

PROVINCE OF BRITISH COLUMBIA
Department of Education

PROVINCIAL MUSEUM
of NATURAL HISTORY
and ANTHROPOLOGY

Report for the Year 1947



VICTORIA, B.C. :
Printed by DON McDIARMID, Printer to the King's Most Excellent Majesty.
1948.

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

MAY IT PLEASE YOUR HONOUR:

The undersigned respectfully submits herewith the Annual Report of the Provincial Museum of Natural History and Anthropology for the year 1947.

W. T. STRAITH,
Minister of Education.

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

PROVINCIAL MUSEUM OF NATURAL HISTORY
AND ANTHROPOLOGY,

VICTORIA, B.C., June 28th, 1948.

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

SIR,—The undersigned respectfully submits herewith a report of the activities of the Provincial Museum of Natural History and Anthropology for the calendar year 1947.

I have the honour to be,

Sir,

Your obedient servant,

G. CLIFFORD CARL,

Director.

DEPARTMENT OF EDUCATION.

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

Lieut.-Col. F. T. FAIREY, *Superintendent.*

PROVINCIAL MUSEUM OF NATURAL HISTORY AND ANTHROPOLOGY.

Staff:

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

GEORGE A. HARDY, *General Assistant.*

A. E. PICKFORD, *Assistant in Anthropology.*

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

BETTY C. NEWTON, *Artist.*

SHEILA GRICE, *Typist.*

ARTHUR F. COATES, *Attendant.*

PROVINCIAL MUSEUM OF NATURAL HISTORY
AND ANTHROPOLOGY.

OBJECTS.

- (a) To secure and preserve specimens illustrating the natural history of the Province.
- (b) To collect anthropological material relating to the aboriginal races of the Province.
- (c) To obtain information respecting the natural sciences, relating particularly to the natural history of the Province, and to increase and diffuse knowledge regarding the same.

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

ADMISSION.

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

DEPARTMENT OF EDUCATION

The Honorable W. T. STEARNS, Minister

1100 - Col. F. T. FINE, Superintendent

PROVINCIAL MUSEUM OF NATURAL HISTORY AND ANTHROPOLOGY

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(Section 4 "Provincial Museum Act", R.S.B.C. 1984 c. 241)

ADMISSION

The Provincial Museum is open to the public free of charge on Tuesday afternoon 1 p.m. to 5 p.m.

REPORT OF THE PROVINCIAL MUSEUM FOR THE YEAR 1947.

REPORT OF THE DIRECTOR.

The varied activities carried on by the Provincial Museum during the year 1947 are outlined on the following pages.

EXHIBITION AND PREPARATION.

The rearranging and relabelling of the Indian exhibit, which was undertaken in 1946, was completed early in 1947, and many favourable comments have been received concerning the improvements in the display.

The exhibit of living animals on the main floor was augmented during the summer months by a display of living insects collected and arranged by Mr. Ron Forbes. Included in the exhibit were aquatic insects of various kinds, beetles, crickets, termites, and other common forms. A colony of bees contributed by Dr. J. B. Munro, Deputy Minister of Agriculture, received considerable attention.

Temporary exhibits have included the skull of an Indian woman of high degree (judging by copper ornaments found in association with the remains) and a sea-otter skin on permanent loan from the United States Fish and Wildlife Service.

SPECIAL EXHIBITIONS.

The Sixth Annual Exhibition of British Columbia Indian Arts and Crafts was opened by Lieutenant-Governor Charles A. Banks on June 10th. Sponsored by the British Columbia Indian Arts and Welfare Society, the display featured the work of Miss Judith Phillis Morgan, a Tsimshian student at the Alberni Residential School, who was awarded the society's scholarship of \$150. Other paintings included those by Bernard George, Henry Jones, Wilson Bob, and other students from both the Alberni Residential School and the Christie Indian School at Kakawis.

An exhibition of wild-flower paintings by Miss Emily Sartain, of Victoria, was opened on July 10th under the ægis of the Society for the Preservation of Native Plants. The collection of seventy-six water colours attracted considerable attention on the part of Museum visitors during the period of greatest attendance.

FIELD-WORK.

During the period April 12th to 17th the Director accompanied officials of the Dominion Department of Fisheries on a trip to Knight and Kingcome Inlets where sea-lions congregate each year at the time of the eulachon run. Motion-pictures and still photographs were obtained of sea-lions in action and of the local Indians gathering and processing eulachons. Grateful acknowledgment is made of the assistance of Mr. J. F. Tait, Fisheries Supervisor at Nanaimo, who made this trip possible, and of the crew of the C.G.S. "Kitimat," in the charge of Capt. C. W. Earnshaw, who added much to the success of the venture.

From May 28th to June 8th field-work was carried on in the Skagit Valley in connection with the survey of Manning Park, which was commenced in 1945. The party consisted of G. C. Carl, G. A. Hardy, and a temporary assistant, J. D. Yarwood. By kind permission of Mr. F. Schlickeisen, project manager of the Silver-Skagit Logging

Company, we were able to travel over the company logging road to the old Whitworth ranch, where Mr. Harold Fletcher, caretaker, kindly permitted us to make our headquarters. From this point a short general survey was made of a portion of the area which will eventually be flooded by a power project on the Skagit in the State of Washington and an overnight trip was made to Lone Goat Mountain on the Skyline Trail through Manning Park. The specimens and data collected will be combined with those collected in Manning Park on the previous occasion.

During the period August 26th to 31st a field-party, consisting of G. A. Hardy, J. D. Yarwood, and F. L. Beebe, made a collecting-trip to the Jordan Meadow area, north-west of Victoria. The results of this trip are reported upon elsewhere in this report.

At other times during the year collecting-trips have been made to the Lost Lake area by Mr. Hardy, who is conducting an intensive study of plant-animal relationships in this district.

PUBLICATIONS.

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

By G. Clifford Carl—

“The Alaska Fur-seal Industry and Canada’s Interest.” Report of the Provincial Museum for 1946, pp. 21–24, 1947.

“Natives of the Pribilof Islands.” *The Native Voice*, Vancouver, B.C., Vol. 1, No. 2, January, 1947.

“The Provincial Museum and its Relationship to Wildlife Conservation.” Report of the Proceedings of the Game Convention, B.C. Game Dept., pp. 52–54, 1947.

“Mammals of Vancouver Island.” *Victoria Naturalist*, Vol. 4, No. 1, pp. 4–9, 1947.

“The Pacific Leatherback Turtle.” *Victoria Naturalist*, Vol. 4, No. 4, p. 47, 1947.

By G. A. Hardy—

“Two Interesting Fungi from John Dean Park.” *Victoria Naturalist*, Vol. 4, No. 5, pp. 54, 55, 1947.

“Fourth Annual Fungus Foray.” *Victoria Naturalist*, Vol. 4, No. 5, pp. 56, 57, 1947.

By A. E. Pickford—

“Prehistoric Cairns and Mounds in British Columbia.” *B.C. Hist. Quarterly*, Vol. 11, No. 4, October, 1947.

By J. A. Munro (Dominion Wild-life Officer for British Columbia)—

“Observations of Birds and Mammals in Central British Columbia.” Occ. Paper No. 6, B.C. Prov. Museum, pp. 1–165, figs. 1–52, January, 1947.

By J. W. Eastham (Provincial Plant Pathologist, Vancouver)—

“Supplement to ‘Flora of Southern British Columbia’ (J. K. Henry).” Special Publication No. 1, B.C. Prov. Museum, pp. 1–119, 1947.

By J. A. Munro (Dominion Wild-life Officer for British Columbia) and I. McTaggart Cowan (Department of Zoology, University of British Columbia)—

“A Review of the Bird Fauna of British Columbia.” Special Publication No. 2, B.C. Prov. Museum, pp. 1–285, figs. 1–42, December, 1947.

The type-script of “The Fresh-water Fishes of British Columbia,” by G. C. Carl and W. A. Clemens, was almost completed during the year; it is planned to publish this material in the handbook series.

MOTION-PICTURES.

The motion-picture film based on material collected on the Pribilof Islands, Alaska, in 1946 was augmented by the addition of several hundred feet of film obtained from Dr. Georges Prefontaine of the University of Montreal, to whom the Museum is much indebted. We now have a 1,600-foot duplicate film which has been of considerable use in public lectures.

Through the generosity of the Fouke Fur Company, of St. Louis, Missouri, a short reel of film was obtained showing the birth of seals on St. Paul Island.

The films obtained of the Indian eulachon fishery are being combined with others to make a motion-picture "short" featuring the eulachon in Indian life. Further material is also being gathered concerning whales and other sea-mammals.

EDUCATION.

MUSEUM LECTURES.

