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FEATURED IN THIS ISSUE

E D I T O R I A L C O M M E N T

You may often feel like writing a strong letter about something to the government. If ever a letter was needed, it is now, to support proposed amendments to the Archaeological and Historic Sites Protection Act.

The Act itself is, of course, excellent, as far as it goes. But the key phrase is "as far as it goes". For while the B.C. Government deserves commendation for legislation which endeavors to protect historic sites, there are several major gaps.

One gap is the scope of the Act. At present only scheduled sites or sites on Indian reserves are protected. This despite the latter being well covered under the Criminal Code. And we suspect that the number of sites which have been officially scheduled could be counted on one hand. Hence in fact most sites are not covered.

The other major omission is the provincial government itself--at present all government departments are exempted from the Act. In other words, Highways men, for instance, can demolish valuable sites without any retribution.

These then, are two gaps. There are many others which boil down to an Act without teeth and an Archaeological Sites Advisory Board without much real power.

So there is a real need for amendments, and Dr. C. Borden, who can be credited with cajoling the government into the original Act, is now proposing several dramatic improvements.

If you agree there is room for improvement, write your MLA. Or better still, write the Honourable Wesley Black, Minister responsible for archaeology, endorsing Dr. Borden's proposed amendments. Today.

AT CAPE ALAVA

a time capsule unsealed

by Richard D. Daugherty

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Located on the northern coast of Washington at Cape Alava, the westernmost point of the contiguous United States, the Ozette Indian Village Site represents one of the most remarkable and scientifically significant archaeological discoveries ever made in North America.

The importance of this site lies in the completeness of the archaeological record that has been preserved. Time after time, catastrophic slides and mud flows have swept down the slopes of the low hills behind the Ozette village, smashing and burying the large wooden houses of the prehistoric and early historic occupants. By nearly stopping all oxidation, bacterial action and other forms of weathering, these unfortunate events have created a time capsule in which the entombed houses and their contents have survived in an almost perfect state of preservation. Employing specialized archaeological procedures, we are now opening this time capsule.

The task of the archaeologist is to interpret the evidence of man's past by employing all of the sophisticated excavation and analytical techniques at his disposal. Often this involves assistance from other scientific specialists such as the geologist, the soils specialist, the botanist and the zoologist. Such specialists can tell the archaeologist about past environments and man's exploitation of these environments. But what the archaeologist can learn about the culture of the prehistoric inhabitants of an area depends primarily on the amount of cultural material that has survived over the hundreds or thousands of years since a particular culture flourished. Most often, the archaeologist is faced with attempting to reconstruct the past on the basis of a collection of stone and bone tools, perhaps enhanced by pottery and the remains of masonry structures. Imagine an archaeological site, however, where nearly everything that the previous inhabitants had made and used has been preserved, including all of those normally perishable things made of wood and other fibrous materials. This is Ozette.

Many people are unaware of the richness and level of cultural development that existed along the Northwest Coast of America before European and American explorers and traders visited the area, leaving behind them not only trade goods but epidemics of smallpox and other diseases which depopulated and demoralized the native inhabitants. The true level of technological and artistic development is now becoming apparent at Ozette.

At the beginning of the historic period, Ozette was one of the five principal villages of the Makah Indians who occupied the northwest corner of the Olympic Peninsula. These people have been great sea mammal hunters for well over 2000 years -- pursuing whales, sea lions and fur seals from large canoes. Their bountiful environment also provided shellfish, bottom fish, salmon, land mammals and a great variety of wild plant foods.

Ozette is the largest archaeological site yet discovered along the Washington Coast. On the mainland, it extends along the beach for over one-half mile and, in places, is nearly one-quarter mile wide. In addition, this site complex includes evidence of prehistoric and historic occupation on the offshore islands, Cannonball Island, Ozette Island and the Bodelteh Islands.

Our aim during the first year was to explore, through extensive test excavations, all major areas of the site. When we returned the following year, we concentrated our efforts on two areas: where the surface remains of historic houses had been located, and on top of Cannonball Island just offshore where we hoped to learn why people had chosen this rather unlikely spot to live. It was during this second season's work that the first of the houses buried by mud slides was discovered. While excavating a test pit back near the base of the hill, we discovered, at a depth of approximately two and one-half meters from the surface, a beautifully preserved house timber and some equally well-preserved baskets and matting fragments. Oral traditions of the historic Ozette people record that slides had occurred at the village and that at least one house had been buried. As we continued our test excavation, subsurface water flowing into the excavation and the slumping of the side walls made it apparent that some form of power equipment would be necessary to complete the excavation of a structure as large as a house.

Plans to continue at Ozette had to be abandoned temporarily because of the spectacular discoveries of early human remains at Marmes Rockshelter in eastern Washington which had to be

salvaged before the site would be flooded by the Lower Monumental Dam reservoir.

In April of 1970, I received a telephone call from Mr. Ed Claplanhoo, Head of the Makah Tribal Executive Committee, informing me of a slide that had occurred along the bank adjacent to the beach, exposing planks and timbers of a buried house, along with a number of well preserved artifacts. He reported that visitors to the site had recovered halibut hooks, boxes, a canoe paddle and probably other things as well. A hurried visit to the site confirmed that this was still another buried house, and not the one we had found in 1967. As with the house discovered earlier, it was clear that the slide had smashed and buried the house, placing an effective seal over the structure and its contents. This meant that whatever had been in the house at the time of the slide should still be there, in an excellent state of preservation.

