

PROVINCE OF BRITISH COLUMBIA
DEPARTMENT OF EDUCATION

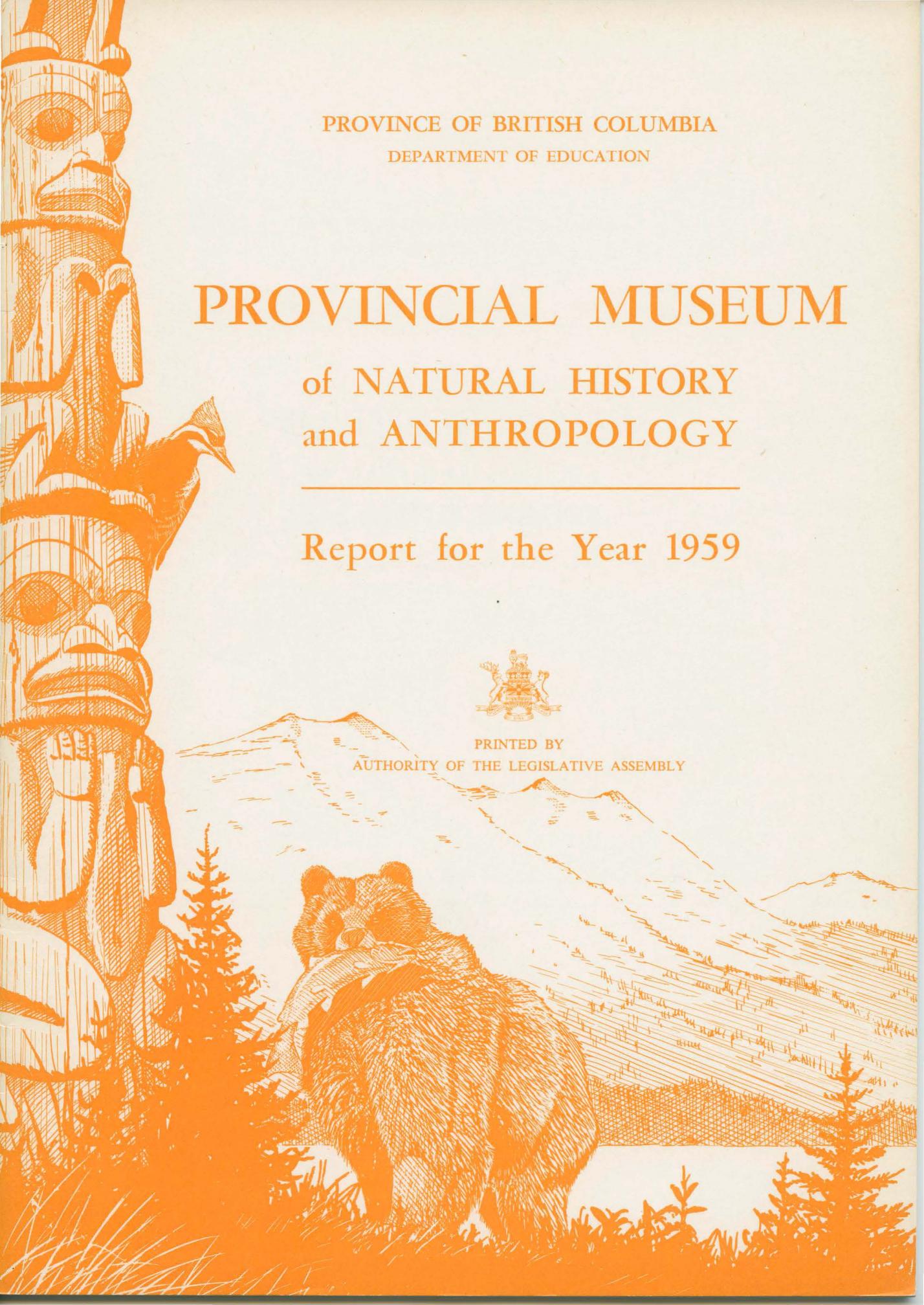
PROVINCIAL MUSEUM

of NATURAL HISTORY
and ANTHROPOLOGY

Report for the Year 1959



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PROVINCE OF BRITISH COLUMBIA
DEPARTMENT OF EDUCATION

PROVINCIAL MUSEUM
of NATURAL HISTORY
and ANTHROPOLOGY

REPORT FOR THE YEAR 1933



Printed by Don McEwen, Printer to the Queen's Most Excellent Majesty
at the Presses of the Government of British Columbia

To His Honour FRANK MACKENZIE ROSS, C.M.G., M.C., LL.D.,
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 1959.

L. R. PETERSON,
Minister of Education.

*Office of the Minister of Education,
January, 1960.*

PROVINCIAL MUSEUM OF NATURAL HISTORY AND ANTHROPOLOGY,
VICTORIA, B.C., January 22nd, 1960.

The Honourable L. R. Peterson,
Minister of Education, Victoria, B.C.

SIR,—The undersigned respectfully submits herewith a report covering the activities of the Provincial Museum of Natural History and Anthropology for the calendar year 1959.

I have the honour to be,

Sir,

Your obedient servant,

G. CLIFFORD CARL,
Director.

DEPARTMENT OF EDUCATION

The Honourable LESLIE RAYMOND PETERSON, LL.B., *Minister*
J. F. K. ENGLISH, M.A., Ed.D., *Deputy Minister and Superintendent.*

PROVINCIAL MUSEUM OF NATURAL HISTORY
AND ANTHROPOLOGY

Staff

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

CHARLES J. GUIGUET, M.A., *Curator of Birds and Mammals.*

WILSON DUFF, M.A., *Curator of Anthropology.*

ADAM F. SZCZAWINSKI, Ph.D., *Curator of Botany.*

J. E. MICHAEL KEW, B.A., *Assistant in Anthropology (to September 30th).*

DIANE MACEACHERN, B.A., *Assistant in Anthropology (from October 1st.)*

FRANK L. BEEBE, *Illustrator and Museum Technician.*

MARGARET CRUMMY, B.A., *Clerk-Stenographer.*

BETTY C. NEWTON, *Museum Technician.*

SHEILA Y. NEWNHAM, *Assistant in Museum Technique.*

GEORGE A. HARDY, *Curator of Entomology (part time to March 31st).*

CLAUDE G. BRIGGS, *Attendant.*

Totem-pole Restoration Programme

MUNGO MARTIN, *Chief Carver.*

HENRY HUNT, *Assistant Carver.*

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REPORT OF THE PROVINCIAL MUSEUM

FOR THE YEAR 1959

REPORT OF THE DIRECTOR

NEW EXHIBITS

The most notable addition to the permanent exhibits this year is a display-case of models of local wild flowers, the result of the combined work of Mr. Beebe, who originated the idea, and other staff members, including student assistants. The case itself was designed by the Architectural Branch of the Public Works Department in consultation with Dr. Szczawinski and Mr. Beebe. The featured plants include yellow arum, trillium, false lady's slipper, camas, shooting star, erythronium, satin flower, stone-crop, rhododendron, balsam root, and dogwood.

Another colourful exhibit is a tank of tropical fishes, installed and maintained by the Victoria Aquarium Society.

A number of temporary exhibits were also on display in the botanical section and in the anthropological section, as reported in more detail later.

A few changes were made in the mammal exhibits on the main floor. By removing one or two duplicates and making a few switches, several of the exhibits were improved in general appeal and it was possible to remove two large empty cases to storage. In addition, a mounted specimen of musk-ox, a mammal not found in British Columbia, was transferred to the Vancouver City Museum on a permanent loan basis. As a result of these operations, exhibits on the main floor have a less crowded appearance.

On an experimental basis the registration desk and two cases of living reptiles were moved from the entrance hall to the main floor, and totem-poles were installed in their places. Visitors may now see carved figures through the entrance-way as they approach the Museum wing from the main Parliament Building.

The observation hive of honeybees installed and maintained by Mr. G. V. Wilkinson, of the Victoria Beekeepers Association, continued to be a centre of attraction.

FIELD WORK AND OUT-OF-PROVINCE TRAVEL

Several sessions were spent in the field in 1959 by various staff members, as follows:—

C. J. Guiguet: Queen Charlotte Islands, May 28th to June 18th; Cold Fish Lake area, July 6th to August 15th.

A. F. Szczawinski: Cold Fish Lake area, July 19th to 30th.

G. C. Carl: Friday Harbor, July 22nd to 24th; Long Beach, August 14th to 19th.

Details of shorter field periods and of local archæological work are given in the curatorial reports.

We are grateful to the Provincial Department of Mines, who provided transportation and accommodation for Mr. Guiguet in the Queen Charlotte Islands area, and to the Department of Recreation and Conservation, who made it possible for both Mr. Guiguet and Dr. Szczawinski to work in the Cold Fish Lake area.

In March, Carl made a lecture tour through a number of the Eastern States under the auspices of the National Audubon Society and the Audubon Society of Canada. En route, visits were made to several museums, including Chicago

Museum of Natural History, Peabody Museum (New Haven, Conn.), and Portland City Museum (Portland, Maine).

While still in Ontario on special leave, Duff attended the annual meeting of the Canadian Museums Association at Toronto in May and attended a course on "Display in Museums," presented at McGill (Montreal) by the Canadian Museums Association in June. En route to Victoria in July, he visited several museums, as reported later.

In August, Szczawinski attended the Ninth International Botanical Congress held in Montreal. While in the East, he made use of the opportunity to visit several museums, as reported in a following section.

While on vacation in Europe, Miss Betty Newton also took extra time to visit a number of museums and to confer with officials on problems of display and museum techniques in general.

We are indebted to officials of the various museums visited for the courtesies extended to our various staff members.

MUSEUM FILM PROGRAMMES

The seventeenth annual series of Saturday morning programmes was given for school-children of the Greater Victoria area, as follows:—

Date	Topic	Attendance
February 21st	" Island Exploration "	429
February 28th	" The Marine World "	531
March 7th	" Flowers and Bees "	471
March 14th	" Caves and Corn "	404
March 21st	" Native Peoples "	470

As in past years, we are indebted to the Audio-Visual Education Branch of the Greater Victoria School Board for distributing the free tickets to the various schools and to the British Columbia Electric Company for granting special travel privileges to school-children attending the lectures.

A similar series of films was presented to the general public on Sunday afternoons during the same period. The attendance was 624 persons. We are again indebted to the Public Information Department of the British Columbia Electric Company for loan of certain films used in these programmes.

OTHER LECTURES AND DEMONSTRATIONS

In 1959 the Director gave lectures and film shows to thirty-eight organizations, not including eighteen made on the tour arranged by the National Audubon Society. In addition, five sessions were presented at a night course arranged by the Greater Victoria School Board and several playground programmes were carried out.

Other lectures and class demonstrations were given by other staff members, as reported elsewhere.

FORMATION OF BRITISH COLUMBIA MUSEUMS ASSOCIATION

A third seminar for museum people, arranged this year by the Provincial Archives and the Provincial Museum, was held on September 17th, 18th, and 19th at Camp Chilliwack, Vedder Crossing, B.C. The meetings were made possible by a grant-in-aid from the Leon and Thea Koerner Foundation.

