PROVINCE OF BRITISH COLUMBIA
DEPARTMENT OF RECREATION AND CONSERVATION

PROVINCIAL MUSEUM

of NATURAL HISTORY and ANTHROPOLOGY

REPORT FOR THE YEAR 1967

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1968

To Major-General the Honourable GEORGE RANDOLPH PEARKES,
V.C., P.C., C.C., C.B., D.S.O., M.C., C.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 1967.

W. K. KIERNAN,
Minister of Recreation and Conservation.

Office of the Minister of Recreation and Conservation,
January, 1968.

PROVINCIAL MUSEUM OF NATURAL HISTORY AND ANTHROPOLOGY,
VICTORIA, B.C., January, 1968.

The Honourable W. K. Kiernan,
Minister of Recreation and Conservation,
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 calender year 1967.

I have the honour to be,
Sir,
Your obedient servant,
G. CLIFFORD CARL,
Director.

DEPARTMENT OF RECREATION AND CONSERVATION

The Honourable WILLIAM KENNETH KIERNAN, *Minister.*

D. B. TURNER, PH.D., *Deputy Minister.*

PROVINCIAL MUSEUM OF NATURAL HISTORY AND ANTHROPOLOGY

STAFF

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

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

ADAM SZCZAWINSKI, PH.D., *Curator of Botany.*

T. CHRISTOPHER BRAYSHAW, PH.D., *Associate Curator of Botany* (from December 1st).

DONALD N. ABBOTT, B.A., *Curator of Archæology.*

PETER L. MACNAIR, B.A., *Curator of Ethnology* (from January 1st).

CAROLYN M. CASE, B.A., *Curator of History* (from June 1st).

ERIK THORN, *Chief of Displays.*

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

PHILIP R. WARD, *Conservator.*

GEORGE H. E. MOORE, *Museum Adviser.*

JOHN H. SMYLY, *Technician.*

MICHAEL D. MILLER, *Assistant in Museum Technique.*

EDGAR M. MULLETT, *Shopman.*

THOMAS L. PUTNAM, *Display Technician.*

LLOYD COOK, *Technician* (from April 3rd).

JOHN WATERS, *Technician* (from October 23rd).

ALEX JAMES, *Technician* (from December 4th).

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

SHEILA Y. NEWNHAM, *Herbarium Technician.*

HELEN M. BURKHOLDER, *Clerk.*

CLAUDE G. BRIGGS, *Attendant.*

GORDON KING, *Relief Attendant.*

NORMAN W. MILKE, *Relief Attendant* (deceased September 5th).

JOHN H. W. SENDEY, *Archæological Technician.*

NANCY HAYDEN, *Student Assistant.*

E. J. NOURY, *Student Assistant.*

VERONICA HARRISON, *Student Assistant.*

SPRING HARRISON, *Student Assistant.*

PATTIE MCAFEE, *Student Assistant.*

TOTEM-POLE RESTORATION PROGRAMME

HENRY HUNT, *Chief Carver.*

E. C. (TONY) HUNT, *Assistant Carver.*

SIMON CHARLIE, *Assistant Carver* (to May 31st).

PROVINCIAL MUSEUM OF NATURAL HISTORY AND ANTHROPOLOGY

OBJECTS

(*a*) To secure and preserve specimens and other objects which illustrate the natural history and human history of the Province.

(*b*) To increase and diffuse knowledge in these fields by research, exhibits, publications, and other means.

(Section 4, *Provincial Museum Act, 1967,* chapter 41, S.B.C. 1967.)

ADMISSION

The Provincial Museum is open to the public, free. In 1967 hours were: Week-days, 8.30 a.m. to 5 p.m.; Saturdays, 9.30 a.m. to 5 p.m.; and on Sunday afternoons, 1 to 5 p.m. July and August: Week-days, 8.30 a.m. to 9 p.m.; Saturdays, 9.30 a.m. to 9 p.m.; Sundays, 1 to 5 p.m.

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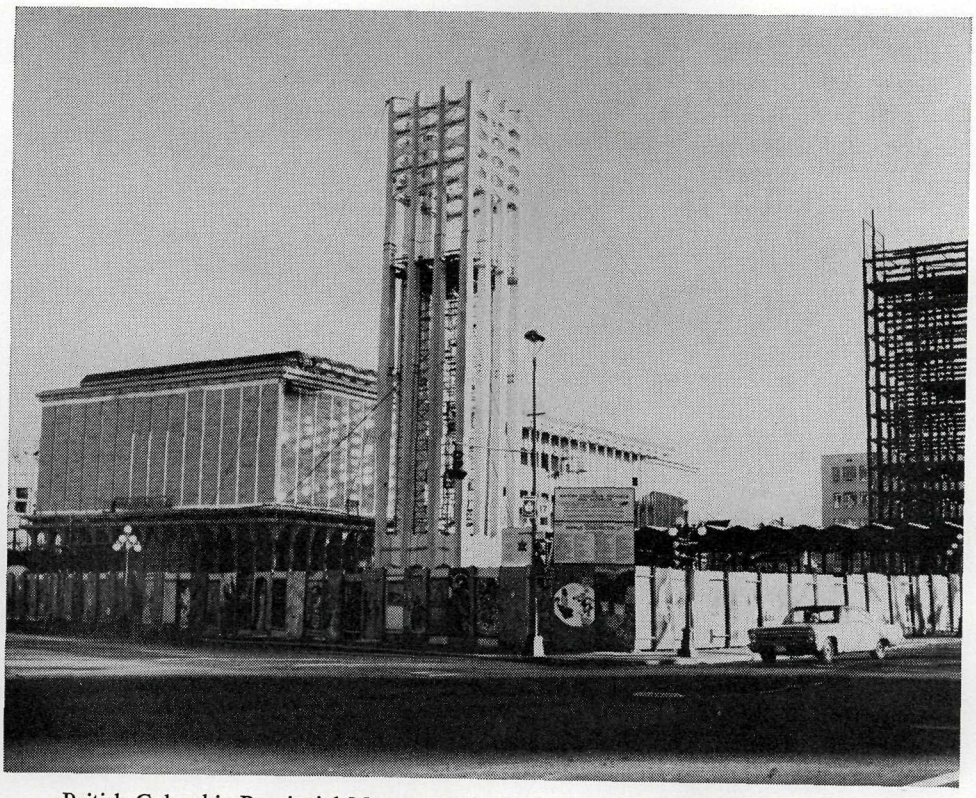


British Columbia Provincial Museum and Archives complex with Carillon Tower in foreground, as it looked in November, 1967.

Site of archæological dig at Gabriola Island, August, 1967.

Report of the Provincial Museum

For the Year 1967

REPORT OF THE DIRECTOR

The year 1967 was a particularly busy one for the Provincial Museum. Apart from field work undertaken by members of all divisions, the major activity concerned the planning and production of displays for the building under construction. The Museum's scope of activity was also broadened and deepened by several additions to staff, and attendance figures almost reached an all-time record. The details are given in the following sections.

FIELD WORK

Natural History Division

Field work carried on by staff in this Division has been directed toward collecting material either for exhibits or for research. For example, Mr. C. J. Guiguet spent several seasons in the field, first in the Lower Fraser Valley, accompanied by Mr. M. D. Miller, to collect small mammals and birds, and then later in the Nanaimo Lakes area on Vancouver Island and in the Fort St. John area in the northern part of the Province to collect big game for mounting. While in the latter area he was joined by Dr. A. F. Szczawinski, who collected local vegetation for use in a diorama under construction. Also involved in this particular project were Conservation Officer G. D. Gosling and W. G. Pratt and Senior Conservation Officer B. G. Paull, whose combined help was greatly appreciated.

In the research category was field work carried on by Mr. Guiguet on several islands in the Barkley Sound area near Bamfield. The objective here was to collect significant samples of small mammals as part of a long-range project concerning mammalian populations on coastal islands.

On the botanical side, extensive plant collections were made in various parts of Saanich Peninsula by Mr. S. Harrison, under the direction of Dr. Szczawinski, as the second phase in a survey of vegetation cover of this part of Vancouver Island. The volunteer help of Miss M. C. Melburn in this project is gratefully acknowledged.

Human History Division

A wide variety of field work was carried on by staff members in this Division in several parts of the Province. Of major importance was an excavation undertaken at a very large archæological site on Gabriola Island facing False Narrows. Here a crew under the direction of Mr. John Sendey spent four months, during which a representative profile was completed and a series of burials was studied in detail. The results promise to be most significant in interpreting the prehistory of the Gulf Islands area. At the same time, the operation attracted a great deal of public interest; more than 2,000 persons visited the site before the crew left at the end of August.

Another productive venture was a boat trip up the coast as far as the head of Bute Inlet through the generosity of Mr. and Mrs. R. I. Stewart, of Canoe Cove, Sidney, B.C., who offered their services and accommodation aboard M.V. "Point

Hope" for this purpose. The several staff members who took part were able to visit and record a number of archæological and historical sites located in relatively inaccessible areas.

The Provincial Museum wishes to acknowledge its gratitude to the following volunteers, who gave significant assistance to these and other archæological projects during the year: Mr. and Mrs. Frank Fleming, of North Vancouver; Mr. Stanley Waters, of Philadelphia; and Messrs. Alan Carl, John Hall, and David Sawbridge, all of Victoria, who helped in the excavation at False Narrows. Mr. William O. Payne, of Newport Beach, Calif., carried out a site survey for the Museum among the islands off Sidney and also joined the coastal survey crew aboard the "Point Hope." Mr. S. Whalens also assisted on the "Point Hope" survey, as did Mr. and Mrs. Stewart's daughters, Mrs. Ann Neelley and Miss Merrie Stewart. Mrs. Nancy Hayden has given considerable help with cataloguing artifacts in the Museum.

Thanks are also due to other Government departments which contributed materially to the success of the False Narrows project. The Archæological Sites Advisory Board (Department of Provincial Secretary) provided the salary for one regular crew member, Alan Hoover. The Surveys and Mapping Branch, Topographic Division of the Department of Lands, Forests, and Water Resources, produced an excellent topographic map of the site to our specifications.

On several occasions Mr. P. Nacnair and occasionally other staff members were able to witness natice dances and other ceremonies both locally and at Alert Bay. Other trips were as follows: D. N. Abbott and P. Macnair to Friendly Cove to investigate totem poles; P. R. Ward and John Smyly to Hazelton to inspect and advise on conservation of totem poles; John Sendey and G. Moore to Alert Bay and Fort Rupert to purchase Indian material; Miss C. M. Case to Southern British Columbia and Williams Lake to purchase historical material; Messrs. Moore and Ward to Alert Bay and Fort Rupert to establish contacts with both communities and to reconnoitre island sites in Johnstone Strait; Messrs. Moore and Ward to the Okanagan Valley to visit museums and historic sites; several staff members to Comox to produce a short historical documentary film on board the replica of the S.S. "Beaver" on her last trip before retirement.

While on a personal trip to Eastern Canada, Mr. Moore visited the new Museum of Science and Technology at Toronto and the Peabody Museum at Yale.

DISPLAY PREPARATION

The planning and production of new exhibits was carried on throughout the year with no interruption, but occasionally slowed when key staff members were on leave or away on other business. However, real progress has been made; many display units are now ready for final installation, and a number of others are in various stages of planning and construction.

Four dioramas, which are major exhibits in the Natural History Section, have been assembled in their location on the exhibit floor. Although lighting fixtures, glass, and other components have not been completely installed, the background painting for the bighorn sheep group has been well started by Mr. Clarence Tillenius, and work on all four is expected to proceed smoothly in the new year. In the meantime Mr. John Hermann-Blome, Vancouver taxidermist, has mounted and delivered three bighorn sheep and four caribou; in preparation are three elk, four mule deer, and a bull moose.

