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FURTHER FINDINGS FROM WATER-SATURATED DEPOSITS AT
MUSQUEAM NORTHEAST (DhRt 4)

Charles E. Borden and David J. W. Archer

In view of the important discoveries made at Musqueam Northeast in the summer of 1973, the Musqueam Band Council postponed real estate development, thus making it possible to continue salvage work at the site in the 1974 season. As in 1972 and 1973, C. E. Borden, Department of Anthropology and Sociology, University of British Columbia, was in overall charge of the project while D. Archer, assisted by K. Bernick, directed field operations.

Major financial support for the 1974 project came from the Archaeological Salvage Section, National Museum of Man, Ottawa. Additional funds were provided by the Archaeological Sites Advisory Board, Province of British Columbia, under the B.C. Government's Career Opportunities Programme. We are also greatly indebted to Dr. N. Stolow, Director, Canadian Conservation Institute, Ottawa, for his co-operation in assigning Miss Susan Nash to the Musqueam project. Miss Nash, an experienced conservator, stayed with us for four weeks at no cost to the project and instructed crew members in the not-yet-widely-known techniques of conserving perishable objects of vegetal matter.

Aside from Borden, Archer, Bernick and Nash, 13 other individuals took part in last season's salvage operations as regular members of the crew. These included eight U.B.C. students in Anthropology/Archaeology and one from Vancouver Community College, two members of the Musqueam Indian Band and two high school students (one of whom was Neil Kennedy, a member of the Archaeological Society of British Columbia). In addition, six other members of A.S.B.C. participated on two weekends in a field school organized by David Archer.

Efforts in 1974 were mainly concentrated on recovering as many as possible of the perishable artifacts from the waterlogged sediments, Zone A1, beneath the shell-midden deposits of Zone A2. The importance of these perishables had been enhanced through the results of radiocarbon analysis of wood from Zone A1 which gave a date of 2970 ± 90 B.P. or 1020 B.C. (I-7791), thus making them the oldest cultural materials of this kind yet recovered on the entire Northwest Coast.

Exposing and extracting the perishable artifacts from the waterlogged deposits was a slow and difficult process, requiring not only skill and patience, but also a willingness to work for prolonged periods under miserable conditions,

standing in mud and water, often with a bone-chilling wind blowing, and the roar of the pumps constantly assailing the ears. Despite the slowness of the procedure, nearly 350 artifacts of split roots, cedar bark, plant fibre, and wood were recovered from Zone A1.

Among the perishable artifacts that merit special mention are numerous net fragments of rather large mesh, probably for catching salmon; six sinker stones, each strapped like a package over the ends and at intervals over the middle with strips of cedar bark for suspension; parts of what appears to be a canoe bailer similar to ethnographic specimens; two wooden hafts, one end-slotted, the other with an open groove at one end for the insertion of stone blades; wooden wedges of different size; split and drilled lumber; pointed stakes and sticks; four virtually complete baskets and over 120 basket and mat fragments; 11 basket handles; 64 pieces of cordage; numerous knots of cord or fibre; several rope rings; and 15 small rings of fine, stiff cord. The latter may have been used for the suspension of a bag-net from a dip-net hoop.

Cleaning, conservation and analysis of materials recovered in the course of the 1974 Musqueam Salvage Project are currently proceeding at U.B.C. Through the kind cooperation of Dr. Richard Daugherty of Washington State University and Ozette Village fame, two of his graduate students, Mrs. Jan Friedman, an ethnobotanist, and Mr. Dale Croes, an expert in basketry and cordage, are with us for part of February 1975, to assist in wood identification and in the analysis of basketry weaving patterns.

OZETTE
EXPERTS
HELP

The recovery of artifacts of wood and plant fibre is greatly expanding our knowledge of prehistoric Northwest Coast cultures. We may therefore expect that special efforts will be made in future years to locate more sites with water-saturated deposits. There is every reason to believe that sites with much older perishable remains than those at Musqueam Northwest will be found. Perhaps some day we will be in a position to trace the development of Northwest Coast wood-working, wood sculpture, and related skills from their early beginnings to recent times.

WORTH SEEKING...

The Journal of Field Archaeology, new publication out of Boston University in collaboration with the Association of Field Archaeology. For information about the group and the periodical: 775 Commonwealth Avenue, Boston, Mass. 02215.

Among subjects bruited for the first issue: exploration of Inland Southern Italy, attempts to salvage a 17th century Dutch ship, excavations in Pakistan, a survey of shipwrecks off Turkey, and experiments in forming lithic edge damage.

EXHIBITION OF B. C. INDIAN STONE SCULPTURE

Written and illustrated by Hilary Stewart

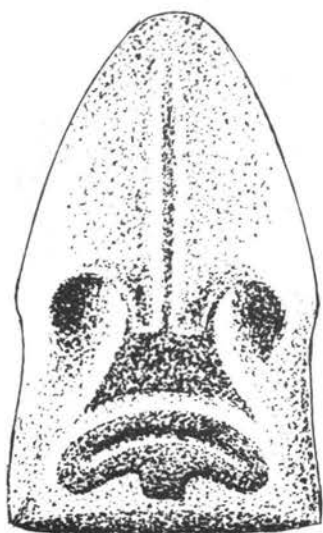


Frog mortar. 8-3/4" x 7".
Haida.
McCord Museum. Montreal.