The following programme of Saturday morning lectures was presented to school-children of the Greater Victoria area during February and March:—

Date.	Topic.	Speaker.
February 15.....	" Birds ".....	Mr. J. A. Munro, Dominion Wild-life Officer, Okanagan Landing, B.C.
February 22.....	" Mountain Building ".....	Mr. George Winkler, Mining Engineer, Victoria, B.C.
March 1.....	" How to Paint a Picture ".....	Mr. John Kyle, Night-school Instructor in Art, Victoria, B.C.
March 8.....	" Sea-shore Animals ".....	Mr. George A. Hardy, Botanist, Provincial Museum, Victoria, B.C.
March 15.....	" Fur Seals of the Pribilofs ".....	Dr. G. Clifford Carl, Director, Provincial Museum, Victoria, B.C.
March 22.....	" The Insect World ".....	Dr. K. M. King, Dominion Entomologist, Victoria, B.C.
March 29.....	" Mammals ".....	Dr. Ian McT. Cowan, Department of Zoology, University of British Columbia, Vancouver, B.C.

Total attendance, 3,041.

We are again pleased to thank here the various outside speakers who contributed to the success of this series and also the British Columbia Electric Railway for again granting special travelling privileges to school-children attending the lectures.

This year a new plan was inaugurated in the form of a motion-picture programme offered to the general public on Sunday afternoons. On each Sunday, during the period in which lectures were given to school-children, films were shown in the Museum to audiences varying in size from 40 to 150 people. The response has been so encouraging that the programme will be continued in other years.

OTHER LECTURES.

During 1947 lectures and film-shows have been given by members of the Museum staff to the following organizations: Royal Oak Parent-Teacher Association, Victoria Women's Canadian Club, Victoria West Parent-Teacher Association, Outdoors Club, Belmont Church Men's Club, Victoria Natural History Society (Zoology Group), Victoria Rotary Club, Fairbridge Farm School, Ladysmith Lions Club, B.C. Alpine Club (Vancouver Section), Burrard Lions Club (Vancouver), Kitsilano High School (Vancouver), Rest Haven Hospital (Sidney), St. Mary's Church Men's Club (Victoria), Kelowna Rod and Gun Club, Kelowna High School, Kamloops High School, Kamloops Section of University of British Columbia Alumni and Outdoors Club, Senior Zoology Students (University of British Columbia), Women's Auxiliary of Fairfield United Church (Victoria), Vancouver Rotary Club, New Westminster Rotary Club, Nanaimo Gyro Club, Brechin School (Nanaimo), Duncan Consolidated School, Victoria Horticultural Society, Victoria Electric Club, Women's Canadian Club (Vancouver), Saanich Playground Club, Victoria Summer School, Sidney Nature Club, Empress Hotel staff,

Women's Canadian Club (Alberni), Alberni Indian Residential School, Canadian Club (Courtenay), Courtenay High School, Women's Canadian Club (Nanaimo), Canadian Club of Cowichan (Duncan), St. Michael's School (Victoria, two lectures), Mount St. Mary Hospital (Victoria, two shows), Canadian Society of Forest Engineers (Victoria), Agricultural Institute of Canada (Victoria Section), Canadian Phyto-pathological Society (Victoria Section), British Columbia Game Convention (Harrison Lake).

In addition to these, numbers of school classes and other groups have been guided through the Museum and have been given instruction by members of the staff, particularly in connection with the display of Indian arts and crafts.

Several demonstrations were also given to the junior members of the Victoria Natural History Society, who meet in the Museum on Saturday mornings during the fall and winter months.

Also under this heading may be noted the Museum and staff facilities extended to Miss Judith Morgan, Tsimshian artist, working under a scholarship awarded by the British Columbia Indian Arts and Welfare Society. The instruction received by Miss Morgan was under the direction of Mr. George Sinclair, art instructor at the Indian Residential School, Alberni.

SCHOOL LOAN MATERIALS.

A further addition to the material used in teaching Indian life in schools is in the form of a cardboard diorama depicting the interior of a Coast Salish "long-house," prepared by Miss Betty Newton. In addition to this, Miss Newton has prepared copies of the following dioramas or panels: "Skidegate Village" and "Cowichan Potlatch."

A number of these loan materials were circulated among schools of the Greater Victoria area during the spring months through Miss Marian James, Director of Kindergarten Primary Education.

RESEARCH.

Mr. A. E. Pickford has continued his researches into early Indian life in connection with the series of type-scripts being prepared for school use. Those now completed include the Coast Salish, Interior Salish, Nootkan, Haida, Kootenay, Sekani, Tsimshian, and Kwakiutl.

Mr. G. A. Hardy has been collecting further material relating to the ecology and plant succession as found in a relatively undisturbed area in Saanich, as well as material of a general nature relating to plants of the Province. The life-histories of certain local insects have also been studied in detail.

ATTENDANCE.

The number of visitors to the Museum during 1947 is summarized as follows:—

Month.	Registered.	Estimated.
January	1,621	2,027
February	2,038	2,690
March	2,081	2,875
April	2,273	3,642
May	2,603	3,480
June	4,127	6,800
July	7,554	9,530
August	8,280	11,110
September	5,178	7,850
October	2,267	2,783
November	1,225	1,640
December	1,217	1,360
Totals	40,464	56,587

In addition, there were 3,041 children who attended the Saturday morning lectures, over twelve school classes, twenty Junior Naturalist classes, four groups of naval officers, and one British Columbia Police class, making an estimated total of over 60,000.

Compared with former years, the estimated attendance is less than that of 1946 by 7,000 and under that of 1945 (a record year) by 16,000 persons.

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

Residence.	Registration.	Residence.	Registration.
British Columbia	1,465	Washington	1,775
Alberta	405	Oregon	703
Saskatchewan	376	California	1,205
Manitoba	265	Alaska	13
Ontario	199	Other States	907
Quebec	65	Great Britain	67
New Brunswick	4	Other countries	72
Nova Scotia	16	Country not stated	6
Prince Edward Island	5		
Newfoundland	4	Total	4,748
Yukon Territory	2		
	—	Grand total	7,554
Total	2,806		

Compared with a similar analysis of the attendance for July, 1946, the registration during this month was slightly higher in 1947. The various Provinces and States were represented in approximately the same proportion as in the former year, indicating that tourist travel has remained about the same.

STAFF CHANGES.

By a special arrangement the Museum regained the services of Mr. A. E. Pickford, who retired in the fall of 1946. This allowed him to complete the rearranging and relabelling of the Indian exhibit commenced in 1946 and also to prepare further type-scripts for school use, as mentioned elsewhere. We are indeed fortunate to have obtained this extension of time.

In December Mr. G. A. Hardy was made general assistant on the Museum staff. He will continue to be in charge of the botanical and entomological work and will take on other administrative duties in addition.

During the summer months Mr. Ron Forbes was associated with the Museum as student-assistant. During this period he installed and maintained an exhibit of living insects and related forms, and completed the resorting and fumigation of stored material.

As field assistant, we obtained the services of Mr. J. D. Yarwood, a senior university student, who accompanied us on two field-trips. Mr. F. L. Beebe, Vancouver artist and biologist, was a volunteer assistant on one of these expeditions.

REPORT OF THE BOTANIST.

ACTIVITIES.

The routine work of accessioning, mounting, and naming specimens and caring for the herbarium has continued throughout the year without abatement. Additional storage-space, always a problem, has now become a major requirement.

Recorded accessions number 948 sheets, excluding fungi, lichens, and mosses. Over and above these, 700 plants were brought in for identification or for other information.

Considerable headway has been made with the mounting, labelling, and filing of specimens with the help of Miss S. Grice. A total of 2,633 sheets have thus been completed for shelving as soon as space can be found.

As in previous years, the seasonal wild-flower exhibit has been maintained and shows no lack in interest to the visiting public. Advantage of this space is taken to stress matters of current interest—poisonous plants, garden weeds, edible berries, and so forth.

It is found that an interest in natural-history subjects is increased where there is a periodical change of subject-matter, such as obtained with the seasonal wild-flower case, for it is known that several visitors regularly follow up the cycle of the flowers as it progresses through the year. During the winter months evergreen trees and shrubs replace the flowers of spring, summer, and autumn.

A percentage of the botanist's time is taken up with the preparation and delivery of lectures, talks, and demonstrations to schools, teachers' organizations, and similar groups and institutions.

Two field-excursions of a general biological nature were undertaken, in which botanical investigations formed an essential part of the activities. One was to the Skagit Valley, contiguous to the western boundary of Manning Park, where a series of plants was collected, partly as a continuation of the park survey and partly to assess the flora of the Skagit Valley before it is flooded by the projected construction of a dam. The second field-trip was to Jordan Meadows, west of Shawnigan Lake. It is felt that a permanent record of this area is desirable while still in the primeval condition and before the encroachments of civilization have changed its native economy. In addition to the larger excursions, a certain amount of local field-work was undertaken, chiefly arising from the need to supply the wild-flower exhibit with fresh material. During these it was found possible to include observations of a general biological nature. By concentrating on a particular area, a week-by-week record of its wild life may be obtained and later may prove to be of some value as a basis of comparison in a study of the fluctuating numbers of the native fauna and flora, especially in regard to their reactions to a changing environment. Material gathered on these occasions will be used as a basis for future publication. A manuscript on the willows and certain birds has already been completed.

ACKNOWLEDGMENTS.