In response to an emergency appeal, funds were made available by the Bureau of Indian Affairs, to be administered through the National Park Service, for the salvage of this important discovery. We estimated at the time that it would take until mid-September to complete the excavation. We did not know then of the unbelievable richness of the house contents, nor that in the process of excavating this house we would locate four additional structures.

I recruited Mr. Gerald Grosso as my project operations manager, and together we rounded up a small crew and tons of supplies and equipment. The U.S. Coast Guard provided helicopter support, and by late April the crew was in the field setting up the camp and preparing for excavation. In mid-June the size of the crew was substantially increased by the addition of a number of experienced students in archaeology.

In places, over three meters of overburden rested on top of the buried house. Previous experience indicated that there was no possible way that this material could be hand shoveled away to expose the structure. The use of power equipment such as a bulldozer or backhoe seemed impossible short of dismantling it and flying it in a few pieces at a time, because the nearest road is three miles from the site. Limited previous experience with high pressure pumps and hoses suggested that washing away the overburden would be the most feasible approach. Six pumps and thousands of feet of hose were brought in and excavation began, using the ocean as a source of water. In order to protect the delicate ecology of the reef in front of the site from the tons of silt and sand, a number of settling basins were constructed of beach logs and plastic. In this way, only clear water was returned to the ocean.

It was soon learned that heavy power equipment would have been quite impractical, and that the proper use of water was the only possible way that delicate baskets, arrows, art work and thousands of other items made of wood and fiber could be freed from their matrix of clay and sand.

The excavations began with the clearing of brush and small trees from the surface and the establishing of our datum point and excavation grid. Immediately under the surface duff, we began to encounter rotted house planks and artifacts of the late historic occupation of the site. Great quantities of broken dishes, bottles and rusted items of iron were found. Below this layer was a culturally sterile slide deposit averaging one-half meter thick. Next, a thick midden layer representing the early historic period of the early 1800's was encountered. Below this occupation layer is a massive clay and sand layer that represents the slide which had smashed and buried the house exposed by the collapse of the bank along the beach. This house with its associated cultural deposits is the primary object of our current excavations. Exposures along the bank reveal that several other depositional and cultural units lie below this house, but excavation of these deposits will have to wait until the excavation of the overlying house has been completed.

Excavation of the buried house was slowed considerably because it was first necessary to sample the two overlying cultural strata. When sterile deposits of slide material were encountered, however, massive streams of water from the pumps and heavy hoses were directed at the resistant deposits which were rapidly washed away. Small garden hoses with nozzles that are adjustable for pressure and type of stream were used to expose and remove the delicate cultural objects.

The excavation of a structure such as this, with its contents, involves not only the collection of the artifacts and house remains, but also the careful mapping of the structure and the location of all of the cultural materials. In so far as is possible, we hope to plot the interior arrangement of the house and its furnishings and learn the locations where certain activities were carried on. In execution, this presents major difficulties because when the slide hit the structure, certain things were buried immediately. Their original locations were preserved, but other things were carried along with the slide for a short distance and mixed up with a tangle of broken house planks, poles and timbers. In the southeastern corner of the house, for example, there is a large pile of house planks which are intermixed with wooden boxes, canoe paddles, food dishes, a whale harpoon and a number of baskets. The archaeologist must start at the top of this pile and map, photograph and remove the

planks and artifacts as he comes to them. After a time, this three-dimensional record keeping becomes highly involved.

Another aim of the careful excavation procedures is to reconstruct the events that occurred at the time of the slide. For example, it now appears that another house, situated immediately behind the first and directly in the path of the slide, was hit first. Some of the planks of this structure were incorporated in the slide and deposited on top of the house we are excavating.

One of the principal problems of the project concerns the preservation of the objects recovered from the excavations. Although appearing to be in a state of perfect preservation when first exposed, the objects of wood and other fibrous materials, if allowed to dry without proper care, will shrink, warp and split. Since materials of this type are so rarely preserved, very little is known about the proper methods and techniques of treating them once they are removed from the ground. Our technique, which is proving quite successful, is to quickly immerse the specimen in a tank containing a solution of polyethylene glycol and water. European archaeologists have enjoyed some success with this method.

Even though we have been excavating for nearly a year, we are constantly amazed at the wealth and variety of objects occurring in this single household, as well as the level of technological development that these people had reached. One of the hallmarks of Northwest Coast Indian culture is the sophistication of their woodworking technology. We found heavy carved beams for the house framework and beautifully adzed hand-split cedar planks for the house walls and roof. We have now recovered dozens of wooden wedges which were used in splitting the planks from cedar logs. The variety of wooden objects is really exceptional. There are, for example, yew wood bows with cedar arrows and cedar arrow points; cedar boxes of all sizes in which the sides have been made from a single piece which has been curved and steamed to form a rectangle, pegged at one corner and then pegged to another piece that forms the bottom. Carved wooden bowls made from alder have been found, as well as food trays or dishes which appear to have been made from oak. A number of clubs used to kill harpooned fur seals have been found. Each has a superb carving of a seal's head at the end opposite the handle.