The most important accomplishment of the seminar was the formation of a Province-wide organization to foster the museum movement in British Columbia.

A constitution was formally adopted and a slate of officers was elected. The Director was elected as president. Secretary-treasurer is Capt. James S. McGivern, Royal Canadian Engineers Museum, Camp Chilliwack, Vedder Crossing, B.C., to whom all inquiries regarding the association should be directed.

MODELS AND ILLUSTRATIONS

The outstanding models created this year are those of native wild flowers already noted. These are the work of Mr. Frank Beebe, assisted by Misses Susan Taylor, Anne Hassen, and Betty Newton, whose combined talents have produced extremely lifelike replicas in natural appearing habitats. In addition, Mr. Beebe has produced an albatross in flight and several fish models, all completely of plastic.

In anticipation of visiting scientists, delegates to the Ninth International Botanical Congress held in Montreal, plant models in the botanical exhibit were cleaned, repaired, and restored by Miss Newton.

In the field of illustrations, Mr. Beebe, Miss Newton, and Miss Hassen have each turned out a number of black-and-white drawings for use in future publications.

RADIO AND TELEVISION

The Director has continued to participate in the weekly radio programme "Outdoors with the Experts," sponsored by the Victoria station CJVI. The programme continues to have many listeners, judging by the volume of mail and the verbal comments received.

Several staff members have also appeared as guests on other programmes, both on radio and television.

In April the Thunderbird Park project was photographed by Alan Wicker and assistant, both of the British Broadcasting Company, for later use on television programmes originating in London.

PUBLICATIONS

The following publications have been produced in 1959:—

By Frank L. Beebe—

"A Nesting Record of a Black Swift." *Murrelet*, Vol. 40, No. 1, pp. 9-10.

By G. Clifford Carl—

"How's Your Nature Study." *B.C. Teacher*, Vol. 38, Nos. 1-8, 1958-59.

"James Alexander Munro." *Murrelet*, Vol. 40, No. 2, pp. 17-18.

"Animals around Us." A series of articles in the *Victoria Daily Times* in July.

By G. Clifford Carl and A. W. Perry—

"An Authenticated Case of Black Widow Bite." *Proceedings Entomological Society of B.C.* (1959), p. 21.

By G. Clifford Carl, W. A. Clemens, and C. C. Lindsey—

"The Fresh-water Fishes of British Columbia." *British Columbia Provincial Museum Handbook No. 5, Third Edition (Revised)*. March, 1959, pp. 1-192.

By Wilson Duff—

"The Histories, Territories, and Laws of the Kitwano." *Anthropology in British Columbia*, Memoir No. 4, 1959 (in press).

"Mungo Martin, Carver of the Century." *Museum News*, Vol. 1, No. 1, May, 1959. Art, Historical and Scientific Association, Vancouver.

"Digging into the Past." A series of eight articles in the Victoria Daily Times in August, 1959.

By C. J. Guiguet—

"Anna's Hummingbird (*Calypte anna*) at Victoria, British Columbia." Murrelet, Vol. 40, No. 1, p. 13.

"Owls of British Columbia." A series of articles illustrated by F. L. Beebe appearing in The Province (Vancouver).

"The Vancouver Island Water Shrew." Victoria Naturalist, Vol. 15, No. 6, p. 66.

By George A. Hardy—

"Painted Lady, *Vanessa cardui*, on Vancouver Island." Proceedings Entomological Society of B.C. (1959), Vol. 56, p. 39.

"Notes on the Life Histories of Four Moths from Southern Vancouver Island." Proceedings Entomological Society of B.C. (1959), Vol. 56, pp. 49-53.

By Adam F. Szczawinski—

"The Orchids of British Columbia." British Columbia Provincial Museum Handbook No. 16, February, 1959, pp. 1-124.

"Survey of Airborne Pollen and Fungus Spores of Victoria, British Columbia." American Academy of Allergy, Report for 1959.

By A. F. Szczawinski and V. J. Krajina—

"Corticolous and Lignicolous Synusia of the Forest Phytocænoses in the Coastal Douglas-fir Zone on Vancouver Island." University of British Columbia Publ., August, 1959.

"Lichens, Check List." International Botanical Congress, Field Trip 1, British Columbia, Canada, 1959.

"Corticolous and Lignicolous Synusia of the Forest Phytocænoses in the Coastal Douglas-fir Zone on Vancouver Island." Abstract in Proceedings of the IX International Botanical Congress, Vol. 1, Montreal, 1959.

In addition to the above a number of publications have been readied for the printers. These include a revision of "The Mammals of British Columbia" (Handbook No. 11), "Common Marine Fishes of British Columbia," "The Thrushes of British Columbia," and "The Bivalve Molluscs of British Columbia." A start has also been made on "The Heathers of British Columbia," by Dr. Szczawinski, and a detailed account of the peregrines of the north-west Pacific Coast was completed by Mr. Beebe and submitted to the "Condor" for publication.

ATTENDANCE

The number of visitors to the Museum in 1959 is summarized as follows:—

January	956	August	15,377
February	1,232	September	5,355
March	1,657	October	1,393
April	1,855	November	722
May	2,681	December	446
June	6,632		
July	13,056	Total	51,362

The total registered attendance figure shows an increase of about 6,000 compared with the 1958 registered attendance, which is probably a reflection of the normal increase in tourist travel being experienced in recent years.

As noted previously, these figures are taken by counting signatures in the visitors' register and are therefore not a true measure of attendance since all persons do not register. From previous experience we know that the proportion of people who register varies with the number of persons who happen to be near the registration desk. When few are present, all are likely to sign, especially if they see someone else in the act; when the entrance-way is crowded, many pass by the register without bothering to sign. No actual counts of visitors were made this year to determine the ratio of signers to non-signers, but, based on counts made in previous years, we estimate the 1959 attendance to be about 70,000 persons.

To this estimated total there should be added 2,929 persons who attended the spring film programmes and 1,473 persons who attended as school classes or other organized groups, making a grand estimated total of 74,402.

As in former years, Mr. Briggs has broken down the July attendance on the basis of place of origin as follows:—

Residence	Registration	Residence	Registration
British Columbia	2,100	Washington	2,341
Alberta	621	Oregon	1,035
Saskatchewan	276	California	3,666
Manitoba	213	Other States	3,838
Ontario	532	Great Britain	161
Quebec	114	Other countries	106
New Brunswick	17		
Nova Scotia	34		
Prince Edward Island	4	Total	9,136
Newfoundland	2	Grand total	13,056
Yukon Territory	3		
Northwest Territories	4		
Total	3,920		

Compared with the same period in the previous year, the July attendance is up by about 4,000 persons, and, in fact, it almost reached the all-time high of 13,278 recorded in 1957. Visitors from California still outnumber those from other individual States and Provinces, with Washington running a close second.

The sum of \$385.17 collected by the Solarium donation-box during the year was turned over to the Queen Alexandra Fund for Crippled Children.

STAFF CHANGES

In July Mr. Wilson Duff returned after spending a year on a research problem at the National Museum in Ottawa. The project was partly financed by a grant from the Canada Council.

After more than three years' service as Assistant in Anthropology, Mr. J. E. Michael Kew left the staff of the Provincial Museum to join the service of the Saskatchewan Government in the Department of Natural Resources. Here he will continue his keen interest in native peoples by working in the field of sociology, a most rewarding experience. We offer him best wishes in this new post.

To fill the vacancy we were most fortunate indeed in obtaining the services of Miss Diane MacEachern, a graduate of the University of British Columbia in anthropology.

Students Anne Hassen, Susan Taylor, John Sendey, and Richard Cox were employed during the summer months, as noted elsewhere, and Mr. John Nutt has

been employed on a part-time basis to care for the living plant exhibit. Mr. Charles Hope acted as attendant while Mr. Briggs was on leave from April 1st to June 30th.

LIBRARY REORGANIZATION

The reorganization and recataloguing of the Museum reference library, commenced in 1958, was continued during the year with the help of Miss K. Clark, Chief Cataloguer, Miss Margaret Hastings, and Mrs. Lorna Sager, all of the Provincial Library staff. By the end of 1959 most of the separates had been recatalogued and a start was being made on the periodicals in series and on the bound volumes. The programme is expected to be continued into 1960.

OBITUARIES

We regret to record here the passing of the following persons, all of whom have rendered services to the Museum and to the Province as a whole:—

Mr. John Owen Clay, of Victoria, for many years convener of the Bird Group of the Victoria Natural History Society, organizer of the Annual Christmas Bird Count, and well-known amateur ornithologist (March 24th).

Mr. Dan Cranmer, of Alert Bay, well-known Kwakiutl informant who collaborated with Dr. Franz Boas and, more recently, a participant in the ceremonies in connection with the opening of the Kwakiutl house in Thunderbird Park (June 10th).

Mr. David Martin, son of Chief Carver Mungo Martin, who assisted his father in the planning and construction of the Thunderbird Park house and who helped carve many of the totem-poles now standing in Thunderbird Park, the world's tallest totem-pole in Beacon Hill Park, the Queen's pole in London, and poles in other parts of British Columbia (September 3rd).

Dr. Sidney L. Neave, of Kyuquot, a graduate of the University of Illinois in biology, an ardent collector and authority on the flora and fauna of the Kyuquot area, west coast of Vancouver Island (October 7th).

Mr. William Downes, of Victoria, for many years (1917 to 1946) officer in charge of the entomological Laboratory in Victoria and an authority in Hemiptera (December 24th).

REPORT OF THE CURATOR OF BOTANY

HERBARIUM

Recorded accessions for the year 1959 amounted to 1,100 sheets of phanerogams, bringing the total to 34,015 phanerogams. The accession of cryptogams amounted to 510, consisting mainly of material collected on the west coast of Vancouver Island, Kyuquot Sound area, and in Northern British Columbia.

The smaller number of accessions this year is mainly due to the fact that present herbarium cases are overcrowded and cannot accommodate more material without risking serious damage to the present collection.

Considerable time was spent working on the collections from previous years. There is still a large amount of unmounted material from collections of our earliest botanists, and more material is constantly arriving from many new collectors.

The scheme started in 1956 to operate supervised collecting was continued with great success. As a result, a number of valuable collections from the most inaccessible, non-collected parts of the Province were received. Space does not permit us to list each individual collector, but we acknowledge their fine work and help with most sincere thanks.

From some of the more remote areas in British Columbia, collections were received from Mrs. D. H. Calverley (Dawson Creek), Mr. George Robinson (Monkman Pass area), Dr. S. Holland (Haines Road, Barrington River and Skeena River areas), Dr. Peter A. Ziegler (Toad and Peace River areas), Dr. A. Sutherland-Brown (Queen Charlotte Islands), and Mr. J. E. Underhill (Manning Park). These collections are a very valuable addition as they are from localities not previously represented in our herbarium.

The Smithsonian Institution collaborated with the herbarium concerning the study of cryptogams and identified a number of our specimens (mainly mosses and lichens). We are urged by the Smithsonian Institution, Michigan State University, University of Washington, Swedish Museum of Natural History, Chicago Natural History Museum, and University of Cracov (Poland) to collect and exchange with them our cryptogams in the future, but unfortunately this will require additional help and space. At the moment we are not able to establish to any great extent exchange of cryptogamic material with other institutions due to the above-mentioned reasons.