That the Indian of British Columbia developed his urge to create, to carve and to express significant social and spiritual attitudes and beliefs through the medium of stone is known to us through the very nature of that material - its quality of endurance. The carver endowed the object he made with purposeful design that related to himself, his environment, his legends or his spiritual world, and it became sculpture in a high art sense.

An exhibition entitled "Images: Stone: B. C." is the result of an audacious idea to locate the widest possible range of these sculptures, select those that present themselves to the eye and mind as "a singular image", bring them together in one meaningful assemblage, and form them into a unique and spectacular exhibition.

The idea originated with Richard Simmins, Director of the Art Gallery of Greater Victoria. Visiting the Centennial Museum in Vancouver, he was impressed by the sculptural quality of the monolithic "Sechelt Image", and that started a train of thought on Images of Stone.



Pile driver. 15 1/2" high.
Kwakiutl.
Museum of Art.
Philadelphia.

It has taken more than one and a half years to plan, organize, research, photograph, catalogue and display the product of that idea. Richard Simmins headed up the organization behind the exhibit, raised the necessary funding, and hurdled the numerous obstacles by never taking no for an answer. He provided the impetus and set into motion what was to become a major exhibition of international importance.

While this writer travelled from west to east and other places scouring endless museums, storage attics and private collections, both in Canada and the U.S., researching material and photographing it all as she went, Wilson Duff, Professor of Anthropology at U.B.C., was at the academic and artistic helm, determining the direction and forming the shape of the show. He assembled and wrote the catalogue, which has become a comprehensive and handsome book in its own right.

Entering the exhibition you - the visitor- will first go through a didactic section where a series of interpretive panels and visuals prepare your mind and eye for what is to follow. Then, moving through the various galleries, you will soon become aware of many things.

Initially perhaps, the technology that enabled the transformation of a boulder into an object of purpose and beauty will intrigue you, the quality of design and degree of sophistication will impress you, as will the range in size of the carved stone - from a tiny 1½" abstract form to a massive 80 lb. granite phallic symbol. You might express surprise at the diversity of the pieces in the show: bowls, mortars and pestles; hand hammers, sledge hammers and pile drivers; clubs, weapons and slave killers; sculptured heads, masks and ornaments. And more.

Ultimately, though, you will become aware of the deeper meanings that lie within the stone and its sculptured image.

As researcher and photographer for the exhibition, I have spent many hours alone with these images of stone. It has been an experience that I now recognize as a rare and immense privilege. Each single carving has conveyed some aspect of itself to me, and the emotions they have triggered in me have ranged from plain dislike, through awe, delight, amusement and love to high elation.

I found images that still radiated a strange power and I felt humbled and awed in their presence. A few seemed to be light hearted and I could laugh with them, and there were others that deeply touched me by the sheer power of their magnificence and vitality. One mortar in particular seemed to bring it all together in one great crescendo of high art, and I could only stand before it and wonder.

No two people will find the same emotion from any one sculpture, each of us will relate personally and differently to what we see, for such is the stuff that images are made of.



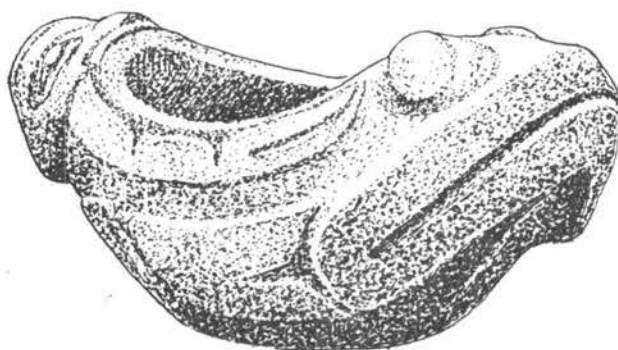
Stirrup maul. 5½" high.
Northern.
Museum of the American
Indian. New York.



Man with hunchback.
16" high.
Coast Salish.
Found at Boundary Bay.
Museum of Man. Ottawa.

"Images: Stone: B.C." is the most comprehensive exhibition of stone sculpture of the British Columbia Indians ever to be assembled, comprising 135 carefully chosen items that cover a time-span of 30 centuries. The show opens at the Art Gallery of Greater Victoria on March 4th where it will remain for two months. It then moves to the Vancouver Art Gallery for the month of May. During the remainder of the year the exhibition will travel to Ottawa, Toronto and Winnipeg.

(The sculptures illustrated here are included in the exhibition.)



