by Mr. Hardy and similar work in other areas has been carried on in 1948 as usual.

ATTENDANCE.

The number of visitors to the Museum during 1948 is summarized as follows:—

Month.	Registered.	Estimated.
January	1,821	2,426
February	1,907	2,542
March	2,316	3,088
April	2,080	2,773
May	3,254	4,338
June	4,572	5,762
July	9,257	12,476
August	7,698	10,264
September	3,886	5,181
October	1,954	2,605
November	1,062	1,416
December	768	1,024
Totals.....	40,575	53,895

In addition, there were 2,227 children who attended the Saturday morning lectures, over thirty school classes, twenty Junior Naturalist classes, and two large groups made up of members of Trades and Labour Council and Kiwanis International. A series of film-shows presented in the Museum for the general public on Sunday afternoons during the period February 15th to March 21st, inclusive, drew a total attendance of over 900 persons, making an estimated grand total for the year 1948 of over 60,000.

The attendance record for the month of July, as shown by the entries in the visitors' register, has been analysed by Mr. Maxwell as follows:—

Residence.	Registration.	Residence.	Registration.
British Columbia	2,453	Washington	1,439
Alberta	548	Oregon	623
Saskatchewan	408	California	1,617
Manitoba	230	Alaska	4
Ontario	388	Other States	1,235
Quebec	79	Great Britain	108
New Brunswick	15	Other countries	71
Nova Scotia	19		
Prince Edward Island	13	Total	5,097
Newfoundland	2		
Yukon Territory	5	Grand total	9,257
Total	4,160		

Compared to a similar analysis of the attendance for July, 1947, the registration for this month was higher by 1,703.

The sum of \$159.89, collected from the Solarium donation-box during 1948, was turned over to the Queen Alexandra Fund for crippled children.

STAFF CHANGES.

Major changes in staff have included one retirement and one new appointment. On June 30th, after a final extension of time, Mr. Pickford officially retired as Assistant in Anthropology. Since no one is available for this position, it has not yet been filled.

On May 1st Mr. C. J. Guiguet joined our staff as biologist. Having had many years of field experience collecting for the National Museum of Canada and for the University, followed by formal training in wildlife management at the University of British Columbia, he is especially suited for museum-work. His keen interest in the birds and mammals of the Province will be of great value in increasing our knowledge in this field.

During July and August temporary assistance was rendered by Mr. Ron Forbes and Miss Della Charles. Miss Charles, a native student of the Alberni Residential School, assisted as a guide to visitors, especially through the Indian exhibit.

Mr. Coates, Museum attendant, was granted six month's leave of absence, commencing September 1st, in order to visit England. Mr. E. J. (Gerry) Maxwell has been temporarily appointed to take his place.

OFFICE EQUIPMENT.

During the year a new rug was acquired for the Director's office and fluorescent-lighting fixtures were installed in all offices.

OBITUARY.

With regret we record here the death on February 2nd, 1948, of Mr. H. H. (Peg) Pegler, former Museum attendant. Mr. Pegler was known by many throughout the Province, and during his six years on the Museum staff he made many more friends, all of whom mourn his passing.

REPORT OF THE ASSISTANT IN BIOLOGY.

A general collecting and ecological field party, financed jointly by the Provincial Museum and the University of British Columbia, spent the summer, May through August, upon the Goose Island group off the coast of British Columbia.

These outermost islands were selected as an area of ecological study mainly because of their position; they represent a good geographic mean for the outer fringe of islands off our west coast. Surrounding waters are rich in marine life. The group is also ideal as a launching base for the trips involved in studying and collecting those birds which live far out to sea.

A wealth of data and specimens was collected. Three hundred pages of detailed notes were taken on weather, birds, mammals, and amphibians. These pages include an index system for quick access to species observations.

Some 400 specimens of birds and mammals were collected, catalogued, and preserved, representing valuable material such as the Chilean skua and pale-footed shearwater.

A complete collection was made of all mammals inhabiting the group, including specimens of porpoise.

Large series of the indigenous meadow mouse (*Microtus*) and other terrestrial species were made. Forty-eight specimens of living white-footed mice (*Peromyscus*) were collected and shipped to the University of British Columbia. These are being used in genetical experiments concerned with the speciation of these mice upon the coastal islands.

Population studies of small mammals and terrestrial birds were also carried out, and, in addition, several hundred specimens of fishes were collected and preserved for later study.

A complete collection was made of those plants present during the time spent on the group, and a floral survey was carried out in the four major habitat types on the islets.

These raw data of the summer's work are now undergoing analyses at the Provincial Museum and will appear shortly as an occasional paper or special publication.

The specimens collected were divided equally between the Provincial Museum and the University of British Columbia.

REPORT OF THE GENERAL ASSISTANT.

BOTANY.

ACTIVITIES.

The accumulation of plant specimens and the dissemination of knowledge concerning them has gone steadily apace.

Much patient and time-consuming effort is necessary in order to keep up to date with the progress of botanical science, particularly in regard to taxonomy. In this field the acquisition of new material and increased studies by specialists have resulted in changes in nomenclature as a better understanding of plant relationships is realized.

Thus the keeping of our plants' names up to date is one of our activities. New weeds and other plants are unexpectedly turning up in the Province, each of which must be dealt with and allocated to its place, in order that future identification may be readily made.

The practical use of the herbarium in connection with noxious weeds and relevant matters has been eminently satisfactory during the past season. One of the major occupations of the botanist is the identification of wild flowers for schools, teachers, and writers. Over 1,000 species of plants were dealt with in this way during the past year.

Recorded accessions for the year amount to 791 sheets of vascular plants, together with 98 fungi, 40 mosses, and a number of lichens and marine algæ. Many of these contain species new to the herbarium or are new locality records for the Museum files.

Mrs. S. Davies has continued her work of previous years in the mounting, labelling, and filing, accounting for 812 sheets which have been shelved or are ready for shelving as soon as space is available.

The wild-flower seasonal exhibit continues to be a popular feature and has been maintained uninterruptedly throughout the year. An average of twenty-five species are constantly on view.

As a corollary to identification, talks, lectures, and demonstrations were undertaken for schools and other organizations.

The collection of mushrooms has been rearranged with a view to easy reference; the plan of using "species-envelopes" which can be filed like a card-catalogue has been adopted, and proven to be efficient in every way.

A model demonstrating the life and development of the fairy-ring mushroom has been prepared and placed on view in the botanical exhibition series.

A short field-trip was made to the Jordan Meadows area as a continuance of similar studies carried out during the past two seasons. This resulted in new data, which are incorporated in the account of Jordan Meadows which appears elsewhere in this Report. A number of plants (102) from Goose Island were added to the herbarium by Mr. C. J. Guiguet, who spent four months in that vicinity on a joint field-trip with the University of British Columbia.

Part of the botanist's time was spent in the preparation of articles for publication. Work on a manuscript concerning the botany and entomology of Manning Park has been continued at odd moments between other duties, and some time has been devoted to matters pertaining to the Victoria Natural History Society.

Attention has also been given to the routine of caring for the herbarium—fumigation, storage, etc. The collection is in first-class condition as regards preservation of material, but increased storage facilities are urgently needed to take care of a large overflow.

ACKNOWLEDGMENTS.

We are indebted to the interest and enthusiasm of the following gentlemen for the trouble they have gone to in gathering specimens for the Museum, particularly in the case of the surveyors, who do this in addition to their regular duties:—

Mr. J. W. Eastham is again responsible for the acquisition of a large number of specimens, the results of his extensive and specialized field-work in little-frequented parts of the Province so far as botanical interests are concerned.

In the first place he contributed 440 numbers from his 1945-47 collecting trip, which covered a large section of the Province near the 54th parallel in the south-eastern part of British Columbia. Among these are many records of localities and species new to the herbarium and, in one or two cases, to the Province. He has also donated a series of twenty-four sheets of *Salix* from various parts of the Province and, last but not least, sixty-two sheets of this year's collection from South-eastern British Columbia.

Mr. A. G. Slocomb, of the Department of Lands and Forests, Surveys Branch, has contributed a welcome series from the Kyuquot Sound district of Vancouver Island.

Mr. R. Thistlewaite, also of the Surveys Branch, is responsible through Mr. L. G. Temple, a member of his party, for a number of most desirable examples from the extreme northern boundary of British Columbia, a section of our Province from which we can never receive too many specimens, having in view the fact that no organized treatment of the north part of the Province beyond the 54th parallel as yet has been published under one cover.

Mr. J. A. Munro, Dominion Wildlife Officer, has augmented his donations of last year by another set of specimens from the Creston district, one or two of which are of outstanding interest.

Mr. J. W. B. Wagg, of the British Columbia Forest Service, has been generous enough to supply us with a duplicate collection of plants from the Cowichan area of Vancouver Island.

Mr. E. A. Porsild, of the National Museum of Canada, Ottawa, has contributed fifty-one specimens relative to British Columbia and adjacent territories.

To the above and to others who have from time to time enriched our collection during the past season, we wish to extend our cordial thanks and appreciation. These sentiments are also accorded to the following specialists for their hearty and spontaneous willingness to examine and name or verify the various specimens submitted to their judgment:—

Mr. J. W. Eastham, formerly plant pathologist at Vancouver, B.C., now retired—Juncaceæ, Gramineæ, and Cyperaceæ; Dr. C. R. Ball, Plant Extension Service, United States Department of Agriculture, Washington, D.C.—Salix; Dr. F. W. Pennell, Academy of Natural Sciences of Philadelphia, Philadelphia, Pa.—Castilleja; Dr. Leon Kelso, Washington, D.C.—Castilleja; G. Llandos, New York, N.Y.—Lichens; Mr. Stanley J. Smith, New York State Museum, Albany, N.Y.—Trillium. (Mr. Smith has revised and annotated all our species.)

Last but not least, we would like to thank those who have brought in specimens for the flower-case, especially Miss Marjory Palmer, of the Department of Lands, who has consistently supplied material for this purpose.

MISCELLANEOUS NOTES.

The following plant is not recorded in the "Flora of Vancouver and Queen Charlotte Islands":—

Lamium purpureum L. Red Dead Nettle. Saanich, V.I., May 1st, 1948, in garden, G. A. Hardy. I am informed by A. Nicholls and K. Christiansen that this European species is an abundant weed in various gardens and nurseries in Saanich, Duncan, and Swan Lake district, and is known to have occurred there during the past ten years. J. W. Eastham reported a thriving colony in Burrard Inlet in 1939.

The following plant is not known to have been recorded from British Columbia:—

Alliaria Alliaria (L) Brit. Garlic Mustard. Victoria, April 27, 1948, G. C. Carl. Locally abundant in gardens and waste places, where it is proving difficult to eradicate. There do not seem to be any other records for British Columbia. A native of Europe, it is prevalent in Eastern North America and as far west as Winnipeg.

The species of the genus *Castilleja* are not easy to identify. The latest identifications, as given by Dr. F. W. Pennell and Dr. Leon Kelso, are listed here, as they are not given in Henry's "Flora" or in Eastham's "Supplement":—

- (1) *Castilleja confusa* Grieve. Cranbrook; June 14th, 1942; W. B. Johnstone.
- (2) *Castilleja cusickii* Greenman. Cranbrook; June 14th, 1942; W. B. Johnstone.
- (3) *Castilleja Dixoni* Fern. Sooke; August 6th, 1933; F. Kermode. Spider Island; July 7th, 1939; I. McT. Cowan. Hitherto under several other names in our collection. Close to *miniata*.
- (4) *Castilleja pinetorum* Fern. Mt. Three Brothers, Manning Park; August 4th, 1945; G. A. Hardy.

- (5) *Castilleja septentrionalis* Lindl. Creston; June 11th, 1947; J. W. Eastham. An eastern species close to *sulphurea*.
- (6) *Castilleja Tweedyi* Rydb. Nicola, Glacier, Princeton, Lytton, Mt. Revelstoke. Formerly under several other names in our herbarium.
- (7) *Castilleja unalaschensis* (C. & S.) Malte. Skidegate, Q.C.I.; May 26th, 1923; Dr. C. F. Newcombe.

ENTOMOLOGY.

A steady interest in entomology has been evinced throughout the year by inquiries, both from the general public and the specialist.

In the first category are the demands to know the name of some large or conspicuous moth, beetle, or bug that has attracted attention, such as the big polyphemus moth, the barred borer and California prionus, both large beetles, or the electric-light bug, a gigantic bug. All of above are common, but showy.

Information is continually sought concerning the poisonous or non-poisonous species of insects, whether they are useful or injurious in field, garden, or dwelling.

Any small insect found in the house is at once under suspicion as to its intentions. Having in mind storied accounts of certain noxious denizens of the home, the layman hastily seeks advice from the Museum officials, whose pronouncements mean all the difference between a disturbed or tranquil state of mind to the party most concerned.