As in other years, the co-operation of survey parties and private individuals has continued, resulting in very desirable additions to the herbarium. By this means also much valuable information concerning the plants of this Province is obtained. The northern portion of British Columbia is still a botanical *terra incognita*, and no organized work has yet been undertaken to bring what is known into one publication. Much of this area is still in need of more intensive study before it can be said to be thoroughly known. While various collections have been made by parties outside British Columbia, much of this material is not represented in our herbarium. Until representative specimens are obtained, our collection cannot be said to be sufficiently authoritative to

supply a basis for a full knowledge of our botanical resources. It is by helping to fill these gaps that the collections made by members of the survey parties are so much welcomed.

Among those who contributed in this manner are G. C. Emerson, of the Topographic Surveys, who contributed an excellent series of plants from Terrace; A. G. Slocomb, of the same department, with plants from the West Coast of Vancouver Island; J. A. Munro, Dominion Wild-life Officer, who collected a nice series of plants from the Creston area.

I would like to take this opportunity of thanking those friends of the Museum who have provided fresh material for the wild-flower case. Through their kindness many species of flowers have been on view that would otherwise not have been shown.

I wish to express my thanks and appreciation also to the following for their kindness in determining difficult species: Dr. C. R. Ball, Plant Extension Service, United States Department of Agriculture, Washington, D.C.—Salix; Mr. J. W. Eastham, Provincial Plant Pathologist, Vancouver, B.C.—Juncaceæ, Gramineæ, Cyperaceæ; Dr. Leon Kelso, Washington, D.C.—Castilleja; Mrs. H. Mackenzie, Victoria, B.C.—Bryophytes; Mr. A. E. Porsild, National Museum of Canada, Ottawa—Compositæ.

MISCELLANEOUS NOTES.

The following record is an addition to those given in the "Flora of Vancouver and Queen Charlotte Islands," 1921:—

Acer circinnatum Pursh. Cowichan. E. H. Garman. August 28th, 1945.

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

Bidens Beckii (Torr) Green. Creston flats. J. A. Munro. August, 1947.

REPORT OF THE ENTOMOLOGIST.

The major activity in the entomological department is connected with the routine inspection and fumigation of the collections. Much of this work was efficiently done by Mr. Ron Forbes, who was on the Museum staff for the summer months.

The general public continues to show a marked interest in insects in general and of insect pests in particular. Every effort is made to satisfy all inquiries, either by direct information or by reference to sources of a more specialistic nature.

Reports of insect occurrences of any nature are encouraged, for in this way much valuable information has come to hand, the results of which have often proved to be worth publishing under various headings, according to the species involved.

During 1947, for instance, in the group of the long-horned beetles, two species new to Vancouver Island and two rarely seen species have been reported. These records will be published in the British Columbia Entomological Society proceedings.

Among recent contributors of material are Mr. G. Stace Smith, of Creston, who donated a collection of Coleoptera of various orders, and Mr. R. Guppy, of Wellington, who supplied a number of named Diptera. We are indebted to Mr. Hugh B. Leech, California Academy of Sciences, San Francisco, Calif., for identifying aquatic Coleoptera and, through him, to Dr. E. C. Van Dyke for naming Carabidæ. To Mr. J. R. Llewellyn Jones, of Cobble Hill, we are indebted for a similar service in the Lepidoptera.

REPORT OF THE ANTHROPOLOGIST.

In the Annual Report for 1946 it was shown that the rooms in which the anthropological collections are displayed were redecorated, after which a rearrangement of the exhibits had been made. Due to the retirement of the anthropologist in September, this work was discontinued until the opening of the new year when Mr. Pickford resumed his duties with the Museum. Finishing touches were then added to the exhibits, and the important work of labelling was undertaken in such a manner that the exhibits are now largely self-explanatory.

Projects of archæological field-work during the year included a preliminary study of the traces of native fortifications and associated burial cairns on Southern Vancouver Island. In this work Mr. Cecil French lent valuable assistance. Due to Mr. Pickford's visit to the hospital in July and August, the work was not carried to a conclusion. A field-study of ancient Indian pictographs in the Lillooet and Seton Lake areas was made available to the Museum through the excellent work of Major H. F. Tasker Taylor. The land on which these interesting relics were found proved to be Crown property, therefore representations were made to the Lands Department and the area was set aside in perpetuity as a historic site. Similar action was taken in regard to the well-known petroglyphs at Nanaimo. Mr. Bruce McKelvie approached Mr. H. R. Plommer, general manager for the Canadian Collieries, on whose land these petroglyphs were situated and, through a representation of these gentlemen, a deed of the land to the Provincial Government has now been prepared. Co-operation in this way by members of the public is much appreciated by the Museum authorities.

Lectures on anthropological subjects were delivered to several groups, including a group at the Christ Church Memorial Hall, the Community Workers' Club, the Grey Lines personnel, and others. On the floor of the Museum the local Parent-Teacher Association was addressed, as were several of the local schools and groups of interested visitors.

Publications of the season include the appearance in the British Columbia Historical Quarterly of an article prepared some time ago by Mr. Pickford on the prehistoric cairns and mounds in British Columbia. In the field of publicity much time of the Museum staff was taken up in supplying information to sections of the press and to the growing school of free-lance writers who, finding the public very receptive of articles on native life, are devoting their energies to stimulating this branch of education. In conjunction with the pictorial panels designed for use in the local schools (as to which *see* Annual Report, 1945) two more scripts were added, each of about 15,000 words. In the script series now prepared are the following: (1) The Haida of the Queen Charlotte Islands, (2) The Tsimshian, (3) The Nootka, (4) The Coast Salish, (5) The Interior Salish, (6) The Kootenay, and (7) The Sekani, the latter tribe being a northern section of the nomadic Dene or Athapascan people of the Interior.

Every effort is made by the Museum to stimulate interest in the Indians native to British Columbia. To this end assistance was extended to the Vancouver Art Gallery at the time of their Christmas exhibit, when certain material was loaned. Letters received at the Museum indicate that interest is growing in anthropological matters. In appreciation of this interest much time is spent in supplying information to correspondents, special attention being given to prospective tourists.

The policy of the Museum to increase public interest in the social welfare of the Indians has been continued, the staff of the Museum working in co-operation with the British Columbia Indian Arts and Welfare Society, with the Inspector of Indian Schools, and with teachers and others working in the Indian field. In line with this policy the spring exhibit of arts and crafts sent in by the Indian schools was again held,

and won great appreciation from the many who were present to view the pictures and other works of art. In August Mr. Pickford was selected to judge the Indian exhibits displayed at the Pacific National Exhibition held in Hastings Park at Vancouver.

Of the ancient lore of the Indian much remains to be written, and no effort is spared to make the most of opportunities to add to this store of knowledge. To this end—by sympathetic treatment—some of the older Indians lend themselves quite readily by acting as informants. Interviews with surviving pioneers, such as Mr. Frank Partridge, who is over 90 years old, are also recorded.

During the summer a visit was paid by Dr. Marius Barbeau and Mr. Arthur Price, both from the National Museum at Ottawa. A great many photographs were taken by the visitors, and several excellent drawings were made by Mr. Price. Miss Helmi Juvonen, a prominent artist from Seattle, also paid a similar and even more prolonged visit; her work in this connection, we understand, is now in the Seattle Art Museum. In each of these instances the staff of the Museum has been at considerable pains to supply the demands of the visitors.

ACCESSIONS.

During 1947 the following specimens were added to the catalogued collections (figures in parentheses indicate the total number on December 31st, 1947): Indian material, 164 (6,516); plants, 948 (20,678); mammals, 80 (5,307); birds, 21 (9,284); reptiles, 7 (282); amphibians, 3 (558); fish, 10 (693).

INDIAN MATERIAL.

Authentic specimens of ancient Indian handicrafts are becoming increasingly rare. In late years many specimens of great value, from point of view of anthropological record, have been lost by fire and other hazard: Thus many private owners have seen the desirability of placing their specimens in the permanent collections of this Museum, where they will be carefully preserved for the study of aboriginal life by students of generations to come. Such contributions include the following items:—

The F. J. Barrow Collection.—(Gift.) In 1944 a large collection of artifacts passed to this Museum under the will of the late F. J. Barrow, of Sidney. During the past season certain additions were made to this donation by Mrs. Barrow; these include a life-sized human figure of Kwakiutl origin, also a number of bone and stone implements, chiefly arrow and spear heads from the Gulf Islands.

The D. Clayton Collection.—(Purchase.) An important addition was made to the ethnological material from the Bella Coola district in a purchase from Mr. D. Clayton of specimens collected by his father while in charge of the Hudson's Bay post in that area. Among the masks in the collection are included examples from the hands of some of the best carvers on the Coast. Also included are a shaman's apron of unusual design in goat's wool, some aboriginal wood-carving tools, spirit whistles, a "copper," and some large painted storage boxes.

The Mrs. Maurice Proctor Collection.—(Gift.) This collection consists of archaeological material and is chiefly composed of small stone and bone artifacts from Lytton, including decorated concretions and pestle-hammers. There are also a few bone implements from the local shell-mounds.