Various exhibit accessories have also been prepared, including mounted small mammals and birds, artificial tree trunks, wild flowers, rocks, and working models

of several types. Most await construction of exhibit cases before they can be installed.

In the human history field a number of large totems and other wood carvings have been expertly repaired and restored by Mr. Smyly, ready for placing on display, and outstanding examples of art have been selected by Mr. Bill Holm, an expert in this field, for inclusion in a hall being designed by him.

Not directly related to the Museum programme were two other activities of the Display Division—namely, involvement of technical staff in the training programme sponsored by the Vancouver City College in February, and active participation in various workshops held in connection with the annual meetings of the British Columbia Museums Association held in Victoria in September. For the latter, considerable time and labour went into the construction of an animated map in conjunction with a rear projection cabinet.

CURATORIAL ACTIVITIES

Natural History Division

In addition to routine inspection and care given to the bird and mammal collections, the entire bird skeleton collection was reorganized by Miss Veronica Harrison. During her term of employment she also prepared and catalogued a significant part of our large accumulation of bird and mammal material. Special attention was also given to the stored insect collection and to the fish, amphibian, and reptile collections preserved in liquid, neither of which had been checked for some time.

As a spare activity, Mr. E. Thorn has reorganized the collections of spiders, millipedes, and centipedes and has submitted a number of the former to specialists for study and identification.

During his travels in various parts of the Province, Mr. Moore has arranged for further specimens to be collected to augment the Provincial collection.

Human History Division

A great deal of time and energy was spent on the Indian collection during the year as a result of several major projects. The first was the selection, documentation, and transportation of a large number of items which were loaned to the Vancouver Art Gallery as our contribution to the very successful "Arts of the Raven" exhibit on view from June 15th to September 24th.

Loans of Indian material were also made to exhibits at Expo 67 in Montreal, the most important being a mask displayed in the International Fine Arts Exhibition.

Another flurry of activity was occasioned by the necessity to move our extensive collection of Indian artifacts from a storage place in the Dogwood Building to temporary quarters in another location, where the material will remain until required for display or until moved into permanent storage quarters.

With the appointment of Miss C. M. Case as Curator of History, a system of accessioning and recording historical material was set up, and much time was spent in organizing collections in this field and in acquiring further material. The number of valuable historical items that have been turned over to the Museum as a result of her activities has been most gratifying.

Miss Case has also devoted some time giving technical advice in connection with the operation of Helmcken House and Craigflower Manor.

In connection with all the above activities, the services of Mr. P. R. Ward have been in constant demand concerning conservation and handling of the various objects concerned. This has involved cleaning, repairing, photographing, documenting, and handling a great many objects, mostly examples of Indian art; checking environ-

mental conditions in display and storage areas; and visiting other places in the Province where his advice was required.

Messrs. Moore, Ward, and Smyly, together with Miss Case, collaborated to produce a plan (including a brief and a model) for a proposed reconstruction of the Father Pandosi Mission near Kelowna at the request of the Okanagan Historical Society; the early stages of the project were implemented in November.

RESEARCH

While most of the Museum staff time has been devoted to routine matters and to the display programme, a portion has been utilized in research. As already reported, field collecting of research material was carried on in connection with the long-term study of small-mammal distribution, with the plant survey of Saanich Peninsula which was started last year, and with the survey of archæological sites on the Gulf Islands. Materials so collected have yet to be critically examined in detail. Progress has also been made in the study of the flora of the Province, a joint undertaking of Dr. Szczawinski and Dr. T. M. C. Taylor, of the University of British Columbia.

Other research projects under way include an analysis of archæological material from the Pedder Bay area by Mr. Abbott, a taxonomic study of local spiders by Mr. Thorn, an investigation of wood preservation by Mr. Ward, a study of data retrieval systems by Mr. Moore, and a study of plant preservation by dehydration by Mr. F. L. Beebe and Mr. Miller.

THUNDERBIRD PARK

Early in January a 60-foot pole carved by Messrs. Henry and Tony Hunt was completed and shipped to Montreal for erection in the Indian Pavilion at Expo 67. The original log was generously donated by MacMillan Bloedel Limited (Shawnigan Division). At the same time, a "welcome figure" designed and carved by Simon Charlie, of the Cowichan Band, was also completed and sent to Montreal. The log for this carving was donated by British Columbia Forest Products Limited. Later Mr. and Mrs. Henry Hunt, Mr. Jonathon Hunt (Henry's father), Mr. Tony Hunt, and Mr. Simon Charlie flew east to take part in the dedication ceremonies at the Indian Pavilion.

In April and May Mr. Charlie designed and carved two 12-foot poles which were presented by the Honourable W. K. Kiernan to the 3rd Field Squadron, R.C.E., for erection at the entrance to the camp at Vedder Crossing. Mr. Charlie also spent a week in San Francisco demonstrating carving as guest of the Canadian Government Travel Bureau.

The remaining time of the carvers was spent producing house posts and adzed planks to be used in constructing a replica of a dance house in the new museum. Logs for the planks were donated by MacMillan Bloedel Limited, and those for the house posts by British Columbia Forest Products Limited.

OUT-OF-PROVINCE TRAVEL

During 1967 various staff members travelled outside of British Columbia, as follows:—

Abbott: Ann Arbor, Mich., to attend annual meetings of the Society for American Archæology, returning by way of Toronto and Ottawa (May).

Abbott: Bluff Creek, Calif., to investigate reports of Sasquatch.

Carl: Toronto, to attend joint meetings of the Canadian Museums Association and American Association of Museums, returning via Montreal (May).

Guiguet: San Francisco, to attend annual meeting of the North American Wildlife and Natural Resources Conference, returning by way of Denver, Colo., to study diorama presentation (March).

Macnair: Seattle, to attend Northwest Anthropological Conference (March).

Moore: Portland, Oreg., to attend a seminar as guest of the American Association of State and Local History (September).

Thorn: Toronto, to attend the joint meeting of the Canadian Museums Association and the American Association of Museums. He also visited the National Museum of Canada, Expo 67, Museum of History and American Museum of Natural History, New York (May).

Ward: Anchorage, Alaska, to attend the second conference on Southeast Alaska Native Artifacts and Monuments, and the inaugural meeting of the Alaska Historical Society at Anchorage, Alaska (November). (Mr. Moore accompanied Mr. Ward as guest of the Alaska Government to attend the same meetings as a consultant on organizational matters, and to address the first annual meeting of the Alaska Historical Society.)

EXTENSION SERVICES

The chief activity under this heading was that of Mr. Moore, who was appointed as Museum Adviser in October, 1966. In order to acquaint himself with the museums of the Province and to learn of their needs and problems, Mr. Moore travelled over much of British Columbia visiting as many institutions as possible and conferring with all interested persons. In those cases where a personal call was not possible, contact has been maintained by letter or by telephone.

The results so far have been most gratifying. In all cases he was able to offer helpful advice or to put persons with common interests in touch with one another. Often he acted as a catalyst between local groups requiring guidance in museum matters.

Mr. Moore also took an active part in the training course offered by Vancouver College by contributing to the teaching sessions in Vancouver and by arranging a two-week training session in Victoria whereby 11 students received specialized instruction at the Greater Victoria Art Gallery, the Maritime Museum of British Columbia, and the Provincial Museum. In this connection the co-operation of local residents who provided lodging and entertainment for the visitors was greatly appreciated.

In September Mr. Moore attended an intensive three-week seminar on museum management sponsored by the American Association of State and Local History. The meetings were held in Portland, Oreg.; Mr. Moore was the only Canadian to be selected for the course.

Throughout the year various staff members have presented lectures and demonstrations on numerous occasions, especially during the September meetings of the British Columbia Museums Association, hosted by the Maritime Museum of British Columbia. Two short television programmes were also given over Channel 8.

After an uninterrupted period of 12 years on the air, the weekly local radio programme " Outdoors with the Experts," in which the Director took an active part, was discontinued in May.

Mr. Abbott was appointed to the Advisory Committee to the 'Ksan project, an ARDA-sponsored scheme to improve the economic situation of Indians around the Bulkley and Upper Skeena Rivers. He has paid one visit to Hazelton to obtain

background for the proposed reconstruction there and in connection with a craft training programme which he has been asked to organize.

In October Mr. Abbott organized a meeting of several dozen scientists and other persons at the University of British Columbia to view a film made by Mr. Roger Patterson, of Yakima, Wash., and purporting to show a Sasquatch photographed near Bluff Creek, Calif.

PUBLICATIONS

The following publications have appeared in 1967:—

G. Clifford Carl.

On Powdered Wings. "Beautiful British Columbia," Spring, 1967.

The Lone Sentinel. Victoria Naturalist, Vol. 23, No. 9, pp. 101–102.

Arthur Lionel Meugens (1881–1967). Victoria Naturalist, Vol. 24, No. 2, p. 21.

Between Tides on Southern Vancouver Island. Naturalist's Guide to the Victoria Region. B.C. Nature Council, pp. 25–29.

Putting "Life" into Exhibits. Museum Round-up. British Columbia Museums Association, No. 28, pp. 45–47.

Carolyn M. Case.

Cataloguing and Classifying. Museum Round-up. British Columbia Museums Association, No. 28, pp. 27–32.

L. Colin Curtis.

The Mosquitoes of British Columbia. Occasional Papers of the British Columbia Provincial Museum No. 15, pp. 1–90.

George Moore.

Random Notes. Museum Round-up. British Columbia Museums Association, No. 25, pp. 15–17.

Twelve-day Workshop. Museum Round-up. British Columbia Museums Association, No. 26, p. 3.

Museums and the Tourist Dollar. Museum Round-up. British Columbia Museums Association, No. 27, pp. 4–5.

Museum Management. Vancouver City College, Museum Workers' Newsletter, November.

Robert F. Scagel.

Guide to Common Seaweeds of British Columbia. British Columbia Provincial Museum Handbook No. 27, pp. 1–330.

Adam F. Szczawinski.

Recommended References to the Flora of British Columbia. Provincial Museum 1967.

Erik Thorn.

Preliminary Distributional List of the Spiders of British Columbia. Report of the Provincial Museum for 1966, pp. 23–39.

Philip R. Ward.

Conservation. Museum Round-up. British Columbia Museums Association, No. 28, pp. 48–51.

Some Notes on the Preservation of Totem Poles in British Columbia. British Columbia Provincial Museum, manuscript report. November.

In addition to the above, the following reprints were issued: "The Birds of British Columbia, (5) Gulls, Terns, Jaegers, and Skua," Handbook No. 13; "The Birds of British Columbia, (6) Waterfowl," Handbook No. 15; "Guide to

Common Edible Plants of British Columbia," Handbook No. 20; "The Freshwater Fishes of British Columbia," Handbook No. 5.

In the meantime a manuscript on the Alcids and related sea birds is being prepared by Mr. C. J. Guiguet for possible publication in 1968.

STAFF CHANGES

Coupled with the need to increase the production of new displays and with the expanding scope of the Museum, several persons were added to the staff in 1967.

Two notable additions were Miss Carolyn M. Case as Curator of History and Dr. T. C. Brayshaw as Associate Curator of Botany. A graduate in history from the University of British Columbia, Miss Case spent several years in the museum field in England before coming to the present post; she is now in charge of the acquisition, documentation, preservation, and interpretation of historical items for the Provincial collection. Dr. Brayshaw is also a University of British Columbia graduate with special training in plant ecology and related fields. He has had some 10 years' experience in the employ of Canada Department of Forestry as a research scientist at Ottawa and Chalk River before returning to British Columbia.