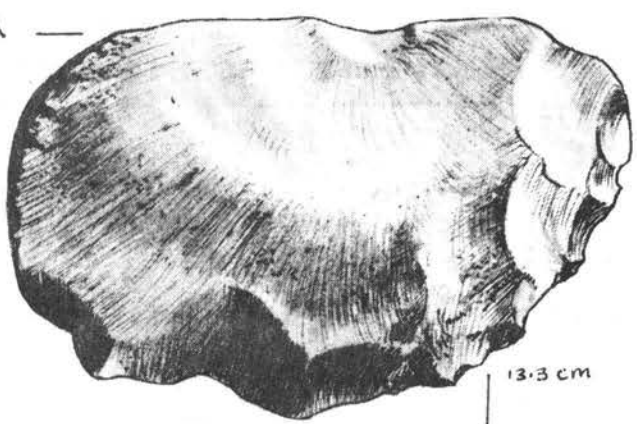
Frog/human bowl. 17" x 8".
Haida.
McCord Museum. Montreal.

A.S.B.C. DIARY

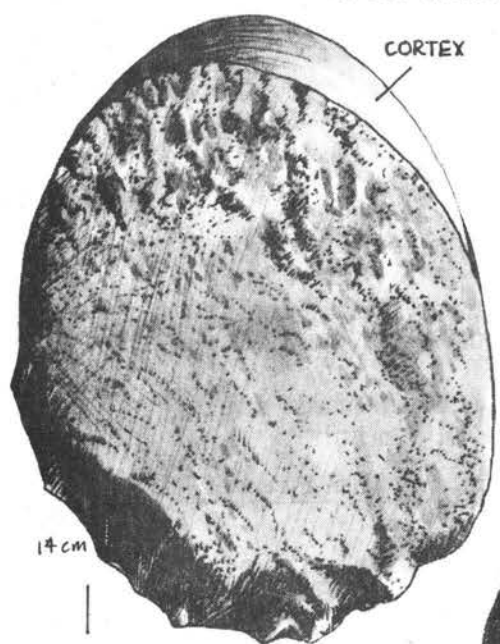
- Wed., March 5 - Archaeological Institute of America meeting - Dr. Stephen Miller, University of California at Berkeley, "Excavating the Sanctuary of Zeus at Nemea", Room 102, Lasserre Bldg., U.B.C., 8:30 p.m. A.S.B.C. members welcome.
- Wed., Mar. 12 - Regular monthly meeting of the Society, 8 p.m. Centennial Museum Auditorium. Speaker: Dr. Malcolm McGregor. U.B.C. speaking on Greek inscriptions.
- Wed., April 9 - Regular monthly meeting - speaker to be announced.
- Wed., May 14 - Regular meeting - Dr. J. Russell, U.B.C.
- Centre for Continuing Education Courses - U.B.C.
- Tues., Feb. 25 - Mar. 11, 105 Lasserre Bldg., 8 p.m. - \$10.00
The Past Serves the Present: Archaeology in New China, Dr. Richard Pearson, Anthropology, UBC.
- Tues., Mar. 18 - Apr. 8, Museum of Anthropology, Marine Drive, UBC, 8 p.m., \$15.00, class limited. Issues in Archaeology: A Seminar Series, Dr. R.J. Pearson, Dr. R.G. Matson, Mr. H.L. Crew (UBC) and Mr. Glen Purdy (Provincial Museum).
- Thur., Feb. 20 - Mar. 27, Kitsilano Public Library Auditorium, 7:30 p.m., \$18.00, Recent Discoveries in B. C. Archaeology, Messrs. K.R. Fladmark, R. Percy, W. Choquette, A. McMillan, Dr. R.I. Inglis and Dr. R.G. Matson.
- Tues., Feb. 25 - Mar. 25, Vancouver Public Library, 1:30 p.m., \$12.00, Class limited, B.C.'s Native Heritage Northwest Coast Foods: Kwakiutl, Gloria Webster, Anthropology Museum, UBC.
- Travel and learn... (for further information phone 228-2181)
- Egypt, Lebanon, Syria - September 26 - October 23, accompanied by Dr. Hanna Kassis.
- Classical Greece III - May 15 - June 12, Dr. Colin Edmonson, U. of Washington, Dept. of Classics.
- Ancient Sicily - May 26 - June 16, Dr. J.A.S. Evans, Classics, UBC.
- Maya Civilization of Central America: December 1975.
- Travellers' Introduction to Classical Greece - commencing Apr. 1.
- " " " Ancient Sicily - " Apr. 3.
- The Near East; Its Architecture and Art - " Feb. 17.

Continued on page 14 ...