The Curator received an invitation from the well-known authority on bryophyta, Dr. Herman Persson, of the Swedish Museum of Natural History, Stockholm, to collect mosses and liverworts of Vancouver Island and to prepare a publication on them. Dr. Persson has worked with bryophytes from the Queen Charlotte Islands and is well acquainted with the flora of the Pacific Coast.

SUMMER ASSISTANCE

In 1959 two students were employed—Miss Anne Hassen, Victoria College, and Miss Susie Taylor, University of British Columbia. Both were engaged in constructing plant models in preparation for a new display. Their work was of great help. They also had a chance to work in the herbarium, helping in the preparation of illustrations and other routine work under the careful direction of Mrs. S. Newnham.

PLANT EXCHANGE

Exchange of duplicate British Columbia plant material was continued with various universities, museums, and government botanical institutions, particularly

the University of British Columbia, Science Service (Ottawa), National Museum (Ottawa), and University of Washington (Seattle).

NEW EXHIBITS

During the year several new exhibits were established. An enlarged model of sphagnum moss was reproduced very accurately by Miss B. Newton, of our staff, and was included in a display showing its life-cycle and uses.

A giant puffball donated by Mr. and Mrs. G. B. Williams, Victoria, and a giant morel donated by Mr. E. Powell, Victoria, were modelled by Miss Hassen and Miss Taylor under the supervision of Miss Newton.

These fungi weighed 15 and 2 pounds respectively and are among the largest ever recorded for these species. We express our thanks to the two donors for these unusually large specimens.

Through the Department of Public Works, we were able to have a large display-case made, containing seven dioramic windows to house models and habitats of some of our interesting and common spring flora. These include skunk cabbage, trillium, Easter lily (two species), chocolate lily, shooting star, satin flower, camas (two species), calypso, rhododendron, dogwood, and balsam root. The modern display of these plants is a great asset to the botanical section and is very popular with the public.

These models and habitats are not only artistically pleasing, but are true and accurately presented. The credit for this goes to Mr. F. L. Beebe and our summer assistants, particularly Miss S. Taylor for her splendid work.

FIELD WORK AND BOTANICAL SURVEY

In an advisory capacity on vegetation, the Curator participated in an expedition to the Cold Fish Lake-Spatsizi Plateau area, being invited by the Department of Recreation and Conservation. Other members of the survey party were Dr. D. B. Turner and Mr. Charles Guiguet. A number of plants were collected and many new locality records were added to our files. A full report was submitted to the Department of Recreation and Conservation.

A few short collecting trips on Vancouver Island were made jointly with Dr. T. M. C. Taylor, University of British Columbia, in connection with the Ninth International Botanical Congress.

SPECIAL RESEARCH

A survey of air-borne pollen and fungus spores of Victoria, British Columbia, was continued on from 1958.

The primary purpose of this survey is to furnish information of value in studies on pollinosis (hay fever). Although it is designed for use by patients and physicians who need to know what, where, and when organic particles are in the air in sufficient quantities to cause medical concern, the presentation and discussion is from a botanical standpoint only. The particles that were identified were recorded, and a report was submitted to the Research Council of the American Academy of Allergy (Council on Aeroallergens, Pollen, and Moulds Subcommittee) for publication.

EXTENSION WORK

Twenty-nine lectures, illustrated by coloured slides, were given to popularize plant knowledge of our Province. These lectures were at the invitation of agricultural and horticultural associations, conservation groups, garden clubs, parent-

teacher associations, teachers' conventions, church clubs, professional and service clubs, Scouts, and schools, both in Victoria, Vancouver, Seattle, and many up-Island points.

The Curator was twice invited to address the Pacific Northwest Bird and Mammal Society—first at the University of Washington, Seattle, presenting a paper entitled "Botanizing along the Alaska Highway," and the second in Victoria, entitled "Observations on Alpine and Sub-alpine Vegetation in British Columbia."

A number of appearances on television and radio were made in connection with the Ninth International Botanical Congress (in Victoria, Vancouver, and Montreal).

Other extension work of the botanical section is covered in the Director's report.

OTHER ACTIVITIES

The exhibit of fresh material of native plants was maintained all year round by Mr. John Nutt. As usual, this exhibit was carefully prepared and well arranged and is popular with many visitors.

Routine curatorial duties, such as the identification of plant collections, mounting, cataloguing, labelling, and filing plant specimens, were performed with the very able assistance of Mrs. Newnham, and information service was provided for the general public and various Government departments (that is, Recreation and Conservation, Horticulture, Agriculture, and Forestry of the Provincial Government, and Forest Pathology Laboratory and Experimental Station, Saanichton, of the Federal Government).

The service of plant identification was also extended to the head gardener at Government House and a number of District Agriculturists and Forest Rangers.

In November the Curator had the privilege of attending the Twelfth British Columbia Natural Resources Conference at Harrison Hot Springs, the conference theme being "Resources of the Northern Cordilleran."

BOTANICAL CONGRESS

The Curator took an active part in the Ninth International Botanical Congress held in Montreal August 19th to 29th, 1959. This is the first time the Botanical Congress has ever been held in Canada.

As a member of the British Columbia Field Trip Sub-committee of the Congress, the Curator participated in organizing the field-trip in British Columbia and was mainly responsible for Vancouver Island. Together with Dr. T. M. C. Taylor, preparations were made for the four-day tour of the Island, and for the publication of a botanical booklet dealing with British Columbia flora. The touring party consisted of forty-two members of the Congress, representing sixteen countries. In Victoria the party visited the Provincial Museum. At the formal meetings of the Congress in Montreal, a paper was jointly presented by Dr. A. F. Szczawinski and Dr. V. Krajina entitled "Corticolous and Lignicolous Synusia of the Forest Phytocenoses in the Coastal Douglas-fir Zone on Vancouver Island."

After the Congress the Curator visited the American Museum of Natural History, New York Botanical Garden, Brooklyn Botanical Garden, Brooklyn Museum of Art, and Columbia University in New York, and the Museum of Natural History in Chicago.

ACKNOWLEDGMENTS

The botanical section continues its cordial relationship with the following groups: Department of Biology and Botany at the University of British Columbia;

Science Service, Department of Agriculture, Ottawa; National Museum of Canada, Ottawa; University of Washington, Seattle; Smithsonian Institution, Washington, D.C.; and many other research institutions in Canada, the United States, and other countries. We are indebted to them for their interest and help in the field of botanical work.

We wish to acknowledge in general the voluntary co-operation and help of those who contribute to botanical collections and knowledge. Space does not permit us to list everyone who helped, but we intend to include all of them in a grateful vote of thanks.

OTHER ACTIVITIES

The exhibit of ferns, mosses, and native plants was maintained all year round by Mr. John Hoyt. As usual, this exhibit was carefully prepared and well arranged and a popular with many visitors. Numerous curatorial checks such as the identification of plant collections, the ecological labelling, and flag plant specimens, were performed with the aid and assistance of Miss Newburn, and information service was provided for the general public and various Government departments (Fish, Research, and Conservation, Forestry, and Botany) of the Provincial Government, and Forest Pathology Laboratory and Experimental Station, Vancouver (Provincial Government).

The service of plant identification was also extended to the local gardeners in Government House and a number of District Agricultural and Forest Stations. In November the Curator had the privilege of attending the Twelfth British Columbia Natural Resources Conference at Harrison Hot Springs, the conference theme being "Resources of the Northern Cordillera".

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As a member of the British Columbia Field Trip Subcommittee of the Congress the Curator participated in organizing the field trip in British Columbia and was mainly responsible for Vancouver Island. Together with Dr. T. M. L. Young, preparations were made for the four-day tour of the island and for the production of a botanical booklet dealing with British Columbia ferns. The meeting party, a staff of forty-two members of the Congress, representing sixteen countries, visited the party at the Provincial Museum. At the formal meeting of the Congress in Montreal a paper was jointly presented by Dr. A. F. Bennett and Dr. V. Kraline entitled "Coniferales and Ligustrales Systems of the Pacific Northwest in the Coastal Douglas Fir Zone on Vancouver Island".

ACKNOWLEDGMENTS

The botanical section continues its cordial relationship with the following: Department of Biology and Botany at the University of British Columbia;

REPORT OF THE CURATOR OF BIRDS AND MAMMALS

In 1959 field research was carried out in the Queen Charlotte Island area during the months of June and early July. Six islands off the coast of Moresby Island were investigated. A sample of small mammals was taken from Moresby Island at Armetieres Channel and series of scientific-study specimens were taken and prepared from Louise, Chaatl, Helgesen, and Saunders Islands. Due to unforeseen circumstances, it was impossible to work Hibben Island in the west coast group, but student assistant geologists took a small sample of the mammals there after the Museum member's departure.

We were fortunate in being invited to join the Provincial Geological Survey party working the west coast of the Charlottes this summer. The group, led by Dr. Athol Sutherland-Brown, operated from a large motor-launch, "Pride of the West." Without such facilities it is practically impossible to work these otherwise inaccessible west coast islands. The Museum is most grateful to the Department of Mines for this opportunity and to Dr. A. Sutherland-Brown for the co-operation, the assistance, and the facilities so generously provided in the field.

In July and August six weeks were spent on a trip to the Spatsizi Plateau near the headwaters of the Stikine River, where the ecology of the area in relation to the bird and mammal influents was studied and scientific-study specimens were collected. The opportunity to visit this wilderness was made possible through the Department of Recreation and Conservation, and facilities such as horses, guides, and accommodation were generously provided for the Museum member by Mr. T. A. Walker, the outfitter at Cold Fish Lake, and to him the Museum expresses its gratitude. An area of approximately 4,000 square miles enclosed by the Klappan River to the south and west and by the Stikine River to the north and east was investigated by air, on horseback, and on foot. The large amount of travelling consumed much of the time and hampered collecting operations to a certain extent, but a good deal of information was gathered. In view of the current and pending encroachment of civilization on northern wilderness areas, further and intensive investigations are indicated, especially in the big-game belt which extends across the Province north of the 57th parallel of latitude.

Short field excursions usually carried out each year on Vancouver Island were curtailed this year due to these other commitments. The zoological explorations usually carried out annually on islands off the west coast of Vancouver Island were also projected to next year.

Handbook No. 11, "The Mammals of British Columbia," went out of print in the current year and has been revised, mainly by the senior author, Dr. I. McTaggart Cowan. We are indebted to Dr. E. Raymond Hall, of the University of Kansas, for critical reading of the manuscript. The revised edition will appear in print at a later date.

"Thrushes of British Columbia," prepared for the Handbook series, was completed and made ready with plates for publication.

"Owls of British Columbia," also prepared for the Museum Handbook series, is currently running as a series of articles in a Vancouver newspaper. It will appear in handbook form at a later date.

Material for several other handbooks on birds, prepared in the past three or four years, are in rough draft and will appear as opportunity and priority permit.