At various times during the year Mr. Lloyd Cook, Mr. John Waters, and Mr. Alex James joined the display division as technicians, and for the summer months student help was employed as follows: Mrs. Nancy Hayden, Mr. E. J. Noury (archæology), Miss Veronica Harrison (zoology), Mr. S. Harrison (botany), and Miss P. McAfee (display).

Mr. Robert Nichols left the Museum staff early in the year, and his duties as Museum field agent were taken over by Anthropological Technician John Sendey.

From time to time, as required, Mr. Gordon King and Mr. N. W. Milke acted as relief attendants.

We were saddened by the loss of Mr. Milke, who died suddenly on September 5th just after a short turn of duty. He had been acting as occasional relief attendant since July, 1966.

At a ceremonial potlatch given at Alert Bay in late December, Anthropological Assistant Peter Macnair was greatly honoured by being given the Kwakiutl name "Muhleedi" by Chief Peter Smith, of Turnour Island, B.C.

ADMINISTRATION

In order to provide authority for the Provincial Museum to operate in the full field of human history, minor amendments to the *Museum Act* were proposed and approved at the 1967 Session of the Legislative Assembly. At the same time the objects of the Museum were rephrased in simpler and clearer terms.

ATTENDANCE

The following attendance figures are estimates based upon sample counts made at irregular intervals:—

January	6,700	August	81,000
February	8,000	September	27,000
March	12,000	October	5,000
April	7,000	November	6,000
May	12,000	December	3,000
June	28,000		
July	78,000	Total	273,700

Of the total attendance, 9,621 persons were members of groups classified as follows:—

Kindergartens	7
School classes	117
Summer play groups	11
Guides or Scouts	44
Church groups	4
Birthday parties	7
Others (education for democracy, clubs, tours, etc.)	34
Total	224

The estimated total attendance is one of the largest on record, being matched only by the attendance in 1962, the year of the World's Fair in Seattle, Wash. The 1967 figure shows an increase of about 29 per cent over that of the previous year.

As has been the policy in recent years, the Museum's hours were extended to 9 p.m. each evening except Sunday during the summer months.

NEW BUILDING CONSTRUCTION

The contract for the final phase of construction of the main building of the Museum-Archives complex was awarded to Farmer Construction Limited, of Victoria, in December, 1966; work commenced almost immediately and continued without interruption throughout 1967. A rough schedule of progress is as follows:—

January: Floors being poured; service tunnel to power-house under construction; retaining-walls and stairs being constructed in sunken garden (Oliver Construction Company).

February: Service driveway poured, steam pipes and duct-work being installed.

March: Pouring of third floor completed; south wall being erected.

April: South and north wall completed; junction boxes for power-line installed along Government Street.

May: Insulation applied to south wall; some stone facing in place.

June: Plaster walls being installed in basement; lecture theatre floor poured.

July: External stonework completed except for vertical columns; tarring and gravelling of roof almost finished; insulation of interior steelwork largely completed.

August: Partitions being installed on exhibit floors and walls being painted.

September: Metal framing for windows being installed.

October: Installation of marble work almost completed.

OBITUARIES

We pay tribute here to several citizens of British Columbia who have passed on in 1967.

Mr. W. D. (Bill) Reith, Information Officer, Parks Branch, Department of Recreation and Conservation, an outstanding nature photographer, writer, and naturalist (January 5th).

Dr. Edgar C. Black, physiologist and faculty member of the University of British Columbia School of Medicine, renowned for his work on physiology of fatigue in fishes (March 11th).

Mr. Archie Nicholls, amateur naturalist and photographer of fungi, a long-time resident of British Columbia (July 17th in New Zealand).

Mr. Arthur Lionel Meugens, amateur oologist and photographer, co-founder of the Victoria Natural History Society (July 27th).

Mr. Norman Milke, relief attendant, on the Museum staff since June, 1966 (September 5th).

DONATIONS AND ACCESSIONS

BOTANICAL

Various institutions, game biologists, foresters, and private individuals have contributed a number of plant collections and individual plant specimens during 1967. Deserving special mention were Mrs. G. Mendel, whose collection represents the Kitimat district, and Mr. Keith Illingworth, who contributed a collection of British Columbia conifers. Space does not permit us to list each contributor individually, but we include all in a grateful vote of thanks.

Herbarium exchange was continued with the following institutions: National Museum of Canada, Ottawa; Plant Research Institute, Department of Agriculture, Ottawa; Laval University, Quebec; Smithsonian Institute, Washington, D.C.; University of British Columbia, Vancouver; University of Washington, Seattle, Wash.; University of Victoria, Victoria; Stockholm Museum, Stockholm, Sweden; University of Helsinki, Finland; University of Krakow, Poland; Queen's University, Kingston, Ont.; and others.

With the addition of 857 sheets of specimens during 1967, the total now stands at 49,057. The project of remounting and uniformly labelling all herbarium specimens, started in 1965, was continued through 1967.

During the year a number of plant scientists from Canada and abroad visited and worked in the herbarium.

ZOOLOGICAL

Mammals

By gift—

R. J. Baines, Department of Highways, Victoria—one vertebra and one vertebral disk of whale.
Byron Davies, Westham Island—one jumping mouse and two field mice.
Greg Gardner, Victoria—one vertebra of harbour porpoise.
Jack Holland, Sidney—one red squirrel.
Clarence Hronek, Victoria—one western big-eared bat, one big brown bat.
Johnny Hunt, Victoria—one meadow mouse.
Joseph Kaye, Victoria—one whale rib.
Ian MacAskie, Biological Station, Nanaimo—partial skull of pike whale.
Larry McCafferty, Victoria—three *Canidæ* teeth.
Mrs. C. B. Wallace, Victoria—one squirrel.
Miss Anne Warren, Victoria—skull of harbour porpoise.
Jim Wright, North Surrey—one cottontail rabbit.

By staff—420.

Birds

By gift—

Mrs. G. C. Boyd, Lake Cowichan—one nest of chimney swift.
Miss B. Coburn, Victoria—one dozen quails' eggs and one fox sparrow.
Mrs. E. Davidson, Victoria—one fox sparrow and one red-breasted sapsucker.
Byron Davies, Westham Island—one immature Virginia rail, one pintail duck.
Miss Frances Druce, Victoria—three kildeer chicks.
Michael Ferguson, Victoria—one bushtit nest.
M. Haggerty, Victoria—one pine siskin.
Miss M. Hallett, Victoria—one orange-crowned warbler.
F. P. Hinwood-Smith, Cowichan Station—one red crossbill.
Miss E. Hopkins, Galiano Island—one house finch.

Mrs. A. L. Meugens, Burnaby—one collection of British Columbia birds' eggs.
Mrs. R. E. Murphy, Victoria—one sharp-shinned hawk.
Miss Leigh Porter, Victoria—one robin.
Mrs. P. Ramsell, Cumberland—one albino starling.
Norman Sear, Victoria—one pine siskin.
Bud Smith, Nanaimo—one albinistic blue grouse.
J. W. Smith, Victoria—one great blue heron.
J. Thomas, for Montessori School, Victoria—three sets of birds' eggs.
Mrs. C. B. Wallace, Victoria—one varied thrush.
F. E. Watchler, Victoria—one Java dove.
Miss Daisy White, Victoria—nine quails' eggs.
Miss J. M. Wilkinson, Victoria—one robin's egg.
Jim Wright, for Cloverdale School, Victoria—one rufous hummingbird.

By staff—47.

By purchase—

The Eric Tait Collection.—A collection consisting of 93 mammal study skins and skulls, 10 mammal skulls, 133 bird study skins, 193 birds' nests with eggs, and 121 sets of birds' eggs without nests, all from British Columbia.

Amphibians and Reptiles

By gift—

Edward Hovilkamp, Victoria—one northern alligator lizard.
Mrs. W. Medwedrich, Becher Bay—one painted turtle.
Miss D. White, Victoria—one snake skin and one northern alligator lizard.
J. Woolrich, Victoria—one eared turtle.

Fish

By gift—

Kurt Cehak, Race Rocks Light-station—one ribbon fish.
Jim Lees, Victoria—one pearl gourami fish.
W. A. McTaggart, Sidney—one black rockfish.
D. B. Quayle, Biological Station, Nanaimo—one flounder, mounted.
Frank Smith, Victoria—one dover sole.

Invertebrates

By gift—

Mrs. W. Aller, Victoria—one California prionus.
A. B. Ayling, Victoria—one jumping spider.
Mrs. Roberta Ballantyne, Port Renfrew—display of silkworm life history and culture.
Mrs. E. Beckerley, Victoria—one black widow spider.
Arthur Broughton, Victoria—one black widow spider.
Stephen Buchanan, for Montessori School, Victoria—one nudibranch.
J. M. Cameron, Victoria—one cecropia moth.
Ian Clark, Victoria—larvæ of hawk moth.
Peter Demchuk, Victoria—one sea pen.
Mark Gagne, Victoria—one tiger moth.
J. Galliford, Victoria—two spiders.
Ted Groves, Department of Mines, Victoria—collection of ice worms.
Mrs. N. Henderson, Nanaimo—specimens of caddis fly.
R. H. Holly, Victoria—one striped cockchafer.
K. C. Holt, Victoria—one crab spider.

W. Hutchinson, Victoria—collection of shells.
L. Hyde, Victoria—one eyed hawk moth.
Bruce Hoanisse, Victoria—one shamrock orb-weaver.
D. S. Layton, Victoria—one wolf spider.
Calvin Lee, Victoria—one spiny wood-borer.
J. L. Malkin, Cobble Hill—two purple-hinged scallops.
C. Miller, Victoria—one California prionus.
W. E. Neilson, Victoria—ghost larvæ.
M. Palamar, Victoria—one black widow spider.
Miss M. Parkin, Victoria—one black widow spider.
W. Guy Pearce, Victoria—one garden millipede.
Allan E. Pierce, Nanaimo—one trap-door spider.
Mrs. K. E. Perry, Victoria—one striped cockchafer.
Henry Petersen, Victoria—one cecropia moth.
Jim Roberts, Deep Cove—two abalone shells, collection of shells.
Blaney Scott, Victoria—one black widow spider.
Lyle Smith, Victoria—one spider.
Mrs. J. W. Strand, Victoria—one crab spider.
William Thomas, Victoria—two specimens of rock-borers.
Rex Thomson, Victoria—one nudibranch.
Miss Merle Thurier, Victoria—one orb-weaver spider.
Rick West, Victoria—one tarantula and one trap-door spider.
Miss D. White, Victoria—one mourning cloak butterfly.
Miss Dawn Yeomans, Victoria—one mourning cloak butterfly.

PALÆONTOLOGY

By gift—

R. De Frane, Victoria—one fossilized bone.
Mrs. J. Hawes, Victoria—one fossilized bone.
Ken Nelson, Carmanah Point Light-station, Victoria—one Miocene fossil.
Perry S. Ross, Duncan—collection of fossils.
Duane Salmon, Victoria—one specimen of *Inoceramus*.

By purchase—

The George H. Larnder Collection of British Columbia Insects.—November, 1966.

HISTORICAL

The Mabel Scurrah Collection of period costumes, 1912–62. (Gift.)
H. W. Blenkinsop, Victoria.—(Gift.) Iron horse bit inlaid with silver.
Mr. and Mrs. Sawers, Victoria.—(Gift.) Hudson's Bay Company safe.
The Kenneth Reid Collection of lamps, lighting equipment, and catalogues representing the development of street-lighting in Victoria, B.C. (Gift.)