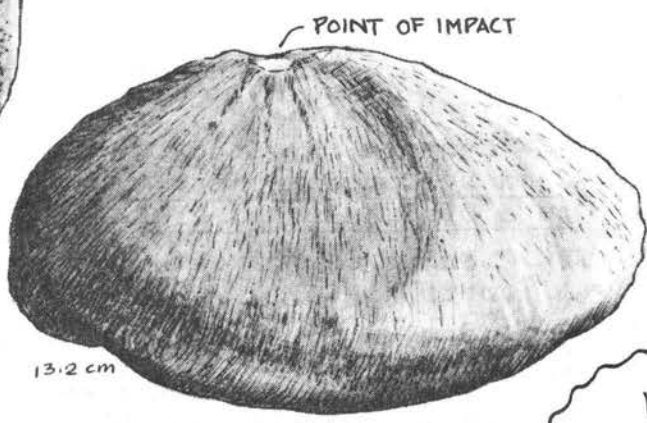
SIDE STRUCK SPALL TOOL



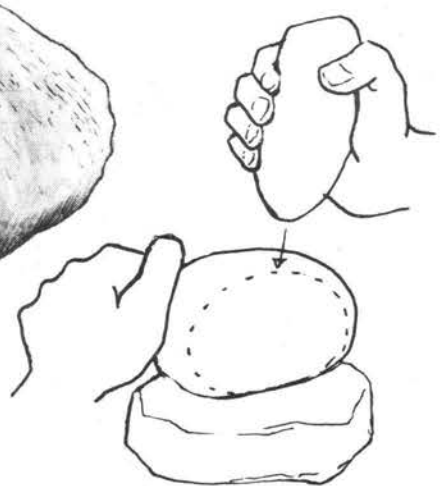
SECONDARY FLAKING ALONG EDGE



END STRUCK CORTEX SPALL TOOL, DETACHED FROM THE END OF THE PEBBLE.



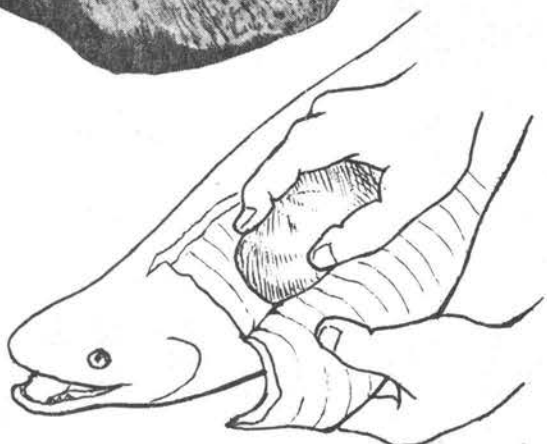
POINT OF IMPACT



BI-POLAR PERCUSSION, TECHNIQUE USED TO DETACH A SPALL FROM A PEBBLE. SPALL CAN BE STRUCK OFF THE END OR THE SIDE.



TYPICAL PROFILE



USING A SPALL TOOL TO BUTCHER FISH

Cutting, chopping and scraping tools were always a requirement of a people living close to the land, and these implements are found in great variety.

One of the most simple to make was the cortex spall tool. A skilfully placed blow to the top or side of a smooth, water worn pebble, while it rested on another stone, quickly detached a flake with a naturally sharp edge. The smooth cortex of the spall made it comfortable to the hand, and it no doubt served many different cutting and hacking purposes. When dulled, the edge could be rapidly resharpened by percussion flaking.

Cortex spall tools range in size from about 10 cm to 25 cm.

EXCERPT FROM "ARTIFACTS OF THE NORTHWEST COAST INDIANS" by HILARY STEWART. COPYRIGHT © 1973

NATIONAL MUSEUM RICH IN COAST PUBLICATIONS

The National Museum of Man has a substantial stable of publications to its credit, and its list runs to nearly 40 pages.

The following is a selection of titles of special interest to British Columbia in the current list. They may be obtained from the National Museum, Marketing Services Division, 360 Lisgar Street, Ottawa, Ontario, K1A 0M8.

PB MB056/1927 (5 articles, including) "Kitchen-middens of the Pacific Coast of Canada" by H.I. Smith	\$.50
PB MB162EXT02 Borden, C.E., <u>An Early Site in the Fraser Canyon</u> , 1960	.75
PB MB194EXTPO6 Couture, A. and J.O. Edwards, <u>Origin of Copper Used by Canadian West Coast Indians in the Manufacture of Ornamental Plaques</u> , 1963	.75
PB MB193EXTPO3 Sanger, D., <u>Excavations at Kesikep Creek (near Lillooet)</u> , 1964	1.00
PB MB224EXTPO5 Kidd, R.S., <u>Archaeological Survey in the Lower Fraser River Valley, B.C.</u> , 1963, 1968	1.25
PB MB224EXTPO2 Sanger, David, <u>The Chase Burial Site, EeQw:l British Columbia</u> , 1968	2.75
PB MB232EXTPO2 Kidd, R.S., <u>The Archaeology of the Fossil Bay Site, Sucia Island, Northwestern Washington State</u> , 1971	1.00
PB AP 01 Borden, C.E., <u>Fraser River Archaeological Site</u> , 1961	.50
PB AP 10 Mitchell, D.H., <u>Preliminary Excavations at a Cobble Tool Site in the Fraser Canyon, B.C.</u> , 1965	
PB AP 12 Sanger, David, <u>Excavations in the Lochnore-Nesikep Creek Locality, B.C.: Interim Report</u> , 1966	1.00
PB AP 17 Sanger, David, <u>The Texas Creek Burial Site Assemblage, British Columbia</u> , 1968	.75