Information on birds and mammals received through the general public from various points in the Province and locally through staff members and members of the Victoria Natural History Society was filed and awaits indexing for the annual field records.

One hundred and seventy-nine scientific-study specimens were out on loan to various institutions and individual students this year. Some research students visited the Museum study collections in person.

Curatorial activities, care and maintenance, and shipping and receiving of study collections, handling of routine queries, correspondence, identification of material brought in by the public, indexing, cataloguing of accessions, preparation of skeletal materials, preparation of manuscripts, a limited amount of lecturing, and the host of minor but important Museum activities combined to completely utilize the Curator's time in the current year.

We wish to acknowledge the co-operation of citizens and organizations who contribute annually to our biological collections with services, information, and specimens. We are indebted to Dr. D. B. Turner, Deputy Minister, Department of Recreation and Conservation; Mr. P. Mulcahy, Deputy Minister, Department of Mines; Dr. A. Sutherland-Brown, Department of Mines; Dr. E. Raymond Hall, Director of the Museum of Natural History, University of Kansas; Mr. T. A. Walker, Cold Fish Lake; members of the Canada Department of Fisheries—Mr. A. J. Whitmore and Mr. H. E. Palmer; Mr. Frank R. Butler, Director of the British Columbia Fish and Game Branch, and his staff of biologists, inspectors, and game wardens throughout the Province; Mr. R. H. Mackay, of the Canada Wildlife Service; the Royal Canadian Navy; and the many private citizens too numerous to list here.

REPORT OF THE CURATOR OF ANTHROPOLOGY

STAFF

The Curator returned in July from a year's leave of absence spent on a special research project at the National Museum in Ottawa. On September 30th Mr. Kew, who had most capably managed the affairs of the anthropological office during the Curator's absence, left to take a new position with the Saskatchewan Department of Natural Resources. Replacing him as Assistant Anthropologist, Miss Diane MacEachern joined the staff on October 1st. Miss MacEachern is a recent graduate of the University of British Columbia in anthropology, with practical experience in museum work and archæology. For the months of July and August we were once again pleased to have John Sendey as student assistant. His time was profitably spent on routine museum tasks and archæological field work.

RESEARCH

An outline of the Curator's research project at the National Museum was given in last year's report. Briefly, it was a study of the social organization and traditional histories of the twenty-five Tsimshian tribes of the Skeena and Nass Rivers, based on the voluminous files assembled since 1915 by Dr. Marius Barbeau. By the end of the twelve months' work, the relevant information had been extracted from the original field-notes of Dr. Barbeau and his Tsimshian collaborator William Beynon and reassembled into an orderly file. This file, which now fills a cabinet drawer in the anthropological office, contains the material for several monographs, but much time will still be required to analyse it and prepare the publications. Since July other duties have left very little time for research. However, with Miss MacEachern's assistance, some progress has been made on sections dealing with winter ceremonials.

FIELD WORK

Because of the Curator's extended absence, no major field-trip was made during the year. However, Mr. Kew undertook a number of projects in the vicinity of Victoria. These included attendance at several Salish spirit dances and Shaker Church meetings and the archæological projects described below. In August the staff and volunteers conducted an archæological excavation at Shoal Bay.

A valued collaborator during the year was Mr. Robert S. Kidd, an instructor at the Canadian Services College at Royal Roads, who had had some previous training in archæology. In his spare time Mr. Kidd surveyed a large number of sites between Jordan River and North Saanich. He has since turned over his site records and artifacts to the Museum.

Two small excavations were made jointly by Mr. Kew and Mr. Kidd. The first was a 5- by 5-foot test-pit in a midden on the property of the Canadian Services College. The other was a similar test-pit in a midden on Tsehum Harbour, North Saanich. The records and artifacts from both projects are in the Museum.

For two weeks in August the Museum sponsored an archæological "dig" in a small midden on Shoal Bay, Victoria. To a large extent it was a "public relations dig" to publicize local archæological resources and a "training dig" for the benefit of local amateurs. The Victoria Times agreed to publish a daily article prepared by the Curator, and added excellent illustrations, a concluding editorial, and (last but not least) a cartoon. In addition, C.B.C. television provided good coverage of the project, both locally and nationally. The crew, under the direction of the Curator and Mr. Kew, included summer assistants John Sendey and Richard

Cox and a varying number of local volunteers—Mrs. Edith Cross, Miss Carol Turner, Cleave Hughes, Ellis Pryce-Jones, and others. The publicity drew considerable numbers of interested spectators to the site while the project was in progress and a distressing number of overenthusiastic relic-hunters when it was over.

The excavation was carried out using modern scientific methods. The site was surveyed and staked out in 5-foot squares. Digging proceeded by levels in each square to form two 5-foot trenches, and careful records were kept of the strata and the finds. The artifact count grew to about 150 and revealed a limited assemblage characteristic of a specialized fishing site. We cannot claim that the results are of great scientific value, for this was not a site of great age or importance and the excavation was not large enough to give a very definitive sample.

COLLECTIONS

The outstanding addition to the anthropological collections during the year was the Mungo and David Martin collection of Kwakiutl masks and other ceremonial equipment. Purchased by means of a special grant from the Government, this unique family collection is composed of all the paraphernalia used in the ceremonies which Mungo Martin had inherited and passed on to his only son David. After David's unfortunate death by drowning in September, Mungo Martin no longer wanted to retain possession of these objects, and gave the Museum the opportunity of acquiring them. In a simple but moving ceremony in the Kwakiutl house in Thunderbird Park on December 11th, the Honourable Leslie Peterson, Minister of Education, formally accepted the collection on behalf of the Museum.



The Honourable Leslie Peterson, Minister of Education, receives the Mungo and David Martin collection from Chief Carver Mungo Martin on behalf of the Museum.

The objects in the collection are listed with the other anthropological accessions below. Almost all were used in one of two ceremonies—the initiation dances of the Hamatsa or Cannibal Society or the hereditary Dance of the Animals. All were used on the occasion of the opening of the house in Thunderbird Park in 1953.

Care and cataloguing of the collection has always been a continuous job. Miss MacEachern's addition to the staff, however, has resulted in marked improvements in these fields. Storage methods have been improved; for example, costumes formerly folded in boxes have been hung from racks in moth-proof plastic bags, and mats and blankets have been rolled on cardboard tubes.

EXHIBITS

In 1956 plans were made to construct false walls containing built-in showcases along some of the walls of the basement display-rooms. At that time the necessary electrical wiring was installed, but the project itself was shelved. This year the Public Works Department was able to revive the project.

Minor changes and improvements in the Indian exhibits were made throughout the year, and planning went on for the new exhibits. The entrance hall was altered by the removal of the guest-book and live reptiles, the addition of one more totem-pole, and the installation of new lighting. A visitor now receives a single dramatic impression created by the totem-poles, rather than conflicting impressions presented by totem-poles, a live rattlesnake, and the guest-book. A pair of wall cases in the basement was used for temporary exhibits. Two exhibits were installed: first, a selection of water-colour portraits of Indians by Arthur D. J. Pitts; the second, the Mungo and David Martin collection.

EDUCATION

Thirteen of the school classes and other organized groups which visited the Museum were given tours of the Indian exhibits or Thunderbird Park, or both. Members of the anthropological staff gave ten illustrated lectures to outside groups, including, for example, the Victoria White Cane Club, Sidney Kiwanis Club, and an assembly of the students and staff of Colquitz Junior High School. While in Ottawa the Curator delivered an illustrated public lecture on "Two Totem Towns" of British Columbia as part of the National Museum's winter lecture programme.

MUSEUM TRAINING

The Curator's visit to the East provided several opportunities for improving his knowledge of museum administration and techniques. From June 8th to 19th he attended the training course "Display in Museums," sponsored by the Canadian Museums Association at the Redpath Museum, McGill University, Montreal. He represented the Museum also at the annual conference of the Canadian Museums Association at the Royal Ontario Museum, Toronto, May 21st to 23rd. The experience of a year at the National Museum in Ottawa, with its opportunities to observe and participate in the affairs of such an institution, was also very stimulating and educational. En route home to Victoria, he visited museums in Hamilton, Jordan, Buffalo, Cleveland, Lincoln, Scotsbluff, Cody, Yellowstone, Penticton, and Chilliwack.

In September the Curator participated in the planning and was a speaker on the programme of the British Columbia museums seminar at Camp Chilliwack. The theme of the seminar was display techniques, and the Curator contributed the opening lecture, "Ten Steps in the Development of Effective Museum Exhibits," which is to be published in the proceedings of the conference.

PUBLICATIONS

The major anthropological publication of the year, now in press, is "The Histories, Territories, and Laws of the Kitwancool," Memoir No. 4 of the Anthropology in British Columbia series. This unusual anthropological document comprises statements by the Kitwancool Indians of the Upper Skeena of what they consider to be their histories, territories, and laws, with a preface and an introduction by the Curator. In addition to this memoir and the other publications listed elsewhere in the report, progress was made on an article on the Indians of the Gulf Islands.

MISCELLANEOUS

The loan was made of a large amount of Indian material to the Hudson's Bay Company for a special exhibit in the Douglas Room of the Victoria store during July and August. A number of other specimens were sent on loan to the Royal Ontario Museum and were used on the television programme "Who Knows?"

Several visiting photographers required assistance from the staff while working with objects in storage or from display-cases. Most notable, perhaps, was a visit from Eliot Elisofon, of Life magazine, who photographed specimens in the Museum and Indian dances in Thunderbird Park.

The conducting of correspondence, answering of inquiries, reception of visitors, maintenance of the photographic and other files, and other routine office work all comprise important parts of the day-by-day work of the staff.

TOTEM-POLE RESTORATION PROGRAMME

The totem-pole carving programme in Thunderbird Park was continued under the direction of this office. Mungo Martin and Henry Hunt, the permanent carvers, worked steadily through the year, except for a six-week period in the fall, which Mr. Martin spent in mourning for his son David (*see* Obituaries). George Clutesi was also employed in the carving workshop for a short period in the spring.

Seven months were taken up with the carving of the copies of three Kitwancool poles described in last year's report. These are to be returned to Kitwancool village, while the originals are to be retained for permanent preservation. Special steel bases were designed and (at the expense of the anonymous private donor) fabricated. For several reasons the shipment of the poles and bases to Kitwancool has been postponed until the spring of 1960.

During the spring we were approached by the Provincial Council of the Boy Scouts Association regarding the possibility of carving a totem-pole to stand in front of the new national headquarters building of the Boy Scouts Association in Ottawa. The Curator discussed the matter with the architects and Scout officials in Ottawa, and it was agreed that the pole should be an integral architectural feature of the building and should be 60 feet high. An agreement was reached whereby the Provincial Council would provide the log, a grant of \$2,500 for the costs of carving, and all moving and engineering expenses. We would provide the facilities, carvers, and direction of the work. The carving was started on this pole at the beginning of August, and at the end of the year it was very near completion.

For the occasion of Her Majesty's visit on July 16th, Mungo Martin and Mr. and Mrs. Henry Hunt went to Nanaimo to provide a demonstration of Indian craftsmanship. They were honoured by meeting Her Majesty and chatting with her about the Centennial pole which they had carved as a gift for her in 1958.