By purchase—

Numerous classified lots of pioneer articles and other objects of historic interest, including a Norwegian loom and accessories, optical materials and equipment, sealing equipment.

By gift—

Mr. and Mrs. P. Alexander, Oregon—photograph of early pioneers.
Don Andrews, Victoria—typewriter, oil stove, wire-stretcher, broad axe.
Mrs. A. R. Beadle, Victoria—pair of late Victorian chairs.
R. P. Brown, Victoria—collection of costumes.

A. Carruthers, Creston—copy of Centennial issue of Valley Advance.
J. A. Case, North Surrey—collection of domestic items.
Miss D. G. Cox, Victoria—domestic articles and items of lace and needlework.
Miss M. Crummy, Victoria—shawl.
Mrs. Ada Davies, Pitt Meadows—railway items.
Miss Alix Doull, Victoria—fans, hat-box, costume and accessories.
F. W. Ericson, Victoria—apple-corer.
Mrs. H. L. Fleming, Victoria—iron horse plug.
Don Gain, Victoria—suits and jacket.
R. A. Greene, Victoria—illustrated catalogue.
Mr. and Mrs. G. Halvorsen, Victoria—domestic items and carpenters' tools.
Mrs. R. Helme, Lister—carding-combs, lamp, pocket watch, horse belt.
Mrs. M. Hodgkin, Sidney—early police items.
Mrs. S. T. Hogben, Langley—mangle.
L. Huscroft, Lister—agricultural and carpenters' tools.
C. F. Hutchinson, Victoria—carpenters' tools and army tunics.
E. Jones, Victoria—grindstone.
Mrs. H. D. Joy, Victoria—side chair, three period dresses.
G. King, Victoria—hay knife, zinc window.
C. Kingsfield, Victoria—pair of shoes.
Mrs. A. G. Lambrick, Victoria—Royal visit souvenirs (1939), miscellaneous domestic items.
Mrs. J. Lapham, Victoria—wool-winder, leather luggage.
Mrs. R. Lawrence, Cowichan Bay—Paisley shawl.
Don Lewis, Victoria—Victoria Directory (1893), carpenters' tools.
W. C. Matthews, Victoria—crosscut saw.
Mrs. Melba Menzies, Vancouver—domestic items, costume and accessories, sewing equipment.
Mrs. Lillian Metcalfe, Victoria—pair of butter paddles.
D. Miller, Victoria—axe head.
Mr. and Mrs. C. Moore, Victoria—doll.
Mr. and Mrs. C. R. Muirhead, Victoria—sewing-machine (1898).
Mr. and Mrs. G. M. Owen, Victoria—butter-making equipment, carpenters' tools, household articles.
Russell Porter, Williams Lake—household articles, two lacquered spectacle cases.
Mrs. M. A. Reynolds, Victoria—cider press.
Mr. and Mrs. J. M. Roelofsen, Victoria—early 20th-century gramophone and needles.
A. G. Shold, Victoria—writing-box, sheep shears.
Mr. and Mrs. E. E. Smart, Victoria—carpenters' tools.
Mrs. F. H. Smyly, Victoria—embroidered nightdress.
W. Stavdal, Victoria—book, air-crew cadet cap.
Inspector G. Stevenson, Victoria—cape of seal and Russian sable.
Rev. W. Sweeney, Fort Fraser—two copies of the Carrier Prayer Book.
Mrs. Tomlinson, Vancouver—sheet music, doll, costume and accessories, umbrella.
Mr. and Mrs. Toulsen, Victoria—early green glass bottle.
Mr. and Mrs. C. Wales, Vancouver—sewing-machine.
A. Walker, Whonock—mangle, spectacles, luggage rack, miscellaneous tools.
J. Watson, Sechelt—early postcards.
Mrs. H. Weber, Victoria—ration books, souvenirs of World War II.

Hilton Young, Creston—educational material.
Canadian Pacific Hotels, per E. C. Fitt, vice-president and general manager, Montreal, Que.—one 100-horsepower Skinner uniflow steam engine coupled to a 75-kilowatt 625-ampere Allis-Chalmers and Bullock generator, one of two units formerly in the power-house of the Empress Hotel.

ETHNOLOGY

By gift—
Mrs. E. Costain, Victoria—Salish basket.
Alec Glover, Nanaimo—Interior Salish beaded bag.
Mrs. R. Lawrence, Cowichan Bay—Coast Salish basketry trunk.
G. Mitchell, Deroche—Coast Salish composite toggling harpoon head, cedar-bark canoe-bailer.
Arthur Peak, Haney—Kwakiutl stone slave-killer.
Mrs. D. M. Peers, Victoria—Athapaskan sample of beadwork.
Bill Reid, Vancouver—silversmith's hammer and anvil which belonged to Charles Edenshaw.

Staff purchases (miscellaneous sources)—
Nootka—Thunderbird mask, three D-adzes, two whistles.
Haida—argillite panel, argillite plate.
Shuswap—three coiled baskets, three birch-bark baskets, two beaver pelts.
Thompson—one birch-bark basket, two coiled baskets.
Kootenay—eight beaded women's belts, model sturgeon nose canoe, two women's parfleche cases, one woman's rawhide bag, two hondas.
Coast Salish—five tump-lines, coiled basket, two wooden spoons, wooden ladle, salmon knife, dip-net, large collection of baskets, basket starts, raw materials, basket-making tools, contemporary sxwaixwe mask, copper rattle.
Kwakiutl—large collection of ceremonial materials, tools and implements from various sources, model totem pole attributed to Charlie James.
Thunderbird Park—model totem pole, silver pin, bee mask by Tony Hunt, model totem pole by Henry Hunt.
Miscellaneous—five J. Webber engravings of Nootka Sound, carved walking-stick, northern style.

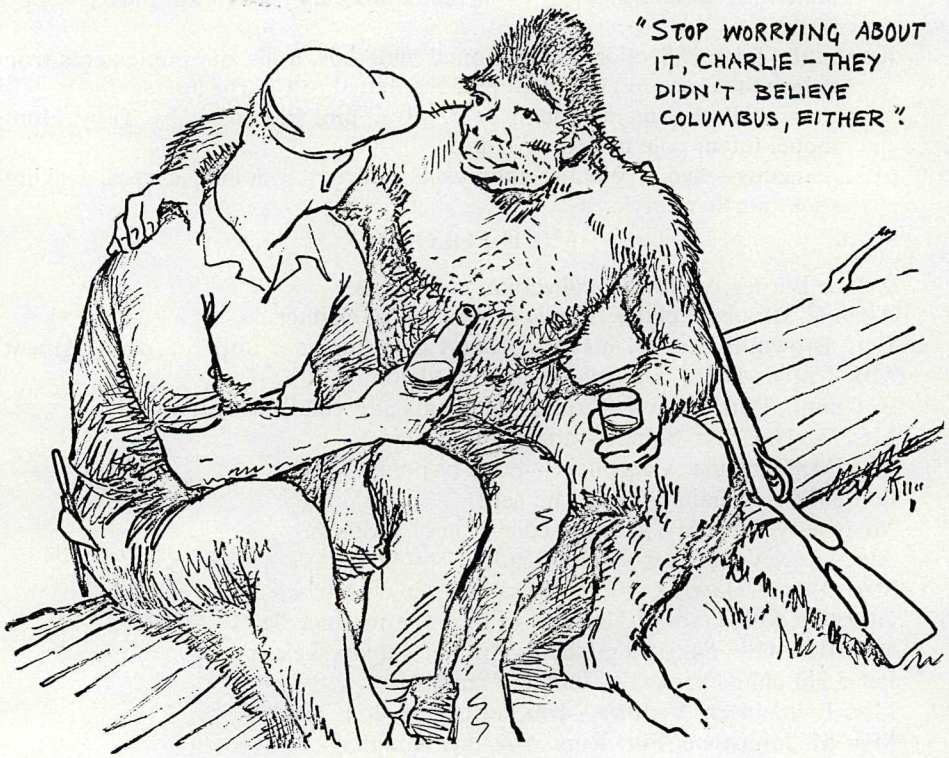
ARCHÆOLOGY

By gift—
Arthur Barnes, Victoria—collection of artifacts.
Allan C. Brooks, Pender Island—collection of artifacts.
E. L. Brown, Edmonds, Wash.—ground slate fragment, antler wedge fragment.
Mrs. Craigie-Hood, Ganges—human skeleton.
B. Cramb, Port Alberni—box of fragments and child's skeleton.
Mrs. W. H. Cross, Sidney—adzed antler object.
Miss M. Fairhurst, Vancouver—bone bi-point.
G. Fiddick, Nanaimo—nephrite celt.
Mrs. Betty Gibson, Victoria—collection of artifacts.
Alec Gow, Vancouver—maul head.
Mrs. Nancy Hayden, Victoria—collection of artifacts.
Gerry Heddle, Gabriola Island—whalebone mat needle.
Mrs. Beth Hill, Saltspring Island—partial human skeleton.
Peter Hutchins, Victoria—human mandible.
Miss J. Johansen, Victoria—two perforated stone sinkers.
Miss M. Johnstone, Fort Rupert—stone hammer.

Mrs. O. M. Landsvik, Hernando Island—collection of artifacts.
W. C. Matthews, Victoria—collection of artifacts.
D. H. Mitchell, Victoria—collection of artifacts.
G. H. Mitchell, Deroche—large collection of artifacts.
J. Mitchell, Victoria—human skull.
Mrs. Ann Neelley, Los Angeles—collection of artifacts.
L. Nelson, Victoria—human skeleton.
F. Neville, Vancouver—engraved antler object.
T. Ray, Burns Lake—human skull.
J. G. Saul, Victoria—obsidian point.
David Sawbridge, Victoria—collection of artifacts.
D. Sawers, Victoria—two perforated sinkers.
Peter Schmidt, Victoria—handle fragment of perforated stone club.
Aubrey Sessions, Victoria—nephrite celt.
Mrs. H. Stewart, Saltspring Island—two human skull fragments.
Hilary Stewart, Vancouver—collection of artifacts.
Mrs. R. Thompson, Wellington—ground slate knife.
Mrs. W. Williams, Zeballos—11 polychrome beads.
Bob Wilson, Fort Rupert—one stone hammer.
D. Witmer, Victoria—hammer-stone.
R. B. Worley, Victoria—stone hammer.

MISCELLANEOUS

Proceeds from the Museum donation box during 1967 amounted to $175.34, which was turned over to the Mungo Martin Scholarship Fund.



NOTES ON THE NATURAL HISTORY OF CLELAND ISLAND, BRITISH COLUMBIA, WITH EMPHASIS ON THE BREEDING BIRD FAUNA

By R. Wayne Campbell and David Stirling,
Parks Branch, Department of Recreation
and Conservation, Victoria, B.C.

INTRODUCTION

Seabird study in British Columbia is a somewhat neglected field. This neglect can be attributed to various things.

The 7,000 miles of indented and irregular coast-line dotted with numerous islets make complete exploration and cataloguing of seabird islands time-consuming. The unpredictable and inhospitable littoral waters make landing on many islands both difficult and dangerous and, therefore, the assessment of potential colonies is sometimes impossible. The lack of travel and recordings by serious amateur naturalists and active banders along the coast is another major drawback in acquiring knowledge of our seabirds. The most perplexing problem in seabird study, however, is the habits of the seabirds themselves. Most true seabirds in British Columbia, the Hydrobates (storm petrels) and Alcids (auklets and puffins), spend the better part of their lives at sea, venturing to land only to carry on breeding activities. Students of bird study must attempt to gather information on the ecological, distributional, and behavioural habits of seabirds during these short terrestrial visits. This is undoubtedly a mammoth task and requires co-operation from both professional and amateur naturalists.