Mercury Series Publications

No. 5 NbVk-1: <u>An Historic Fishing Camp In Old Crow Flats, Northern Yukon Territory</u> , Richard E. Morlan	.75
No. 7 Morland, Richard E., <u>A Technological Approach to Lithic Artifacts from Yukon Territory</u>	1.00
No. 9 MacDonald, George F., <u>Haida Burial Practices: Three Archaeological Examples: The Gust Island Burial Shelter, The Skungo Cave North Island, Mass Burials from Tanu, and Cybulski, Jerome S., The Gust Island Burial Shelter: Physical Anthropology</u> *	2.00

* May be borrowed from Publications Committee, G. Groves.

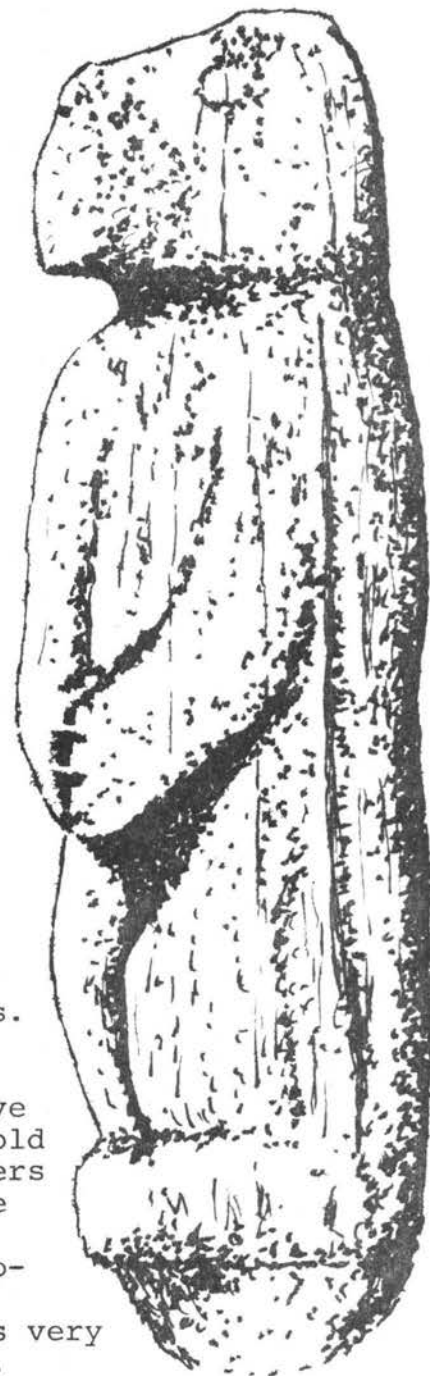
THE ROSE POINT FIGURE:
AN UNUSUAL WOOD SCULPTURE FROM THE
QUEEN CHARLOTTE ISLANDS

By Knut R. Fladmark,
Department of Archaeology
Simon Fraser University

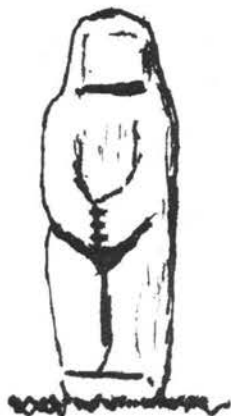
In July 1967, Mr. James Onion and his family of Port Clements, B.C. were enjoying a weekend excursion to Rose Point, a lonely wind-blasted spear of dunes, grass and gnarled trees forming the extreme northeast tip of the Queen Charlotte Islands. On the east shore about six miles south of the end of the point they discovered a large wooden zoomorphic carving lying partly buried in the beach near the high tide line. After digging it free of the sand it was transported back to Port Clements and erected against a post guarding the driveway of Mr. Onion's home. Although the discoverers have sought information as to the age and origin of the carving, little attention has been paid to the find other than a brief notice in the local newspaper.

The Queen Charlotte Islands are the historic home of the Haida Indians, world renowned for their sculptural masterpieces in wood and other materials. Weathered totem poles 90 - 100 years in age still gracing the overgrown sites of abandoned Haida villages bear eloquent testimony to the superlative skill of their makers. In such an atmosphere of old villages, leaning totem poles and constant reminders of the richness of the traditional native art, one might, perhaps, be forgiven for not being unduly surprised by the discovery of a large wooden sculpture buried in a beach. However, the Rose Point figure demands an attempt at explanation for it is very unlike the typical work of historic Haida artists.

In the course of carrying out archaeological research on the Charlottes in 1969 and 1970, I had opportunities to examine the carving, and the following is a brief



description accompanied by a few comments as to its possible origin and antiquity.