Weaving technology was highly developed in prehistoric as well as historic times at Ozette. Literally hundreds of baskets, large and small, and exhibiting a great variety of techniques, have been recovered. Some baskets were obviously used

for storage; others appear to have been used for gathering clams and mussels. One basket was full of red pigment when it was found. Perhaps the most interesting example of weaving is a small blanket that has a very sophisticated plaid design. Two beautifully carved and ornamented spindle whorls and parts of a suspended warp loom add significant information concerning the technology of weaving.

A great variety of tools and implements have been recovered including adzes, clubs, beaver tooth incising tools, mauls, hammerstones and ground slate blades. Items of personal use such as combs are highly ornamented.

A number of harpoons have been found in the house, including the large ones used for whale hunting and smaller ones used for hunting seals, sea lions and sea otters. One of the whale harpoons was inlaid with shell.

Perhaps the most spectacular item found to date is what has been referred to as the replica of a whale "saddle". The "saddle" of the whale is that portion just below the dorsal fin which, reportedly, is richest in oil. This portion is always given to the head whaler of a whaling team. Apparently, this portion of the whale also figures prominently in the rich ceremonialism and symbolism associated with the practice of hunting whales. This object is carved from cedar and inlaid with over 700 sea otter teeth. Part of another, inlaid with shell rather than teeth, has also been recovered.

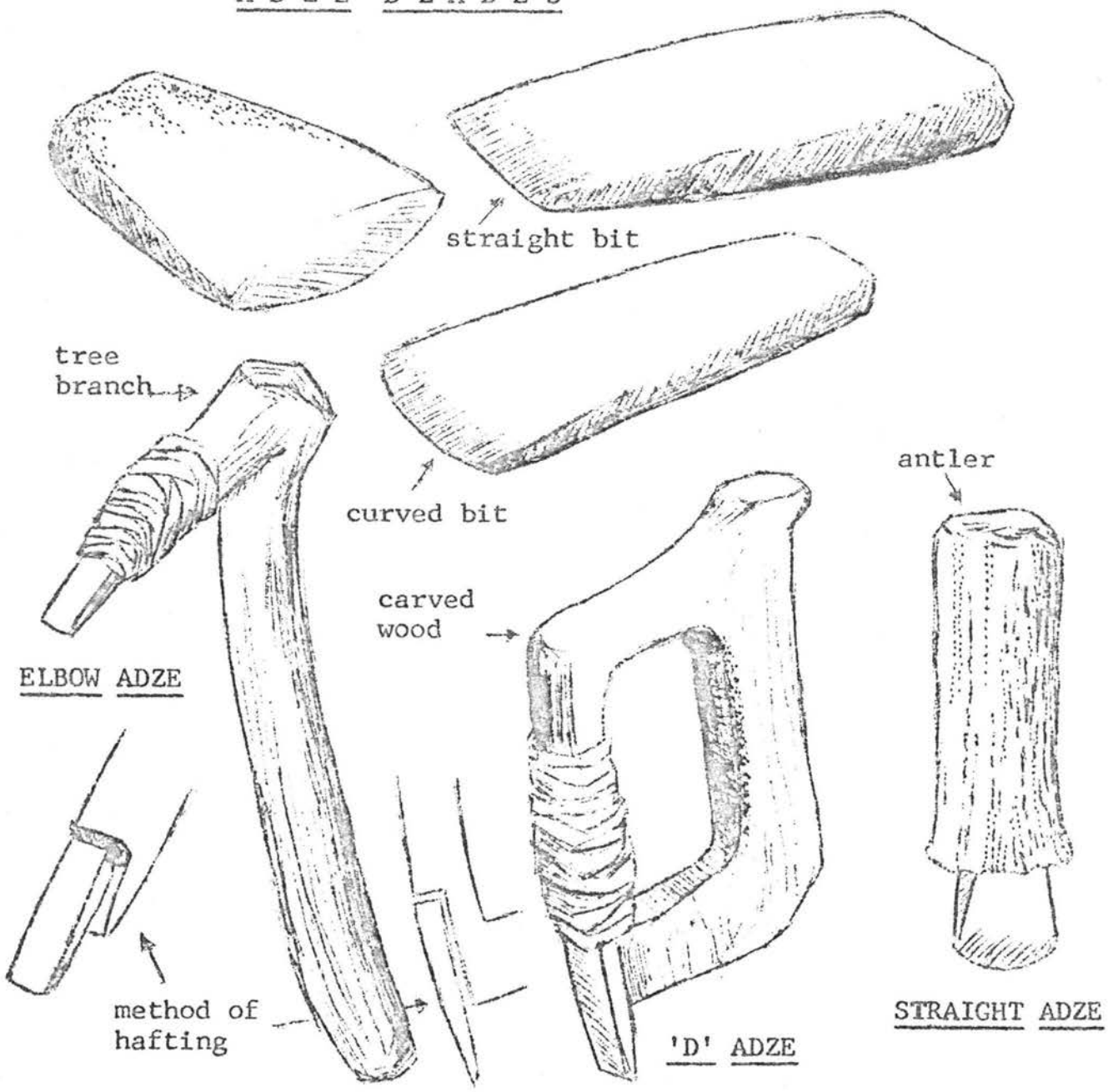
To date, over 4000 artifacts have been catalogued, and many more will be found as excavation of the house proceeds. Since the crew is still working on the first house, imagine what the excavation of the remaining five houses will bring.