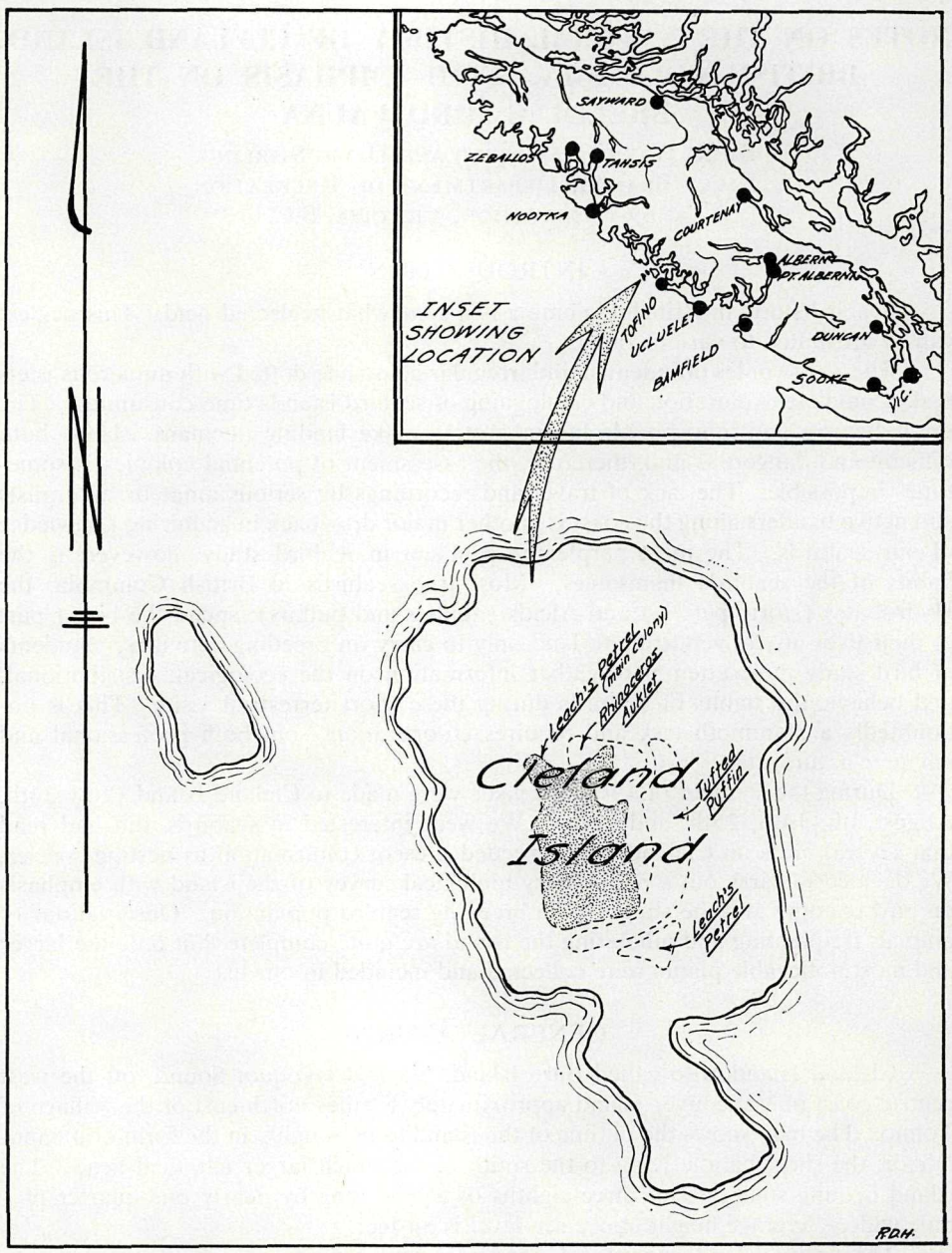
During the summer of 1967 five visits were made to Cleland Island (July 24th, August 4th, 14th, 25th, and 28th). We were interested in seabirds and had read that several birds on Cleland Island needed present confirmation as nesting species. We decided to carry out a preliminary biological survey of the island with emphasis on bird banding and the study of the breeding seabird population. Observations of animals frequenting and inhabiting the island are quite complete, but only the larger and most noticeable plants were collected and included in our list.

GENERAL ASPECT

Cleland Island, also called Bare Island, lies in Clayoquot Sound, off the west central coast of Vancouver Island approximately 8 miles north-east of the Village of Tofino. The map shows the outline of the island to be roughly in the form of a hand-mirror, the short handle lying to the south of the much larger elliptical head. The island is quite small, about three-eighths of a mile long by nearly one-quarter of a mile wide. Average height above sea-level is 34 feet.

The entire island consists of bare rock outcroppings, probably of volcanic origin. The lower periphery is almost entirely rocky, vegetation becoming luxuriant toward the crown of the island. An extensive grass-brush belt, perhaps 300 by 300 feet, laterally divides the top of the island. Wild rose, salmonberry, cow parsnip, Douglas aster, and wild ryegrass are dominant plants here. Over most of the rest of the island, vegetative growth is restricted to rock fissures containing soil. There are no trees on the island, but driftwood in many places suggests that waves generated from winter storms sweep over much of the island.

There are two small beaches composed of shell fragments on the island. The beach on the east side offers best landing conditions.



BENTHONIC MARINE ALGÆ

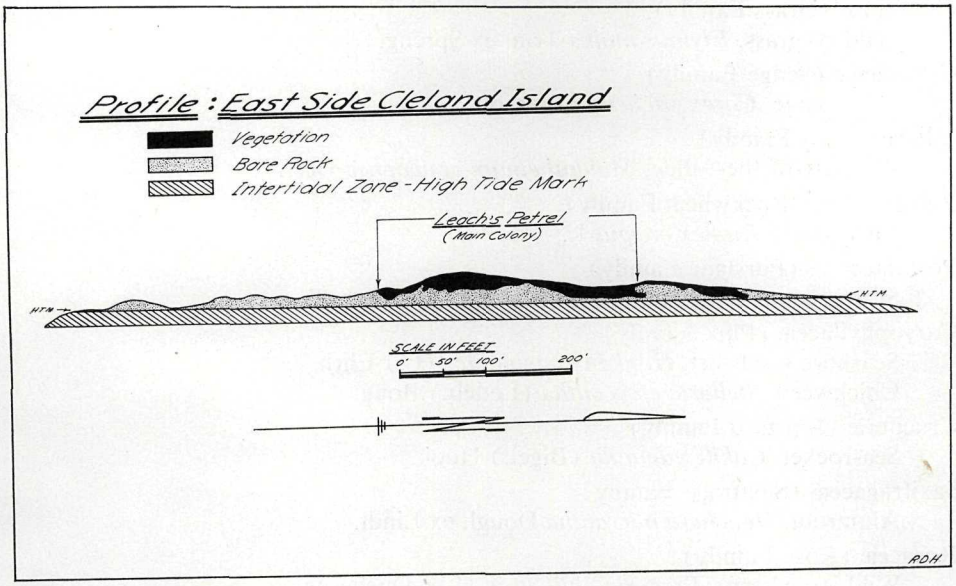
CHLOROPHYCOPHYTA (GREENS)

Ulvaceæ

Sea lettuce, *Ulva lactuca* Linnæus.

Codiaceæ

Sea staghorn, *Codium fragile* (Suringar) Hariot.



PHÆOPHYCOPHYTA (BROWNS)

Ralfsiaceæ

Tar spot, *Ralfsia pacifica* Hollenberg.

Punctariaceæ

Oyster thief, *Colpomenia sinuosa* (Roth) Derbes and Solier.

Laminariaceæ

Sea girdle (tangle), *Laminaria platymeris* De La Pylaie.

Lessoniaceæ

Bull kelp, *Nereocystis luetkeana* (Mertens) Postels and Ruprecht.

Sea palm, *Postelsia palmæformis* Ruprecht.

Alariaceæ

Feather boa, *Egregia menziesii* (Turner) Areschoug.

Fucaceæ

Popping wrack, *Fucus furcatus* C. Agardh.

RHODOPHYCOPHYTA (REDS)

Corallinaceæ

Tidepool coral, *Corallina chilensis* Decaisne.

Gigartinaceæ

Turkish towel, *Gigartina exasperata* Harvey and Bailey.

Iridescent seaweed, *Iridophyous sp.* Setchell and Gardner.

Rhodymeniaceæ

Sea sac, *Halosaccion glandiforme* (Gmelin) Ruprecht.

VASCULAR PLANTS

Polypodiaceæ (Fern Family)

Leathery polypody, *Polypodium scouleri* Hook. & Grev.

Sword fern, *Polystichum munitum* (Kaulf.) Presl.

Bracken fern, *Pteridium acquilinum* (L.) Kuhn.

Zosteraceæ (Eelgrass Family)

Eelgrass, *Zostera marina* L.

False eelgrass, *Phyllospadix scouleri* Hooker.

Gramineæ (Grass Family)
Wild ryegrass, *Elymus mollis* Trin. ex Spreng.
Cyperaceæ (Sedge Family)
Sitka sedge, *Carex sitchensis* Prescott.
Liliaceæ (Lily Family)
Wild lily-of-the-valley, *Maianthemum canadense* Desf.
Polygonaceæ (Buckwheat Family)
Curly dock, *Rumex crispus* L.
Portulacaceæ (Purslane Family)
Siberia miner's lettuce, *Montia sibirica* (L.) Howell.
Caryophyllaceæ (Pink Family)
Seashore sandwort, *Honkenya peploides* (L.) Ehrh.
Chickweed, *Stellaria calycantha* (Ledeb.) Bong.
Cruciferæ (Mustard Family)
Sea-rocket, *Cakile edentula* (Bigel.) Hook.
Saxifragaceæ (Saxifrage Family)
Alumroot, *Heuchera micrantha* Dougl. ex Lindl.
Rosaceæ (Rose Family)
Wild strawberry, *Fragaria chiloensis* (L.) Duchesne.
Silverweed, *Potentilla pacifica* Howell.
Spray flower, *Potentilla villosa* Pall. ex Pursh.
Wild rose, *Rosa nutkana* Presl.
Little wild rose, *Rosa gymnocarpa* Nutt.
Salmonberry, *Rubus spectabilis* Pursh.
Onagraceæ (Evening Primrose Family)
Fireweed, *Epilobium latifolium* L.
Umbelliferæ (Parsley Family)
Angelica, *Angelica lucida* L.
Conioselinum, *Conioselinum pacificum* (Wats.) Coult. & Rose.
Cow parsnip, *Heracleum lanatum* Michx.
Ericaceæ (Heath Family)
Salal, *Gaultheria shallon* Pursh.
Labiatæ (Mint Family)
Hedge Nettle, *Stachys cooleyæ* Dougl.
Scrophulariaceæ (Figwort Family)
Indian Paint-brush, *Castilleja* sp.
Yellow mimulus, *Mimulus guttatus* Fisch. ex DC.
Plantaginaceæ (Plantain Family)
Common plantain, *Plantago major* L.
Seaside plantain, *Plantago maritima* L.
Rubiaceæ (Madder Family)
Northern bedstraw, *Galium trifidum* L.
Caprifoliaceæ (Honeysuckle Family)
Twinflower, *Linnæa borealis* L.
Compositæ (Composite Family)
Yarrow, *Achillea millefolium* L.
Douglas aster, *Aster subspicatus* Nees.
Sow thistle, *Sonchus asper* (L.) Hill.