The insects in the above class usually turn out to be silverfish, cockroaches, death-watch beetles, bread-beetles, spider-beetles or carpet-beetles, to mention a few—rarely those most dreaded!

In the second category, the collections have been consulted for various taxonomic reasons, such as the revision of certain Carabidæ by Dr. Melville H. Hatch. Mr. J. R. Llewellyn Jones has thoroughly examined the macrolepidoptera in connection with his forthcoming annotated check-list for the Province. In addition, the writer has endeavoured to keep up to date with the Cerambycidæ of Vancouver Island.

As a member of the Entomological Society, the writer submitted two papers at the annual meeting at Lytton in March—"Notes on the Life History of *Xanthorhoe defensaria*" and "Notes on, and Additions to, the Cerambycidæ of Vancouver Island."

Time has been spent on the care of the collections, which necessitate much fumigation and a constant alertness to the many dangers that threaten dried specimens. Such time and cost is in direct proportion to the suitability of storage-cases, a condition which at present leaves much to be desired.

We wish to take this opportunity to thank those who have contributed material or have helped in the identification of specimens during the past year.

ACCESSIONS.

During 1948 the following specimens were added to the catalogued collections (figures in parentheses indicate the total number on December 31st, 1948): Indian material, 112 (6,629); plants, 894 (21,573); mammals, 61 (5,368); birds, 486 (9,770); reptiles, 3 (285); amphibians, 7 (565); fish, 36 (729).

ANTHROPOLOGICAL ACCESSIONS.

The Canon A. J. Beanlands Collection.—(Gift.) From Miss Alyson H. Beanlands and Miss Angela Beanlands and through the office of Mr. W. A. McAdam, Agent-General for British Columbia in London, the Museum has received a valuable collection of Indian materials collected by the late Canon Beanlands, M.A., F.S.A., F.R.C.I., who served as an Anglican clergyman in Victoria for twenty-five years prior to 1909. Canon Beanlands and the late Dr. C. F. Newcombe were active in gathering Indian materials which are the nucleus of the present Museum collection.

The C. G. Barber Collection.—(Gift.) A number of articles of wearing-apparel and other objects made by northern tribes and collected by Mr. C. G. Barber were donated to the Museum by Mrs. C. G. Barber, of Kaslo.

The P. Clough Collection.—(Gift.) A varied collection of Indian and Eskimo objects was presented by Mrs. P. Clough, of Duncan.

The A. D. Crease Collection.—(Purchase.) A small collection of Salishan and Haida Indian materials was obtained from Mr. A. D. Crease, of Victoria, as listed on the following pages.

H Aidan.

By gift—

- Goat-horn spoon. In Beanlands collection.
- Sheep-horn spoon. In Beanlands collection.
- Soopallalie spoon. In Beanlands collection.
- Ceremonial rattle. In Beanlands collection.
- Globular rattle. In Beanlands collection.
- Oval rattle. In Beanlands collection.
- Wooden dish. In Beanlands collection.
- Toasting-stick. In Beanlands collection.
- Paint-brush. In Beanlands collection.
- Black slate totem-pole. Mr. Theo. Forbes, Sidney.
- Copper. Mr. A. M. D. Fairbairn, Sooke.
- Totem-pole model. Mr. A. M. D. Fairbairn, Sooke.
- Labret. Mr. A. M. D. Fairbairn, Sooke.

By purchase—

- Wooden figures, human and eagle. In Crease collection.
- Wooden box and lid. In Crease collection.
- Fish-hooks (two). In Crease collection.
- Stone hammer, fish-head design. In Crease collection.

Tsimshian.

By gift—

- Coronet of bear-claws. In Barber collection.
- Group of quills for coronet. In Barber collection.
- Globular wooden rattle. In Barber collection.

By purchase—

- Wooden spoon. In Crease collection.

Kwakiutl.

By gift—

- Wooden cradle. In Beanlands collection.
- Whalebone chopper. In Beanlands collection.
- Spindle and whalebone whorl. In Beanlands collection.
- Wooden comb. In Beanlands collection.
- Canoe-paddle. Mrs. A. H. Jennings.
- Mask. A. M. D. Fairbairn, Sooke.

Nootkan.

By gift—

- Bone war club (minus handle). Ivan Clarke, Refuge Cove.
- Fish-basket. In Clough collection.
- Basket and tump-line. In Clough collection.
- Fish-net. In Clough collection.
- Tray of basketry. In Clough collection.

COAST SALISH.

By gift—

Cradle, imbricated basketry. In Beanlands collection.
 Basket, square. In Beanlands collection.
 Pestle-head. James Pearce, Victoria.
 Chisel-point of nephrite. F. M. Sutton, Victoria.
 Game-stones (two). J. D. Ogilvie, Qualicum.
 Head of war club. J. D. Ogilvie, Qualicum.
 Stone war club. J. B. Willcox.
 Spear-point. Alex Millar, Swan Lake.
 Human skull. C. E. Ennals, Mud Bay.
 Human skull. V. Moxam, Marne Station.
 Human skulls (two). Mrs. B. Clowes, Sooke.
 Chisel-point. Mrs. W. O. Wallace, Eugene, Ore.

By purchase—

Model canoes (four). In Crease collection.
 Canoe-bailer. In Crease collection.
 Canoe-paddles (four). In Crease collection.
 Mats of cedar-bark (seven). In Crease collection.
 Stone hammer. In Crease collection.
 Stone axe-head. In Crease collection.

INTERIOR SALISH.

By gift—

Berry-picking basket. In Beanlands collection.
 Human skull. D. S. E. Thomson, British Columbia Provincial Police.

DENE.

By gift—

Buckskin coat, trimmed with fur. In Barber collection.
 Gauntlets, horseshoe and floral design. In Barber collection.
 Moccasins, with porcupine-quill work. In Barber collection.
 Buckskin slippers, embroidered. In Barber collection.
 Stone pestle. In Barber collection.
 Bow, wood and sinew. In Clough collection.
 Quiver and six arrows. In Clough collection.
 Waist-band, beaded. In Clough collection.
 Fire-bag, beaded. In Clough collection.
 Game-bag, open mesh. In Clough collection.
 Belt, porcupine-quill work. In Clough collection.
 Belt, beaded. In Clough collection.
 Garter and leggings. In Clough collection.
 Gun-case of moose-hide. In Clough collection.
 Bag of moose-hide. In Clough collection.
 Basket, woven. In Clough collection.
 Basket, birch-bark. In Clough collection.
 Duck decoy, wooden. In Clough collection.
 Hat, birch-bark and cloth. In Clough collection.

KOOTENAIAN.

By gift—

Snowshoes. Miss C. I. Alexander, Victoria.

CHIPEWYAN.

By gift—

Snowshoes. Miss C. I. Alexander, Victoria.

PLAINS.

By gift—

Peace-pipe. Mrs. W. O. Wallace, Eugene, Ore.

Tomahawk. Mrs. W. O. Wallace, Eugene, Ore.

Beaded bag. Mrs. W. O. Wallace, Eugene, Ore.

Spear-point. Mrs. W. O. Wallace, Eugene, Ore.

Chisel-point. Mrs. W. O. Wallace, Eugene, Ore.

CREE.

By gift—

Bow, wood and horn. Mrs. W. E. Weller, Victoria.

Arrows (five). Mrs. W. E. Weller, Victoria.

Bonnet of rabbit-fur. Mrs. W. E. Weller, Victoria.

Bola (throwing-weapon). Mrs. W. E. Weller, Victoria.

ESQUIMO.

By gift—

Mucklucks of doeskin. In Barber collection.

Labrets of stone. In Clough collection.

Pipe, metal bowl. In Clough collection.

Rattle, child's. In Clough collection.

Fish-hooks (three). In Clough collection.

Scraper, bone and metal. In Clough collection.

Whip, dog-team. In Clough collection.

Seal-spear. In Clough collection.

BOTANICAL ACCESSIONS.

J. E. Bennett, Ganges, one; K. Christiansen, Victoria, three; Miss H. Hinder, Victoria, one; H. R. Lacon, Denman Island, one; Mrs. K. Long, Crofton, one; Mrs. G. M. Lynes, Victoria, one; C. R. Nairne, Victoria, one; Miss B. Niblett, Tofino, one; A. Nicholls, Victoria, one; R. Thistlewaite, Victoria, collection of plants from Northern British Columbia.

ZOOLOGICAL ACCESSIONS.

MAMMALS.

By gift—

C. M. G. Farrell, Victoria. One musk-ox skull.

J. Jobin, Williams Lake. Three pikas, two red squirrels, three meadow-mice, one chipmunk.

C. A. Neaves, Saanichton, per Alex. Patterson. One albinistic muskrat.

E. J. Petersen, Deep Cove, Sidney. One sea-lion skull.

By the staff.

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The L. O. Howard collection.—(Gift.) The following biological specimens collected by the late L. O. Howard were presented by Mrs. L. O. Howard, of Victoria: Collection of birds' eggs containing seventy-one sets of eggs, four specimens of tarantula, two specimens of centipede, one scorpion, eight skins of quail, one insect collection, one skin of bull snake, four skins of rattlesnakes, three skins of gila monster, one mounted gila monster, one mounted head of collared peccary, one collection of negatives and prints.

BIRDS.

By gift—

- J. Beasley, Victoria. One kingfisher.
 Roy Cuzner, Victoria. One song sparrow nest and egg.
 J. Alfred Flett, Duncan. One horned owl.
 D. Loggin, Langford. One rail.
 C. Nairne, Victoria. One rail.
 N. Taylor, Royal Oak. One horned owl.
 A. N. Upward, Victoria. One bushtit nest.

By the staff—

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FISH.

By gift—

- D. Dicker, Victoria. One sculpin.
 G. R. Grossmith, Victoria. Four pompano.
 R. D. Klight, Victoria. One sturgeon.
 N. McSween, Victoria. One wolf-eel.
 D. G. Odlum, Victoria. One liparid, one sea-poacher.

INVERTEBRATES.

By gift—

- The Misses M. and L. Baker, Ladysmith. One banded borer.
 R. L. Colby, Victoria. One lady-bird beetle.
 Roy Cuzner, Victoria. One moon snail.
 D. Dicker and A. W. McIntyre, Victoria. One pteropod.
 J. W. Dobbie, Jordan River. One dobson fly.
 Miss Alice Green, Victoria. One silk-moth.
 Ronald Greer, Ladysmith. One ten-striped potato-beetle.
 Mrs. E. Hayden, Cordova Bay. One ichneumon fly.
 John E. Hepworth, Shawnigan Lake. One cave cricket.
 Mrs. Johnson-Tighe, Victoria. One California prionus.
 Michael and Bobbie Keilly and Murray Holmes, Victoria. One jumping spider.
 David McCandless, Victoria. One banded borer.
 Billy Milligan, Ladysmith. One spiny wood-borer.
 Mrs. M. Minchin, Thetis Island. One crab.
 G. Paulson, Victoria. One eyed-hawk moth.
 Jack Ralph, Victoria. One black-widow spider.
 Mr. Roome, Victoria. One California prionus.
 Mrs. A. Sedgley, Victoria. One tiger-moth and eggs.
 C. D. Stevenson, Victoria. One spider, from Kelowna.
 Mrs. William Stoba, Victoria. Two giant clam-shells.
 C. A. Trotter, Victoria. One horse-hair worm.
 Mrs. J. E. Watson, Campbell River. One spiny borer beetle, one marine sponge.
 Doreen Wilby, Victoria. One sand shrimp.

PALEONTOLOGY.

By gift—

- J. S. Cummer, Victoria. One concretion.
 Gideon Danchuck, Victoria. One mammoth tooth.
 Miss B. C. Newton, Victoria. One fossil.
 P. Sweetman, Duncan. Fossil shells.

A REPORT ON A STUDY OF JORDAN MEADOWS, VANCOUVER ISLAND.

BY G. A. HARDY, PROVINCIAL MUSEUM, VICTORIA, B.C.

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INTRODUCTION.