DONATIONS AND ACCESSIONS

ZOOLOGICAL

MAMMALS

By gift—

- Richard Chaffey, Royal Oak, whale scapula.
- A. E. Roberts, Mesachie Lake, one beaver skull.
- T. A. Walker, Qualicum, five mountain-goat skulls.

By the staff, 177.

BIRDS

By gift—

- T. R. Ashlee, Victoria, W. C. McKechnie collection of birds from Manitoba.
- Mrs. H. M. S. Bell, Victoria, one linnnet.
- Miss Caroline Bradfield, Victoria, one grebe.
- Harrison Brown, Hornby Island, one russet-backed thrush.
- Harry Caldwell, Ganges, one mourning dove.
- A. R. Davidson, Victoria, one grouse.
- Mrs. Mary Fentzel, Victoria, one lutescent warbler and six quail eggs.
- Gordon Hardy, Victoria, nest and eggs of crow.
- Miss Esther Medler, Victoria, one young flicker.
- Alan Poynter, Victoria, downy young and egg of blue-winged teal.
- Corporal J. B. Short, Victoria, one saw-whet owl.
- Peter Stocker, Victoria, one golden plover.
- E. F. G. White, Victoria, a series of field-notes on birds.

By the staff, eight.

By purchase—R. M. Stewart collection of 525 specimens of Queen Charlotte Island birds.

AMPHIBIANS AND REPTILES

By gift—

- E. R. Buckell, Salmon Arm, one rubber boa.
- Dudmund Gudmundseth and Terry McKenzie, Victoria, one garter-snake.

FISH

By gift—

- Waldon Davis, Victoria, one orange rock-fish.
- Fred Egeland, Sidney, two sauries, one surf smelt, one eulachon, one darter sculpin, one spiny-headed sculpin.
- G. R. Grossmith, Victoria, one wolf-eel.
- Wilf Klingsat, Victoria, one Eastern brook trout.
- M. McInnis, Victoria, two puffer fish from Jamaica.
- Mrs. W. B. Ross, Victoria, head of buffalo sculpin.

INVERTEBRATES

By gift—

- O. B. Bass, c/o Yarrows Limited, Victoria, one horntail.
- David Burkard, Victoria, one black widow spider.
- Mrs. D. Drayton, Brentwood, one wolf-spider.
- S. G. Eales, Victoria, one black widow spider.
- Mrs. H. Fanthorpe, Victoria, one black widow spider.
- Steve Grinter, Victoria, one black widow spider.
- G. R. Grossmith, Victoria, one Alaska king crab.

John P. Humberstone, Victoria, one conch shell.
 W. A. James, Victoria, caterpillar of eyed hawk-moth.
 Miss Jill Keir, Victoria, one California prionus.
 H. Lloyd, Victoria, one European slug.
 H. McAllister, Victoria, caterpillar of polyphemus moth.
 Mrs. C. Morgan, Victoria, one eyed hawk-moth.
 C. Murray, Victoria, one portion of colonial worm, one giant barnacle.
 Miss Susan Musgrave, Victoria, one sea-urchin.
 E. Neish, Victoria, one commercial crab.
 A. Rowbotham, Victoria, one orb-weaver.
 A. P. Slade Limited, Victoria, two banana crab-spiders.
 Miss Donna Sharpe, Victoria, one sea-slug.
 Joey Smith and Glen Lyon, Victoria, one leafy hornmouth shell and two blue topshells.
 Geoffrey B. Swannel, Victoria, one serpent star.
 Harvey Todd and Ross Coates, Victoria, one California prionus.
 Don Ward, Victoria, one crab.
 Carl Westby, Victoria, one giant chiton.
 Miss Marnie Wulff, Victoria, one tiger-moth.

MISCELLANEOUS

By gift—

Frank Mulliner, Victoria, one African wood carving.

ANTHROPOLOGICAL

The Robert Kidd Collection.—(Gift.) Archæological materials from the Victoria area, site survey reports, and catalogue.

The Mungo and David Martin Collection.—(Purchase.) An extensive collection of Kwakiutl ceremonial masks and paraphernalia owned and used as hereditary privileges by Mr. Martin's family.

The Edson I. Schock Collection.—(Purchase.) A collection of fine Haida model totem-poles and platters carved of argillite, purchased from Edson I. Schock, of Kingston, Rhode Island.

HAIDA

Argillite poles, ten. Schock collection.
 Argillite platters, two. Schock collection.
 Human skull. Royal Canadian Mounted Police, Masset, Q.C.I.

TSIMSHIAN

Bone charm. Canon A. J. Beanlands, per the Misses Beanlands.
 Sopalallie spoon. Canon A. J. Beanlands, per the Misses Beanlands.

KWAKIUTL

Stone celt. Canon A. J. Beanlands, per the Misses Beanlands.
 Grave goods, circa 1880. Rev. J. Wannop, Quathiaski Cove.
 Painted screen. Martin collection.
 Wolf mask. Martin collection.
 Whistles, nine. Martin collection.
 Rattles, three. Martin collection.
 Song-leader's baton. Martin collection.

Large Cannibal mask. Martin collection.
 Small Cannibal mask. Martin collection.
 Dance of the Animals masks, ten. Martin collection.
 Daylight Spirit Dance head-dress. Martin collection.
 Carved wooden frog. Martin collection.
 Hide drums, two. Martin collection.
 Cedar-bark costumes, six. Martin collection.
 Dancer's neck-rings and arm-bands, four. Martin collection.

NOOKA

Scrimshaw necklace of ivory. R. Nicholls, Victoria.
 Basket. Mrs. D. Tulloch, Victoria.
 Bow. Canon A. J. Beanlands, per the Misses Beanlands.

COAST SALISH

Stone sinker. Mrs. J. F. Malkin, Vancouver.
 Necklace and watch-chain. R. Nicholls, Victoria.
 Model canoes, two. Canon A. J. Beanlands.
 Arrow. Canon A. J. Beanlands.
 Whistle. Canon A. J. Beanlands.
 Antler wedge. Mrs. Wurtele, Victoria.
 Stone object. J. P. Humberstone, Victoria.
 Human skull. L. Lepaidevine, Saanichton.
 Human skull. Stephen Stewart, Victoria.
 Human skull. Mr. Carolsfeld, Metchosin.
 Human skull. Royal Canadian Mounted Police, Ladysmith.
 Human skeleton. Tony Earle, Dale Scroule, and Brian Paul, Victoria.
 Human skeleton. Robert Fleming, Victoria.
 Human skeleton. R. Kidd, Victoria.
 Human skeletons, two. Mrs. Edith Cross, Deep Cove.
 Game stone. J. W. Winson, Huntingdon.
 Yew-wood bow. R. Nicholls, Victoria.
 Abrasive stones, eight. Staff.
 Antler objects, two. Staff.
 Bone objects, sixteen. Staff.
 Sinkers, stone, two. Staff.
 Ground slate objects, four. Staff.
 Chipped points, seven. R. Kidd, Victoria.
 Ground slate celt. Ken Martin, Oak Bay.
 Chipped blade. Mrs. J. A. Lidgate, Oak Bay.
 Celt. A. Hutchinson, Victoria.
 Stone objects, five. Staff.
 Chipped stone objects, seven. F. W. Hearle, Saanich.
 Hand-maul. F. W. Hearle, Saanich.
 Celts, four. F. W. Hearle, Saanich.
 Stone bark-shredder. Jim Bradley, Pender Island.
 Archaeological materials from the Victoria area, seventy-eight artifacts. Kidd collection.

INTERIOR SALISH

- Coiled baskets, two. Mrs. McGarry, Victoria.
 Basketry cradle. F. E. Warring, Victoria.
 Dentalium shell necklace. Miss E. F. Ivatt, Victoria.
 Coiled baskets, two. Anglican Women's Auxiliary, Lake Cowichan.
 Basket. Mrs. A. D. MacDonald Estate, per Provincial Archives.

MISCELLANEOUS

- Grooved stone maul, Saskatchewan. M. Vernier Rondeau, Rouleau, Sask.
 Beaded vest and belt, Plains. Mrs. D. Tulloch, Vancouver.
 Bone and stone objects, ten. Canon A. J. Beanlands, per the Misses Beanlands.
 Basketry hat, basketry shoes. Mrs. A. D. MacDonald Estate, per Provincial Archives.
 Trade beads and wooden chest fragments. Mrs. V. O'Hara, Zeballos.
 Chilkat blanket, Tlingit. Mrs. MacGarry, Victoria.

ALBINISTIC KILLER WHALES IN BRITISH COLUMBIA

BY G. CLIFFORD CARL, PROVINCIAL MUSEUM, VICTORIA, B.C.

Killer whales (*Grampus rectipinna* (Cope)) are world-wide in their range but are most abundant in northern and southern seas where food is plentiful. In British Columbia they are found along the entire coast and are frequently seen even in rather heavily fished areas. Nevertheless, they always excite interest when observed, possibly because of their comparatively large size and spectacular appearance. They are commonly, though erroneously, called "blackfish," a name which should be reserved for the Scammon blackfish (*Globicephala scammoni*), which is rather rare in British Columbia.

Little is known about the life-history of killer whales. Consequently, when the presence of a white individual in local waters was brought to the attention of the writer in 1946, we decided to alert observers at various points along the coast and to collect sight records of killer whales, particularly albinistic individuals, in the hope that something could be learned of their movements.

The initial 1946 observation was by Mr. P. W. Martin, biologist of the Provincial Fish and Game Branch, Kamloops, B.C. At that time Mr. Martin was fishing commercially but was using his biological training by keeping records of birds and mammals sighted during the course of his work. He saw a white killer whale near Race Rocks, Victoria, on August 7th, and from the shape and size of the dorsal fin he judged the animal to be a "full-grown female."

The animal was described as being all white in colour with some grey showing on the dorsal fin. It was in company with eight to ten normal-coloured individuals.

The colour of normal killer whales is generally black with white on the throat, chest, and abdomen and extending back in a trident-shaped area in the anal region. The outer fork of the trident extends up the flank on each side and is conspicuous when the rear end of the body is brought above the surface. A bean-shaped white patch is present above and behind the eye, and there is often a light-coloured saddle-shaped patch behind the dorsal fin (see Figs. 1 and 2). This latter patch is usually ill defined and never is as white as the eye-patch. In newly born young the underparts and the eye-patch are ochraceous buff, not white.

White killer whales have been reported on at least three previous occasions—once in British Columbia and twice in adjacent waters in the State of Washington. The first recorded observation is by Mr. J. Moran (1924), who saw a white killer whale in Chatham Sound north of Prince Rupert on August 23rd, 1923, in a band of fifteen. The other two reports are for Deception Pass, January 2nd, 1942, by Mr. George Rodgers, and between Bellingham and Friday Harbor, March 22nd, 1946, by the skipper of M.V. "Osage." Both of these Washington observations have been recorded by Scheffer and Slipp (1948).