ANIMALS

COELENTERATA

Anthopleura xanthogrammica (Brandt)—Green Anemone

Quite common in rock crevices and sheltered tide pools below mean tide-level.

ANNELIDA

Arctonoë vittata (Grube)—Scale Worm

A small commensal worm was found within the mantle cavity of *Diodora aspera.*

Serpula vermicularis (Linnæus)—Calcareous Tube Worm

Quite common on rocks about mid-tide and lower.

ARTHROPODA

Balanus cariosus (Pallas)—Thatched Barnacle

Several large specimens, about 5 cm. long, were taken from their rocky bases about the mean tide-line.

Balanus glandula Darwin—Acorn Barnacle

The upper intertidal rocks are covered with this " foot cutter."

Balanus nubilus Darwin—Giant Barnacle

Two large clusters containing several barnacles each were found in about 15 feet of water.

Mitella polymerus (Sowerby)—Goose Barnacle

Large clusters were common among the larger beds of sea mussels in the intertidal zone.

Pandalus danæ Stimpson—Coon-striped Shrimp

Two specimens were taken near the base of a large boulder in about 25 feet of water.

Petrolisthes cinctipes (Randall)—Flat-topped Crab

A large specimen was secured from beneath a rock in the lower tide zone.

Pugettia producta (Randall)—Northern Kelp Crab

A few animals were seen in the small eelgrass-covered tide pools at low tides.

Cancer magister Dana—Commercial Crab

A small carapace of this species was collected in 15 feet of water near a kelp-bed.

Cancer productus Randall—Rock Crab

A cast shell of this species was found, fully intact, on the largest beach on Cleland.

Hemigrapsus nudus (Dana)—Purple Shore Crab

Fairly common in sheltered tide pools around the island.

Hemigrapsus oregonensis (Dana)—Hairy Shore Crab

Common under rocks about the middle tide zone.

MOLLUSCS

Katharina tunicata Wood—Leather Chiton

Very common intertidally, usually seeking shelter from sunlight and predators in rock crevices during the day. This animal is a favourite food of the black oyster catcher.

Tonicella lineata Wood—Lined Chiton

Common under rocks and among sea palm holdfasts around the island's intertidal zone.

Hinnites multirugosus (Gale)—Purple-hinged Rock Scallop

A small specimen, 3 inches long, was collected in 15 feet of water by Miss D. Choquette. Pieces of this shell can be found in the upper beaches around the island.

Mytilus californianus Conrad—Sea Mussel

Large, dense beds skirt most rocky areas in the middle tide zone around the island. These beds offer excellent foraging grounds for long-billed shorebirds, gulls, and crows.

Searlesia dira Reeve—Dire Whelk

Fairly common in tide pools and sheltered rock crevices in the upper intertidal zone.

Nassarius fossatus Gould—Channeled Dog Whelk

No live specimens were found, but many unoccupied shells were seen on the beaches around the island.

Amphissa columbiana Dall—Wrinkled Amphissa

Very common, often clustered together in small masses in rock crevices or tide pools.

Thais emarginata Deshayes—Rock-dwelling Thais.

Uncommon. Only two specimens were collected from a tide pool in the lower intertidal zone.

Thais lamellosa Gmelin—Wrinkled Purple Snail

One live specimen extracted from a deep rock crevice in the lower intertidal zone.

Diodora aspera Eschscholtz—Rough Keyhole Limpet

Uncommon, only two specimens collected, both from the lower mussel beds.

Acmaea digitalis Eschscholtz—Fingered Limpet

Very common in clusters in rock crevices high up the intertidal zone.

Acmaea mitra Eschscholtz—Whitecap Limpet

Quite common on rocks subtidally, where several large specimens were collected.

Haliotis kamtschatkana Jonas—Northern Abalone

Two small specimens, 3 inches long, were collected from the side of a kelp-covered boulder in 15 feet of water. Many fragments of abalone shells dotted the island's beaches and occasionally an entire shell was found in the gull colony.

Tegula funebralis (A. Adams)—Black Top-shell

Abundant in tide pools and often clustered together in rock crevices throughout the intertidal zone.

Littorina scutulata Gould—Checkered Littorine

Common in tide pools toward the upper intertidal zone. Seemingly less abundant than *L. sitkana.*

Littorina sitkana Philippi—Sitka Littorine

Very common throughout the middle tide zone.

Crepidula adunca Sowerby—Hooked Slipper-shell

No live specimens were collected, but several shells were collected from the island's beaches.

Anisodoris nobilis (MacFarland)—Sea Lemon

Several small specimens were seen and photographed in tide pools in the lower intertidal zone.

Vespericola (Triodopsis) columbiana (Henderson)—Hairy-shelled Snail

This terrestrial gastropod is easily identified by its small size, six body whorls, and the numerous stiff hairs covering the external surface of the shell. It inhabits the vegetative regions of the island and is often found under logs or deep in cracks in driftwood. This animal is nocturnal in its habits asd is seldom seen on vegetation during daylight hours. It is often found with slugs and *Haplotrema vancouverense* during the day.

Haplotrema (Ancomena) vancouverense (Lea)—Vancouver Haplotreme

This snail is best identified by its large size, five body whorls, and the yellowish-green periostracum. It is very similar to *V. columbiana* in its habits and habitats on the island. Apparently this species is voracious and preys upon *V. columbiana* (Grass, 1966).

Ariolimax columbianus (Gould)—Large Spotted Slug

This large native slug is common on the island. Its colour varies from a spotted dull yellow to an olive brown. It is nocturnal and spends daylight hours in dark places. Favourite estivating places are petrel burrows. Here, as many as 13 slugs, both *A. columbianus* and *D. reticulatum,* were removed from a single burrow (*see* Table 1). During the early evening the slugs crawl from their hiding spots to feed on the nearby vegetation.

Deroceras reticulatum (Muller)—Netted Slug

This small yellow slug is very common and similar in habits to *A. columbianus.* It is more numerous in petrel burrows and driftwood cracks than the former species and is often found clustered together. Apparently this species was introduced from Europe.

TABLE 1.—SLUGS REMOVED FROM LEACH PETREL BURROWS DURING POPULATION ESTIMATIONS ON AUGUST 28, 1967

Quadrat	Slug Ranges per Quadrat	Total Slugs per Quadrat	Total Burrows per Quadrat	Average Slugs per Burrow
I	0–12	82	16	5.1
II	0– 5	12	8	1.5
III	0– 6	17	6	2.8
IV	2–12	46	9	5.1
V	0–13	39	17	2.3
VI	0– 5	10	7	1.4
Averages	0.33–8.8	34.3	10.3	3.0

ECHINODERMS

Dermasterias imbricata (Grube)—Leather Star

Two specimens, about 15 centimetres across, were collected from the underside of large boulders in 15 feet of water.

Henricia leviuscula (Stimpson)—Blood Star

One specimen, 7 centimetres from tip to tip, was collected from small rock near the mean tide-line.

Pisaster ochraceus (Brandt)—Purple Star

Very common on mussel beds around the lower tide zone. Both colour phases present.

Strongylocentrotus drobachiensis (Müller)—Green Sea Urchin

Quite common in sheltered Zostera-covered tide pools around the island.

Strongylocentrotus purpuratus (Stimpson)—Purple Sea Urchin

Uncommon in tide pools, but occasionally found half buried in a rock crevice.

Birds

Gavia immer (Brunnich)—Common Loon

Usually seen on trip to Cleland, occasionally in bays near Tofino. Two sightings—two on July 24th and three on August 28th.

Gavia arctica (L.)—Arctic Loon

Five birds counted off outer islands on trip to Cleland August 28th.

Puffinus griseus (Gmelin)—Sooty Shearwater

A transient bird often seen in large flocks offshore " shearing " the water surface for food. On July 24th a flock of about 4,000 birds was seen on the water near Cleland, slowly moving about, grounded by a low heavy mist. On August 28th an active flock of about 1,500 birds was seen moving northwards past Cleland.

Puffinus puffinus (Brunnich)—Common Shearwater

On July 24th a contrasting brown and white shearwater was seen in association with sooty shearwaters near Cleland. The bird was smaller than the sooty shearwater, dark brown on the back, white below with a dark bill. Campbell had seen the pink-footed shearwater *P. crotopus* near Langara Island, Q.C.I., in April, 1965, so this sighting could not be mistaken for that species.

Oceanodroma furcata (Gmelin)—Fork-tailed Petrel

First recorded as a nesting species on Cleland in 1925 by S. J. Darcus (Drent and Guiguet, 1961). Five years later, I. McT. Cowan visited the island and suspected nesting. C. J. Guiguet (August 4, 1961) found tail and contour feathers of this species and also suspected nesting.

Fig. 3. Nestling fork-tailed petrel, Cleland Island, 1967.

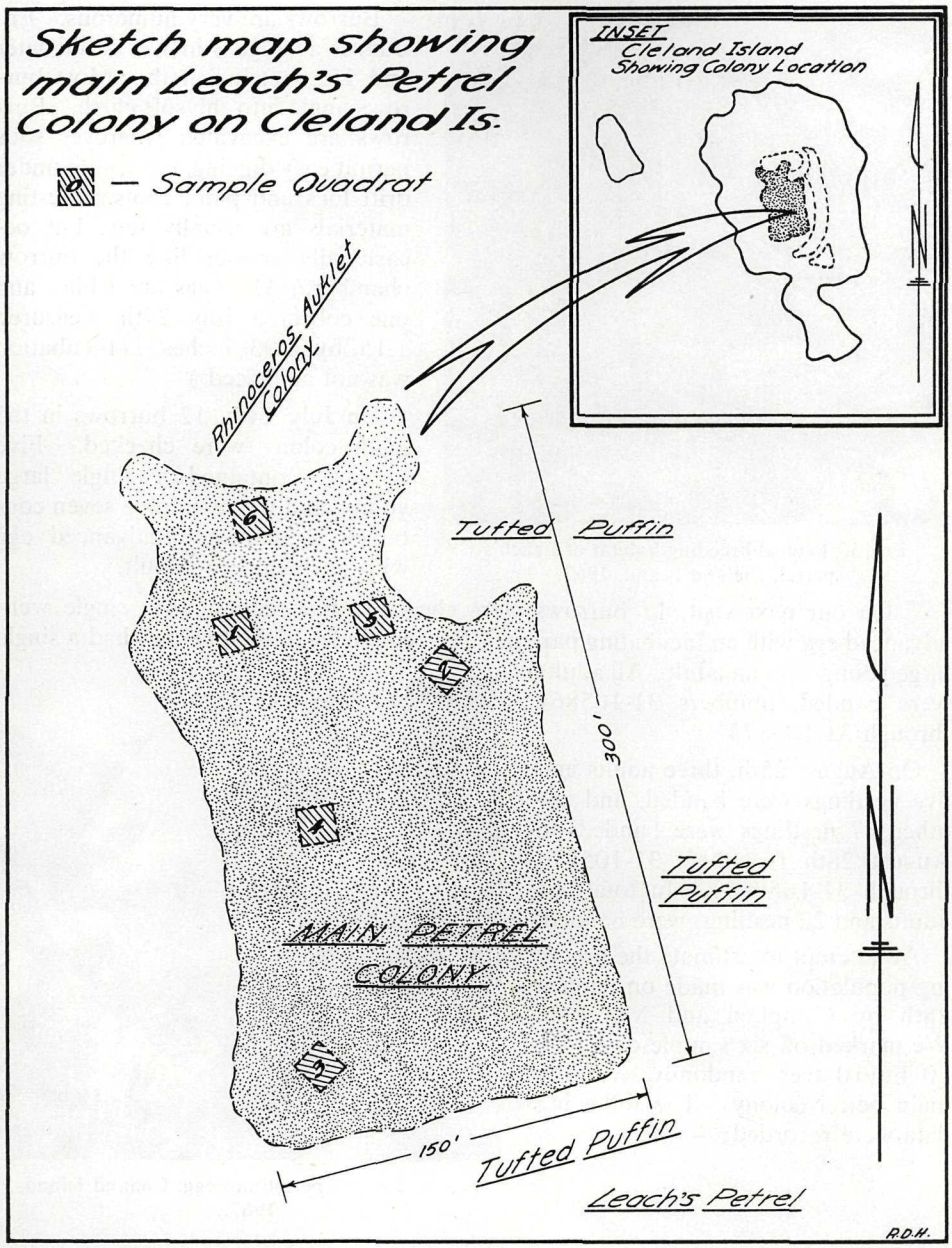
The fork-tailed petrel as a nesting species on Cleland has been confirmed. Two nests were found. Each had a large young. No adult birds were seen on the island, but on August 14th the writers saw an adult fork-tailed petrel just off Cleland. One nestling was banded on August 28th (band number 31-105900).