Current plans call for continued excavation at Ozette for at least three more years. During this period, it is hoped that the remaining houses can be excavated. The richness of the site and the excellent state of preservation of the houses and their contents, have combined to produce an archaeological site of exceptional importance, one that is providing an unparalleled view of prehistoric man in the Pacific Northwest.

DR. DAUGHERTY is professor and chairman of the department of anthropology at Washington State University. He first surveyed the Ozette Site in 1947 and, under a National Science Foundation grant, began excavations in 1966.

Any member wishing to visit this fascinating site should call Gladys Groves (681-1456) who has been there and has detailed instructions on reaching Ozette.

ADZE BLADES



THE ADZE, in all its variations, formed part of the triad of the major woodworking industry along most of the Pacific Northwest Coast; the handmaul and the wedge being the two other important tools. The stone used for the blade of the adze had to be extremely hard and durable, and capable of taking a sharp edge that could be resharpened with an abrasive stone.

The most favoured stone for adze blades was nephrite (commonly called jade). Because of its value, the raw material and finished blades were traded into many villages, and reached even to the California coast. The adze played a major part in shaping and dressing the massive beams and planks of the coastal houses, and fashioning the great dug-out canoes that were so much a part of the coast life style.

Hilary Stewart

A.I.S.A. STUDENTS PROPOSE TO DIG UP PIONEER GRAVES

Reprinted with permission from the American Indian Student Association newsletter, Vol. 1, No. 1, May 1971

The National Science Foundation will soon receive a proposal submitted by the American Indian students from the University of Minnesota campus to excavate a Pioneer cemetery. Many archeologists and anthropologists receive large amounts of money to dig and desecrate Indian graves. They receive the grants under the pretext of learning about that tribe's burial customs, diseases etc.

To this day, Indian people have often wondered about the life style, burial customs etc. of the Pioneer invaders. Now, we may have the chance to dig, label and learn about that noble white savage! The following is an excerpt of the proposal being submitted:

Statement of Purpose: While many books are available dealing with the history of the founding of Minnesota, very little has been written from the point of view of the pioneers who lived the frontier experience. These pioneers, for the most part, did not write books, and therefore, many gaps exist in our knowledge of their beliefs and values or their actual day to day life. In cases where no written history is available, the researcher must turn to the methods of the archaeologists who have developed techniques whereby they can interpret past events on the basis of excavations of the material remains of past societies. One technique they employ consists of the excavation of human bones. The British scholar, D. R. Brothwell states in his book Digging Up Bones that "bones can provide much information on human societies of the past and in fact, no social reconstruction can be complete without examining the health and physique of the community".

We wish to make a contribution to the knowledge of Minnesota residents of their pioneer ancestors. We, therefore, propose to excavate Pioneer Cemetery located in Minneapolis at the corner of Lake Street and Cedar Avenue. We believe, that by carefully excavating this burial site, we can make a valuable contribution to historical scholars concerned with understanding pioneer community life, and to human population biologists, anatomists, and medical practitioners who will be able to draw valuable inferences about pioneer populations in Minnesota with regard to length of their lives, their nutritional standards, diseases that plagued them, the origin of their injuries, and

how their general physical condition compares with their descendents.

Using Pioneer Cemetery as a random site example, and by carefully excavating each grave, we can, upon analysis of the bone remains discover the incidence and frequency of diseases such as inflammation of the bone, tuberculosis, bone tumors, arthritis, congenital defects, certain blood diseases, endocrine disorders, skeletal deformities, riclets, diseases of the teeth, and syphilis. We may also discover the general life expectancy of these residents, and by noting how they died, we may discover the frequency of physical violence in the pioneer community. If we find heads severed, for example, it may point to the frequency of ax killings and community feuds.

This proposed excavation will also provide valuable cultural information. By carefully noting the type of grave goods associated with each skeleton we can discover the kinds of material objects that had the most meaning to these pioneers. These goods will allow us to make conclusions about pioneer religious life and the specific nature of their primitive beliefs of the afterlife. By noting differences in individual burials, we can discover what lines of social class were drawn in the pioneer settlement and variations in burial customs which may indicate the origins of individual families. We may also learn much about pioneer dress fashion. By taking photographs of each skeleton, we can tell how such objects as pins and jewelry were worn.

While the kinds of information archaeological procedures can provide may seem limited, the data gained from these procedures has the advantage of telling the truth, an advantage which historical materials lack.

Statement of Procedure: Before conducting the excavation, we plan to attain a greater basic knowledge of the human skeleton. As Brothwell states this knowledge can be achieved in a relatively short time span and is "quite within the reach of those without anatomical training."

We plan to map the area around the cemetery, take several soil samples, and with the excavation of each individual burial, we plan to photograph and mark each object as it appeared in its original place. When the bones and grave goods are cleaned, preserved, and labeled, we will make a careful analysis and submit our findings in the form of a site report. We will then dedicate the skeletons and grave goods to the State Museum in St. Paul where they can use this material for display of original pioneer burial customs in one of their marvelous glass cases.