The Capt. L. A. Peck Collection.—(Gift.) Captain Peck has been a generous donor to this Museum for several years and has now added a number of interesting specimens to his donations. Among these items is one truly remarkable circular stone pile-driver of a black glossy rock, deeply engraved with a human face bearing the patina of great antiquity. Also included are some rare arrows collected many years ago in the

Tsimshian area, also wooden and horn spoons, Haida baskets and numerous other baskets from various sources.

In addition to the above groups, the specimens shown in the following summary have been added to the accession lists:—

TAHLTAN.

By gift—

Skin-scrapers of bone. See Mrs. Maurice Proctor donation.

H Aidan.

By gift—

Two walking-sticks, carved human hand holding snake; sea-bear's head and tribal designs. Mrs. A. S. Robertson, Victoria.

Model canoe, painted aboriginal designs. C. W. Kinlock, Victoria.

Two black slate pipes (broken). B. W. Pearse, Victoria, courtesy Provincial Archives.

Baskets, etc. In Capt. L. A. Peck donation.

Human skull. Commissioner of British Columbia Provincial Police.

By purchase—

Two pipes and one totem-pole, carved in black slate, each with intricate representations of human and mythical animal figures.

Rattle, globular, carved human face, etc.

Goat-horn spoon, carved totemistic design.

Large cedar-bark mat, painted animal figure, etc.

TSIMSHIAN.

By gift—

Arrows, baskets, etc. In Capt. L. A. Peck donation.

KWAKIUTL.

By gift—

Large totem-pole (erected in Thunderbird Park). His Honour the Lieutenant-Governor.

Pile-driver and baskets. In Capt. L. A. Peck donation.

Carved wooden figure (life size). In F. J. Barrow donation.

Human skull and skeletal remains (Mesocephalic), Nimpkish; human skull (Dolichocephalic), Bute Inlet. The Commissioner of British Columbia Provincial Police.

Nootkan.

By gift—

Large whaling-canoe (displayed in Thunderbird Park). His Honour the Lieutenant-Governor.

Baskets. In Capt. L. A. Peck and Dr. G. Clifford Carl donations.

Coast Salish.

By gift—

Jadeite chisel. J. Duff, Sidney.

Netting-needle. Mrs. A. S. Robertson, Victoria.

Open-weave basket. Mrs. A. S. Robertson, Victoria.

Pestle-hammer, stone. Col. C. G. Seymour Bagot, Victoria.

Whale-bone war club. L. Callahan, Denman Island.

Bark-lifter. Mrs. E. G. Posgate, Victoria.

Wooden grave memorial. Miss Josephine Crease, Victoria.

Two food-dishes. Miss Y. E. V. Mesher, Victoria.
 Two canoe-paddles, painted. Miss Y. E. V. Mesher, Victoria.
 Large stone anchor. P. E. Wilford, Victoria.
 Hammer stone. Walter H. Ford, Ganges.
 Model cradle in basketry. In Capt. L. A. Peck donation.
 Archæological material. In F. J. Barrow and Mrs. Maurice Proctor donations.
 Human skulls and skeletons. H. R. Lacon, Denman Island. Mrs. E. C. Posgate, Victoria. Commissioner of British Columbia Provincial Police, Victoria.

By purchase—

Tump line, hand-woven.
 Basket-makers' needles and materials.
 Tray in coiled basketry.

INTERIOR SALISH.

By gift—

Berry basket, with slings. Mrs. A. S. Robertson, Victoria.
 Three worked concretions. Mrs. A. D. Muskett, Victoria.
 Black soapstone pipe. Mrs. A. D. Muskett, Victoria.
 String of copper beads, found in association with human remains. A. W. A. Phair, Lillooet, through courtesy of Vancouver City Museum.
 Archæological material. In Mrs. Maurice Proctor donation.
 Human skulls and skeletal remains from Victoria and Lillooet areas. Commissioner of British Columbia Provincial Police.

BELLA COOLA SALISH.

By gift—

Human skull with (associated) twisted copper neck-piece and four bracelets to match.

By purchase—

Fine collection of masks, etc. In D. Clayton purchase.

DENE.

By gift—

Birch-bark basket. In Capt. L. A. Peck donation.

ESKIMO.

By gift—

Seal-spear, ivory point. (Anon.)
 Model kyak.

CHIPEWYAN.

By purchase—

Birch-bark basket with floral design in porcupine quill.

ASSINIBOINE.

By gift—

Stone hammer, rounded and grooved. J. E. Hastings, Victoria.

BOTANICAL ACCESSIONS.

D. Flynn, Victoria, one; W. H. Forrest, Victoria, one; O. C. Furniss, Alberni, one; Miss M. Legget, Langford, two; J. A. Munro, Okanagan Landing, collection of plants from Kootenay Flats; F. P. Newcomb, Victoria, one; J. F. Palmer, Alberni, one; Mr. Putnam, Lulu Island, one; Mrs. A. Simpson, Winnipeg, Man., collection of

Vancouver Island mosses; A. G. Slocomb, Victoria, collection of plants; L. F. Solly, Westholme, one; H. Toms, Vancouver, collection from Ashton Creek; J. W. Bruce Wagg, Uxbridge, Ont., collection of plants.

ZOOLOGICAL ACCESSIONS.

MAMMALS.

By gift—

- W. B. Delahunt, per F. Weir, Duncan. One wolf specimen.
 Gordon Hardy, Victoria. One brown bat.
 John B. Heal, Victoria. Whalebone specimen.
 Inspector Larsen, per K. Ulrich, Victoria. Skull of muskox.
 A. Olson, Lake Cowichan. Four wolf specimens (skins and skulls).
 A. E. Wale, Millstream. One cougar.

By the staff 10

BIRDS.

By gift—

- Mr. Fraser, per Roger Monteith, Victoria. One golden eagle.
 R. C. W. Lett, Victoria. One humming-bird's nest.
 Mrs. F. Ray, Langford. One bald eagle.
 Lieutenant-Colonel Miles, Victoria. One penguin egg from Falkland Islands.

By the staff 11

FISH.

By gift—

- Dick Brumwell, Victoria. One skipjack.
 W. Egeland, Sidney. One grunt-fish.
 Denis Gaunt, Duncan. One steelhead.
 John B. Heal, Victoria. One wry-mouth.
 R. W. Hull, Victoria. One sculpin.
 Kyuquot Trollers, Victoria. One albacore.
 G. H. Smith, Victoria. One sculpin and one pompano.
 William Stevens, Deep Cove. One cut-throat trout.
 J. H. Todd & Sons, Victoria. One soupfin shark.
 Sandys Wunch, per F. Weir, Duncan. One brown trout.

AMPHIBIANS AND REPTILES.

By gift—

- Dan Leavens, Cultus Lake. Two giant salamanders (*Dicamptodon*).
 D. P. O'Connell, Penticton. One western skink.
 G. Stace Smith, Creston. One western skink.
 Bob and Ron Starkey, Victoria. Two newts.
 Pat Stroyan, per Dan Leavens, Cultus Lake. One tailed toad.
 Mrs. T. L. Thacker, Hope. One salamander.

By the staff 1

INVERTEBRATES.

By gift—

- Ted Brown, Ganges. Twelve ticks.
 Mrs. A. M. Caron, per R. C. W. Lett, Victoria. One hornets' nest.
 Miss Susan Crease, Victoria. Two cases of butterflies.
 R. D. Cumming, Ashcroft. Collection of fresh-water snails.

- R. Frost, Victoria. Two crab-spiders.
 F. Goerty, Vancouver. One sea-shore earwig.
 Miss Ann Hanley, White Rock. One tiger-moth.
 V. B. Harrison, Nanaimo. One beetle and one Ichneumon fly.
 F. T. Humphries, Victoria. One larva of spiny wood-borer.
 Miss M. Jackson, Victoria. One spider.
 Mrs. L. Little, Victoria. One eyed hawk-moth.
 H. A. Munson, Sidney. One beetle.
 F. Raynbaird, Royal Oak. Two polyphemus moths.
 C. A. Roberts, Victoria. One banded borer.
 Miss E. Sartain, Victoria. One caterpillar.
 Bob and Ron Starkey, Victoria. One water-bug.
 S. A. K. White, Victoria. One California prionus.

PALÆONTOLOGY.

By gift—

- A. D. Crease, Victoria. Fossils from Cowichan Lake.
 A. Heighes, Victoria. Marine fossils.

MISCELLANEOUS.

By gift—

- J. Duff, Sidney. Sixteen lantern-slides of prehistoric art.
 Dr. A. L. Aylmer, Victoria. One publication, "A Description of the Character of the Whistling Swan," by Thomas Cook, published in 1823.

ARCHÆOLOGICAL EXCAVATION OF INDIAN MIDDENS.

BY A. E. PICKFORD, PROVINCIAL MUSEUM, VICTORIA, B.C.

In the world at large there is a growing interest in archæological excavation. In late years people have become increasingly aware of the extent to which the results of such excavations throw a great new light on the origins of human race and culture. We begin to understand ourselves and our fellow men much better as this light increases. It is natural, therefore, that we should wish to find out about these things for ourselves and to obtain at least some knowledge at first hand. In British Columbia opportunities for such work are manifold, thus we find many well-meaning persons engaging in what, when reduced to tangible results, is merely "digging for Indian relics."