Unlike the Leach's petrel burrow, both fork-tailed petrel nests were under drift logs at the edge of the Leach's colony. No actual burrow had been excavated, and no nesting materials were visible.

A thorough check of the island may reveal a few more fork-tailed petrels' nests, but it is unlikely that its present status as an uncommon breeder will change appreciably.

Oceanodroma leucorhoa (Vieillot)—Leach's Petrel

This petrel was reported breeding on Cleland by Drent and Guiguet (1961). Guiguet (1965) collected a fully incubated egg and a large downy young.



Leach's petrel is undoubtedly the most abundant breeding bird on Cleland Island. At first glance the island seems devoid of petrels, but closer examination of the extensive grassy areas of the island reveals hundreds of small holes, entrances to petrel burrows. During daylight hours the adults are either far at sea feeding or incubating in the protection and shelter of their burrows.

The main petrel colony is situated in a broad grassy area on the north-east side of the island. The area, approximately 300 feet in length and 150 feet wide, has associated vegetation of *Aster subspicatus, Stachys cooleyæ, Elymus mollis, Heuchera micrantha,* and *Heracleum lanatum,* with scattered driftwood throughout.

Fig. 5. Typical breeding habitat of Leach's petrel, Cleland Island, 1967.

Burrows are very numerous. Entrances average 3 inches in diameter and 1½ feet in length. Most burrows angle into the soft earth. Burrows are excavated wherever soils permit easy digging, especially under drift logs and plant roots. Nesting materials are usually few, but occasionally grasses line the burrow chamber. The eggs are white, and one collected July 24th measured 1.15 by 0.93 inches. (Incubation was not advanced.)

On July 24th, 12 burrows in the main colony were checked. Five burrows contained a single large young, and the remaining seven contained a single well-advanced egg with an incubating adult.

On our next visit, 11 burrows were checked; nine contained a single well-advanced egg with an incubating parent. The remainder of the burrows had a single large young with an adult. All adults were banded, numbers 31-105864 through 31-105874.

On August 25th, three adults and five nestlings were banded, and another 17 nestlings were banded on August 28th (numbers 31-105874 through 31-105899). In total, 14 adults and 22 nestlings were banded.

An attempt to estimate the breeding population was made on August 28th by Campbell and Morrison. We marked off six sample quadrats, 10 by 10 feet, randomly over the main petrel colony. The following data were recorded:—

Fig. 6. Leach's petrel and egg, Cleland Island, 1967.

Typical Plant Associations

Quadrat I: Grasses, *Aster subspicatus, Stachys cooleyæ,* driftwood.
Quadrat II: *Rubus spectabilis, Rosa nutkana, Stachys cooleyæ.*
Quadrat III: Grasses, *Elymus mollis, Sonchis asper,* driftwood.
Quadrat IV: Grasses, *Stachys cooleyæ, Heracleum lanatum,* driftwood.
Quadrat V: *Heracleum lanatum, Rubus spectabilis, Epilobium latifolium.*
Quadrat VI: *Elymus mollis, Heracleum lanatum,* grasses, *Sonchus asper.*

TABLE 2.—QUADRAT DATA

Quadrat	Total Burrows per Quadrat	Total Unoccupied Burrows	Total Burrows with Single Young	Total Slugs in Total Burrows	Average Slugs per Burrow per Quadrat
I	16	5	11	82	5.1
II	8	2	6	12	1.5
III	6	2	4	17	2.8
IV	9	4	5	46	5.1
V	17	3	14	39	2.3
VI	7	2	5	10	1.4
Average	10.3	3	7.5	34.3	3.0

From data recorded and by simple mathematics, we calculated the petrel population in the main colony to be 4,635 pairs. Many more petrel burrows were found in other small grassy areas, so the breeding population perhaps approaches 5,000 pairs.

Throughout the summer many dead adult petrels were found on the island. Causes of their deaths remain unknown, but slugs are suspected of playing a part. During the day, slugs seek cover and coolness in petrel burrows, often lining them so that penetration by hand is impossible. Perhaps the parent birds, anxious to change their incubation duties, force themselves through the slug-lined burrow. In doing so the sticky slime from the slugs mats the bird's feathers, rendering the bird incapable of extended flight. The bird then probably starves to death. We noticed no evidence of these petrel carcasses being used for food.

Fig. 7. Leach's petrel chick taken from burrow on Cleland Island, 1967.

It should be noted that occasionally when extracting an excited adult petrel from a burrow, a blood-red substance is ejected from the tube on the bird's bill. The spray is strong, so that it is advisable to keep the head of the bird away from the face.

Phalacrocorax penicillatus (Brandt)—Brandt's Cormorant

About 70 birds were seen roosting regularly on the lower rocks on the southeast side of the island. Just prior to dusk, cormorants arrive from adjacent islands and feeding-grounds to spend the evening on Cleland. The evening roosting population is probably around 300 birds. By early morning most cormorants have left to feed.

No nests or nesting attempts were found.

Phalacrocorax pelagicus Pallas—Pelagic Cormorant

Common but less abundant than *P. penicillatus*. About one pelagic for every ten Brandt's recorded. No nests were found.

Branta bernicla (L.)—Black Brant

Recorded on three visits, feeding and resting in the intertidal zone. Sightings: July 24th, two; August 14th, seven; and August 28th, six.

Anas platyrhynchos L.—Mallard

A female, presumably the same bird, was flushed from rain pools around the island on July 24th, August 25th and 28th.

Anas acuta L.—Pintail

A male pintail was observed on August 28th flying southward, low over the island.

Anas carolinensis Gmelin—Green-winged Teal

A female was flushed from an algæ-covered rain pool near the centre of the island on August 28th.

Histrionicus histrionicus (L.)—Harlequin

About six birds were usually seen swimming and feeding close to the outer islands on trips to Cleland. On August 28th, 17 harlequins were counted on a trip around Cleland.

Melanitta fusca (L.)—White-winged Scoter

A flock of 20 birds was recorded on July 24th off Cleland.

Melanitta perspicillata (L.)—Surf Scoter

A common sight in sheltered bays near the shore. On June 24th a flock of 30 birds flew low over the water past Cleland.

Oidemia nigra (L.)—Common Scoter

Three birds seen in association with white-winged scoters on July 24th.

Haliaëtus leucocephalus (L.)—Bald Eagle

An adult eagle was seen circling high over the island on July 24th. No other eagles were sighted.

Pandion haliaëtus (L.)—Osprey

On July 24th two ospreys were seen in the air off Cleland. Later a nest, with at least two large young, was found on Vargas Island.

Falco peregrinus Tunstall—Peregrine Falcon

One record only of a female flushed from a rocky outcropping on August 28th. The bird flew to a nearby island and, surprisingly, gulls gave little notice.

Rallus limicola Vieillot—Virginia Rail

An unexpected pleasure was the two sightings of this rail on July 24th and August 25th. The bird, presumably the same one, was flushed from the thick grasses bordering a small algæ-covered rain pool near the centre of the island. Once flushed the bird would fly a short distance, perhaps 30 feet, and remain inconspicuous in the protection of the tall grasses at the edge of the petrel colony.

Hœmatopus bachmani Audubon—Black Oyster Catcher

A very common bird frequenting the rocky areas of the island, resting on the upper parts and feeding extensively among the lower intertidal zone. Numbers varied from 20 to about 100 each visit.

On July 24th a nest containing two eggs in advanced stages of incubation was found in a rock crevice. The shallow nest was lined with small shell fragments of

sea mussels. Two other nests, both empty, were also found on the upper shell-covered beaches. Two large young with black-tipped bills and traces of natal down were found on July 24th. None was banded.

Aphriza virgata (Gmelin)—Surfbird

A flock of seven surfbirds was seen on July 24th in association with ruddy and black turnstones.

Guiguet (1961) mentions that this species was seen in numbers on August 4th. Surfbirds are transient along the outer coast, and numbers probably increase as the summer progresses.

Arenaria interpres (L.)—Ruddy Turnstone

Ten birds were counted among surfbirds and black turnstones on July 24th.

Arenaria melanocephala (Vigors)—Black Turnstone

Approximately 50 birds frequented the lower parts of the island during the summer, feeding on small animal life among the dense beds of mussels and barnacles. During the nocturnal hours the birds frequented the higher rocky parts of the island, no doubt seeking shelter from the brisk winds.

Actitis macularia (L.)—Spotted Sandpiper

This nervous " teeter " was startled on two occasions from the rocky edges of rain pools—two on July 24th and one on August 14th.

Heteroscelus incanum (Gmelin)—Wandering Tattler

On our first visit to Cleland we recorded about 40 birds on the lower rocks around the island, often associated with black turnstones and surfbirds. Wandering tattlers, however, seemed more solitary in their habits than the turnstones or surfbirds. By August 25th the tattler population had decreased to about six birds.

Totanus melanoleucus (Gmelin)—Greater Yellowlegs

One record only of two birds on July 24th.

Erolia minutilla (Vieillot)—Least Sandpiper

On July 24th five birds were seen wading and feeding in shallow tide pools at ebb tide. These birds were a regular sight among the tide wrack on the upper beaches for the remainder of the summer, but they were never numerous.

Limnodromus griseus (Gmelin)—Dowitcher

Two records only—three on July 24th and seven on August 25th.

Ereunetes mauri Cabanis—Western Sandpiper

One record only of two birds with least sandpipers on July 24th.

Limosa fedoa (L.)—Marbled Godwit

This large reddish-brown shorebird was first seen on August 14th wading in a shallow tide pool. On August 25th one was seen resting on the upper beach with several least sandpipers.