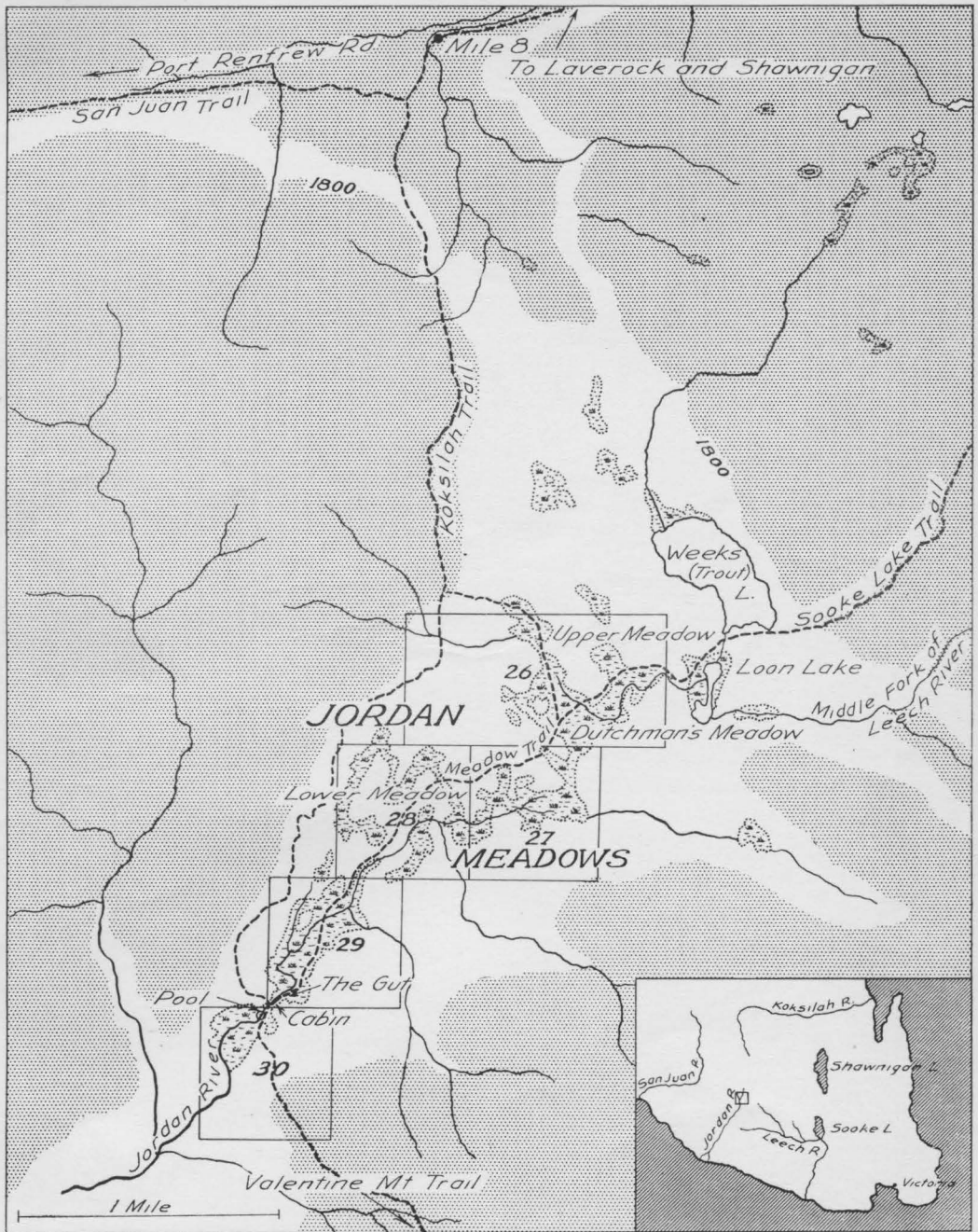
Jordan Meadows have long held an attraction for the naturalist. They were brought prominently before the public by the writings of Archdeacon R. Connell in 1926 and 1928 and again by Frank M. Kelley in 1943. For years they have offered a challenge to the would-be visitor because of the difficulty of access.

Stories of rare plants, wolves, and marmot, coupled with the reports of an extensive area of level land in a setting of hilly and mountainous country, seemed to offer intriguing possibilities for a biological investigation. A further incentive to this study was the opportunity offered to record the natural history of this area while it was still in a primeval condition and before this was changed by further encroachments of civilization.

The final deciding factors were the proximity of the district to Victoria and the opening of the new Port Renfrew road, which provided easier access to the area.

ITINERARY.

A preliminary reconnaissance was made by the writer in 1946 in the form of three short visits—June 26th to 27th, July 20th to 21st, and August 6th to 7th. In



Map of Jordan Meadows area, Vancouver Island, British Columbia.

each case the old Koksilah trail was used, commencing where it is intersected by the new Port Renfrew road at Mile 8, directly north of Jordan Meadows.

From this point the trail skirts the western boundary of the meadows, following a tortuous route through heavy forest. It was much obstructed by windfalls, shrubs, and young hemlock. Decaying cedar slabs bridge the several rivulets. Although the trail was only some 5 or 6 miles long, it was soon realized that all equipment would have to be back-packed in.

Under the circumstances it was decided to devote the available time during these preliminary trips to a study of the trail and adjacent territory, leaving the meadow for later investigation. Based on this experience, another trip was planned, involving additional personnel.

As the meadows are of a very wet and swampy nature, it was decided to go in during the driest time of the year. Accordingly, on August 26th, 1947, a party consisting of F. L. Beebe, J. D. Yarwood, and the writer proceeded from Victoria, via Shawnigan, to the intersection of the Koksilah trail and the Port Renfrew road, where the truck was parked. From this point packs were shouldered, and after an arduous trip the cabin at the foot of the meadows was reached at the end of the same day. Camp was organized and collections made until the 29th, when packs were again resumed, and, after a short trek north, camp was set up on the margin of Loon Lake. This body of water was investigated, and a visit made to Trout Lake. On August 30th we returned to the road over the Trout Lake trail, which joins the Koksilah trail about midway between the pool and the Port Renfrew road. On July 10th to 13th, 1948, another trip was made. This time Dr. G. C. Carl and R. Forbes accompanied the author. The previous route was followed, but under much more pleasant conditions, for the trail had been cleared of major obstacles by a party of timber-cruisers working in the area. At this time, however, part of the old San Juan trail was followed, due to lumbering along the north end of the Koksilah trail.

GENERAL DESCRIPTION.

LOCATION AND ALTITUDE.

Jordan Meadows lie some 10 miles due west of Shawnigan and Sooke Lakes, about 25 miles by road from the former.

The altitude is about 1,675 feet at the site of the old house at the lower end of the meadows and 1,680 feet at Trout Lake. The surrounding hills and mountains average 2,500 feet in elevation, reaching a maximum of 3,100 feet on Valentine Mountain to the south, 3,000 feet on Survey Mountain to the south-east, and over 2,700 feet on Mount Logan to the north-east. They form part of the hilly and mountainous areas that constitute the interior highlands of Southern Vancouver Island.

TOPOGRAPHY.

Jordan Meadows occupy a valley resembling an isosceles triangle in shape, with the acute apex lying to the south-west in the neighbourhood of the pool and cabin, the two long sides on the west and east respectively and the base skirting Trout Lake on its north-eastern shore.

The total area is approximately 1,200 acres, divided between low forested ridges and swampy flats. The ridges are covered with a scrubby growth of lodgepole pine, white pine, and Douglas fir on the drier parts and fringed with a dense tangle of crab-apple and willow thickets, or bracken, in the more open places.

The meadows are divided into lower and upper sections by the presence of a rocky ridge extending in a north-west by south-east direction. The upper section drains into Loon and Trout Lakes, while the lower one drains into Jordan River.

The lower half of the meadows is more moist than the upper half, and is drained by a meandering creek from 6 to 12 feet in width, having its origin in the meadow to the south of the dividing ridge. It terminates at the southern end, where it empties into a pool about 20 feet deep below the rocky dam (Fig. 1). The creek flowing into Loon Lake originates in the upper half and shows evidence of having been artificially deepened, which may account for the drier nature of this area of the meadows.

Throughout the greater part of their length, the banks of the creeks drop steeply into comparatively deep water. These banks are bordered by a heavy growth of sweet gale and willows. Menzies' spiræa is the characteristic shrub on the swamp flats, where it often forms dense and continuous cover 2 to 3 feet in height (Fig. 2). Near the cabin much of the area supports large tracts of burnet, while clumps of Labrador tea and June-berry grow where a slight change in soil or moisture provides suitable conditions for the requirements of the species concerned. Sedges occupy the wettest parts. In the upper meadows, extensive tracts of tall grasses prevail. At the time of our visit the dominant flowering plant, particularly noticeable in the southern section of the meadows, was the swamp gentian, which dotted the ground in places with clumps and patches of dark blue.

West of Loon Lake is an extensive and, at the time of our visits, fairly dry swamp known as Dutchman's Meadow. The trail across this is bounded on either side by a row of short posts, which are shown in Fig. 4.

Loon Lake consists of two small bodies of fairly shallow water of nearly equal size connected by a narrow neck of still shallower water. This lake has an over-all length of about 400 yards and an average width of 300 yards. The shores are steep and heavily wooded on the east, but are flat and open on the west, where they are clothed with an extensive and continuous growth of Menzies' spiræa. Extensive beds of water-shield (*Brasenia*) and yellow pond-lily (*Nymphaea*) occur in the upper section of the lake, while the shallow lower part supports a large bed of buckbean (*Menyanthes*) in addition to the water-shield (Fig. 5).

The presence of these last two species is indicative of shallow water—2 or 3 feet in depth.

The overflow of Loon Lake to the south-east gives rise to the middle fork of the Leech River, while to the north and west Loon Lake receives the drainage from Trout Lake and the swamps to the west respectively.

Five hundred yards north of Loon Lake lies Trout Lake, which extends roughly three-quarters of mile long in a north-westerly direction and with a width of about one-quarter of a mile. Its shores are for the most part densely wooded and fringed by an almost impenetrable thicket of crab-apple and fallen trees that extend out into the water, making travel exceedingly difficult. Its lower end, being shallow, supports an extensive bed of water-shield (Fig. 6).

An inflow at the northern end drains the hills to the north-east.

TRAILS.

Originally there were several trails into the meadows. The best known of these may be conveniently designated the Valentine Mountain, Sooke Lake, and Koksilah trails respectively.

Valentine Mountain Trail.—This comes in from the south by way of Jordan River and Beer Creek, thence over the mountain and into the meadows by the pool.

Sooke Lake Trail.—From the south end of Sooke Lake this trail leads north-west, finally entering the meadows at the south end of Trout Lake. From Trout Lake it follows the centre of the valley south to the pool. A short trail connects Trout Lake with the Koksilah trail at about the midway point of the valley. The first part of this route was known as the Baker trail.



Fig. 1. Looking north-east across the pool, cabin in background. July, 1948.



Fig. 2. Loon Lake, looking east, showing dense tract of *Menzies' spiræa* in foreground.

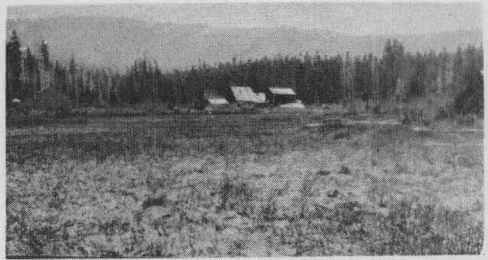


Fig. 3. Looking south from the "Gut." 1892.

(Photograph courtesy of Mrs. C. Bannerman.)



Fig. 4. Dutchman's Meadow. 1892.

(Photograph courtesy of Mrs. C. Bannerman.)



Fig. 5. Loon Lake, south section, looking south, showing *Brasenia* and *Menyanthes trifoliata*. July, 1948.

Koksilah Trail.—This is a continuation of the old trail from Koksilah, which eventually joins the wagon-road from Victoria at a place called Laverock on the Koksilah River, about 15 miles from the Weeks' homestead. From there the trail followed a westerly and southerly route, entering the north end of the Jordan Meadows valley and thence down the west side through the forest until it eventually came out at the pool.

The first trail used by the Weeks family was over Valentine Mountain, but this was abandoned later, and the Sooke Lake trail was used, being less steep. After settlement, the Koksilah trail was extensively used to pack in supplies from Laverock, where a cabin was built to store supplies brought by wagon from Victoria. From Laverock the supplies were taken to the homestead by pack-horse.

Laverock takes its name from David Laverock, who purchased Lot 40, consisting of 95 acres, at \$3 per acre, on August 7th, 1893.

GEOLOGY.

The Jordan Meadows valley is one of the largest of a number of "catch" basins, or "meadows," that exist in this section of the interior of Vancouver Island. It lies 1,000 to 1,500 feet below the old Tertiary penepain, and is underlain by the older Leech River slates of carboniferous origin, with an intrusion of the younger green volcanic schists on the divide between the Koksilah and Jordan Rivers.

The southern end of the valley is abruptly blocked by a low dam 4 to 5 feet above the meadow, formed by a section of the Leech River schists that have an east to west strike and a nearly vertical dip to the north. This ridge, by its resistance to erosion, has played an important part in the formation of the meadows by preventing a too rapid run-off from the valley above.

While considered to be of pre-Glacial origin, the valley was heavily glaciated during the Ice Age. Since the retreat of the ice, the resulting hollows and channels gouged out by the glaciers have gradually become silted up. Trout Lake is but a remnant of a larger body of water that probably filled most of the valley.

The general composition of the soil is fine glacial silt intermixed with humus of a peaty nature, the latter giving a brown tinge to the water.

CLIMATE.