ECOLOGICAL SAMPLING OF MIDDENS ON THE NORTHWEST COAST

Abridged and reprinted from Northwest Anthropological Research Notes Vol. 4, No. 2, by permission of the authors, JAMES J. HESTER and KATHRYN J. CONOVER, University of Colorado

Abstract

Detailed sampling of Northwest Coast prehistoric shell middens has indicated a need for precision in the sampling techniques employed. The samples collected must be neither too small nor too large for the recovery of the desired materials. Different materials require different size samples and therefore there is no single optimum sample size. Thus different suites of samples must be collected and correlated through reference to the stratigraphy. Detailed collecting techniques are outlined for the following types of samples: column, miscellaneous, large shell, bone, pocket feature, soil, non-site soil samples, charcoal, shell for dating, pollen, and samples for chemical analyses. Comprehensive sampling of middens provides data relevant to prehistoric diet, environmental utilization, cultural change, and environmental change.

Introduction

As archaeology focuses more attention upon correlating cultural remains with their total environment, it becomes increasingly necessary for archaeologists to modify their techniques for recovery of information from the site, and to re-examine their methods of analysis and interpretation.

The recognition of this problem has led to the development of "environmental archaeology" -- dealing with refined dating methods, an increasing number of techniques for microanalysis of site materials, more effective excavation plans, and an unprecedented interdisciplinary cooperation.

Of the systems evolved for efficient recovery and analysis of site materials, one of the most frequently and successfully employed has been that involving "ecological sampling" -- the taking and examination of a number of non-artifactual site samples, including pollen samples; charcoal and shell samples for dating; soil samples for chemical analysis; shell, bone, and plant samples for identification and chemical testing; and so on. The results of analysis of these ecological or environmental samples on many levels have provided bases for approximations of site age, population numbers, times and causes of economy shifts, and overall paleoenvironmental setting.

The Problem

A typical site on the Northwest Coast consists of masses of food debris and soil distributed in a linear band parallel to the marine beach on which it is situated. Termed "shell mounds" because of their high content of marine shell, the middens are a complex record of cultural activities and environmental events; and the obvious component of shell is only a portion of the meaningful data available for study if suitable techniques are employed. The middens contain huge volumes of food debris and a limited quantity of artifacts, with cultural features being rare and indefinite. In this situation, standard archaeological techniques based on collection of a large sample of artifacts and ex[illegible] following cultural features cannot be employed. One alternative, the excavation of sizeable volumes of midden debris in order to obtain a large enough artifact sample to be statistically valid, requires the utilization of enormous quantities of labor. This method has been most typically used on the Northwest Coast with the result that few sites have been excavated. The approach adopted in our current project has emphasized the fact that the primary data preserved in the middens are ecological in nature, and therefore techniques of collection and analysis of these data should be stressed.

The procedure of digging the excavation units by level, either trenches or pits, is essential. Use of either arbitrary levels or real stratigraphic levels is theoretically possible. In practice, neither method is wholly satisfactory. The real levels are difficult to identify, except in retrospect, through examination of the pit walls. It is possible that even a stratum which appears to be homogenous may have within it a number of different components masked by one major element, as the shellfish remains in the Bella Bella sites excavated overwhelm the lesser quantities of animal bone. Arbitrary levels are equally inadequate in that they may combine more than one real unit into a mixed composite sample.

The items to be recovered pose a considerable problem in sampling inasmuch as they are of different sizes and occur with different frequencies. Sampling techniques must thus utilize a sample which is neither too small nor too large for the efficient recovery of the material sought. Our experience to date suggests that there is no optimum sample size. Instead, what is required is several different types of sampling carried out simultaneously. It is almost inherent in the method that it yields suites of samples which are sufficiently different in size and composition so that it is almost impossible to correlate them. Yet in order to estimate the flesh weight that was consumed, it is absolutely imperative that such samples be as internally consistent as possible.

The materials to be recovered are frequently of small size which requires either fine screening, hand picking, or both. To date, all screening techniques utilized in the field have proved to be too time consuming, with the result that some samples were reduced in

weight to a "concentrate" which was then transported back to the home institution for sifting. This procedure necessitated the shipping of considerable quantities of midden soil from the site.

(A review of the history of ecological sampling is omitted; references were mainly to E.W. Gifford, N.C. Nelson, S.F. Cook, A.E. Treganza, R.F. Heizer, R.L. Greengo, R. Ascher, J.L. Chartkoff and C.W. Meighan.)

Application of the Technique to the Northwest Coast Area

The technique, then, consists of two basic parts: pre-analysis preparation (including collection of the samples) and the actual analysis (including final interpretation). Below is an outline of the major steps to each part as commonly used in present-day site excavation. The methods were originated and developed on shell midden sites; although, providing the site chosen meets the key criteria, they can theoretically be employed anywhere and on any site.

As far as we know, the sampling in progress in Bella Bella area middens is the first use of the technique on the British Columbia coast. The method used to date does not precisely follow that outlined by previous workers; we have used fewer steps and have been freer in our interpretation of the "rules" on number and sample weight, screening and washing, etc. In the process, however, we discovered two facts: 1) we must conform more to the established system to get good results, and 2) some of the "innovations" we employed in field situations of collecting and screening may solve a few of the system's long-standing problems.