Since 1947, when the systematic compiling of records was commenced by this office, we have gathered over seventy such records. These are listed in Table I and their locations are shown in Fig. 3. They have been collected from various sources, all authoritative so far as we can determine. Many of them are from officers in charge of light-stations at several points along the coast. We are grateful to the Federal Department of Transport and particularly to their light-station personnel, some of whom have assiduously kept records of killer whale movements in their areas for many years. The Federal Department of Fisheries has also been most helpful in making sight records and in passing them on to the Museum. We are delighted to make use of this opportunity to thank these organizations as well as the numerous individuals who have co-operated in this scheme.



Fig. 1.



Fig. 2.

(Photos by T. L. Sinclair.)

Albinistic killer whale and normal-coloured killer whale. Entrance to McNeill Bay, Victoria, B.C., January 19th, 1958.

TABLE I.—SIGHT RECORDS OF ALBINISTIC KILLER WHALES FROM BRITISH COLUMBIA AND ADJACENT WATERS
COLLECTED BY THE PROVINCIAL MUSEUM

Date	Locality	Observer	Medium
1. Aug. 23, 1923	Green Island, B.C.	J. Moran	Can. Field-Naturalist, Vol. 38, No. 6, May, 1924.
2. Jan. 2, 1942	Deception Pass, Washington, U.S.A.	George Rodgers	Scheffer and Slipp, 1948.
3. Mar. 22, 1946	Between Bellingham and Friday Harbour	Skipper of M.V. "Osage"	Pacific N.W. Sportsman, per Scheffer and Slipp, 1948.
4. Aug. 7, 1946	Race Passage	P. W. Martin	Letter dated Jan. 6, 1947.
5. Dec. 1946	Off Crofton	A. A. Sherman	Information given to G. C. Carl.
6. Apr. 26, 1947	Off Albert Head Lighthouse	Mrs. P. Georgeson and J. Bowman	Letter dated Apr. 26, 1947.
7. Early May, 1947	Bajo Reef, Nootka Sound	A. E. Hoffman	Letter to J. F. Tait, Nanaimo, May 27, 1947.
8. May 21, 1947	Sunday Rocks, west of Estevan Point	A. E. Hoffman	Letter to J. F. Tait, Nanaimo, May 27, 1947.
9. July 3, 1947	Scarlett Point, Port Hardy	Fred Mountain	Report to Provincial Museum.
10. Aug. 3, 1947	Between Haystack Island and sand-bar off Witty's Lagoon	Allan Jenkins	By telephone to G. C. Carl.
11. Sept. 3, 1947	Race Rocks	T. Westhead	Report to Provincial Museum.
12. Nov. 21, 1947	Princess Royal Island	W. E. Barraclough	Letter to G. C. Carl.
13. May, 1948	Willow Point, Courtenay	Mr. and Mrs. Thomas Brazier	Victoria paper copied from Courtenay paper, May 14, 1948.
14. June 30, 1948	Gowland Point, South Pender Island	J. Freeman	Card to Biological Station, Nanaimo.
15. Aug. 3, 1948	Mill Bay	Gordon Verley	Communicated to G. C. Carl per J. Glassford.
16. Sept. 7, 1948	Galiano Island heading toward Active Pass	Mrs. C. S. Wormald	Vancouver press report, Sept. 9, 1948.
17. Sept. 18, 1948	Between Sidney and James Island	P. Schulz	Letter to Provincial Museum, Sept. 21, 1948.
18. Oct. 12, 1948	Between James Island and Saanichton wharf	Don and Angus McCreesh	Communicated to G. C. Carl per Mrs. Hughes, Elk Lake.
19. Feb. 1, 1949	Between Porlier Pass and Reid Island	Frank Symes	Letter from R. M. Wilson, Feb. 8, 1949.
20. Apr. 15, 1949	Passed Entrance Isle Light heading east.	D. C. Milne	Letter dated Apr. 15, 1949.
21. Last week of July, 1949	Cherry Point	John Stainer	Reported to G. C. Carl.
22. Aug. 10, 1949	Tribune Channel, 1 mile west of Rainy Point	R. S. Racey	Letter dated Aug. 18, 1949.
23. Aug. 15, 1949	Scarlett Point Lighthouse, Port Hardy, going north	Fred Mountain	Report to Provincial Museum.
24. Oct. 23, 1949	Off South Pender Island	Sam Roberts	By telephone to Provincial Museum.
25. Mar. 16, 1950	Entrance of Malibu Rapids, Princess Louise Inlet	Mr. Leith	Reported in letter from J. F. Tait, Regional Supervisor of Fisheries, Nanaimo.
26. June 16, 1950	Nitinat Bar, V.I.	Crew of "Atalasco"	J. F. Tait, Nanaimo (letter).
27. June 28, 1950	Off D'Arcy Island Light	Capt. W. Earnshaw	Letter from J. Haegert, F.P.C. "Kitimat."
28. Sept. 8, 1950	Scarlett Point, Port Hardy	F. Mountain	Letter received May 19, 1951.
29. Oct. 2, 1950	Sansum Narrows	E. G. Moore	Letter dated Oct. 14, 1950.
30. Oct. 12, 1950	Near Victoria	R. Wormald	Colonist, Oct. 17, 1950.
31. Oct. 12, 1950	Off Trial Island	Capt. V. Johnston of F.P.C. "Egret Plume"	Information given to G. C. Carl.
32. Nov. 30, 1950	Between Swartz Bay and Fulford Harbour	V. L. Jackson	Letter dated Dec. 3, 1950.
33. Dec. 28, 1950	Portlock Point, Prevost Island	Mrs. H. Georgeson	Letter dated Dec. 28, 1950.
34. Mar. 31, 1951	Off Chinese Cemetery, Victoria	Miss Marilyn Smith	Reported to G. C. Carl.
35. Sept. 11, 1951	Off Cape Beale	Capt. C. W. Earnshaw	Reported to G. C. Carl.

TABLE I.—SIGHT RECORDS OF ALBINISTIC KILLER WHALES FROM BRITISH COLUMBIA AND ADJACENT WATERS
COLLECTED BY THE PROVINCIAL MUSEUM—*Continued*

Date	Locality	Observer	Medium
36. 1952	Vancouver Harbour	A. L. Engelman	Vancouver Sun.
37. Mar. 26, 1952	Discovery Island going north	P. C. Pike	Report to Provincial Museum.
38. May 2, 1952	Off Cape Cook	N. W. Garrard, Port Alberni	Report to G. C. Carl.
39. Aug. 26, 1952	Off Sisters Light-station, Lasqueti Island	A. N. Hensen	Letter to G. C. Carl dated Aug. 27, 1952.
40. Mar. 13, 1953	Cape Mudge Light-station	O. Meagert	Letter from O. S. Dean dated Apr. 1, 1953.
41. Sept. 20, 1953	Off Race Rocks Light-station	Gordon C. Odlum	Letter dated Sept. 21, 1953.
42. Nov. 17, 1953	Campbell River Spit going north	Pupils of Indian school	Times newspaper, Nov. 18, 1953.
43. Feb. 11, 1954	Vancouver Harbour	A. L. Engelman	Vancouver Sun, Feb. 11, 1954.
44. Aug. 5, 1954	East of Sheringham Point	H. E. Palmer	Letter dated Aug. 19, 1954.
45. Sept. 22, 1954	Lower end of Swanson Channel	Capt. H. R. Lewis	Letter from H. E. Palmer.
46. Apr. 15, 1955	Off Ballenas Light-station	A. G. Waldon	Letter dated Apr. 15, 1955.
47. June 22, 1955	Victoria side of Trial Island	Dr. R. Scott-Moncrieff	By telephone to G. C. Carl.
48. Aug. 29, 1955	Lennard Island near Tofino	J. R. Georgeson	Reported by C. G. Barrie, Tofino.
49. Apr. 20, 1956	Tofino	C. G. Barrie	Letter.
50. July, 1956	Rivers Inlet	George McIndoe, Federal Fisheries Department	Reported to G. C. Carl.
51. July 24, 1957	Off Cattle Point	Mrs. E. C. Posgate	By telephone to G. C. Carl.
52. Sept. 17, 1957	Off Sheringham Point Light	T. Westwood	Routine report.
53. Sept. 29, 1957	Off Sheringham Point Light	T. Westwood	Routine report.
54. Oct. 18, 1957	Off Yellow Point (Nanaimo)	W. Mossman	Reported by R. Malthouse.
55. Jan. 16, 1958	Fulford Harbour, Saltspring Island	Captain of "Atlin Post"	Letter from A. J. Whitmore.
56. Jan. 18, 1958	Off St. Margaret Bay	L. A. Stewart	By telephone.
57. Jan. 19, 1958	Pedder Bay	Mrs. C. J. Smith	By telephone.
58. Jan. 19, 1958	McNeill Bay	G. C. Carl and about sixty other observers	By telephone from E. G. Hart.
59. Feb. 11, 1958	Off Telegraph Bay	A. L. Squire	By telephone.
60. Feb. 17, 1958	North of Dodds Narrows	O/C naval diving tender	By telephone from G. McIndoe.
61. Mar. 1, 1958	Off Telegraph Bay	Mrs. A. L. Squire	By telephone.
62. Aug. 14, 1958	Sooke Basin	Fisheries Guardian	By telephone from G. McIndoe.
63. Aug. 1958	Near Secretary Island, Sooke	Mrs. Jean Walker	By letter.
64. Aug. 28, 29, and 30, 1958	Off Race Rocks Light-station	G. C. Odlum	By letter.
65. Sept. 1, 1958	Off Trial Island Light	E. H. Franklin	By telephone.
66. Sept. 2, 1958	Off Discovery Island	M. Gwynne	By telephone.
67. Sept. 23, 1958	Pedder Bay	John Stearn	By telephone.
68. Sept. 24, 1958	Willis Point, Saanich Arm	F. P. Fatt	By telephone.
69. Oct. 9, 1958	Parry Bay, Albert Head	George Duddy	By telephone.
70. Oct. 23, 1958	Forward Harbour, Quatsino Sub-district	Fisheries Patrolman	By letter from G. E. Moore.
71. Jan. 29, 1959	Navy Channel, Gulf Islands	J. Hawthorne	By letter from Mrs. M. E. Bachlund.
72. Feb. 17, 1959	Sooke Harbour entrance	Phillip W. Keller	Personal call.
73. Mar. 13, 1959	Ten Mile Point	Mrs. S. C. Mitchell	By telephone.
74. Dec. 29, 1959	Quatsino Narrows	Fisheries Officer	Letter, Federal Fisheries Department.

All but two of the observers report seeing a single white whale, invariably in company with other individuals of normal appearance. The exceptions are reports Nos. 31 and 37. On October 12th, 1950, Captain Johnston, of the F.P.C. "Egret Plume," reported seeing two white killer whales in a pack of about twenty. The larger of the two appeared to be an all-white albino; the smaller one was mostly whitish on the sides of the body and head but with black bordering the dorsal fin. It was his impression that the smaller one was the young of the albino. A few hours later the two were sighted again at about the same place, off Trial Island, when the ship returned along its earlier route.

The second observation was made from Discovery Island Light-station, only a few miles east of Trial Island, but almost eighteen months later. From this point Mr. P. C. Pike reported seeing two white killer whales in company with four others. The "mother and young were both pure white; the young one about 6 feet long."