Monumentally sculpted in red cedar, the Rose Point figure represents a single naturalistic anthropomorphized animal, standing $7\frac{1}{2}$ feet high on short thick legs and holding slightly flexed upper limbs against its abdomen. The head is wide and domed and rests directly on the shoulders with a pronounced snout or muzzle formed by a thick rounded anterior projection. Rudimentary eyes are represented by shallow ovate incisions on each side of the snout, while ears, mouth and nostrils are undefined. The five digits of the "hands" are shown by simple V-shaped notches; if the feet were ever similarly treated it is no longer visible. The feet merge into a short pedestal terminating in a rounded base suggesting the weathered cap of a longer section once sunk in the ground. The legs are slightly bowed and bulge strongly at the thighs. Traces of what may be a black pigment are visible in protected hollows of the carving, such as beneath the hands, and a crushed and rusted piece of tubular iron has been hammered into the top of the head.

The carving is in a generally excellent state of preservation. The wood is firm and with the exception of the base there are no signs of rot; beneath the weathered silver-grey surface the cedar is red and strong. There is no visible evidence of damage by marine organisms, nor is there any sign of moss or fungi on the surface of the carving. Rose Point is subject to violent storms in winter and the abrasive effects of wind-blown sand can be seen in the rounded and eroded surfaces of certain parts of the figure, particularly the head. However, in sheltered areas of the carving surface details, including individual tool scars, are well preserved. Where right-angled cuts have been made, such as around the upper limbs, impressions of the tool edge can be seen. These take the form of thin elongated incisions about $2\frac{1}{2}$ - 3" in length, which appear to be the products of a thin metal blade.

Stylistically the Rose Point figure shows little resemblance to the traditional wood sculpture of the northern Northwest Coast. It lacks the formalized dished eye-sockets, recurved irises, incised eyebrows, nostrils, mouth, and claws which distinguish the art of the area. Besides the absence of specific surface details, the free-standing, fully-rounded presentation and naturalistic posture and proportions are very

unlike typical Haida, Tsimshian or Tlingit carving which usually depicts animal or human forms in rigid flexed positions designed for frontal viewing.

The excellent state of preservation of the Rose Point figure combined with its stylistic peculiarities might suggest that the carving is not a product of aboriginal culture, instead having been recently produced by an artist unfamiliar with the traditional style of the area. In the absence of data firmly contradicting this possibility it must remain as one alternative explanation for the carving. However this alternative is lessened by the fact that Rose Point has not been permanently occupied for at least the last 50 years, and additionally, the burial in the sand suggests some antiquity for the figure.

A number of Haida totem poles, recorded in photographs from 1878, still stand at several historic village sites on other parts of the islands. While mainly in advanced states of decay, these poles are situated within regions of heavy forest growth where the damp still air between massive trees promotes the rapid development of wood-destroying fungi and moss. The Rose Point area, on the other hand, is open and wind-swept with scattered smaller trees relatively unaffected by parasitic growths. It is quite conceivable that driftwood or fallen logs could survive in this area in excellent condition for considerable lengths of time, kept free of moss and fungi by natural sand-blasting, or protected entirely beneath shifting dunes and aggrading beach ridges. Thus the apparent freshness of the carving is not conclusively indicative of a very recent date of manufacture, although evidence of metal tools and the fragment of iron in the head of the Rose Point figure limit it to the post-contact period.

The possibility that the figure is an aberrant example of Haida art, perhaps produced by an inexperienced craftsman, or designed to serve a specialized function must remain. However to my knowledge there are no similar pieces recorded for the Haida area which can definitely be attributed to the hands of a local artist. As shown by the few preserved details such as eyes and fingers, the carving was apparently in a finished state when it reached Rose Point and cannot be considered merely the roughed-out or preliminary stage of a more typical Haida sculpture.

If we accept the probability that the carving is a product of Northwest Coast aboriginal culture of the post-contact period we are faced with the task of determining which specific ethnographic group is most likely responsible. As already noted, the style of the figure is unlike typical northern coast sculpture. However it does show considerable similarity to wood sculpture of the southern Northwest Coast, in particular that of the Nootka and Coast Salish. Among these groups large wood carvings often took the form of simple, single figures,

fully carved in the round in naturalistic unstylized postures. Certain Salish mortuary figures (e.g. Barbeau 1950: 742-3) closely approach the size, stance, proportions, and simplicity of detail of the Rose Point carving, especially in features such as the bulging slightly bowed legs and loosely flexed upper limbs pressed against the abdomen. If a specific discovery context were not known for the Rose Point figure there would seem little doubt that it would be attributed to the southern Northwest Coast.