The climate of this region, while comparatively mild on the whole, is subject to extremes of precipitation and temperature during the year, as might be expected from its altitude and situation among high hills and mountains. Precipitation is considerable, mostly falling as snow during the winter months.

The following figures relative to precipitation are taken from those recorded for Beer Creek, about 5 miles to the south of the meadows and at an altitude of 1,450 feet above sea-level, where conditions might reasonably be expected to closely duplicate those of the meadows.

According to these figures the average total precipitation for the ten-year period ended in 1939 was 133.38 inches. Other figures from the same source are given to show variations for specific years:—

1922: rain, 42.46 inches; snow, 191 inches.

1935: rain, 109.65 inches; snow, 118.9 inches.

1937: total precipitation, 142 inches, including 174 inches of snow.

For purposes of comparison, the ten-year average precipitation up to 1939 for Shawnigan Lake is 46.74 inches; for Sooke Lake, 68.85 inches; and for Victoria, 29.05 inches.

No comparable figures are available for temperature, but one record for Jordan River gives extremes of 90° and 23° F.

Mrs. C. Bannerman, who lived in the area for some years, has informed me that the winters were long and very cold; the thermometer on one occasion dropped to 20° below zero. While this was exceptional, indications are that the winter temperature often hovers around 32° F.

July and August are the driest months. At the time of our visit the overflow from Trout and Loon Lakes had almost ceased and many of the smaller creeks and rivulets were dry, while only a trickle of water passed over into the pool, whereas in June a broad stream flowed in considerable volume.

In 1946 each of the three trips was handicapped by rain, although the sun was shining brightly in Victoria.

In 1947 we experienced a spell of cloudless skies, with intense, burning sunshine during the day and clear cold nights.

In 1948 much cloudy and drizzly weather was experienced.

LIFE ZONES.

Jordan Meadows are contained within the Pacific Humid Area, designated by Piper (1906) as the Vancouver Strip and occupying the Coastal area from Alaska to Northern California, west of the Cascade Mountains. In general this corresponds with the British Columbia Coast Forest Biotic Area of Munro and Cowan (1948).

The area is characterized by a mild climate, abundant rainfall, and luxuriant coniferous forests, with Douglas fir as its dominant tree.

FORESTS.

Two phytosociological units, each representing a distinct forest type, have been recognized by Jones (1936) as occurring within the zone, and which can be identified in the Jordan Meadows district. These, together with a third as applied to the meadows in particular, may be briefly referred to as follows: (1) The Hemlock-Cedar Climax, (2) The Spruce-Hemlock Climax, (3) Swamps.

Hemlock-Cedar Climax.—This is the major forest association in the Jordan Meadows area. It clothes the adjoining ridges and mountains where uninterrupted by fires or lumbering. The western hemlock reaches its best development here, occurring in dense stands that tower up to 175 feet or more, with clear trunks extending over half their height. Their crowns form dense canopies of crowded limbs that shut off much light and give to the forest a subdued and sombre aspect. Comparatively little undergrowth develops, except where streams or windfalls have allowed more light to penetrate. In the moister hollows and levels, red cedars grow luxuriantly. Intermixed with these is a sprinkling of western white pine and Douglas fir.

Spruce-Hemlock Climax.—This is the typical association of the lower Coastal area, in which the Sitka spruce is dominant. The region of the meadows appears to represent the extreme eastern and upper altitudinal limit of this association, for a thin scattering of spruce is to be found here and there throughout the district.

Yellow cedar and lovely fir occur frequently, especially in the southern part of the meadows. These trees are more typical of the higher lands, designated by Munro and Cowan as the Southern Alplands. They may be relicts of a stand which flourished during the colder climate adjacent to the retreating glaciers.

Characteristic Coastal Forest Zone plants are the saprophytes Indian-pipe, pine-drops, coneflowers, and the Mertens' coral-root. Conspicuous shrubs include oval-leaved and small-leaved huckleberries, salal, devil's-club, salmonberry, woodland rose, and prince's-pine. Predominating herbaceous plants are queen's cup, bunchberry, foam flower, one-sided wintergreen, and trailing raspberry.

Swamps.—Jordan Meadows are a swamp rather than dry-land meadow as this term would indicate. The greater part of the bottom is of silt admixed with decayed

vegetation of a peaty nature. No true sphagnum bogs were seen, though traces of sphagnum exist in small thin patches here and there. It is possible that a sphagnum bog may have originally formed the base of much of the understratum on which the present flora is supported. The soft and treacherous parts of the meadows are often indicated by a luxuriant crop of sedges. Representative vascular plants of the meadows consist of the following: Shrubs—sweet gale, Douglas spiræa (by far the dominant species), Labrador tea, swamp-laurel, northern huckleberry, and crab-apple (the latter on the border of the swamps, adjoining the forested slopes and ridges); herbs—arctic star-flower, false bugbane, with rein orchid and triangular-leaved ragwort. While not abundant in variety, the flora is characterized by a wealth of individual plants of comparatively few species, some forming large monospecific stands.

Mammals.—The most obvious large mammal is the Columbian black-tailed deer, an animal characteristic of the Coastal Forest Zone. Some of the other mammals common to this area are subspecies confined to the Island or near-by Mainland, and, while not specifically confined to this zone, the local differentiation is significant of the humidity and insularity of their environment, resulting in a tendency to be dark in colour and smaller in size. Two races of white-footed mice, *Peromyscus maniculatus interdictus* and *P.m. angustus*, intergrade in the meadow. The former is typical of the higher and drier areas, while the latter is typical of the lower and moister areas.

Birds.—The birds noted were for the most part typical of the Coastal forests; they include Steller's jay, Canada jay, chestnut-backed chickadee, winter wren, varied thrush, Hammond's flycatcher, junco, dwarf hermit thrush, tree-creeper, and hairy woodpecker. The western yellowthroat was seen on the meadows, while the western peewee haunted the bush bordering the open water.

INSECTS.

Several species of long-horned beetles were taken, all distinctly Coastal Forest species; these include *Anoplodera crassipes*, *Leptura soror*, and *Anoplodera dolorosa*.

The western fritillary butterfly *Brenthis epiphore* was taken, a species characteristic of swamps and bogs.

EARLY HISTORY.

It is thought that a few notes concerning the early settlement in the meadows are justified, in view of the fact that such ventures often have a marked effect on the subsequent nature of the fauna and flora, particularly as the result of changes in drainage, introduction of weeds and domestic animals.

In the writings of Connell and Kelley (loc. cit.) mention is made of the remains of a once thriving homestead with house and buildings in various stages of decay. At the time of our visit in 1946 only a trace remained. The house and most of the outbuildings were completely effaced; the crumbling dust of foundation logs, parts of the floor, and a few fallen beams of the barn only remaining.

Mr. George Weeks (Fig. 8), accompanied by his wife and five children, from 7 to 19 years of age, moved into Jordan Meadows in 1888. Originally from Cumberland, England, where he was in business as a grocer, he had set out to prospect for gold on the San Juan River; on the way he was so charmed with the meadows that he went no farther, but elected to make his home there.

The site chosen for the house was at the southern end of the meadows on the rock outcropping already mentioned. Over this dam a constant stream of good water flows into the deep pool below—an ideal place for a homesite.

Mr. Weeks was an excellent builder and carpenter, and before long, with the help of his boys, a fine log house, barns, and outbuildings were erected (Figs. 3 and 8). The garden was surrounded by a neat picket fence, as shown by old photos and drawings.

Planks for house and furniture were made by the laborious process of two-man saw and pit. Altogether, a really comfortable home was established. In Mrs. Bannerman's words, "It was a lovely house and beautifully furnished."

The household furniture was home made and of such good quality that it became renowned far and wide. Most of it was fashioned from the native yellow cedar which grew abundantly on the ridges near by. It was perfectly fitted together by tenon and mortise joints, further reinforced by wooden pegs. The wood was finished to a remarkably smooth satiny texture without the addition of paint or varnish. Panelled bedsteads, wardrobes, cupboards, chairs, and tables, even doors and window frames were made with the same painstaking care. The doors were constructed with yellow-cedar frames and red-cedar panels. Each piece embodied original ideas in design and execution; a kitchen table for instance, which I examined, was not only solidly built and of ample proportions, but had an extension cunningly devised to swing on peg hinges that allowed it to be concealed beneath when not in use. Two rocking-chairs from the old home inspected on the same occasion were still solid and serviceable after much rough usage in the present-day cabin.

An unusual article, and at one time often mentioned by visitors to the homestead, was a globe of the world made from a solid block of yellow cedar, beautifully polished and with the continents accurately etched in. Mats and rugs of deerskin with the hair left on formed a cosy floor-covering. The whole establishment was a tribute to the skill with which the Weeks family utilized the raw material furnished by nature.

In addition to the absolute necessities, time was found to administer to the æsthetic side of life, for Mrs. Bannerman speaks with enthusiasm of the little summer house to the east of the house (Fig. 3) where many pleasant moments of respite from the exacting duties of pioneer existence were spent. Of this summer house, only the basal logs and rotted herbage-permeated floor remains. A few straggling pansies grow near by as reminders of a once flourishing flower-garden.

Adjacent to the building-site an occasional relic of the old homestead days was found. A wooden hay-rake, a harrow frame with iron teeth, and a one-horse hay-sled with singletree still attached were discovered partly entangled in the bushes, while a few ancient fence-posts mark the boundary of a field.

One of the photographs (Fig. 7) shows a well-made dugout canoe. Two of these were used on the streams; a flat-bottomed punt was kept on Trout Lake.

A garden supplied a variety of vegetables, while small fruits, such as raspberries, strawberries, gooseberries, and currants, grew in abundance. An orchard was planted, and a wealth of garden flowers was grown.

The cultivated fruit was augmented by the wild species that grew in abundance in the neighbourhood. These included the huckleberries, cranberries, and salmonberries. While the wild fruits still flourish, all that remains of the garden is a vigorous bed of mint and a few small plants of rhubarb.

The meat-supply consisted mostly of deer, wild duck, and grouse, which abounded in the district. During the winter the boys trapped marten and killed an occasional cougar and black bear. Wolves were also plentiful in the valley according to Mrs. Bannerman.

Domestic stock included the indispensable pack-horse, cows, chickens, ducks, and geese.

Mrs. Bannerman is an accomplished artist, as is evident by some delightfully executed water-colour sketches of wild flowers and vignettes of the house and surroundings. The flowers and fruit are portrayed with a realism not often equalled even in these days of ample opportunity for expert tuition. These portrayals are botanically accurate, true to colour, and graceful in both composition and delineation. This artistic manifestation was indulged in between her duties as housekeeper and cook, which included bread and butter making and the feeding of seven hungry persons.

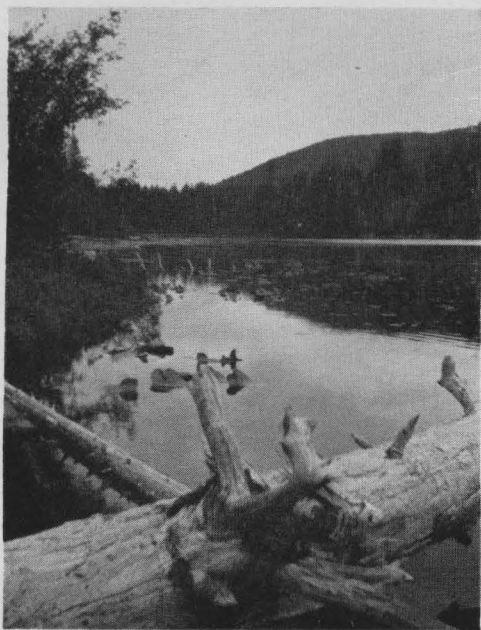


Fig. 6. Trout Lake, looking north.
July, 1948.



Fig. 7. Fishing in the pool from old
dugout. Prior to 1896.
(Photograph courtesy of Mrs. C. Bannerman.)



Fig. 8. The Weeks family at home. Left to right: Mrs. George Weeks, Bernard, Wilfred, Kitty, Cis (Mrs. Bannerman), George, and Mr. George Weeks. Prior to 1896.
(Photograph courtesy of Mrs. C. Bannerman.)

In 1896 Mrs. Bannerman left the homestead on the occasion of her marriage. A year or two afterward, due to the illness of the mother, the whole family moved to Victoria. Later Mr. Weeks and the boys went to the Klondyke during the gold-rush days of '98.

A study of the sketches and photographs reveals that forest fires had taken their toll, and that during the Weeks' sojourn extensive clearings were made in the vicinity of the house. J. B. Green, in his survey report for 1910, records that there was much burnt-over land in the vicinity. At the time of our visit these scars of fire and man's handiwork had nearly all been obliterated by new growth.

A characteristic landmark in the Weeks' days was a large Sitka spruce tree, measuring 6 feet in diameter at its base, which grew in a gap known as the "Gut" between two swamps just north of the buildings. Incidentally this spruce was the local source of a supply of chewing gum. Sometime before our visit this tree had blown down, evidently from rot through sheer old age.