Only occasionally were observers able to make an estimate of size of albinistic killers sighted, and the estimated lengths ranged from 6 to 8 feet for young individuals and 12 to 20 feet for adults. All, however, generally agreed that the adult white whale in each case was not as large as the largest members of the group accompanying it.

A recent observation, No. 72, provides another record of a young albinistic individual. The record is by Mr. Phillip Keller, who saw an all-white killer whale at close range near the entrance to Sooke Harbour over a period of ten to fifteen minutes, making it possible to make a reasonably accurate estimate of size. This individual he judged to be 8 feet long, and it was apparently the offspring of a

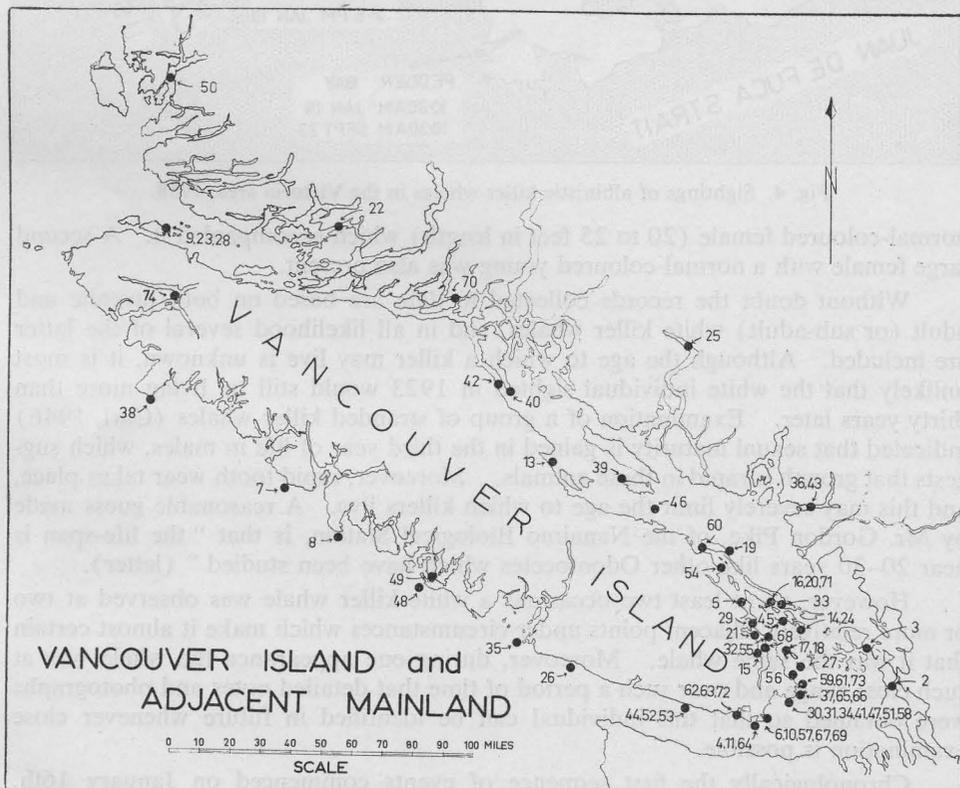


Fig. 3. Location of sight records of albinistic killer whales given in Table I.

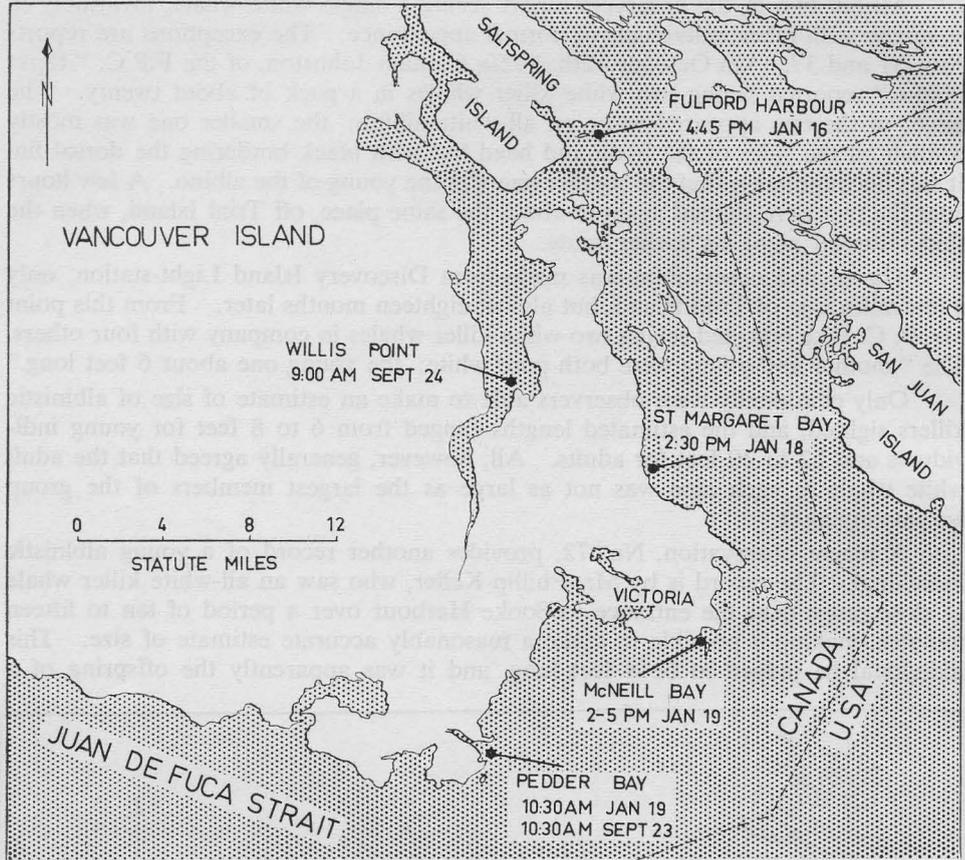


Fig. 4. Sightings of albinistic killer whales in the Victoria area, 1958.

normal-coloured female (20 to 25 feet in length) which accompanied it. A second large female with a normal-coloured young was also present.

Without doubt the records collected to date are based on both juvenile and adult (or sub-adult) white killer whales, and in all likelihood several of the latter are included. Although the age to which a killer may live is unknown, it is most unlikely that the white individual sighted in 1923 would still be living more than thirty years later. Examination of a group of stranded killer whales (Carl, 1946) indicated that sexual maturity is gained in the third year of life in males, which suggests that growth is rapid in these animals. Moreover, rapid tooth wear takes place, and this may severely limit the age to which killers live. A reasonable guess made by Mr. Gordon Pike, of the Nanaimo Biological Station, is that "the life-span is near 20-30 years like other *Odontocetes* which have been studied" (letter).

However, on at least two occasions a white killer whale was observed at two or more relatively adjacent points under circumstances which make it almost certain that it was the same whale. Moreover, during one appearance the whale was at such close range and over such a period of time that detailed notes and photographs were obtained so that this individual can be identified in future whenever close examination is possible.

Chronologically the first sequence of events commenced on January 16th, 1958. On this date a white whale in company with a normal-coloured whale was

seen at Fulford Harbour, Saltspring Island, at 4.45 p.m. by the captain of the F.P.C. "Atlin Post" (see Fig. 4). Two days later a similar white whale was sighted off St. Margaret Bay at 2.30 p.m. by Mr. L. A. Stewart; this is about 15 miles south of the first observation point, and the albino was travelling north along with several normal-coloured whales. The following day, January 19th, a white killer was observed at Pedder Bay, about 10 miles south-west of Victoria, at 10.30 a.m. by Mrs. C. J. Smith. Mrs. Smith reported that the albino was in company with two normal-coloured larger individuals and that the trio had driven a small seal up on the rocks. The killers remained around the rocks "for about one-half hour before setting off toward William Head (north-east), the white one between the two others."

At about 2 p.m. the white whale and its two escorts were sighted at the west entrance to McNeill Bay by Mr. E. G. Hart, whose property runs down to the water just north-west of Harling Point. Here the whales "put on quite a show" which lasted until almost 5 p.m. During this three-hour period many persons witnessed the exhibition, and several photographs and movie shots were made at close quarters.

The rock at this point drops off rather steeply into 15 or 20 feet of water, and a band of kelp (*Nereocystis luetkeana*) a few yards wide lies offshore a distance of about 12 to 15 feet. A marked tidal current flows along the shore, and the area is frequented by rock-fish, greenling, and similar fishes. However, there is no feature to distinguish this part of the shore from adjacent areas; there seems to be no explanation why the whales favoured this particular spot. Yet for several hours the three animals remained within 50 yards of the rock-edge and were often within 12 feet of observers.

The movements of all three whales were slow and leisurely. They worked back and forth through the kelp, sometimes surfacing with ropes of kelp over their backs. Occasionally one would stand on its nose with the fluke waving partly out of the water. Whether they were feeding or not could not be decided; no sign of capturing fish or of eating could be observed. Once the white one grasped a kelp stipe in its mouth and rolled slowly with it at the surface. Occasionally a normal-coloured whale appeared to nuzzle the albino or to surface very close to it; the action could have been interpreted as that of a solicitous parent or the beginnings of courting.

Several persons moved to the edge of the rocks 40 to 50 feet from the nearest whale, but the mammals seemed to pay no attention.

The white killer was estimated to be about 13 feet in length. It was an over-all greyish-white in colour, but not uniformly so. Two ill-defined oval areas on the left flank were dead white, and at least one similar dead-white patch was on the right side. The left anterior patch and its mate on the right side may correspond to the eye-patch, which is white in normal-coloured individuals.

The head as far back as the blow-hole and the dorsal fin was of a darker grey than the body. The fin was further distinguished by a series of three triangular marks, dark grey to black in colour, extending back from the leading edge on the right side (see Figs. 1 and 2). On the left side of the fin, near the apex, was a round dark spot, and the trailing edge of the flukes was dark.

Other distinguishing marks were also present. On the right side was a series of scars or scratches in two main patches—one behind the head and above the eye-level, and one behind the dorsal fin. The latter series seemed to be made up of a number of parallel scratches slanting obliquely downward toward the tail.

On the basis of body size and relative size and shape of the dorsal fin, the white individual was presumed to be a female and the other two males. However, it must be admitted that considerable uncertainty exists here. According to measurements and other data obtained from stranded killer whales (Carl, 1946), the white

killer was sub-adult and presumably could be of either sex and the normal-coloured individuals, which were about 18 feet in length, could be fully adult females. The high mast-like fin characteristic of old bulls presumably does not begin to be noticeable until the animal has reached a length greater than 18 feet.

As the light faded the three whales began to work slowly away from the favoured spot, and eventually they moved off eastward, passing between Trial Island and the Vancouver Island shore.

Two other consecutive sightings (Nos. 67 and 68) are worthy of record. At 10.30 a.m. on September 23rd of the same year (1958) a white killer was again seen at Pedder Bay (Fig. 4). The observer, Mr. John Stearn, noted two other normal-coloured individuals with the white one, and all three were in a kelp-bed.