The pre-analysis preparation we use is as follows.

1. Collecting: Collect as many samples as there are natural or arbitrary levels in a pit or trench under excavation. Collect from a column if possible, using previously recommended dimensions: 4 inch by 4 inch by level depth for each sample, taking the entire column so as to have reliable volume figures. If collecting miscellaneous samples by weight rather than volume, keep each sample as large as possible, starting with a test individual weight range of 5 to 10 pounds each. Minimum number of samples per column should be 10 to 15 - the more the better. If arbitrary intervals are used, their relation to natural levels must be noted.

2. Drying: Dry each sample thoroughly in the field, using an oven or other heat source at the field laboratory. The dry weight of the original sample is <u>crucial</u>. A set of samples from the pits may be reduced to a uniform weight. We suggest the same weight for all samples from one site.

3. Screening: Sift each sample through a set of nested screens. We used 4 mm as largest, followed by 2 mm, possibly followed by a smaller

mesh, or, alternatively, a catch-all pan (depending on the chemical tests planned, if any). Screens can be constructed in the field and transported to sites. One large set-up should remain at the field lab. Either water-screening or dry-screening can be used once the dry weight of the sample has been taken. Strong water pressure with water-screening allows the use of screens even finer than the 2 mm mesh. It makes the work go much faster than dry screening and in our experience provides a larger and more accurate recovery without damage to delicate specimens.

4. Sorting: Dry the screened debris by screen-load, sorting the contents of each screen or mesh size into the major component categories already established: shell (into species), bone (into fish/bird/mammal, and then send to identifying specialists), charcoal, rock, and residue.

5. Recording: Store the charcoal, rock, and residue (if it is decided the residue is needed for chemical or microscopic tests), making certain each major component and macrocomponent has been weighed dry, and that weight recorded before mailing or storage.

6. Labeling: Label each group of components by site, pit, or excavation unit number, level or sample number, depth in pit, screen size, and category of material contained within.

Types of Ecological Samples

A - Midden Samples: column samples of specific dimensions; miscellaneous small material samples by level; huge material samples up to 100 lbs. each, to correct bone bias, by level.

B - Specimen Samples: shell and bone samples for identification, dating or chemical analysis, by real levels; lens samples for content analysis; cultural feature samples for examination.

C - Soil Samples: site samples by real level, for chemical analysis; non-site samples from a test pit to determine natural soil horizons and history.

D - Dating Samples: charcoal for C-14 testing; shell for carbon and oxygen testing.

E - Pollen Samples: generally from bog or lake bottom; also fossils.

F - Chemical Samples: 40-gram vials of soil collected at 10 cm vertical intervals.

The ecological sampling technique expanded and applied in this manner to Northwest Coast middens will undoubtedly produce some intriguing and useful information. If the method proves as successful

as expected, there is reason to believe it can become a standard procedure in midden excavation -- something archaeologists familiar with the technique have been trying to promote for over 20 years.

Application of the Technique to Problem Solution

During the course of the current archaeological project, a wide variety of ecological specimens have been collected from strata with precise information as to their relative position in time. Identification of the species of marine and freshwater fish, shellfish, marine mammals, land mammals, and land snails is currently in progress, including their relative frequency of occurrence. This body of data has been collected to answer specific cultural problems concerning the use of the environment by the past inhabitants of the area. These inquiries include the reliance on specific food resources through time with the development of the requisite technology for their exploitation. We can thus examine the maritime adaptation of the prehistoric peoples through time with respect to shifts in preference, reliance on seasonally available foods, seasonal occupation of specific sites, food processing techniques, etc. We can also relate these data to the ethnographic sources to investigate, for example, the truth of the assumption that the salmon run provided the economic staple. We may also compare site content from various sites to understand the degree of localization in use of nearby food resources.

We are in a position to reconstruct the nature of the Bella Bella region's environment for the time period represented: 1) with the information currently available concerning the bird, mammal, fish, and marine invertebrate species utilized for food; 2) with the information still being collected to provide a pollen record reflecting the area's vegetational history; and 3) with oxygen-18/oxygen-16 data from shell remains indicating past ocean temperatures.

In addition it seems that with a thorough examination of the data available to the present project, it will be possible to make a theoretical contribution. Deevey (1967:64) has posed the question, "How, by the methods favored by historical ecologists, could one distinguish the effects of disturbance from those of climatic change?"

The data available from our shell midden excavations provide one type of information -- the kind of food resources from the local area (primarily marine) that were collected by men and imported to the site for consumption. We thus have an ecological sample which is almost entirely the result of cultural bias.

On the other hand, the communities of terrestrial vegetation are, through time, almost the complete opposite. They are the result of climatic and other natural factors, as the human use of vegetational resources was minimal. This evaluation is based in part on the high rainfall and enormous potential for forest growth in the region and in

part on the fact that human use or alteration of the terrestrial environment was limited by a primary orientation to marine economic resources without any agricultural disturbance. The forest utilization consisted of some tree-cutting for canoe and house construction. In view of the enormous forest growth, it is doubtful that human disturbance can be detected palynologically. Therefore we assume that away from known sites of human habitation we can locate fossil pollen sites which will provide essentially natural rather than humanly-altered profiles.