The meadows originally belonged to the Esquimalt and Nanaimo Railway Company, but were not officially surveyed until 1910, long after the first settlers had come and gone.

About the time of the Weeks' occupation, H. T. Weber and R. Herzberg settled on the northern part of the meadows. An old photograph (Fig. 4) of this area is captioned "Dutchman's Meadow," possibly after the nationality of Herzberg. The remaining lots were divided between members of the Weeks family.

The trail to Loon and Trout Lakes crossed a stretch of Dutchman's Meadow, and because of the boggy nature of its bottom a corduroy bed of cedar logs was laid and periodically renewed as they sank in the soft ground. The sides of this road were marked by a row of upright posts, which remains to this day.

During the Weeks' sojourn in the Jordan Meadows, Mrs. Bannerman informed me that an attempt was made to blast a channel through the rock-outcrop at the southern end, but it was not deep enough to have any appreciable effect.

A small cabin (Fig. 1) now stands on the rocky outcropping above the pool, possibly constructed and partly furnished from the remains of the original buildings.

FLORA.

The meadows constitute an advanced stage in the conversion of an open lake into a bog, in which the earlier or swamp stage is slowly passing over to the solid-ground habitat as the valley becomes filled up with decayed vegetation and silt brought down from the surrounding hills.

The present flora is evidently of long standing and of great age, as shown by the abrupt change in the nature of the vegetation where the flat marshy meadows abut on the dry marginal slopes. Here one can walk from the mesophytic vegetation of the higher ground to the oxylophytes that constitute the typical meadow flora—from bracken to swamp laurel in one step.

Of the total of seventy vascular plants listed below, fifty-nine species were growing in the open meadows, either in the water or in wet or moist soil, and include such water-tolerant species as lodgepole pine, Sitka spruce, crab-apple, and species of *Salix*.

Only a few flowering plants are adventive or obviously introduced. They include tarweed (*Madia glomerata*), cudweed (*Gnaphalium palustre*), corn speedwell (*Veronica arvensis*), neckweed (*Veronica peregrina*), and ox-eye daisy (*Chrysanthemum leucanthemum*).

ANNOTATED LIST OF PLANTS.

Ophioglossaceæ (Grape Fern Family).

Botrichium silaifolium Presl. Grape Fern.

Moist trail-side, upper meadows.

Polypodiaceæ (Fern Family).

Struthiopteris spicant (L.) Scop. Deer Fern.

Common in the woods.

Phegopteris Dryopteris (L.) Fee. Oak Fern.

Common, often in extensive patches in the moist woodland areas.

Pteris aquilina L. var. *languinosa* Bong. Bracken Fern.

Locally abundant. Usually forming a rim around the edges of the woods bordering the meadows.

Athyrium filix-femina var. *sitchense* Rupr. Lady Fern.

Occasional in damp places and stream-banks.

Polystichum munitum (Kaulf.) Underw. Sword Fern.

Scarce.

Equisetaceæ (Horsetail Family).

Equisetum arvensis L. Common Horsetail.

Edge of swamps. Scarce.

Selaginellaceæ (Selaginella Family).

Selaginella inundata L. Swamp Selaginella.

Creeping over mud flats in moist places. Lower meadows.

Taxaceæ (Yew Family).

Taxus brevifolia Nutt. Yew.

Occurring as widely scattered individual trees in the woods. One measured 11 inches in diameter, with a height of 50 feet.

Coniferæ (Pine Family).

Thuja plicata Donn. Red Cedar.

One of the dominant trees in the lower parts of the forest. One of the largest measured 12 feet in diameter at ground-level. Many were overmature and in an advanced stage of decay.

Chamaecyparis nootkatensis (Lamb.) Spach. Yellow Cedar.

Several small trees on the ridges near the pool at south end of meadows. Most of the larger ones in the vicinity were cut down many years ago.

Pinus contorta Dougl. Lodgepole Pine.

Common near the margins of the meadows and on the dividing ridges, where it is of a scrubby nature. An occasional tree was seen encroaching on the meadows.

Pinus monticola Dougl. Western White Pine.

Quite common, particularly on the low ridges where it is much dwarfed. Many fine trees are intermingled with the hemlock at the higher levels.

Abies grandis Lindl. White Fir.

Not very common. Intermixed with the hemlock and cedar association.

Abies amabilis (Dougl.) Forbes. Lovely Fir.

Particularly noticed near the pool, where many fine trees were growing mixed with cedar, hemlock, and pine.

Pseudotsuga taxifolia Lamb. Douglas Fir.

Everywhere intermixed with the hemlock-cedar association. Some large trees are to be seen along the trail, 7 to 8 feet in diameter. Most of these were overmature.

Tsuga heterophylla Sarg. Western Hemlock.

This tree constitutes the climax tree of the district. It averaged 20 to 30 inches in diameter and reached a height of 175 feet or more.

Picea sitchensis Carr. Sitka Spruce.

Several scattered trees were seen, among them one overmature tree that had recently been blown over; the stump measured 6 feet in diameter at the base. It grew alone and was situated at the "Gut" or gap between the two lower meadows. The Weeks boys used it as a source of chewing gum.

Najadaceæ (Pondweed Family).

Potamogeton heterophylla L. Common Pondweed.

In the pool and shallower parts of the main creek.

Gramineæ (Grass Family).

Poa pratensis L. June Grass.

Common on the site of the buildings.

Glyceria elata (Nash) Hitchc. Tall Manna-grass.

Frequent in wet places in swamps and sloughs.

Glyceria pauciflora Presl. Manna-grass.

In dried-up woodland slough at north end of meadows.

Aira præcox L. Early Hair-grass.

Common near cabin.

Danthonia californica Bol. Wild Oat-grass.

Near cabin.

Anthoxanthum odoratum L. Sweet Vernal Grass.

Near cabin.

Cyperaceæ (Sedge Family).

Carex sitchensis Bong. Sitka Sedge.

Common in the meadows, where it is one of the most characteristic plants of the wet boggy places.

Carex languinosa Michx. Woolly Sedge.

With *sitchensis*, common.

Carex Buxbaumii Wahl. Buxbaums Sedge.

South meadows, abundant.

Carex viridula Michx. Green Sedge.

Frequent.

Carex rostrata Stokes. Beaked Sedge.

Abundant in the boggy parts.

Dulichium arundinaceum (L.) Brit. Bulichium.

Muddy margin of swamp, in south meadows.

Eriophorum angustifolium Roth. Cotton-grass.

South meadows, in small patches.

Rynchospora alba (L.) Vahl. White-beaked Rush.

South meadows.

Araceæ (Arum Family).

Lysichiton americanum H. St. John. Skunk-cabbage.

Rich-soil swamps, sometimes in extensive tracts, particularly at the north end of trail. Much sought after by bears, which are very partial to the rhizomes.

Juncaceæ (Rush Family).

Juncus ensifolius Wiks. Rush.

Common in the meadows.

Liliaceæ (Lily Family).

Trillium ovatum Pursh. Trillium.

Moist rich soil along the trail.

Clintonia uniflora Kunth. Queen's Cup.

Abundant, often forming large groups that cover the ground or banks in the woods. In full flower in June.

Maianthemum bifolium var. *kamtschaticum* Gmel. Wild Lily-of-the-valley.

Shady woods, wherever the suitable conditions of rich, moist soil existed.

Smilacina sessilifolium Nutt. False Solomon's Seal.

Common, in shady places by streams.

Streptopus amplexifolium DC. Twisted-stalk.

Moist woods, not common.

Veratrum viride Ait. False Hellebore.

Open places by stream on trail, scarce.

Tofieldia occidentalis Wats. False Asphodel.

Frequent in the lower meadows.

Brodixia grandiflora Smith. Wild Hyacinth.

Record based on paintings of Mrs. C. Bannerman.

Allium acuminatum Hook. Wild Onion.

From painting, based on specimens collected by Mrs. Bannerman.

Lilium parviflorum (Hook) Holtz. Wild Tiger-lily.

Occasional in thickets bordering the meadows, particularly near the pool, where it was in full bloom at the end of June.

Orchidaceæ (Orchid Family).

Corallorhiza Mertensiana Bong. Mertens' Coral-root.

Scarce, in small groups under the hemlock trees. In full flower end of June.

Habenaria hyperborea (L.) R. Br. Green Rein Orchid.

Frequent on stream margins and swampy flats.

Habenaria dilatata (Pursh) Hook. White Rein Orchid.

Common in the rocky channel above the pool, where it was in full flower end of June.

Listera caurina Piper. Tway-blade.

Wood bordering creek near cabin.

Peramium decipiens (Hook.) Ames. Rattlesnake Plantain.

Frequent in the woods.

Spiranthes Romanzoffiana Chan. Lady's-tresses.

Fairly common in the meadows; near the pool.

Salicaceæ (Willow Family).

Salix lasiandra Benth. Black Willow.

One large bush noted at Loon Lake.

Salix Geyeriana var. *meleina* Henry. Geyer Willow.

One bush noted at Loon Lake, where it was growing beside *S. lasiandra*.

Salix Scouleriana Hook. Scouler Willow.

On the shores of Loon Lake, and near the pool at south end of meadows.

Salix sitchensis Sanson. Sitka Willow.

Along the outlet of Loon Lake; a very depauperate form.

Salix Hookeriana Barr. Hooker Willow.

Growing along the creek that flows through the meadows, where its whitish leaves are conspicuous from afar.

Populus trichocarpa T. & G. Black Cottonwood.

Some large trees were noted on the banks of the creek draining into Loon Lake.

Myricaceæ (Sweet Gale Family).

Myrica gale L. Sweet Gale.

Abundant—one of the characteristic shrubs bordering the stream banks and open waters, especially at the south end of the meadows. Here it grew in dense stands that hung out over the water, completely concealing the banks.

Betulaceæ (Birch Family).

Alnus sitchensis (Regel) Sarg. Green Alder.

Quite common, in bush form.

Alnus rubra Bong. Red Alder.

Particularly noticed along the creek flowing east from Loon Lake, where they formed large trees.

Polygonaceæ (Buckwheat Family).

Rumex acetosella L. Sorrel.

Near cabin.

Caryophyllaceæ (Pink Family).

Stellaria borealis Bigel. Northern Chickweed.

Occasional in wet places.

Portulacaceæ (Purslane Family).

Claytonia sibirica (L.) Howell. Miner's Lettuce.

Frequent in damp shady woods.

Nymphaeaceæ (Water-lily Family).

Nymphaea polysepala (Engl.) Greene. Yellow Pond-lily.

Common in every pool and creek, but only in thin marginal stands of widely spaced plants. Their presence usually indicates a depth of 3 to 4 feet of water.

Brasenia Schreberi Gmel. Water-shield.

Locally abundant. In the shallows of Trout Lake and Loon Lakes, thriving best in about 2 feet of water and in monospecific stands. The thick coating of translucent jelly that covers the stems and underside of the leaves is very characteristic.

Ranunculaceæ (Buttercup Family).

Anemone Lyallii Brit. Lyall's Anemone.

Large colony near cabin.

Trautvetteria grandis Nutt. False Bugbane.

Common near streams and in rich moist soil in open places bordering the woods. Red squirrels are fond of the flowering heads.

Ranunculus Flammula var. *reptans* Mey. Creeping Buttercup.

Abundant in wet places. On the banks of the pool it had grown out into deep water, the whole plant being submerged, but flowering only on the bank above the water.

Ranunculus occidentalis Nutt. Western Buttercup.

Near cabin.

Caltha biflora DC. White Marsh-marigold.

Fairly common in the moist margins of the meadows.

Aquilegia formosa Fisch. Red Columbine.

In thickets on margin of meadows.

Actæa arguta Nutt. Baneberry.

Occasionally in moist places in the shade of the trees.

Coptis asplenifolia Salisb. Gold Thread.

Woods, south meadow.

Berberidaceæ (Berberry Family).

Berberis nervosa Push. Oregon Grape.

Not very common; along the woodland trail.

Achlys triphylla DC. May Leaves.

In rich-soil hollows in the woods, not common.

Fumariaceæ (Bleeding-heart Family).

Dicentra formosa DC. Lady's-locket, Bleeding-heart.

In flower near cabin.

Cruciferæ (Mustard Family).

Radicula palustris L. Marsh-cress.

Stream margin near pool.

Droseraceæ (Sundew Family).

Drosera longifolia L. Long-leaved Sundew.

Several plants on the steep muddy banks of the stream below the pool. Also banks of Trout Lake.

Drosera rotundifolia L. Round-leaved Sundew.

Intermixed with former in one place near cabin.

Saxifragaceæ (Saxifrage Family).

Ribes bracteosum Dougl. Blue Currant, Stink-currant.

Banks of woodland streams.