The following morning at 9 a.m. a white whale and three others (two large and one small) were seen at Willis Point, near Brentwood Bay, Saanich Arm, by Mr. F. P. Fatt. If it is presumed that this was the same group of whales seen at Pedder Bay, they would have travelled a distance of at least 48 statute miles in less than twenty-four hours, easily possible by such powerful and active swimmers (*see* Fig. 4).

Previous to these observations, a white whale, very likely the same individual, was seen on September 1st near Trial Island and on September 2nd near Discovery Island, both in the vicinity of Victoria and a few miles apart (Nos. 65 and 66).

CONCLUSIONS

These observations tell us very little about killer whales, beyond the fact that they are relatively common in Coastal areas and that among them there are two or more albinistic individuals. A few consecutive sight records of white whales provide some information on rate of travel but give no indication of a pattern in the movements of killer whales in general. Further observations of white individuals may provide data as to age, relative growth, and possibly other life-history details, all of which will prove useful in the study of these little-known mammals.

REFERENCES

- Carl, G. Clifford. 1946. A School of Killer Whales Stranded at Estevan Point, Vancouver Island. Rept. B.C. Prov. Mus. for 1945, pp. 21-28, 8 figs.
- Moran, J. 1924. Killer Whales at Green Island Lighthouse. Can. Field-Nat. 38(5).
- Scheffer, Victor B., and Slipp, John W. 1948. The Whales and Dolphins of Washington State with a Key to the Cetaceans of the West Coast of North America. Amer. Mid. Nat. 39(2), pp. 257-337.

GRIBBLE ATTACK ON WOOD IMMERSSED IN SEA WATER

BY S. L. NEAVE*

Among small-craft owners, an important consideration is hull protection against marine "worms"—both the "shipworm" or teredo and the "pin-worm" or gribble. Opinions are rife but facts are few, so any information about these marine pests has practical worth.

Despite their popular names, neither pest is a worm. The teredo of our coast (*Bankia setacea*) is a clam with a worm-like body and a reduced shell covering only the front end. Tests by the Fisheries Research Board of Canada† for Masset Inlet and for Departure Bay have shown two annual peaks of abundance for *Bankia*—one in May-June and a much larger one in October-November. So the West Coast fisherman's practice of copper-painting boat hulls in spring and fall apparently is a sound one.

The gribble (*Limnoria lignorum*) is a small isopod, constructed like a sow-bug with flat head and thirteen flattened body segments. In contrast to *Bankia*, which destroys a timber from the inside, gribbles attack its surface and rapidly flake the wood away layer by layer. Commercial fishermen assume that gribbles become destructive only at summer temperatures, but tests have shown that maximum infestation of unprotected wood occurs in the cold waters of early spring. The data given here emphasize the need for protection of wooden hulls during the winter and early spring.

Strips of unpainted wood were hung in the waters of Walters Cove at Kyuquot on the west coast of Vancouver Island and examined at fortnightly or monthly intervals. Three sets of data were collected: Series I for ten months in 1934; Series II for the years 1955 and 1956; and Series III from November, 1958, to March, 1959.

Series I was designed originally to observe the seasonal fouling of different kinds of wood by the assemblage of filamentous algæ, diatoms, coelenterates, etc., which constitute the familiar brown "moss" or "weed," but on these batons a surprising abundance of gribbles was noted in early spring and an absence of them later in the year. Seven kinds of wood were used—the heart and the sap wood of Douglas fir (*Pseudotsuga taxifolia*), hemlock (*Tsuga heterophylla*), alder (*Alnus rubra*), red cedar (*Thuja plicata*), yellow cedar (*Chamaecyparis nootkatensis*) and Sitka spruce (*Picea sitchensis*). Batons of these woods measuring 0.5 by 1.5 by 15 inches were nailed by their upper ends to a 2-foot-diameter wooden disk moored by its centre, so that the seven batons uniformly spaced around its periphery were equally exposed to the vagaries of current and wave action. The site was 30 yards from dock structures already infested by gribbles. The batons were immersed for a month then replaced by seven new ones for the next month's immersion.

On examining the baton surface after immersion, a few gribbles may be seen crawling about, apparently selecting a site for a burrow. Others have excavated little pits in the soft wood between the more lignified annual growth-rings. Some have tunnelled horizontally, leaving a very thin roof, through which breathing-holes are cut at about gribble-length intervals. However, this paper-thin roof does not long survive attrition and bacterial disintegration; it flakes off and the floor of the trough left by its removal is soon excavated by gribbles forming a second layer of tunnels. Thus the wood breaks away in layers of a thickness slightly exceeding a gribble diameter. In our waters, the tunnels or troughs attain lengths up to five-

* Dr. S. L. Neave, of Kyuquot, B.C., passed away suddenly on October 7th, 1959.

† The Shipworm (E. C. Black), Progress Reports of Pacific Biological Station, Nanaimo, B.C., No. 21, 1934. See also The British Columbia Shipworm (D. B. Quayle), Rept. B.C. Dept. of Fisheries, 1955.

sixteenths of an inch in a month, but the sites of gribble entry are spaced widely enough for easy counting. Some batons were immersed for a second month, but by then the confusion of burrows is apt to make counting uncertain.

The gribble data of this series are fragmentary because storms carried away the apparatus in January and February, and again in January of the following year. For March to December, the gribble-hole counts for the seven kinds of wood are given in Table I, from which the heavy infestation of early spring is evident. Water temperature was recorded at weekly intervals for the first six months, then monthly thereafter.

TABLE I.—GRIBBLE ATTACK EXPRESSED AS NUMBERS OF POINTS OF ENTRY PER SQUARE FOOT OF SUBMERGED AREA, FOR 1934

Month	Fir, Heart	Fir, Sap	Hem-lock	Alder	Red Cedar	Yellow Cedar	Spruce	Average
March.....	2,190	936	947	936	918	950	889	1,109
April.....	1,152	468	1,215	144	846	360	819	715
May.....	711	693	450	171	729	468	459	526
June.....	90	103	183	24	88	8	138	91
July.....	12	34	60	21	24	28	30	30
August.....	8	12	9	14	20	8	14	12
September.....	-----	-----	-----	-----	-----	-----	-----	-----
October.....	-----	-----	-----	-----	-----	-----	-----	-----
November.....	-----	-----	22	-----	16	24	12	11
December.....	4	3	9	-----	12	3	6	5

Sea-water Temperature and Rainfall for 1934-35

Month	Temperature (C.)	Monthly Rainfall (In.)
January 1934.....	7.0	19.13
February.....	7.3	7.37
March.....	8.8	8.03
April.....	10.4	4.55
May.....	13.3	8.32
June.....	13.2	2.70
July.....	13.0	6.64
August.....	16.9	5.84
September.....	14.4	7.77
October.....	11.3	12.75
November.....	9.5	16.29
December.....	7.8	19.57
January, 1935.....	6.0	21.37
February.....	5.7	7.70
March.....	7.2	15.37

Series II of observations extended over two years, using fir batons 0.75 by 1.5 by 36 inches immersed for one month. The wood strips were attached to a floating dock within 2 feet of its gribble-infested logs. Hence these wood strips were exposed to a heavier gribble population than the anchored-out batons of Series I. The monthly gribble-hole counts are listed in Table II. Water temperatures were recorded weekly from September to May and averaged for the month.

TABLE II.—GRIBBLE ATTACK EXPRESSED AS NUMBERS OF HOLES PER SQUARE FOOT AFTER ONE MONTH

Immersion Period	1955	1956	1957	Temperature (C.)
January 15 to February 15.....	810	810	322	5.2
February 16 to March 15.....	1,325	870	.....	5.4
March 16 to April 15.....	3,420	3,660	.....	6.6
April 16 to May 15.....	1,084	2,300	.....	10.1
May 16 to June 15.....	155	432	.....	.....
June 16 to July 15.....	14	218	.....	.....
July 16 to August 15.....	56	60	.....	.....
August 16 to September 15.....	15	37	.....	.....
September 16 to October 15.....	21	15	.....	7.2
October 16 to November 15.....	18	27	.....	8.7
November 16 to December 15.....	27	42	.....	8.9
December 16 to January 15.....	128	88	.....	5.5

Series III data, though fragmentary, are included to show the general conformity with the other series. After March, other commitments made it necessary to terminate the series. Red cedar batons were used, with these results:—

	Gribble Holes per Square Foot
November, 1958.....	.....
December.....	270
January, 1959.....	288
February.....	394
March.....	976

From observations it was noted that large numbers of small gribbles appeared in December. This abundance suggests that subsequent overcrowding leads to a voluntary or enforced dispersal movement, though the literature* does not recognize a migratory or dispersal stage in the life-cycle. However, the abundance of gribbles in late winter together with the decreasing surface areas as a wooden structure flakes away apparently results in displacement of the excess population. These conditions evidently create a time of hazard in early spring for unprotected wood surfaces.

Owners of small craft and of floats constructed of wood are wise to time their painting or storing programme to give maximum protection against gribble attack in the late winter and early spring months.

* The Marine Borers of the San Francisco Bay Region (C. A. Kofoid). Report on the San Francisco Bay Piling Survey, 1921, pp. 51-52.

THE GOLDEN PLOVER (*PLUVIALIS DOMINICA*) NESTING IN BRITISH COLUMBIA

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Evidence of the golden plover (*Pluvialis dominica*) nesting in British Columbia was discovered in three areas on the Spatsizi Plateau in North-western British Columbia.

On July 15th, Freeman Russell, guide for a Provincial field party, reported a golden plover and downy young on a high plateau above Kliweguh Creek, at approximately $57^{\circ} 47'$ north latitude, $128^{\circ} 38'$ west longitude. At this time neither Mr. Russell nor myself (I not having seen the birds) was certain of their identity. On July 17th, however, I collected one of a pair to the east of the original sighting, at approximately $57^{\circ} 47'$ north latitude, $128^{\circ} 30'$ west longitude. These birds were behaving in a manner that left little doubt that young or a nest was in the area. As a snow-storm and approaching darkness terminated the search, it was planned to return another day to collect eggs or young. Mr. Russell identified the specimen collected as similar to the adult bird with the downy young he had captured and released above Kliweguh Creek.

On July 21st, above an unnamed creek known locally as Five Mile or Marion Creek, six pairs of golden plover were discovered over an area centred approximately at $57^{\circ} 49'$ north latitude, $128^{\circ} 24'$ west longitude. Downy young were captured and photographed, and one was retained as a specimen.

On the basis of a wing measurement of 7 inches, a tarsal measurement of 1.75 inches, a middle toe (including claw) measurement of 1.25 inches, and relatively little yellow on the crown or over the superciliary line, the adult male collected is presumed to be of the sub-species *Pluvialis dominica dominica* (Müller).

The specimens are stored at the Provincial Museum in Victoria, B.C.

The three areas in which the birds were discovered are similar, being the tundra-like flats at 6,000 feet, which constitute the tops of the plateaux in this region.

This is the first known record of this species nesting in British Columbia. It extends the known breeding range in the West from north of the 60th parallel to a point south of the 58th.

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