If the Rose Point figure was originally manufactured on the southern coast, how did it reach its final resting place on the distant Queen Charlotte Islands? It is possible that it may have been carried by trading ship or native canoe, but a more direct explanation is offered by the configuration of ocean currents in the central and northern Northwest Coast. Although the main Japanese Current reaches North America in about the vicinity of the Queen Charlotte Islands and sweeps south along the coast, it is only noticeable well off the continental shelf. From historical records it would appear that disabled vessels drifting with this current would pass southward along the outer coast usually without ever sighting land. On the other hand, within the limits of the continental shelf other currents prevail. In winter, strong northward flowing streams with speeds between one and three knots cross Queen Charlotte Sound between Vancouver Island and the Charlottes; in the summer any overall pattern is apparently obscured by variable direction tidal currents. Using a conservative rate for the winter current of one knot, drift material could float from Johnston Straits or Nootka Sound to Rose Point - distances up to about 400 miles - in about three weeks. This is a short enough length of time to prevent significant marine growth on driftwood. It is therefore conceivable that the Rose Point figure may have reached its ultimate resting spot as a result of natural northern flowing drift currents along the Northwest Coast.

Haida mythology supports this possibility by indicating that these people had some familiarity with carvings found adrift in the sea. A number of legends relating to the origin of Haida totem pole carving revolve around the discovery of a carved pole in the ocean, in the Rose Point area:

Some people living in Masset Inlet went to Rose Spit to pick berries. On the way a woman looked into the sea and saw a carved post there. The people looked at it long enough to remember how it was made and when they got home carved two posts just like it. At this the supernatural beings became angry and raised a flood, compelling the people to take to their canoes. They threw one of the posts into the sea and put the other on top of a low mountain. Then they began to sing and the flood fell... (Swanton 1905: 218).

Several similar stories exist in different sources (e.g. Barbeau 1950: 823) and all have two essential elements in common: they describe the sighting of carved poles in the ocean, and they consistently note that this discovery was made at Rose Point. There seems to be a native precedent for the discovery of carvings in the Rose Point area, and in fact, the point is a natural trap for drifting objects. The eastern shore of the point is aggrading outwards rapidly, as shown by a complex network of developmental beach-ridges and the area is locally famous as a prime beach-combing location.

In summary, the following is offered as one of the more probable hypotheses concerning the origin and history of the Rose Point figure: the carving was probably produced on the southern Northwest Coast by a Salishan or Nootkan artist sometime in the post-contact era. Subsequently the figure either eroded from its original location, or perhaps was deliberately thrown into the sea, and was carried northward by winter drift currents, until coming to a final rest at Rose Point. There the figure became buried in the beach sands to be protected from serious deterioration until chance rediscovery in 1967. The correlation between this find and traditional Haida narratives seemingly describing similar events in the past raises the intriguing possibility that many objects produced by other Northwest Coast groups may have drifted ashore on the Queen Charlotte Islands during the pre-historic period. The role of ocean currents in the accidental wide-spread distribution of cultural traits along the Northwest Coast has not been adequately explored. However, in the light of the Rose Point discovery there seems some possibility that significant items of material culture, and perhaps embodied concepts, could have been fortuitously spread far beyond their point of origin.

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A.S.B.C. DIARY - cont'dAt the Centennial Museum:

Northwest Coast Indian Artifacts - four-week course commencing February 20. Hilary Stewart, well known Vancouver author, illustrator and lecturer on ethnology and archaeology (and member of the A.S.B.C.) will give workshop demonstrations of how the Indians made and used tools and utensils.

Films - start at 8:00 p.m. in the Auditorium, admission \$1.00
 Fri. and Sat. Feb. 14 and 15. "In the Land of the War Canoes", made by Edward S. Curtis when he photographed the Kwakiutl peoples for the 1914 20-vol. series "The North American Indian". Introduced by Lynn Maranda, Curator of Ethnology.

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NATIONAL MUSEUM PUBLICATIONS - cont'd

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|--------|--|--------|
| No. 13 | <u>Archaeological Investigations in the Hecate Strait -
Milbanke Sound area of British Columbia, Bjorn O.
Simonsen</u> | \$1.75 |
| No. 19 | <u>Crowsnest Pass Archaeological Project 1972
Salvage Excavations and Survey Paper No. 1
Preliminary Report, B.O.K. Reeves</u> | 1.50 |
| No. 20 | <u>Contributions to the Later Prehistory of Kodiak
Island, Alaska, Donald W. Clark and Federick A.
Milan</u> | 2.50 |

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A Technique for Determining Pre-historic
Obsidian Trade Routes in British Columbia

by Erle Nelson, Archaeology Department,
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Anyone who has had a try at making a tool from a lump of raw obsidian - the natural glass that on rare occasions is produced in volcanic eruptions - will realize the value that this material must have had amongst ancient peoples. It is relatively easy, even for a beginner, to produce flakes with razor-sharp edges that may be used much as we use razor-blades. Of course, along with these few sharp flakes, the beginner usually also produces a great deal of blood, and learns very quickly to appreciate the high degree of craftsmanship that has gone into the beautiful obsidian points and knives that are found in archaeological sites.

Obsidian is a relatively rare rock that only occurs in specific types of volcanic eruptions. The scarcity of this material meant that the ancient peoples for the most part had to obtain their supplies of obsidian by trade, or perhaps by travel into foreign territory, as only a few groups would be so fortunate as to have an obsidian flow in their home-lands. The trade in this one material would probably parallel trade in other materials, and would likely be carried out between peoples on reasonably good terms with each other. Along with such trade in raw materials, one might also suspect that an exchange of ideas and techniques took place.