The object of this paper, however, is to point out that much harm is being done by untrained persons engaged in such digging, and to urge that, when opportunities occur, amateurs can render the best service to science by merely recording the existence of sites and mapping them. Unless sites are threatened by building projects, or by destruction from other causes, the information should be supplied to the Provincial Museum or the University of British Columbia, and the sites left undisturbed. Persons who have thus shown interest will then be contacted, and the possibilities of excavation will be discussed with them.

Here the question of the ownership of the land arises as a governing factor. Important sites on Crown land can be made the subject of an application to the Honourable the Minister of Lands and Forests for a reservation to be made setting the site aside for sufficient period for a scientific examination to be made. In case of private ownership, if a person is unable to restrain the impulse to dig on his own land, we urge that he shall adhere to some such principles as those which follow, then he will have the satisfaction of knowing that his work is well done and, when brought into focus with similar undertakings, will help to build up that sound foundation of knowledge, without which the correct story of the early population of this country cannot be written.

VALUE OF AN EXCAVATION.

The value of an excavation is estimated from the amount of knowledge gained from the work. The artifacts which come to light in the process of digging are only valuable in so far as they add to the sum of that knowledge. A crime is committed against society when unscientific people who, knowing of a site, exploit it for relics, which they either sell or hold on to on account of their imagined or fabulous monetary value. The crime is that an irreplaceable volume of scientific information is destroyed in such a digging. If a penalty could be imposed for such a crime, it should be assessed according to the paucity of notes taken on the spot and failure to enlist the co-operation of persons trained to undertake such work.

The science of archæology is now in adolescence as compared with the swaddling child which represented it in the late nineteenth century. On the American continent, knowledge of the most advanced methods of the science is very largely confined to university graduates. But in the Old Country, where archæological opportunities occur in abundance, a great many well-informed people are gathered in archæological societies to excavate, or to assist professional archæologists in such a way that the maximum of information is placed on record and that the artifacts and other relics are preserved and presented to public view in the best possible manner.

In what follows, space does not permit more than the briefest enumeration of principles, so what we have to offer here is merely a condensation of essentials directed to a particular branch of study—namely, the examination of shell-mounds by the sampling method of excavation.

OBJECT OF THE WORK.

Archæological excavation is directed toward the securing of facts such as will throw light on the lives of prehistoric people. In the minds of average citizens the idea of archæology is too much associated with death and dust. But in the mind of the true scientist this association rests rather with life and the ways of living, even though they be, as they inevitably are, of the past. Thus the evidence for which we look may be expected to bear upon any one of the following cultural aspects: Racial and cultural origins, foods, housing, clothing, industries, and techniques in peace and war. Each new study should be approached as if it were a book from which valuable information is to be obtained. He who digs for relics alone may be likened to the child who tears a book apart in order to secure the coloured plates which it contains, being the while all unaware that in scattering the printed pages to the wind he is losing for ever a valuable source of information about those same plates and the life which they represent.

PRELIMINARY OPERATIONS AND MAPPING.

1. A *map* must be drawn to a scale of feet to show the limits of the area under examination. With this should be included a key map to show the relation of the area to existing land lines. (See Fig. 1.)

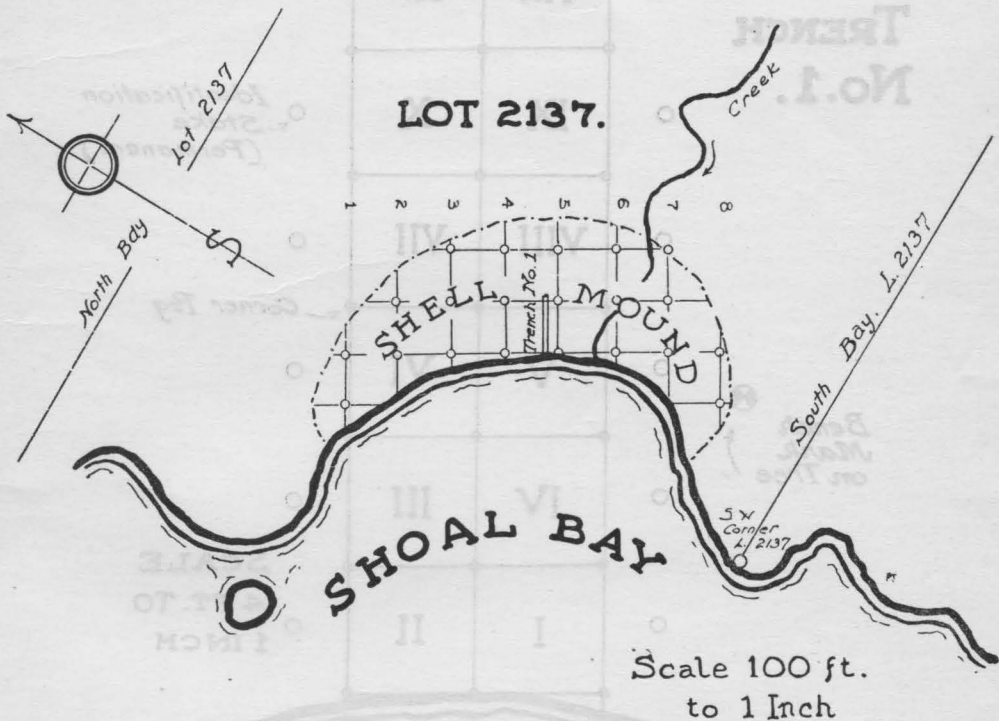


Fig. 1.

2. A *bench-mark*, or point of elevation to which all variations in levels are referred, should be established in the vicinity where it will not be disturbed by the work.

3. From this bench-mark, and by use of an Abney or other level, a *contour map* of the surface of the site should be made, in which the contours are taken at even intervals chosen in accordance with the nature of the site. This contour information, together with fences, buildings, escarpments, and the like, should be plotted on the map drawn in accordance with paragraph 1.

4. To determine the proper place for a sampling trench, *test-holes*, related to a gridiron subdivision of the site, should be dug at regular intervals. Indications of strata should be noted in these test-holes, so that, if possible, a cross-section diagram may be drawn to indicate the trends of these strata. The term "bedding stratum" in this work shall be used to define that original surface of the soil below which no human workings have penetrated.

SAMPLING TRENCH.

5. All excavation done must be related to: (a) a horizontal plane and (b) a vertical plane. The former is established by reference to the bench-mark above mentioned. The vertical plane (b) is established by driving at least three pegs in one straight line, which shall correspond to the middle line of the sampling trench (Fig. 2).

**PLAN
OF
TRENCH
No. 1.**

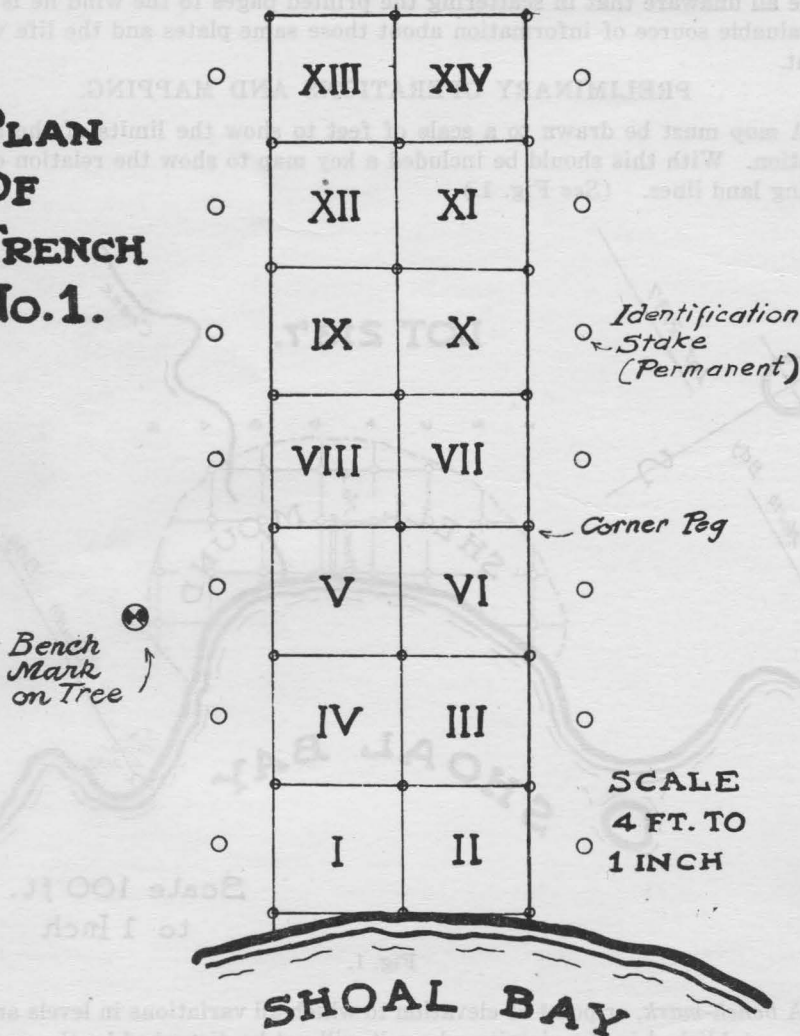


Fig. 2.