Ribes lacustre Poir. Swamp Gooseberry.

Occasionally on open stream-banks in the woods.

Mitella pentandra Hook. Mitrewort.

Along margin of woodland creek.

Tiarella trifoliata L. Foam Flower.

Abundant along the woodland trail, often in massed stands of considerable size that give a lacy appearance to the plant.

Boykinia occidentalis T. & G. Boykinia.

Edge of streams in woods.

Rosaceæ (Rose Family).

Geum macrophyllum Willd. Large-leaved Avens.

On ridge by cabin.

Prunus emarginata Dougl. Wild Cherry.

One or two bushes noted on the dry rocky banks dividing the meadows.

Rubus pedatus Smith. Trailing Raspberry.

Common in the woods, where it creeps over decaying logs and woody debris.

Rubus macropetalus Dougl. Trailing Blackberry.

Open trail-side near cabin.

Rubus spectabilis Pursh. Salmonberry.

Swampy places on stream margins in the woods.

Rosa gymnocarpa Nutt. Woodland Rose.

Along the woodland trails; one of the characteristic shrubs of the forest.

Rosa nutkana Presl. Nootka Rose.

Edge of woods bordering meadows. Near the pool it was in full flower on June 21st, a month later than at Victoria.

Sanguisorba microcephala Presl. Burnet.

Occurred in large tracts at the southern end of meadows, and more thinly elsewhere. Quite a characteristic feature of these meadows.

Physocarpus opulifolius (L.) Maxim. Nine Bark.

Several bushes near the pool. In flower in July.

Spiræa Menziesii Presl. Menzies Spiræa.

The most abundant shrub in the open meadows, where it often forms continuous and extensive stands on the flats bordering the channels. It is especially well developed on the western shores of Loon Lake.

Aruncus sylvester Kost. Goat's-beard.

Along streams. At the pool.

Pyrus diversifolia Bong. Crab-apple.

Very abundant. One of the most obvious shrubs bordering the swamps and meadows, where it forms almost impenetrable thickets.

Sorbus sitchensis (Roem) Piper. Sitka Mountain-ash.

Occasionally seen on the trail, but not common.

Amelanchier florida Findl. Saskatoon.

Common on the dry slopes and less boggy areas in the meadows.

Leguminosæ (Pea Family).

Lupinus latifolius columbianus (Heller) C.P.S. Broad-leaved Lupine.

On ridge between north and south meadows, July, 1948—the only place where it was seen.

Hypericaceæ (St. John's Wort Family).

Hypericum anagaloides C. & S. Creeping St. John's Wort.

Common in muddy places by the creek in meadows.

Violaceæ (Violet Family).

Viola palustris L. Marsh-violet.

One patch near pool; some still in flower at end of August.

Viola glabella Nutt. Smooth-leaved Violet.

Not seen by us, but reported and painted by Mrs. Bannerman from local specimens.

Viola sempervirens Greene. Evergreen Violet.

The leaves were frequently seen along the trails.

Viola tricolor L. var. *hortensis* DC. Pansy.

Near cabin. Two or three survivals of the early settlement.

Haloragidaceæ (Water-milfoil Family).

Myriophyllum spicatum L. Water-milfoil.

Stream near pool. Not abundant.

Umbelliferæ (Parsley Family).

Oenanthe sarmentosa Presl. Water-parsley.

Bank of stream near pool.

Cicuta vagans Greene. Water-hemlock.

Near the pool.

Araliaceæ (Ginseng Family).

Fatsia horrida (Sm.) B. & H. Devil's-club.

Scarce—one or two places on stream-banks in woods; only small stands.

Cornaceæ (Dogwood Family).

Cornus canadensis L. Bunchberry.

Common in the woods. In full flower in June.

Ericaceæ (Heath Family).

Vaccinium caespitosum Mich. Dwarf Bilberry.

Mixed with *uliginosum*; edge of swamp, near cabin.

- Vaccinium parvifolium* Smith. Red Huckleberry.
Common in the woods.
- Vaccinium ovalifolium* Smith. Tall Blue Huckleberry.
Very abundant along the trail-side in the woods.
- Vaccinium uliginosum* L. Bog Huckleberry.
One or two patches near the pool and at Loon Lake. This appears to be the most southern record for Vancouver Island.
- Pyrola secunda* L. One-sided Wintergreen.
Common along the woodland trail.
- Moneses uniflora* (L.) Gray. Single Delight.
Common along woodland trails.
- Chimaphila umbellata* (L.) Nutt. Prince's Pine.
Common in the woods.
- Chimaphila Menziesii* Spreng. Menzies' Pipsissewa.
Quite frequent, growing near decayed logs.
- Ledum groenlandicum* Oeden. Labrador Tea.
Occasionally near the borders of the swamp.
- Gaultheria shallon* Pursh. Salal.
Abundant along the trail.
- Kalmia polifolia* Wang. Swamp-laurel.
On the edge of the meadows near the pool.
- Monotropa uniflora* L. Indian Pipe.
Scarce. Along woodland trail.
- Hypopites Hypopites* (L.) Small. Pinesap.
Under hemlock-trees. Not common.
- Newberrya congesta* Torr. Newberrya.
One clump under hemlock, at north end of meadows.
- Menziesia ferruginea* Smith. False Azalea.
Scarce—two bushes noted in July, 1948.

Primulaceæ (Primrose Family).

- Trientalis latifolia* Hook. Starflower.
Occasionally in rich-soil area of the woods.
- Trientalis arctica* Fisch. Northern Starflower.
Common in the meadows on the peaty soil.

Gentianaceæ (Gentian Family).

- Gentiana sceptrum* Pall. Swamp-gentian.
Abundant in the meadows, particularly at the south end, where it grew in sheets and patches of blue. It was the most obvious flower to be seen in August.
- Gentiana Douglasiana* Bong. Douglas' Gentian.
Occasionally to be seen growing in the swampy meadows, where it occurred in small patches. In full flower at the end of August.
- Menyanthes trifoliata* L. Buckbean.
One large tract was growing thickly in the southern part of Loon Lake.
- Menyanthes crista-galli*. Deer-cabbage.
Occasionally in wet places.

Labiatae (Mint Family).

- Lycopus uniflorus* L. Water-horehound.
On the moist meadows where the peaty soil is exposed. In company with *Hypericum anagalloides*.

Scrophulariaceæ (Figwort Family).

Veronica arvensis L. Corn Speedwell.

Near the old house; probably introduced with garden seeds.

Veronica peregrina L. Neckweed.

Site of the old garden.

Veronica scutellata L. Marsh-speedwell.

In dried slough at north end of trail.

Mimulus moschatus Dougl. Muskflower.

Wet places by stream. Has no scent.

Castilleja hyetophila Pennell. Broad-leaved Paint-brush.

Forming bright patches of colour on bank of stream near pool.

Castilleja miniata Dougl. Paint-brush.

Dry slopes near southern end of meadows.

Lentibulaceæ (Bladderwort Family).

Utricularia vulgaris L. Bladderwort.

South meadow.

Rubiaceæ (Madder Family).

Galium trifidum L. Bedstraw.

Frequent in damp places; edge of pool.

Caprifoliaceæ (Honeysuckle Family).

Linnea borealis var. *americana* (Forbes) Rehder. Twinflower.

Common along the woodland trail.

Lonicera involucrata Banks. Black Twinberry.

Large bushes at south end of meadows, bordering stream.

Sambucus racemosa L. Red-fruited Elderberry.

Scarce—along stream-bank in woods.

Viburnum pauciflorum Raf. Squashberry, High-bush Cranberry.

Borders of swamps, meadows, Trout Lake, near the cabin.

Valerianaceæ (Valerian Family).

Valeriana sitchensis Bong. Valerian.

Frequent along the open stream-sides.

Campanulaceæ (Bluebell Family).

Campanula Scouleri Hook. Scouler's Bluebell.

Woodland trail and at Loon Lake.

Lobeliaceæ (Lobelia Family).

Lobelia Dortmanni L. Water-lobelia.

One or two plants were seen in shallow water in the creek draining Trout Lake. In flower in 12 to 14 inches of water in July, 1948.

Compositæ (Composite Family).

Aster modestus Lindl. Sticky Aster.

Plentiful along the stream and creek sides.

Solidago lepida var. *elongata* (Nutt.) Fern. Goldenrod.

Common at the site of the old house.

Madia exigua (Smith) Greene. Tarweed.

A small patch near cabin.

Achillea millefolium L. Yarrow.

A large stand near cabin. It was very attractive to insect life.

Chrysanthemum leucanthemum L. Ox-eye Daisy.

Near cabin.

Petasites speciosa (Nutt.) Piper. Coltsfoot.

Margins of streams along woodland trail.

Senecio triangularis Hook. Triangular-leaved Ragwort.

Abundant; near rock falls by cabin and occurring along margin of meadow. Leaves much eaten by deer; whole patches consisted of stems only. Extensive tracts seen on meadows in July, 1948.

Anaphalis margaritacea Benth. Pearly Everlasting.

Several plants near cabin.

Gnaphalium palustre L. Cudweed.

At the site of the old house, probably introduced.

Agoseris laciniata (Gray) Greene. False Dandelion.

Open woods on ridges between swamps.

Prenanthes alata (Hook) Gray. Rattlesnake Root.

Several stands on stream-banks along woodland trail.

Hieracium albiflorum Hook. White Hawkweed.

Occasional—in the woods.

Fungi.

Fungi were observed at all times during the visits from June to early August. Owing to the difficulty of preservation, it was not possible to collect much material; the following genera were among those recognized:—

Russula. Perhaps the most common. Several species were noticed, including *purpurea*, *emetica*, *marix*, *integra*, and *delica*.

Cortinarius was also well represented, more perhaps by number of individuals rather than species, especially one that had a yellow or ochre cap with a white stem shaded a delicate purple below.

Hydnum caput-ursi. Several fine examples seen on decaying hemlock.

Boletus of several species occurred, including *chryserteron* and *felleus*, growing on the ground or on rotten stumps.

Lactarius—both white and coloured-zoned types were seen, all with white "milk," *piperatus*, *hygginus*.

Fomes piniperda was especially abundant on the hemlock, some of very large size, 2 feet wide by 1 foot deep in horizontal plane—*F. applanatus*, *F. pinipes*.

Laccara laccata and variety *amethystina* were often seen, the latter of an exceedingly rich purple.

Polyporus brunneus was frequent on the trail among decaying woody vegetation.

Hygrophorus conicus was found near the cabin, its bright scarlet cap giving a vivid note of colour to the grass-patch where it grew.

Scoticum sp. was seen in small numbers along the woodland trail.

Elvella umbraculiformis Seaver. occurred sparingly.

Gomphidius glutinosus (Schaeff) Fr. Woodland trail.

Cantharellus floccosus Schw. July, 1948. One or two large specimens measuring 4 inches in diameter across top of cap.

Numbers of unidentified genera and species were observed, indicating a virgin field for mycetological exploration.

FAUNA.

MAMMALS.

The following annotated list includes all the mammals about which any reliable information could be obtained as to their occurrence in the meadows or areas immediately adjacent. It was surprising to note what a large proportion of the mammals of Vancouver Island is represented in the Jordan Meadows area. A perusal of the list also brings prominently to the fore the insularity of this fauna; in point of fact of the total native mammalian fauna, 75 per cent. have marked racial characters that distinguish them from the species inhabiting other parts of British Columbia.

Vancouver Island Vagrant Shrew. *Sorex vagrans vancouverensis* Merriman.

Two specimens of this shrew were taken; one near the cabin at the south end of the meadows, the other at Loon Lake. Type locality, Goldstream, V.I. (1895).

Miller's Mouse-eared Bat. *Myotis yumanensis saturatus* Miller.

Several small bats were observed flying at dusk over Loon Lake, but none was obtained to verify the supposition that it is this species, but from the known distribution it is most likely to be the above. Type locality, Hamilton, Skagit, in Washington (1897).

Vancouver Island Raccoon. *Procyon lotor vancouverensis* Nelson and Goldman.

Tracks of this animal were seen in the muddy bottom of a dried-up slough at the north end of the meadows. Type locality, Quatsino Sound, V.I. (1930).

Vancouver Island Black Bear. *Euarctos vancouveri* Hall.

Sign of this animal was seen along the trails, chiefly in such forms as wasps' nests recently scooped out of the bank (a few wasps were still flying about the site of one nest), rotten logs torn to pieces in search of grubs, and tracts of skunk-cabbage that had been deliberately uprooted. In the last case the leaves had first been neatly bitten off at ground level, then the rhizome excavated, leaving a water-filled hole about 8 inches in diameter rimmed with the wilted leaves to mark the site of each operation. Over twenty such holes were counted in one place at the northern end of the meadows. A bear was seen in the forest bordering the northern meadows by C. J. Guiguet, June 3rd-4th, 1949. Type locality, King Solomon's Basin, Alberni, V.I. (1928).