Larus glaucescens Naumann—Glaucous-winged Gull

The most conspicuous bird on the island. The summer population is probably around 2,000 birds, with a breeding population of perhaps three to five hundred pairs. Nesting is confined to rocky areas around the lower parts of the island. On July 24th a quick nest census was made along the southern side of the island:—

Nest Contents	Number of Nests
0 eggs	8
1 egg	10
2 eggs	15
3 eggs	7
1 egg, 1 young	5
2 eggs, 1 young	7
1 egg, 2 young	11
1 young	8
2 young	17
3 young	14
Total (101 eggs, 118 young)	102

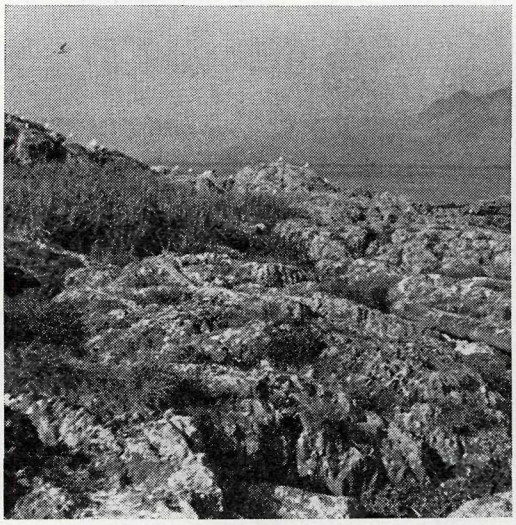


Fig. 8. Bare rock habitat used by breeding and loafing gulls.

All young found were small, indicating a slightly later hatching period than that of our more southern gull colonies.

On July 24th 133 nestlings were banded, and on August 2nd another 300 were banded. Band series were as follows: 667-12168 through 667-12500, 697-51101 through 697-51200, a total of 433.

During banding, nestlings sometimes become excited and cough up partially digested food. Three foods recorded were an 8-inch sea pen (*Leioptilus guerneyi*), Pacific sandlance (*Ammodytes hexapterus*), and fragments of small purple sea stars (*Pisaster ochraceus*).

Larus occidentalis Audubon—Western Gull

On our first visit, three westerns were seen resting near the water's edge with glaucous-winged gulls. On August 14th we observed a western gull on territory with glaucous-winged gulls. On closer inspection the bird flew off and did not return before our departure. Pearse (1946) suggests that a few pairs of western gulls may breed with glaucous-winged gulls on the outer west coast and also that hybridization may occur between the two.

Larus californicus Lawrence—California Gull

About 50 birds frequented the island and adjacent waters in late July, numbers decreasing to about six birds by the end of August.

Larus delawarensis Ord—Ring-billed Gull

One bird seen on August 25th resting with California gulls on seaweed-covered rocks close to Cleland.

Larus canus L.—Mew Gull (Short-billed)

Two sightings only—three on July 24th and two on August 28th.

Larus philadelphia (Ord)—Bonaparte Gull

A small flock of seven immature birds was seen on the water near the island on July 24th.

Larus heermanni Cassin—Heermann Gull

Uncommon on Cleland but quite common on nearby rocky islets. On July 24th about 100 birds were estimated roosting on Plover Reef, off the north-east corner of Cleland. Guiguet (1961) reports 50 to 60 birds roosting on the north side of the island.

Xema sabini (Sabine)—Sabine Gull

One record of an adult bird flying low over the water near Cleland on August 25th.

Uria aalge (Pontoppidan)—Common Murre

Very common in littoral waters along the coast, usually not venturing too close to the island. The population seemed to decrease as the summer passed.

Cepphus columba Pallas—Pigeon Guillemot

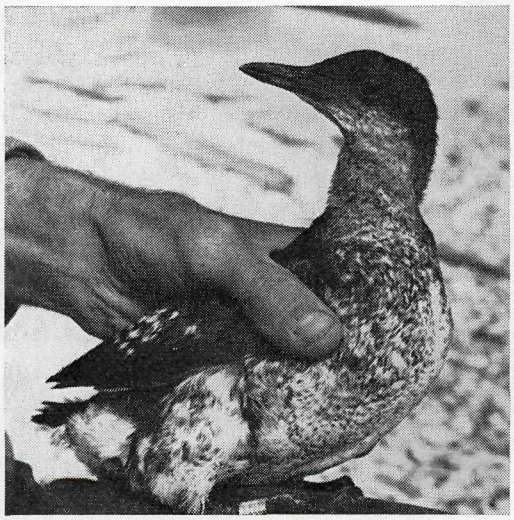


Fig. 9. Young banded pigeon guillemot, Cleland Island, 1967.

Very common. Guiguet (1961) estimated 1,000 birds flying around the island. This summer about 700 birds frequented the island, with a breeding population of about 200 pairs.

The pigeon guillemot seems to have no preference as to nesting location on Cleland. Nests were found in rock crevices, under clumps of fireweed, under drift logs, in abandoned puffin burrows, and among thick grasses. On July 24th six nests were found — three contained one advanced egg each, the remainder a single small young.

Three large young were banded on August 14th (band numbers 524-78908 through 524-78910).

Brachyramphus marmoratum (Gmelin)—Marbled Murrelet

Very common in waters near Cleland and adjacent islands. On July 24th, 105 birds were counted by telescope from atop the island.

Ptychoramphus aleuticus (Pallas)—Cassin Auklet

No live birds were seen or active burrows found, but three freshly dead adults were found—two on July 24th and one on August 14th.

We suspect this auklet may nest on the island; perhaps their burrows are beneath the impenetrable rose bushes toward the top of the island. Guiguet (1961) suspected their nesting here.

Cerorhinca monocerata (Pallas)—Rhinoceros Auklet

On our first visit to the island we noticed immature rhinoceros auklets were quite common along the outer shores and especially so near Cleland. We suspected

that this species might nest on Cleland as Guiguet recorded its burrows there in 1961. After a thorough search of the island, we found a small (perhaps 75 feet square) soft-soil area riddled with large burrows. The entrances were about 6 inches in diameter and the burrows themselves long and twisted. Some burrows paralleled the surface soils, while others angled deep into the soft earth before levelling off. Few burrows were straight; many side branches gave the small colony a honeycomb effect. Walking over colony was almost impossible, and consequently only extreme caution would prevent a foot from penetrating a burrow. We counted 47 burrows and checked four of these by digging. We found four large young and one adult bird. Nesting materials were few, but occasionally a few grasses lined the end of a burrow.

Fig. 10. Rhinoceros auklet burrow.

The colony is divided in two by a large rocky outcropping. The main colony is situated near the eastern end of Cleland and starts where vegetation meets bare rock. Several burrows were found below the main colony beside the petrel nesting area. These burrows were checked, but none was occupied. We have reason to suspect, however, that they were used this year.

Unlike most rhinoceros auklet colonies in British Columbia (Drent and Guiguet, 1961), this colony has a horizontal aspect; that is, on a relatively level terrain. No steep wooded or brush-covered cliffs are to be found, so the birds must either scramble several hundred feet through thick grasses and over bare rock to reach water or scamper to higher parts of the island before they can take wing.

On August 25th three young rhinoceros auklets were banded (numbers 626-32834 through 626-32836).

Drent and Guiguet (1961) list Pine Island, off the northern tip of Vancouver Island, as the southernmost rhinoceros auklet breeding colony in British Columbia. The discovery this summer of this small but seemingly flourishing colony extends the known breeding range of

Fig. 11. Young rhinoceros auklet, Cleland Island, 1967.

this species another 160 miles southward along the outer coast of British Columbia. South of the Canadian border there are colonies along the coast of Washington State.

Lunda cirrhata (Pallas)—Tufted Puffin

A common breeding bird on Cleland and active in daylight. On July 24th, 75 to 100 birds were estimated using the island for nesting purposes. Most burrows were found toward the upper reaches of the island, usually located in the sides of the steeper grassy rock outcroppings where quick flight to the water was possible.

Two burrows, about 6 feet in length, were dug out. Each contained a large young. Both were banded (626-32831 and 626-32832). On August 25th an immature puffin was captured on the bare rocks near the puffin burrows by night-lighting and banded (626-32833).

Puffins are most abundant around 8 p.m., when roosting flights to the island are made.

Puffins have been recorded on Cleland previously. Cowan (I. McT., MS.) collected an adult on May 9, 1930, and Guiguet (1961) collected an adult on August 4th.

Selasphorus rufus (Gmelin)—Rufous Hummingbird

At least 10 birds were seen around the vegetated areas of the island until mid-August. From observations of aggressive action of these birds, we suspect nesting on the island.

Corvus corax L.—Raven

Not recorded from the island, but two were seen on July 24th flying high past Cleland toward Vargas Island.

Corvus caurinus Baird—Northwestern Crow

Six to ten birds frequent the island throughout the summer. On July 24th an empty nest was found at the base of a rose bush near the top of the island. No evidence of predation was noticed, although it seems likely that the seabird colony could certainly support a small crow population.

Melospiza melodia (Wilson)—Song Sparrow

The only abundant songbird frequenting every conceivable niche on the island. On July 24th we counted 36 birds. The population is probably closer to 50 birds. No nest was found, but we suspect nesting.

Mammals

Peromyscus maniculatus (Wagner)—White-footed Mouse

It is interesting to note that no evidence was found of mice inhabitating the the island. Traps were set on several occasions with negative results, and food placed in strategic locations around the island was untouched.

Guiguet (1961) set out four dozen traps with negative results.

Orcinus orca (Cope)—Pacific Killer Whale

A large male and female were seen about one-quarter mile offshore July 24th.

Eumetopias jubata (Schreber)—Northern Sea-lion

Five were scared from Seal Rocks, a tiny rocky islet just north of Cleland.

AMPHIBIANS

Aneides ferreus Cope—Clouded Salamander

Quite common under driftwood and in rotten logs throughout the main Leach's petrel colony and rhinoceros auklet colony. Specimens were sent to the Provincial Museum, Victoria.

SUMMARY AND CONCLUSIONS

Cleland Island, though small, supports a large and flourishing population of breeding seabirds. Most niches on the island are used by seven species. The breeding birds include fork-tailed petrel (few), Leach's petrel (5,000 pairs), black oyster catcher (3–6), glaucous-winged gull (400 pairs), pigeon guillemot (200 pairs), rhinoceros auklet (25 pairs), and tufted puffin (50 pairs). From behaviour and evidence recorded, we suspect Cassin's auklet, rufous hummingbird, northwestern crow, and song sparrow also breed on Cleland.

According to Drent and Guiguet (1961), both petrels needed confirmation as breeding on Cleland in recent years. This has been done. The breeding rhinoceros auklets are a new record for the island. This extends their known breeding range from the Pine Island colony, off the northern tip of Vancouver Island, about 160 miles south along the coast of British Columbia. There is, however, a large colony of breeding rhinoceros auklets on Destruction Island, off the coast of the State of Washington.

Four hundred and seventy-nine individuals of six species were banded on Cleland. Banding summary: Fork-tailed petrel, 1; Leach's petrel, 36; glaucous-winged gull, 433; pigeon guillemot, 3; rhinoceros auklet, 3; and tufted puffin, 3.

The island itself appears to be devoid of both reptiles and mammals. Perhaps their absence helps to explain the abundant seabird populations on the island. Just what effect, if any, the slugs have on the seabirds is difficult to determine. Future studies might solve this interesting problem.

Comparing past and present records, it appears that the seabird colony on Cleland Island is gradually increasing both in species and numbers. This is most encouraging since many of our small and seemingly insignificant islands that provide sites for colonies (for example, Passage Island near the entrance to Howe Sound) are being lost to real estate.

The west coast of Vancouver Island, especially between the Villages of Ucluelet and Tofino, is now a popular tourist attraction. Land here, except for Long Beach, is being sold privately and is now hard to obtain. Tourists wanting land for summer cottages are now seeking it on the larger islands north of Tofino. In time many of our smaller islands and seabird colonies will be lost forever if naturalists and conservationists do not combine their time and efforts to have them set aside as bird refuges. Reserving Cleland Island would be a good start.

ACKNOWLEDGMENTS

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