6. The lateral limits of the sampling trench must next be pegged out upon the ground in two parallel lines. It is recommended that the distance between these two lines should be in even multiples of feet. At a point selected by critical judgment, a line

joining the parallel lines, and at right angles to them, must be marked by pegs set in the ground to establish that line, which for the sake of convenience, we shall refer to as "the base line of Trench No. 1."

To establish a right angle on the ground, using only two measuring-tapes, proceed as follows:—

On any base line AB fix a point C , 16 feet from B .

Fix the zero end of one tape at C .

Fix the zero end of the other tape at B .

Hold the tape from C at 20 feet.

Hold the tape from B at 12 feet.

Swing the tapes—taut—until these two points meet at the point D .

Then the line BD is at right angles to AB .

MARKING ON THE GROUND.

7. From this base line and proceeding in the direction of the centre of the area, the space between the parallel lines must be marked on the ground by pegs set to define a number of regular squares with sides 2, 4, or 6 feet in length, according to the requirements of the site. This gridiron must be plotted on the map and on the detailed enlargements thereof (as to which *see* later), whereon each square must be assigned a distinguishing letter or number. In view of the multiplicity of the numbers and letters used in these records, it is recommended that the gridiron series be designated by roman numerals. In order further to distinguish these areas on the ground, solid stakes, at least 2 feet high, and bearing the number of the sector must be set up midway of the sector and about 2 feet outside of extreme line of the area to be excavated.

SECONDARY BENCH-MARKS.

8. The next step is to establish a "base of horizontal reference" or arbitrary plane, to which all annotations as to levels shall be referred. This is done by establishing a secondary bench-mark close to the work in hand from which measurements may be taken either by foot-rule or by shots from the Abney level reading on the levelling staff. In actual practice a succession of these secondary bench-marks is set up as the work proceeds, the one falling into disuse as the digging progresses beyond it. But each of these secondary bench-marks must be on the same relative level, as a requisite for which the original and more permanent bench-mark has been established. In the notes this constant arbitrary plane must be referred to as (the) zero (level), all levels below this zero are recorded as minus levels, and those above it as plus levels.

RECORDS OF STRATA.

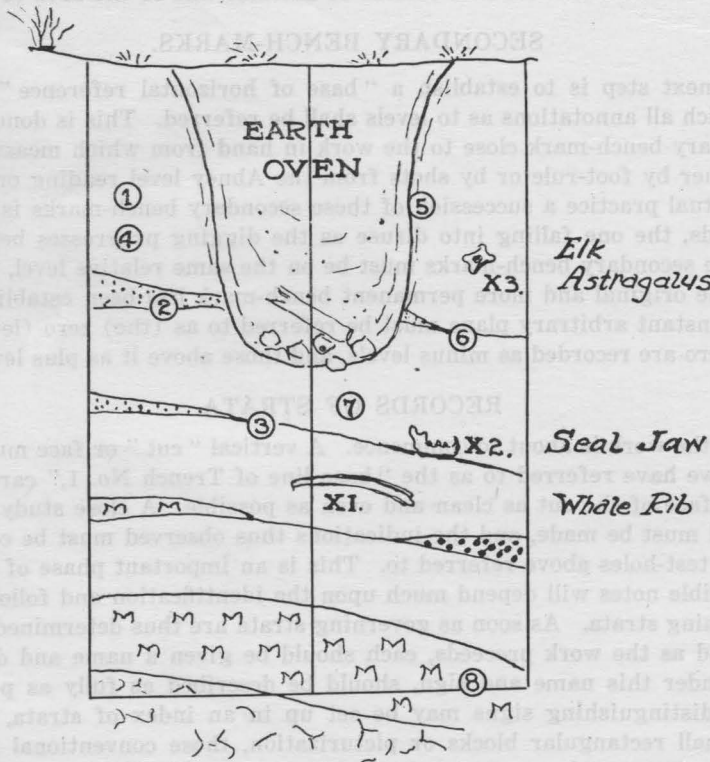
9. Now the work is about to commence. A vertical "cut" or face must be exposed along what we have referred to as the "base line of Trench No. 1," care being taken to leave the face of the cut as clean and even as possible. A close study of the strata thus exposed must be made, and the indications thus observed must be compared with those of the test-holes above referred to. This is an important phase of the work, for clear intelligible notes will depend much upon the identification and following through of the governing strata. As soon as governing strata are thus determined, or as others may be found as the work proceeds, each should be given a name and distinguishing sign, and, under this name and sign, should be described as fully as possible in the notes. The distinguishing signs may be set up in an index of strata, in which, by means of small rectangular blocks or picturization, those conventional markings are shown which are used by geologists and soil experts. There is nothing amiss with setting up one's own series of conventional markings if greater clarity of record may be attained thereby. But, since other people will be interested to examine your work, it is

urged that, in these markings, standard practice should be adhered to as closely as possible. For small-scale work, coloured pencils offer economy of effort in records of strata; when these pencils are used, the index of strata should carry a sample of the colours so employed—this is done by filling in the colour in a small square next to each of the rectangular blocks with conventional markings above referred to.

CROSS-SECTION DRAWINGS.

10. We are still at the vertical cut along the base line of Trench No. 1. We have identified our strata *in situ* with an agreed record of conventional signs. Our next step involves the use of cross-section (or squared) paper. A bound cross-section book is more convenient than loose sheets—it stands up better to the rough usage inevitable in a digging, and sequences are less apt to get mixed. There will be quite a number of these cross-section drawings such as you are about to make, so plan your space accordingly. Sketch in the strata to scale from the humus of the surface to that bottom which we have agreed to call the "bedding stratum." Mark on the face of this cross-section the position of any artifact, bone, or other object of interest which may appear.

CONSOLIDATED
CROSS SECTION for
SUBSECTION "α" of
SECTIONS I & II.



Scale 1" = 1 ft.

Fig. 3.

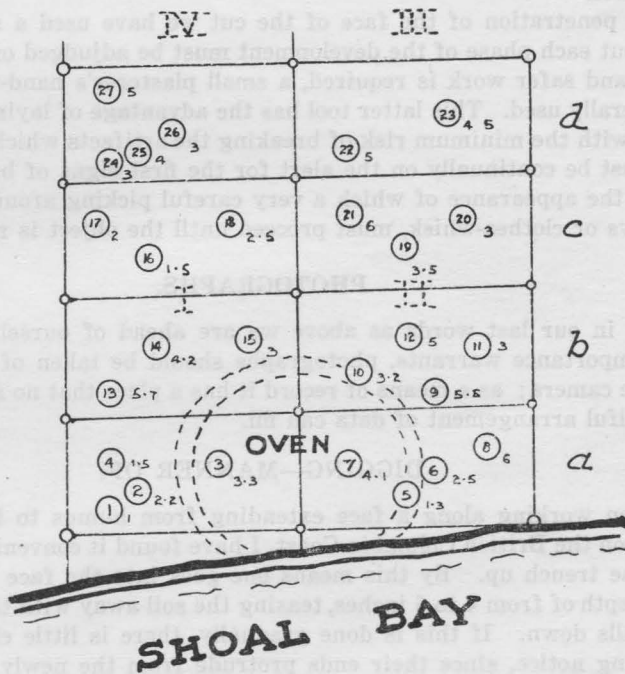
All artifacts and such bones as are worthy of keeping for identification must be given a number, which must be marked on the face of the sketch as well as upon the article itself, which latter must be immediately placed in a safe container. For small artifacts, coin-pockets are used as containers, upon which the serial number of the artifact is marked. Nothing is worse for the work than to have a pile of unnumbered bones and relics piled along the crest of the cut, "waiting to be numbered"; confusion is bound to occur sooner or later unless this practice is checked right from the start. It is desirable to have an independent series of numbers for (1) the artifacts and (2) for the bones and associated material. This may be accomplished by prefixing an "X" and period before the numbers of the second series (e.g., X.267). In the sequence of these numbers a record should be kept showing a brief description of each, as to which record see the following paragraph 11. (See Fig. 3.)

ESTABLISHING POSITION OF FINDS.

11. The work now proceeds until a spot is reached where another cross-section must be drawn. It is well to space these cross-sections on the ground at regular

PLAN OF SECTION No 1, TRENCH No.1.

*Numbers in Circles = Artifact Inventory Nos.
" outside of " = Depth of Find.*



SCALE
1 FOOT TO 1 INCH.

Fig. 4.

intervals, laid out in multiples of the gridiron distance. Bones and relics found in the intervals between these two faces will be numbered in sequence with the others. The position of each, as viewed from above, will be marked upon the detailed enlargement of the map of the section under examination; for this purpose a small circle is used with the number of the object contained within it. Alongside of this circle is marked the depth of the object in its relation to the zero level—this depth is shown in feet and inches. (See Fig. 4.)

INVENTORY OF FINDS.