If our assumption is proven true through research, then we will be in a position to make comparisons between these two sources of data -- the culturally biased shell midden data and the fossil pollen record of vegetational communities undisturbed by man. The following methodology, with a series of hypotheses to be tested, is proposed to handle the data generated:

A. Identify changes in species representation in the shell middens through time.

A1. Attempt to determine if these changes represent trends or whether they are episodal in nature.

B. Examine cultural data to determine if a change in species representation may or may not be correlated with a contemporaneous change in other aspects of the culture.

C. Examine non-cultural fossil sites to determine if changes found in those correlate with changes identified in the cultural sites.

Hypotheses:

B1. Changes in other aspects of culture suggest the changes in the food remains may be due to cultural rather than environmental causes.

B2. Cultural continuity contemporaneous with changes in species representation suggests the change agents may be environmental in nature.

C1. Species changes in non-cultural fossil sites contemporaneous with species changes in the cultural sites suggest that the change agents may be environmental in nature.

C2. Non-correlation of changes in species frequencies or presence-absence between the non-cultural and the cultural sites suggests the changes in the cultural sites may be cultural in origin.

D. Changes in species through time in a midden (within a specific cultural tradition) are the result of random selection of food resources by man. Therefore a reconstruction of the environment can be attempted without reference to outside data for corroboration.

Additional cross checks on the nature of the environment may also be provided by some of the shell studies. The growth lines and geochemical composition of the shells from the midden may provide clues to the nature of the past marine environment. On the other hand, it may be possible to collect natural shell samples from former beach strand lines which could then be compared in species composition with those samples collected from the middens.

Data Presentation

The recovery of ecological data from midden samples is only a portion of the methodology that must be employed. Data are acquired on the weight/volume of individual materials (bone, shell, soil, rock, etc.) and are then converted to a percentage of midden weight/volume. These individual categories are then broken down into the frequency of occurrence of individual species, when obtainable. All of these data have their provenience established relative to a sample column or the principal stratigraphy established for the excavation units. A number of graphing techniques lend themselves to the illustration of such data.

The Philosophy of Midden Analysis

The development of a philosophy toward midden sampling has taken some time and our ideas are continuing to evolve. At this point, it seems to us that no one field technique can be utilized to provide all of the different suites of samples required. It seems to us that a middle course of action is possible with some samples being processed on the site, with others being washed to a concentrate on the site with this concentrate being further picked in the laboratory, and finally with some samples being completely analyzed in the laboratory. What governs our decisions on these matters is the time/data ratio. If test analyses carried out suggest that little additional information is lost by discarding everything passing through a certain size screen, then it is possible to adopt this technique. The decision must be based on the specific site components and probably no exact standards are applicable. It is also possible to become paranoid over the possibility that some data are not being recovered. Probably too much concern has been spent on this aspect. We recommend sifting test samples through different size screens and reaching a decision as to the fineness of sifting necessary -- then stick to that technique to derive samples that can meaningfully be compared.

A major concern may also be in the establishment of cross checks. Column samples may be compared with the contents of the entire excavation unit from which they were obtained, samples screened through 1/4 inch mesh may be compared with those screened through 1/8 inch mesh, or samples from one pit compared with samples from another pit to establish intrasite variability. Many such studies have been carried out in tests of the method. At this time, it is our opinion that the method is established. It is no longer necessary to continue

to carry out such cross checks except to provide specific clues which are currently being investigated.

As a final point of view, we regard the technique as instrumental in the recovery of information. Although the technique may be applied in a kind of rote fashion to all site debris, it probably should not be so applied. The problems being investigated should, in our opinion, be modified to provide the most information possible about that aspect. The problems suitable for investigation range from the reconstruction of population, to diet, ecological adaptation, and the reconstruction of the environment itself. The techniques employed in these studies seem to us, of necessity, to be equally varied.

'NEW PEAK' IN SKILLS

by Humphry Davy, Victoria Times

Anyone interested in the progress and development of contemporary Indian arts and crafts shouldn't miss the exhibition "Legacy" which opened recently at the Provincial Museum.

The quality of the exhibits marks a new peak in Indian artistic development and skills since B.C.'s native art underwent a revival 20 years ago.

Peter McNair, curator of ethnology, said the exhibits are as good "as anything produced by the great Indian craftsmen of 100 years ago." He called it the most significant and comprehensive exhibition of B.C. Indian art ever assembled.

The show, sponsored by the First Citizens' Fund, continues until the end of the year.

Fifty of the best contemporary native B.C. artists were commissioned for the show. Truly inspired, they turned out beautiful works of art. One exquisite piece is a 22 carat gold box carved by Bill Reid, a Haida living in Vancouver. Hazelton artists with three years of training as carvers produced beautiful house boxes and bowls - equal in workmanship to those carved by their ancestors. One of the most spectacular pieces is a carved panel by Doug Cranmer illustrating the legend of the founding of the Nimpkish people. Tony Hunt, of Victoria's Thunderbird Park, carved a chieftain's seat. There are also some excellent carvings by Robert Davidson of Massett, Queen Charlotte Islands, rugs by Salish weavers, argillite carvings, silverware, masks, feast dishes, totem poles and baskets.