Vancouver Island Wolf. *Canis lupus crassodon* Hall.

Recent signs of wolf were plentiful; their large tracks were to be seen wherever sufficient soft mud existed to leave an impression. Tracks were particularly noticeable about the shallow margin of Loon Lake. On the first visit in 1946 they were noted along the trail where it crossed a small creek. Not so evident in 1948. Type locality, Nootka Sound, V.I. (1932).

Vancouver Island Marten. *Martes caurina vancouverensis* Grinnell and Dixon.

Although no marten were seen by us they were trapped here by the Weeks. Type locality, Golden Eagle Mine, 20 miles south of Alberni, V.I. (1926).

Vancouver Island Weasel. *Mustela erminea anguinæ* Hall.

Reported by Mrs. Bannerman to have been frequently seen; probably this subspecies. Type locality, French Creek, V.I. (1932).

Vancouver Island Otter. *Lutra vancouverensis* Goldman.

Reported as being present here during the Weeks' settlement. Type locality, Quatsino, V.I. (1935).

Vancouver Island Cougar. *Felis concolor vancouverensis* Nelson and Goldman.

Seen and taken by the Weeks boys about the buildings. Recent reports of their presence are frequent. Lately (1948) one was shot on Mount Lazar. Type locality, Campbell Lake, V.I. (1932).

Vancouver Island Marmot. *Marmota vancouverensis* Swarth.

Included here on the basis of a specimen in the Provincial Museum, which is labelled Jordan River. While this species is hardly likely to occur in the meadows, it might be found on the surrounding high ground. No mention of marmots or whistlers is made by Mrs. Bannerman during the time of the Weeks' residence on the meadows. Type locality, 20 miles south of Alberni, V.I. (1911).

Vancouver Island Red Squirrel. *Tamiasciurus hudsonicus vancouverensis* Allen.

Abundant in the adjoining woods. Bushels of cone scales were to be found at the base of the Douglas fir trees. Squirrels were observed feeding occasionally on the flower-heads of the false bugbane. Type locality, Duncan, V.I. (1890).

Vancouver Island Beaver. *Castor canadensis leucodontus* Gray.

Mrs. Bannerman reports that very old stumps, obviously gnawed by beaver, were observed half-way between the house and Trout Lake, but none of the animals was seen then or since. Type locality, Vancouver Island (exact place not recorded) (1869).

Big Vancouver Island White-footed Mouse. *Peromyscus maniculatus interdixtus* Anderson.

Mice were not very abundant. Several specimens of this subspecies were taken at Loon Lake, and in 1946 at the northern end of the meadows. Characteristic of the higher places. Type locality, Forbidden Plateau, V.I. (1931).

Little Vancouver Island White-footed Mouse. *Peromyscus maniculatus angustus* Hall.

Several specimens were trapped near the pool. This subspecies is more addicted to the lower elevations. One specimen appears to have characters of both subspecies; apparently these two subspecies intermingle here. Type locality, Beaver Creek, near Alberni, V.I. (1932).

Vancouver Island Meadow-mouse. *Microtus townsendii tetramerus* (Rhoads).

Two or three specimens were taken near the site of the old homestead in July, 1948. Type locality, Beacon Hill Park, Victoria, V.I. (1894).

Rocky Mountain Muskrat. *Ondatra zibethica osoyoosensis* (Lord).

The muskrat is not native to Vancouver Island, but was introduced into the Jordan River, among other places on the Island, about the year 1923. Since then they have spread to the meadows, where they were reported to be very numerous about two or three years ago. At the time of our visit, however, none was seen; possibly they had been trapped out, as ample opportunity occurred to see them if any had been present. Old burrows were often seen in the banks of the streams, but judging from the condition of the herbage that had overgrown them, it was evident that they were not occupied at the time. Type locality, Osoyoos, B.C. (1863).

Columbian Black-tailed Deer. *Odocoileus hemionus columbianus* (Rich).

Abundant. Signs, tracks, and beds were seen everywhere, particularly on the borders of the swamp where the adjoining forest gave complete cover and protection. In one small dried-up slough they had browsed the spiræa, very effectively stunting the bushes, which were much branched, suggestive of a hand-trimmed hedge. Type locality, Cape Disappointment, Washington, where it was collected in 1805 by hunters for the Lewis and Clark expedition (Cowan 1936). First described in 1829.

BIRDS.

The following list of birds observed in the area during the time that the party was there, from August 26th to August 30th, 1947, is compiled chiefly by F. L. Beebe, from our joint observations; a few species and notes are added from the 1946 and 1948 records. Unless otherwise stated, they are sight records only.

The nomenclature and sequence is according to Munro and Cowan (1947).

Subspecific names have been added as probabilities rather than a certainty, having in view the fact that in the majority of cases the birds were not collected.

Loon. *Gavia immer* (Brunnich).

Not seen but reported. Mrs. Bannerman remarks that loons nested on the lake for which it was named.

Pied Billed Grebe. *Podilymbus podiceps* (Linnæus).

Heard at Loon Lake.

Great Blue Heron. *Ardea herodias* Linnæus.

Reported by visitors who were camping in the meadows at the time of our sojourn there. Seen in July, 1948, on several occasions.

Mallard. *Anas platyrhynchos* (Linnæus).

A record from Weeks Lake. Not at all common at this season. Possibly a good deal more so during migration.

Green-winged Teal. *Anas carolinensis* Gmelin.

Recorded from south of the cabin on one of the tiny lakes along the creek.

Western Red-tailed Hawk. *Buteo jamaicensis calurus* Cassin.

A primary wing-feather at the cabin at the lower meadows and a tail-feather at the camp-site at Loon Lake were the only indications of this species found. The country seems to be severely shot-over by hunters every autumn, and no doubt the raptores suffer accordingly.

Northern Bald Eagle. *Haliaeetus leucocephalus* (Linnæus).

Three birds, of which one was an adult, were seen circling very high above the lower meadows the forenoon of August 27th, 1947.

Sparrow Hawk. *Falco sparverius* Linnæus.

By woodland trail near road, July, 1948.

Blue Grouse. *Dendragapus obscurus fuliginosus* (Ridgway).

Reported by C. J. Guiguet, June 3rd-4th, 1949.

Ruffed Grouse. *Bonasa umbellus brunnescens* Conover.

Ruffed grouse were seen on a number of occasions. A hen and brood just able to fly were seen on July 12th, 1948. They frequent the crab-apple jungles fringing the meadows and seem to feed quite extensively on the fruit of this shrub.

Wilson's Snipe. *Capella gallinago delicata* (Ord).

A total of three of these birds were seen on both the upper and lower meadows at different times.

Screech Owl. *Otus asio kennicotti* (Elliot).

Reported by C. J. Guiguet, June 3rd-4th, 1949.

Pygmy Owl. *Glaucidium gnoma swarthi* Grinnell.

A pygmy owl answered to persistent calling on the evening of August 28th, 1947.

Nighthawk. *Chordeiles minor* (Forster).

A pair seen late in the evening hunting over Loon Lake. They were observed while we were shooting at bats; August 29th, 1947.

Rufous Humming-bird. *Selasphorus rufus* (Gmelin).

One was seen on July 20th, 1946, swiftly flying back and forth in the sun where a stream caused a break in the forest canopy. Very common; July, 1948.

Western Belted Kingfisher. *Megaceryle alcyon* (Linnæus).

One or two birds were seen regularly about the cabin at the lower meadows.

Northwestern Red-shafted Flicker. *Colaptes cafer cafer* (Gmelin).

One of the few relatively common birds of the area. They were seen and heard daily throughout the entire area in the timber fringing the meadows. They seem to feed to a certain extent on the crab-apples.

Western Pileated Woodpecker. *Ceophlœus pileatus picinus* (Bangs).

One was seen at the cabin; one seen near Shawnigan Lake on the way in.

Hairy Woodpecker. *Dryobates villosus harrisi* (Audubon).

A pair was seen on June 26th, 1946. They frequented one particular place, their actions indicating a nest somewhere in the vicinity.

Hammond Flycatcher. *Epidonax hammondii* (Xantus).

Specimen collected. Taken in willow scrub bordering a stream at the upper end of the lower meadows.

Western Wood Pewee. *Myiochanes richardsonii* (Swainson).

Lower meadows.

Violet-green Swallow. *Tachycineta thalassina* (Swainson).

Loon Lake.

Gray-streaked Jay (Canada Jay). *Perisoreus canadensis griseus* Ridgway.

These jays seemed rather uncommon. Two were seen a short distance from the cabin on August 28th. A family party was seen in 1946. They seem to drift through the woods, gliding from tree to tree, occasionally uttering a soft "pheu."

Steller Jay. *Cyanocitta stelleri stelleri* (Gmelin).

The most obvious bird in the area. They were noticeable as much for their noisiness as their numbers. They seem to feed a great deal on the crab-apples and were several times observed to pick these fruits and to eat them, not by swallowing them entire, but by holding them in the feet and picking them to pieces.

Northern Raven. *Corvus corax principalis* Ridgway.

Heard and seen about the scrub and broken meadows between the two large meadows on the 29th. There were three or four birds in the group.

Northwestern Crow. *Corvus caurinus* Baird.

Reported by C. J. Guiguet, June 3rd-4th, 1949.

Chestnut-backed Chickadee. *Parus rufescens rufescens* Townsend.

Heard high up in the climax fir forest on the trail in, and seen or heard regularly throughout the area in the scrub timber bordering the meadows. Frequently seen or heard.

Red-breasted Nuthatch. *Sitta canadensis* Linnæus.

Observed on several occasions in the scrub bordering the meadows and once in some very dwarfed pines in the meadows.

Brown Creeper. *Certhia familiaris occidentalis* Ridgway.

A family party was met with on the trail, unobtrusively prying under the bark of the hemlock in search of food.

Western Winter Wren. *Troglodytes troglodytes pacificus* Baird.

Noted in the climax forest on the trail in; they were not seen in the scrub timber.

Bewick Wren. *Thryomanes bewickii* (Audubon).

One seen on August 28th at extreme north-east corner of the twin lakes meadows.

Western Robin. *Turdus migratorius caurinus* (Grinnell).

Robins were seen and heard on several occasions at the lower meadows. They were not seen at all at the upper meadows and do not seem to be very numerous in the area.

Varied Thrush. *Ixoreus naevius naevius* (Gmelin).

Varied thrushes were seen along the main trail in the climax forest, and to a lesser extent in the scrub forest fringing the meadows.

Dwarf Hermit Thrush. *Hylocichla guttata nanus* (Audubon).

Thrushes of this species were seen on several occasions, once or twice in the heavy forest. In June their penetrating song was frequently heard, chiefly at dawn and again at dusk.

Russet-backed Thrush. *Hylocichla ustulata ustulata* (Nuttall).

Heard singing near cabin.

Townsend Solitaire. *Myadestes townsendi* (Audubon).

A single bird seen flying over the cabin at the lower meadows on August 27th.

Ruby-crowned Kinglet. *Regulus calendula grinnelli* Palmer.

Reported by C. J. Guiguet, June 3rd-4th, 1949.

Golden-crowned Kinglet. *Regulus satrapa olivaceous* Baird.

One of the common birds of the area. Heard in the climax forest high up in the trees and seen fairly frequently in the scrub about the meadows and even amongst the willows bordering the stream in the meadows themselves. One collected.

Solitary Vireo. *Vireo solitarius* (Wilson).

Streamside near cabin.

Orange-crowned Warbler. *Vermivora celata* (Say).

Streamside near cabin.

MacGillivray's Warbler. *Oporornis tolmiei* (Townsend).

Streamside near cabin.

Western Yellow-throat. *Geothlypis trichas occidentalis* Brewster.

This was probably the commonest and most beautiful bird found in the meadow. Individuals were generally seen amongst the low willows fringing the stream and in the dense spiræa growth farther back from the water. Oftentimes it was only a brief glimpse of the bird as it flushed from the spiræa tangle to fly a few yards and then drop back into it again. In July, 1948, it was in full song and could be heard throughout the day.

Western Tanager. *Piranga ludoviciana* (Wilson).

One heard as it flew over the cabin at the lower meadows.

Red Crossbill. *Loxia curvirostra sitkensis* Grinnell.

A flock of about twenty-five were noisily occupied about the tree-tops near the cabin on June 21st, 1946.

Oregon Junco. *Junco oreganus oreganus* (Townsend).

Comparatively common about the edges of the meadows and in the scrub timber between and about the meadows. Also seen in the climax forest, but not so commonly. A nest with four eggs was found on June 21st, 1946; it was built on the ground under a salal bush near the cabin and was lined with white deer-hair.

Sooty Fox Sparrow. *Passerella iliaca fuliginosa* Ridgway.

Fairly common about the fringes of the meadows and not infrequently seen well out in the meadows in the spiræa tangles.