12. As a check on these entries, an inventory will be kept in which the number assigned to each gridiron square shall appear (each in turn) as a major caption. Subsidiary to this caption in each case shall be columns to show: (a) The number assigned to the excavated object, (b) its depth in relation to the zero level, (c) a brief description of the object, and (d) remarks as to relations to strata or other findings. It may be convenient in this record-book to have the left-hand page reserved for artifacts and the right-hand page for associated material. (See sample of inventory page.)

DIGGING EQUIPMENT.

13. It is with some trepidation that we have first of all to mention the pick and long-handled shovel. We have seen these instruments used with such abuse to the project in hand that one gets to hate the thought of their extended use in scientific work. But they are essential, not only for preliminaries, but also for keeping the job clean as the work proceeds and for playing fair with the landscape in general after the work is over. In close work a bucket and a small short-handled hearth-shovel are useful adjuncts.

14. For penetration of the face of the cut we have used a small hand-fork with advantage, but each phase of the development must be adjudged on its own merits, and where finer and safer work is required, a small plasterer's hand-trowel with an acute point is generally used. This latter tool has the advantage of laying bare the maximum of exposure with the minimum risk of breaking the artifacts which may be encountered. The eyes must be continually on the alert for the first signs of buried objects of bone or stone, on the appearance of which a very careful picking around, together with the use of bellows or clothes-whisk, must proceed until the object is released.

PHOTOGRAPHS.

15. But in our last words as above we are ahead of ourselves in that, in cases where the importance warrants, photographs should be taken of objects *in situ*. Do not spare the camera; as a means of record it has a place that no amount of descriptive words or skilful arrangement of data can fill.

DIGGING—MANNER OF.

16. When working along a face extending from humus to bed-rock in a typical shell-mound on the British Columbia Coast, I have found it convenient to work from the bottom of the trench up. By this means one goes into the face of the exposure to a horizontal depth of from 4 to 6 inches, teasing the soil away with the point of the trowel so that it falls down. If this is done gradually, there is little chance of artifacts or bones escaping notice, since their ends protrude from the newly exposed face where, due to the lack of accumulated debris, they can readily be seen. By this method there is a minimum use of the sieve. The only legitimate use of this latter is to test the debris from the digging; this test should be applied from time to time to prove that nothing is getting past your observation. Items of interest found in the screenings under this method must be counted as "errors," or proof of bad technique; the fault

lies in the fact that such articles cannot be properly placed in their relation to the strata in which they were originally lodged.

ALTERNATIVE METHODS.

17. Although the method above indicated has been found to be of the utmost service in many instances, yet occasions may occur where the topography, the type of midden material, the future use of the ground, or some other factor may prompt an alternative approach. Here again we urge the taking of advice from a competent authority so that the variation of the method shall not prejudice the ultimate record and yet shall be chosen to suit economy of labour and practical time-limits.

HUMAN BURIALS.

18. Human remains are seldom found in the shell-mounds of Vancouver Island, but are more frequent on the Mainland. The study of modes of burial throws an important light on the cultures of the people concerned, therefore this type of exhumation warrants very special care both in the stripping of the soil and in the photographic and other records taken. The subject is worthy of a much more extended discussion than is possible to give within the scope of this article. But in case such encounters are made, the one important point to bear in mind is that we should use every opportunity of familiarizing ourselves with the identity of the individual bones of the human skeleton. This is necessary because in many cases the identity of the bone first coming to light will indicate the "lie" of the skeleton as a whole and will thus give direction to the digging as will enable proper photographs to be made, or a reconstruction of the burial to be accurately drawn. In this work it is always desirable to bring the work to that pitch where there is a maximum exposure of the bones with a minimum disturbance of their position *in situ*. This type of exhumation will be discussed in more extended form in a later publication.

TYOLOGY.

19. It is suggested that Drucker's monograph "Archæological Survey on the Northern Northwest Coast" (Smith. Inst. Bur. Amer. Eth. Bull. 133, 1943) shall be used as a preliminary basis for the classification and reporting of artifacts in this region. It is also suggested that Duncan Strong's "Archæology of the Dalles-Deschutes Region" (Univ. Cal. Pub. Amer. Arch., Vol. 29, No. 1, 1930) shall be used in like manner as a preliminary working basis for such implements as are not treated by Drucker. These suggestions are made in the realization of the necessity for the ultimate preparation of an extended and consolidated system of typology for the Province as a whole.

GENERAL ADVICE.

20. Never fail to vary digging technique where a change of approach promises better results than the more general practice.

21. At all times keep the bottom of your trench clear, and keep the faces of your digging as trim as possible.

22. In a cross-section of strata laid down by human hands, whether wholly or in part, you must expect to find short disconnected bands of soil; it is very difficult to make sense out of these. In fact they are in many cases quite haphazard, but remnants of posts or of buried prehistoric trenches may give the key to the layout. Do not be disappointed if your results are not outstanding; it is on the cards that you may try half a dozen times before you will be able to make a worth-while contribution to knowledge.

23. Keep your imagination on the alert, but temper this imagination with your experience and do not let it run away with you. With too free an imagination one is apt to be looking all in one direction; when you have a working hypothesis—as you should—seek rather to disprove its theory than to build your evidence around it. If there is anything in this theory, its conclusions will be all the stronger for the severity of your tests on the negative side. Do not come to conclusions before your evidence is brought to bear in comparison with similar undertakings in adjacent fields.

SAMPLE PAGE TO SHOW METHOD OF MAKING AN INVENTORY OF ARTIFACTS.

SECTIONS NOS. I AND II.

Subsection "a."

Inventory No.	Object.	Material.	Size.	DEPTH BELOW.		Photo or Sketch Pg.*	Stratigraphic Relations, etc., Refs.
				Zero Level.	Surface.		
1.	Arrow-head.....	Basalt.....	1 1/4"	6.0	1.0		
2.	Needle.....	Bone.....	3" x 1/4"	7.2	2.2		
3.	Harpoon-point.....	Bone.....	5" x 3/4"	8.3	3.3		
4.	Knife.....	Slate.....	2 1/4" x 1"	6.5	1.5		
5.	Wedge.....	Elk-horn.....	6" x 2 1/4"	6.3	1.3		
6.	Awl, ulna.....	Bone.....	4"	7.5	2.5		
7.	Awl.....	Split-bone.....	2 1/4" x 3/4"	9.1	4.1		
8.	Point.....	Bone.....	1" x 1/4"	11.0	6.0		

* N.B.—If no better can be done in the way of a sketch, lay the object on a sheet of plain paper and trace around the edges with a sharp pencil point. Show inventory number against each such sketch.

GENERAL ADVICE

20. Never fail to vary digging technique where a change of approach provides better results than the more general practice.

21. At all times keep the bottom of your trench clear, and keep the faces of your digging as trim as possible.

22. In a cross-section of strata laid down by human hands, whether wholly or in part, you must expect to find short disconnected bands of soil. It is very difficult to make sense out of these. In fact they are in many cases quite haphazard, but remnants of posts or of buried prehistoric trenches may give the key to the jigsaw. Do not be disappointed if your results are not outstanding; it is on the cards that you may try half a dozen times before you will be able to make a worth-while contribution to knowledge.

NOTES ON PLANTS COLLECTED IN 1947, CHIEFLY IN THE ROCKY MOUNTAIN TRENCH, BETWEEN THE ROCKY AND SELKIRK MOUNTAINS OF BRITISH COLUMBIA.

BY J. W. EASTHAM, PROVINCIAL PLANT PATHOLOGIST (RETIRED).

Agropyron dasystachyum (Hook.) Scribn.—Found quite frequently from the Montana boundary north to Invermere, often in alkaline soils. It was not seen west of Cranbrook, although there is a specimen in the Copley herbarium from Merritt.

Andropogon scoparius Michx.—First collected by the writer in 1939 and found to be quite abundant on the same site at Fairmont Hot Springs in 1947. However, no other site was found, so it may have been introduced by human agency. It has a wide range east of the Rocky Mountains, including Alberta.

Calamagrostis montanensis Scribn.—First collected by the writer on the range at Invermere in 1943. In 1947 careful observations were made to determine its range. It was found to be abundant in the Invermere area and to occur at Wilmer, both on the west side of the Columbia Valley. On the east side it extends from north of Fairmont to some distance south of Edgewater. The ranges here have mostly been heavily overgrazed, but in a small protected area above Windermere Beach it formed the dominant grass. As it is common in Alberta and occurs in Kootenay National Park, it may have migrated along the passes through which the Banff-Windermere Highway runs and then extended north and south.

Calamovilfa longifolia (Hook.) Scribn.—This grass, which does not seem to have been previously recorded from British Columbia, was first brought to the writer's notice by Mr. DeBeck, of the Grazing Commission. It was observed for perhaps 15 miles north of the Montana boundary east of the Kootenay River, often forming large beds from the strong scaly creeping rhizomes and in the driest sandy soil.

Festuca idahoensis Elmer.—One of the important range grasses on Tobacco Plains and St. Mary's Prairie, Cranbrook. The northern limit was not observed, as it had passed the flowering stage by the time we moved north to Fairmont. It was also found on the benches at Creston.

Festuca scabrella Torr.—Also a conspicuous grass, from the Montana boundary at least as far north as Skookumchuck Prairie.