It is possible for archaeologists to reconstruct some of the details of these trading patterns by means of an analytical technique which allows them to determine the exact source of the raw obsidian from which an artifact was made. Then, by such analysis of obsidian artifacts from many different sites and from many different time periods, the extent of the trade in obsidian can be deduced, yielding direct evidence on the degree of contact between the various groups of peoples.

The methods that are most used for characterizing (or "finger-printing") obsidian flows are based on determination, by one analytical means or another, of the chemical composition of the obsidian. In some studies, the major constituent elements are determined, in others only the minor or trace element concentrations are measured. Whatever the technique, the identification system must be based upon the premise that the variation in concentrations of the elements detected in samples from an obsidian source will be very small compared to the variation in these concentrations between different sources.

In establishing an obsidian identification program, then, one must obtain a representative set of samples from each obsidian flow in the area under study. These will then be examined to determine whether the individual flows are chemically homogeneous and whether the "fingerprints" of these flows are sufficiently different that each flow may be distinguished from all others. If these criteria are met, then the fingerprints that have thus been obtained for each flow may be used as a reference against which the fingerprints of actual artifacts may be compared. That source material possessing the same fingerprint as an artifact identifies the raw material from which the artifact was made.

As mentioned previously, there are several methods of analytical chemistry that can be used to determine the elemental composition of the obsidian. In practice, these techniques must be capable of measuring the concentrations of many elements, as one wants as many distinguishing features as possible in the fingerprint. The technique must also be rapid, as one would like to analyze a great number of obsidian artifacts to be able to properly define the obsidian trade patterns. Furthermore, one would prefer that the analytical technique be completely non-destructive, such that archaeologists will not be hesitant to provide their obsidian artifacts for analysis.

It is difficult to find analytical techniques that meet all these criteria. However, at S.F.U., a technique for analyzing obsidian that meets these criteria very nicely has been developed. The technique is centred on some newly-developed analytical equipment known as energy-dispersive X-ray fluorescence analysis, or XRF for short. In this method, the unknown sample under study is bombarded by a beam of X-rays from an X-ray tube. These X-rays excite the individual atoms in the sample, which then return to their normal state after emission of an X-ray. However, this secondary X-ray is emitted with energies that are characteristic of the species of atom that emitted it.

Recent advances in solid-state physics have led to the development of X-ray detectors that can be used to not only detect these secondary X-rays but to measure their energy as well. The information thus obtained is automatically sorted and stored in a small computer. At the end of an experiment, the number of X-rays that have been detected at the various X-ray energies then give a relative measure of the concentrations of the various elements in the sample. In the S.F.U. apparatus, such an analysis on an obsidian sample can be carried out in five minutes. The sample may then be taken from the machine unchanged and handed back to its owner. During this time relative measures of the concentrations of about 13 or 14 elements, ranging from potassium to niobium,

will have been obtained. It can be difficult, however, to relate these relative concentration measurements to the absolute concentrations (say in percentage or ppm) of the elements in the sample without modifying the sample. However, since the purpose of the exercise is to fingerprint the samples, these relative determinations are quite sufficient in themselves, and the extra bother of reducing the measurements to absolute concentrations is not worth the effort.

When this technique had been shown to be viable, Dr. R. Carlson of the S.F.U. Archaeology Department requested and obtained a research grant from the Canada Council so that a large-scale study of the obsidian trade in British Columbia could be undertaken. Obsidian sources from Oregon, Idaho, Wyoming, Alaska, British Columbia and the Yukon are being studied in detail. At present some 15 or so separate types of obsidian are recognized. The major part of the program will involve the analysis and identification of several hundreds of obsidian artifacts obtained from archaeologists working in British Columbia.

At present, this analysis is only well underway, but already some fascinating features of these ancient trade patterns are beginning to reveal themselves. It appears that the peoples in the lower mainland obtained their obsidian supplies from Oregon, as did the peoples in the lower Islands. Obsidian from a source near Anahim Lake in central British Columbia has been quite widely distributed, and is found in sites as far apart as Kimsquit and Lillooet. The artifact analysis has also revealed an intriguing problem - a few of the artifacts have fingerprints completely unlike those of the known sources. It is thus highly likely that obsidian sources which are presently unknown were utilized in the past. (It is of considerable interest to locate these missing sources, and any tips that readers may have would be greatly appreciated. It is necessary to be quite specific though, as a couple of fruitless wild-goose chases have shown.)

As mentioned, the program is as yet only well started. But the results that are being obtained are extremely interesting, and it is likely that this new technique will yield much information that has not before been available to archaeologists.

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WATCH FOR...

The March/April issue of Westworld, the redesigned B.C.A.A. magazine. It contains an article on B.C. Archaeology by Dr. Roy Carlson of S.F.U.

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