Lincoln Sparrow. *Melospiza lincolni gracilis* (Kittlitz).

Evidently on migration; a bird of the swampy meadows. One collected.

Rusty Song Sparrow. *Melospiza melodia morphna* Oberholser.

Rather more numerous than the fox sparrow and more frequently seen away from the edges of the meadows. Song very evident in July, 1948.

According to Mrs. Bannerman, swans and geese were regularly seen during the migration periods.

Two campers at Weeks Lake, when questioned, added the following birds to the list:—

Blue Heron, Osprey, and Turkey Vulture.

The only one of these that may seem doubtful is the turkey vulture. However, the fact that it was called by this name and the presence of wolves and cougar in the area, resulting in kills which would form a food-supply for such birds, would indicate that the record is probably valid. In addition, geese were heard noisily calling on August 6th, 1946. They were not seen, so that specific identification is uncertain, but the call was reminiscent of the white-fronted goose.

FISH.

Rainbow Trout. *Salmo gairdnerii* Richardson.

This species appears to be a native fish. Inquiries relative to the possibility of its introduction have resulted in negative replies, at least as far as official action is concerned.

The variability of this species is well known, its size and coloration depending on the nature of the lake or stream to which it is confined.

Specimens taken in the pool below the cabin at the south end of the lake were all small, averaging from 3 to 5 inches long and only a few ounces in weight. Their colour was a dark greenish-brown on the back with faint parr-marking on the sides, together with a narrow crimson line.

Those examined from Trout Lake and Loon Lake were larger and measured up to 12 inches. They were more bluish-brown on the back and very silvery on the sides, with fine black flecks on the upper part.

In 1947 the creek running into the northern part of Loon Lake was partly dry, leaving small pools of water here and there along its course. One of these pools examined contained a concentrated sample of the small aquatic life and, in addition, a number of small fingerling trout about 2 inches long, closely resembling those from the lower pool.

At the time of our visit the fish were heavily infested with the larval stages of a trematode worm belonging to the genus *Clinostomum*, allied to the liver-fluke of sheep. I am greatly indebted to Dr. W. A. Clemens, Department of Zoology at the University of British Columbia, for the determination of the genus to which it belongs.

Mrs. Bannerman remarked that the fish in Trout Lake were always more "wormy" in the late summer than at other times of the year.

AMPHIBIANS AND REPTILES.

Pacific Coast Newt. *Triturus granulosus granulosus* (Skilton).

Commoner than at first supposed, as they bury themselves in the mud during the daylight hours.

Northwestern Salamander. *Ambystoma gracile* (Baird).

The egg-masses were frequently seen in the shallow water (July, 1948). The adults move about at night.

Red-legged Frog. *Rana aurora aurora* Baird and Girard.

This species is fairly common throughout the meadows. It was occasionally found along the woodland trails, some distance from water. Specimens of young about 1 inch long were taken in Loon Lake on August 29th.

Pacific Tree Frog. *Hyla regilla* Baird and Girard.

Abundant—both tadpoles and young adults in shallow margin of creek near cabin.

Northwestern Toad. *Bufo boreas boreas* Baird and Girard.

By far the commonest amphibian encountered, many reaching a large size. Colour was variable, from greenish-grey to reddish-brown. Young toads an inch long were

taken at the head of Trout Lake. Mrs. Bannerman tells me that Loon Lake is especially resorted to by the toads, the shallows being sometimes black with the tadpoles.

Striped Garter Snake. *Thamnophis sirtalis* Linné.

Garter snakes were frequently seen at the northern part of the meadows, on the dry ridges or banks. One very large one was obtained on August 30th, 1947; this measured 41 inches, with a girth of 3½ inches. Soon after our return it gave birth to twenty young. Later it was found to contain nine more.

INSECTS.

Insect life is abundant, but confined to the less conspicuous families. Dipterous flies were most noticeable because of their unwelcome attentions to our persons. Mosquitoes, though annoying, were not excessively so in August but were very evident in June.

Orthoptera (Grasshoppers and Locusts).

Camnula pellucida (Scudder). The Clear-winged Locust. Dry ground north of cabin, in August.

Trimerotropis suffusus Scudder. The Snapping Locust. Fairly common near cabin, in August.

Plecoptera (Stone-flies).

A large whitish species was noticeably common at Loon Lake, where it was flying about on the margin of the lake at dusk in August.

Megaloptera (Alder-flies, etc.).

Chauliodes disjunctus Walker. Western Dobson Fly. A larva of this large species was taken in a running woodland stream in July.

Odonata (Dragon-flies).

Dragon-flies of several undetermined species were abundant.

Hemiptera (True Bugs).

Gerris remigis Say. Water Skater. Very abundant on shallow water in sheltered places.

Banasa dimidiata (Say.) Stink-bug. Common.

Eremocoris obscurus Van D. Common.

Coleoptera.

Carabidæ (Ground-beetles).

Pemphis angusticollis Mann. Frequent under logs and decaying vegetation. One was found 4 feet up a tree in a clump of the old man's beard lichen.

Bembidium suspectum Baird.

Bembidium cantum (LeC.). The above species of this characteristic Carabid genus were actively running about in the hot sunshine over muddy places. They invariably make for a crack in the ground when approached.

Feronia (Bothriopterus) lustrans (LeC.). Under logs and debris in woods.

Elaphrus riparius Linn. This species was to be found along with the last and in the same habitat.

Gyrinidæ.

Gyrinus picipes Aube. A number of that species was observed in the shallows of Loon Lake.

Dytiscidæ (Water-beetles).

Agabus seriatus intersectus Cr. In shallow margin of Loon Lake. Widely distributed across northern part of continent; the subspecies is the western form of *seriatus*.

Tenebrionidæ (Darkling Beetles).

Phellopsis porcata (LeC.). Feeding on cap of mushrooms (*Russula* sp.).

Elateridæ (Click-beetles).

Four species taken by sweeping on a flower-head, including *Megapenthes stigmomus* (LeC.) and *Corymbites carbo* (LeC.).

Cerambycidæ (Long-horn Beetles).

Leptura soror LeC. Black-tipped Halter. On flowers of yarrow; August.

Anoplodera chrysocoma (Kby.). Golden Longhorn. Flower of yarrow; fairly common; August.

Anoplodera vexatrix (Mann). Small Angled Longhorn. On flower of yarrow; August.

Anoplodera crassipes (LeC.) Yellow-footed Longhorn. Flower of yarrow; August.

Anoplodera dolorosa (LeC.) Black Longhorn. Flower of yarrow; August.

A number of other species of Coleoptera were collected and await identification.

Chrysomelidæ (Leaf-beetles).

Galerucella punctipennis (Mann). Abundant on Menzies' spiræa in August.

Lepidoptera (Butterflies and Moths).

Papilio rutulus Luc. Western Swallowtail. Frequent near the cabin.

Papilio eurymedon Luc. Black and White Swallowtail. With the former; several.

Parnassius clodius f. *claudinus* Stich. Appolo Butterfly. Several were seen skirting the coniferous forest on the margin of swamps, sometimes close to the ground or mounting to the tops of the trees.

Ascia rapæ L. Cabbage White. One or two specimens of this ubiquitous species were observed near the cabin.

Brenthis epithore Edw. Western Fritillary. Abundant in July, 1948, where it was seen flitting over the swamps or alighting on the blossom of *Senecio triangularis*, which was then in full flower and in extensive beds.

Agrosperma dubitana Wlk. Ruby Quaker. One specimen, possibly this species, taken "at light"; August.

Graphiphora smithi Snell. Spotted-clay Dart. "At light"; August.

Lygris xyliana Hulst. The Phoenix. "At light"; August.

Malacosoma disstria erosa Streck. Forest Tent-caterpillar. Though there was a heavy infestation of this moth in Victoria in 1946, only one old web was seen on a crab-apple bush in Jordan Meadows in that year; no living caterpillars or moths were seen. In July, 1948, one or two full-grown larvæ were noted near the cabin.

Hymenoptera (Bees and Wasps).

Bombus bifarius vancouverensis Cr. Bumble-bee. Several were seen and taken near the cabin. Wasps were occasionally met with along the trails when they were disturbed at too close approach to their nests.

A representative cross-section of the insect fauna of the Jordan Meadows area can be made only by more intensive collecting throughout the season than was possible during the present visits. No doubt many interesting discoveries await such an investigation.

MOLLUSCS.

Pacific Giant Slug. *Ariolimax columbianus* (Gould).

Many individuals of the white form of this species were found with the normal yellow-brown specimens along the Koksilah trail. They were either entirely milky-white or with black blotches on a white background.

The various species of mushrooms and other fungi that occur throughout the year in the moist woods provided a ready food-supply for the slug population.

CONCLUSIONS.

The fact that the settlement of Jordan Meadows has never been repeated is evidence that in their present stage they can be of little agricultural value. It is doubtful that, even if drained, it would be worth the cost of such an undertaking as much rock would be exposed, while the soil would prove to be either too shallow or too acid for economical use.

The greatest value of the meadows lies in the fact that they form a natural reservoir, supplying the Jordan and Leech Rivers with a continuous flow of water. They could well be included in a park or game reservation, as was suggested and reported upon by J. A. Munro (1926) in respect to an adjoining area to the south and east.

The meadows could be an ideal sanctuary for the wildlife of the district, forming a perpetual source of supply of deer and other game animals to the surrounding area and a resting place for migrating water-fowl and other birds, while a progressive fish policy could maintain the productivity of the naturally well-stocked lakes and streams.

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SOME LEPIDOPTERA FROM THE FORBIDDEN PLATEAU DISTRICT OF BRITISH COLUMBIA.

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As the result of two visits to the Forbidden Plateau district on Vancouver Island in July, 1947, from the 7th to 10th, and in July, 1948, from the 19th to 23rd, the following Lepidoptera are recorded as seen or captured. Unfortunately, on both occasions the weather was very wet, with consequent lack of sunshine. Very few insects were seen.

On the 1947 trip the area around Mount Becher was investigated. On the lower slopes *Parnassius clodius clodianus* Stich. was frequently seen, together with *Speyeria hydaspe rhodope* Edw. This was as anticipated (see Report of the Provincial Museum, 1943, D 32).

At about the 4,000-foot level on the slope of Mount Becher a female specimen of *Pieris rapæ* L. was taken in good condition on July 8th.

At the 3,500-foot level on Mount Becher trail a specimen of *Sympistis wilsoni* B. & B. was netted on July 9th while hovering among flowers.

At about the same altitude and on the same day a specimen of *Eulype hastata gothicata* Gn. was taken, and a few other specimens were seen.

On the 1948 trip the area around Mariwood Lake was investigated, but as in the previous year, wet weather prevailed, and few Lepidoptera were seen.

The trip was made at a later date, but a late season seemed to have offset this somewhat, judging from the appearance of the flora.

On July 20th, on the way out to Mariwood camp, near Panther Lake, a specimen of *Xanthorhoe* species was taken, probably *incursata harveyata* C. & S. Other specimens were seen and another taken on July 21st near Lake Beautiful.

On July 21st, on a trip to the rim of Cruickshank Canyon, a specimen of *Polygonia satyrus* Edw. was netted, but after inspection it was released. The insect was in a very worn and faded condition, indicating hibernation and a long period of flight thereafter. The capture was made near Lake Beautiful. Specimens of *Strymon melinus atrofasciata* McD. were seen but not taken (see Report of Provincial Museum, 1943, D 33).

Among the moths a series of nine *Anarta melanopa laerta* Sm. were taken, and many others seen, near Lake Beautiful and the canyon's rim. Also a very worn and faded specimen of *Syngrapha orophila* Hamp. was taken and a second captured, but this specimen escaped by diving under the rim of the net, which was resting on uneven ground at the time.

On the return journey on July 23rd a specimen of what appears to be *Venusia cambrica* Curt. was taken from a tree-trunk near McKenzie Lake.

As the result of a further visit to the Mount Becher area during the period July 24th to July 28th, 1949, the following species are recorded:—

July 24th, on Becher trail: *Epirrhoe tristata* L.

July 27th, around summit of Mount Becher (elevation, 4,538 feet):—

Eneis nevadensis F. & F.

Plebeius icarioides Bdv. Form not yet determined.

Plebeius aquilo megalis McD.

Xanthorhoe incursata harveyata C. & S. Two specimens, probably of this species, taken near summit.

July 28th, around summit of Mount Becher:—

Eneis nevadensis F. & F.

Speyeria hydaspe rhodope Edw. Probably form alt. *minor* McD.

Parnassius clodius claudianus Stich.

Polygonia oreas silenus Edw.

Pieris rapæ L.

Vanessa cardui L.

Plebeius icarioides Bdv. Form not yet determined.

Plebeius aquilo megal McD.

Papilio zelicaon Luc.

Anarta melanopa laerta Sm.

Lycaena mariposa Reak. On trail to Mount Becher, at about 3,500 feet altitude.

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