Muhlenbergia glomerata (Willd.) Trin.—This name has usually been regarded as a synonym of *M. racemosa*, but Fernald has recently revived its distinctness (Rhodora 45: 231-235, 1943). It was found growing in the warm effluent from the bath-house at Fairmont Hot Springs. According to J. R. Swallen, of the United States National Herbarium, who made the identification, this appears to be the first record of it in British Columbia.

Panicum Scribnerianum Nash.—Found sparingly in rocky ground at the edge of town in Grand Forks, and very abundant in the sandy "gulch" above East Trail. It does not seem to have been recorded previously in British Columbia from east of the Okanagan.

Poa Canbyi (Scribn.) Piper.—Found sparingly on St. Mary's Prairie.

Poa juncifolia Scribn.—Found, in soil probably alkaline, at Cranbrook and Doyle and abundant on a dry flat between Michel and McGillivray in the Crownsnest Pass.

Setaria verticillata (L.) Beauv. var. *ambigua* Parl.—Abundant around the railway-station and along sidewalks in Kamloops, also in the city park. J. R. Swallen, who confirmed the identification, states that it forms the first record of this variety from Canada in the United States National Herbarium. There is a specimen in the Copley herbarium, collected in a garden at Kamloops in 1933, and identified by A. S. Hitchcock simply as the species. This may represent the origin of this infestation, but the

specimen is not immediately available to be checked for this variety. (Introduced from Europe.)

Sphenopholis intermedia Rydb.—One plant of this was found at Canal Flats, the first time the writer has collected it.

Carex Crawei Dewey.—Found to be very abundant in a clay swamp by the highway about 1½ miles west of Golden. It is also very abundant in marshy ground around Kinbasket auto camp on the Big Bend Highway. A few plants were also found along the old canal at Canal Flats, our most southern record.

Carex Parryana Dewey.—A few plants were found in a wet spot by the road near Windermere, the first time the writer has collected it.

Juncus longistylis Torr.—Abundant with *Carex Crawei* near Golden; also found at Cherry Creek, near Kimberley, and at Canal Flats.

Juncus Torreyi Cov.—Found around a hot-spring basin at Fairmont Hot Springs.

Allium Schoenoprasum L. var. *sibiricum* (L.) Hartm.—Very abundant on the flood plain of Kinbasket Lake, Big Bend. A solitary plant was also found on the lower slope of the forest-fire lookout mountain near McGillivray in the Crowsnest Pass; altitude, about 4,500 feet.

Calochortus apiculatus Baker.—Occurs from the Montana boundary north to Windermere, being commoner in the south. Westward, it extends continuously to Wynndel, and appears to reach its greatest development in the Creston area. It was found east of Michel, but not observed in the Fernie district. It was also plentiful, at about 3,500 feet, about 15 miles up the Kootenay Valley north-east of Canal Flats.

Eriogonum flavum Nutt.—Occurs frequently from the Montana boundary to the northern end of Skookumchuck Prairie, on the hottest, driest spots, often forming large beds in gravelly soil. It was not observed west of Cranbrook or east of Elko.

Silene Cserei Baumg.—Found first in the Coal Creek Valley, Fernie. Later it was found on the site of the coal-dump of the now abandoned Fernie mine, and especially in the railway-yards, where the long ranges of derelict coke-ovens bordering the yards were covered with abundant growth. It seems probable that this is the source of the infestation in the railway-yards at Prince George, since it is said that it was first observed there in the siding used for unloading coal.

Braya humilis Robins. and *Physaria didymocarpa* Gray.—Found on the walls of the "gulch" at the foot of Mount Kinbasket, Big Bend.

Lepidium perfoliatum L.—A large patch was noticed above the lake-beach close to the town of Osoyoos. As this plant has long been abundant in Oroville, Washington, its appearance here was to be expected. In fact, H. Groh reported finding it both at Osoyoos and Cranbrook. In Cranbrook it is abundant in waste ground at the east end of the main street and occurs for some miles along the Wardner road.

Tellima grandiflora (Pursh) Dougl.—Found in the woods along Fairy Creek, Fernie, a considerable extension of its known eastward range. It was previously known from Rossland and Kootenay Lake. It does not seem to be given from east of the Cascades in United States "Floras."

Astragalus goniatius Nutt.—Found frequently in the southern part of the Trench, being collected at Cranbrook, Marysville, Doyle, and Elko.

Hedysarum alpinum L. var. *americanum* Pursh.—Found sparingly at McGillivray in the Crowsnest Pass.

Hedysarum Mackenzii Richards.—Collected twice, both times in river shingle beds, in a creek about 16 miles up the Kootenay Valley from Canal Flats and in the Kicking Horse River at Golden.

Hedysarum sulphureum Rydb.—Recorded by Piper from Okanogan County, Washington, but in British Columbia, so far as known, it is confined to the Rocky Mountain region. It was first seen about 10 miles west of Cranbrook on the Creston road, and

occurs from Roosville on the Montana boundary to Golden. It appears to range into Alberta both through the Crowsnest Pass and Yoho Park.

Euphorbia Helioscopia L.—A patch of this was found along the roadside about 9 miles south of Golden, which is not surprising as it is well established around Windermere, farther south.

Sphæralcea coccinea (Nutt.) Rydb.—A few years ago some hillsides at Windermere were brilliant with the flowers of this plant. Overgrazing, especially with sheep, appears to have destroyed it, at least temporarily.

Sphæralcea Munroanum Spach.—The only site known to the writer was a gravel-bed along the road south of Oliver. Here it was very abundant and, when in bloom, could be noticed long before coming to it. A house and garden now stand on this site, and a solitary plant by the road was all that could be found.

Angelica Dawsoni Wats.—This was fairly plentiful in a moist hollow at about 6,000 feet on the forest-fire lookout mountain at McGillivray, Crowsnest Pass.

Primula Maccalliana Wieg.—Found growing in thousands in marshy ground around Kinbasket auto camp, Big Bend. Only a small percentage of plants appeared to have flowered in 1947.

Phlox rigida Benth.—Abundant on dry banks and overgrazed range on Tobacco Plains. It was not observed north of the Elko-Cranbrook line. Apparently it flowers early, as all plants were past flowering by mid-June.

Asperugo procumbens L.—Found sparingly at two places in the town of Cranbrook. It has long been established in the North Okanagan, Henry recording it from Vernon.

Cynoglossum officinale L.—Found sparingly at Shuswap and Jaffray, and abundant around the settlement of Bull River.

Hackelia floribunda (Lehm.) Johnst.—Common along the highway through the Crowsnest Pass.

Agastache fœniculum (Pursh) Ktze.—A small colony of this was found at about 500 feet above the Columbia River, along a logging-road at Canyon Creek, south of Golden; it was also abundant along the Big Bend Highway for some distance, about 18 miles west of Golden. Plants here were very vigorous, reaching a height of 5 feet.

Orthocarpus tenuifolius (Pursh) Benth.—Occurs frequently, sometimes forming large patches, especially on dry gravelly soils, from the Montana boundary north to Skookumchuck Prairie. It flowers and dies down early. It was not seen west of Cranbrook or east of Elko.

Penstemon eriantherus Pursh.—Has much the same range as the last, but extends farther north. It occurs sparingly at Fairmont, and there is a specimen in the Provincial Museum from Brisco, at the northern limit of the Arid Transition Zone. A large bed of it was seen on a gravel-bank north of Newgate, where the masses of bright pale-blue flowers were very showy.

Symphoricarpos occidentalis Hook.—Very common in the Rocky Mountain Trench from the Montana boundary at least as far north as Windermere. It was also collected at Lytton.

Agoseris glauca (Pursh) Greene.—Very common on the ranges of St. Mary's Prairie, Cranbrook, and Tobacco Plains, north of the Montana boundary, sometimes forming large beds on overgrazed land. *A. scorzonærfolia* was found much less commonly in this region.

Agoseris heterophylla (Nutt.) Greene.—Abundant on a moist rocky outcrop, probably becoming dry later. This is the only time the writer has found it.

Arnica gracilis Rydb.—A large patch of this was found in a moist side-ravine just south of the bridge over the Elk River at Phillipp's Canyon, south of Elko, the only time it was seen.

Aster stenomerus Gray.—Plentiful in a small area, at about 3,300 feet, on a dry knoll on St. Mary's Prairie, Cranbrook.

Cirsium Hookerianum Nutt.—Along the highway through the Crowsnest Pass from Hosmer east to Alberta. The altitude of the road here is from 3,400 to 4,400 feet.

Filago arvensis L.—This introduction from Europe, previously known from Erickson and Moyie, was found to be very abundant in places from Elko south, especially on the overgrazed range at Dorr and Tobacco Plains.

Tragopogon dubius Scop.—Met with from Spuzzum east to the Rocky Mountains through the Okanagan and Boundary Districts. Some hundreds of plants were examined and referred to this species by the writer. In some places it was very abundant, a vacant lot in the town of Cranbrook being a solid mass.

VICTORIA, B.C.:

Printed by DON McDIARMID, Printer to the King's Most Excellent Majesty.
1948.