None of the exhibits are for sale. At the end of the exhibition they will all become the property of the province.

SUMMER CLIPPINGS

Guardian, London, May 1971

Amateur threat to digs

By CAMPBELL PAGE

AMATEUR archaeologists could be ruining sites all over the country in their hunt for "treasure," it was claimed yesterday. Half a dozen people are thought to be in each county scanning sites with electronic metal detectors.

Mr Peter Fowler, honorary secretary of the Council for British Archaeology, said yesterday that the amateurs are reacting to the rising market in antiquities, which meant that even musket balls from Civil War battle sites are now saleable. He hoped searchers would stop investigating sites once they realised that their digging would hamper later attempts at systematic excavation.

"A lot of people have been beguiled into buying these machines and I do not think they realise the harm they can do," Mr Fowler said.

Unauthorised excavation is illegal on the 8,500 scheduled sites listed by the Inspectorate of Ancient Monuments, but there is no legal restriction on other sites. Archaeologists hope legislation will extend legal protection to the sites at risk, but this would mean a much larger official staff to assess sites and arrange for them to be scheduled.

Archaeological finds have received greater protection from commercial exploitation and export since January last year. Previously only objects worth more than £2,000 had to be referred to the Reviewing Committee on the Exports of Works of Art, but since then archaeological finds of whatever value can be

Upper Islander, Campbell River 23 June 1971

PETROGLYPHS FOUND DEFACED

The petroglyphs on Quadra Island have been the victims of vandalism and carelessness.

Some of the ancient Indian rock carvings are now smeared with paint and the petroglyphic forms of other rocks have been chalked up.

Local author, Ed Meade says he thinks most of the damage to the rocks is caused by inexperienced people trying to make rubbings from the petroglyphs.

These people, through either carelessness or stupidity, spill paint on the rocks, Meade says.

This vandalism has caused the Cape Mudge Village Council to erect signs to keep people away. The petroglyphs are protected against vandalism by the B.C. Archeological and Historic Sites Act.

The law can impose fines of up to $500 or six months in jail on anyone found defacing the rocks.

The correct way to make a rubbing of a petroglyph is to tape a piece of canvas across the area to be rubbed and then darken the canvas to highlight the form. Either acrylic or oil paint can be used.

Interior News, Smithers, July 1971

Mammoth found in mining dig

BURNS LAKE, B.C. (CP) — Workmen digging out an open-pit copper mine near this central interior British Columbia community have discovered the remains of what appears to be a prehistoric mammoth, officials of Noranda Mines Ltd. said Tuesday.

Mine manager Bill Allan said: "It appears to be a mammoth. The tusks, or what appear to be the tusks, are in evidence."

A four-foot section of tusk, about eight inches in diameter, has been exposed so far. Another tusk was found about 20 feet away from the first find.

"The animal was likely in an old swamp which was apparently covered over by glacial fill. Whatever was in the swamp was likely preserved."

A Noranda geologist said the remains could be more than 10,000 years old.

It was only the third such find in B.C. history. One mammoth tusk was unearthed dur- and another was found in 1969 in the Pouce Coupe river valley.

Digging around the site of the find has been stopped until a representative of the Canadian Geological Survey can examine the tusk. He was expected today. Scientists at the University of B.C. were also notified.

The mammoth, was one of the largest forms of elephant, covered with long hair and with a pair of tusks up to 10 feet, six inches long.

It was the only elephant adapted to life in cold climates.

It is not known for certain when mammoths became extinct, but some survived in France until the end of the glacial period and others may have lived on in Alaska and Siberia to a more recent period.

The Bell Cooper division of Noranda Mines is doing preparation work for a copper mine at Granisle in Babine Lake, a

DATES FOR YOUR DIARY

A.S.B.C. Meetings - Centennial Museum Auditorium - 8 p.m.

Oct. 13 - Mr. Norman Carter, illustrated lecture, "The Mexicans as Builders".
Nov. 10 - Mr. Philip Hobler of S.F.U. speaks on "An Archaeological Survey and Excavation in the Bella Coola Area".
Dec. 8 - Dr. R. J. Pearson of U.B.C. on "Archaeological Excavations in the East China Sea".

U.B.C. Extension Courses

"Prehistory of B.C. - An Overview of Archaeological Research". 14 Tuesdays, beginning Oct. 5, given by Dr. C. Borden on U.B.C. campus. Special rate to ASBC members. Inquiries to UBC Center for Continuing Education, 228-2181.

"Indians of North America". 10 Wednesdays starting Oct. 13, 8 p.m. at Maritime Museum. Given by Dr. Harold Hickerson of S.F.U.

"The Kwakiutl Indians of the North-west Coast". Six Sundays, starting Oct. 17, 2 p.m. in Centennial Museum auditorium. Five speakers and dance group, co-ordinated by Mrs. Joy Inglis of Centennial Museum.

"Lords of the Mediterranean". Ten Wednesdays, beginning Oct. 6, 8 p.m. on U.B.C. Campus. Given by Dr. Hanna Kassis of U.B.C.

Vancouver Museums Complex

"Mystery of Stonehenge", film. Oct. 8 and 9 at 8 p.m.

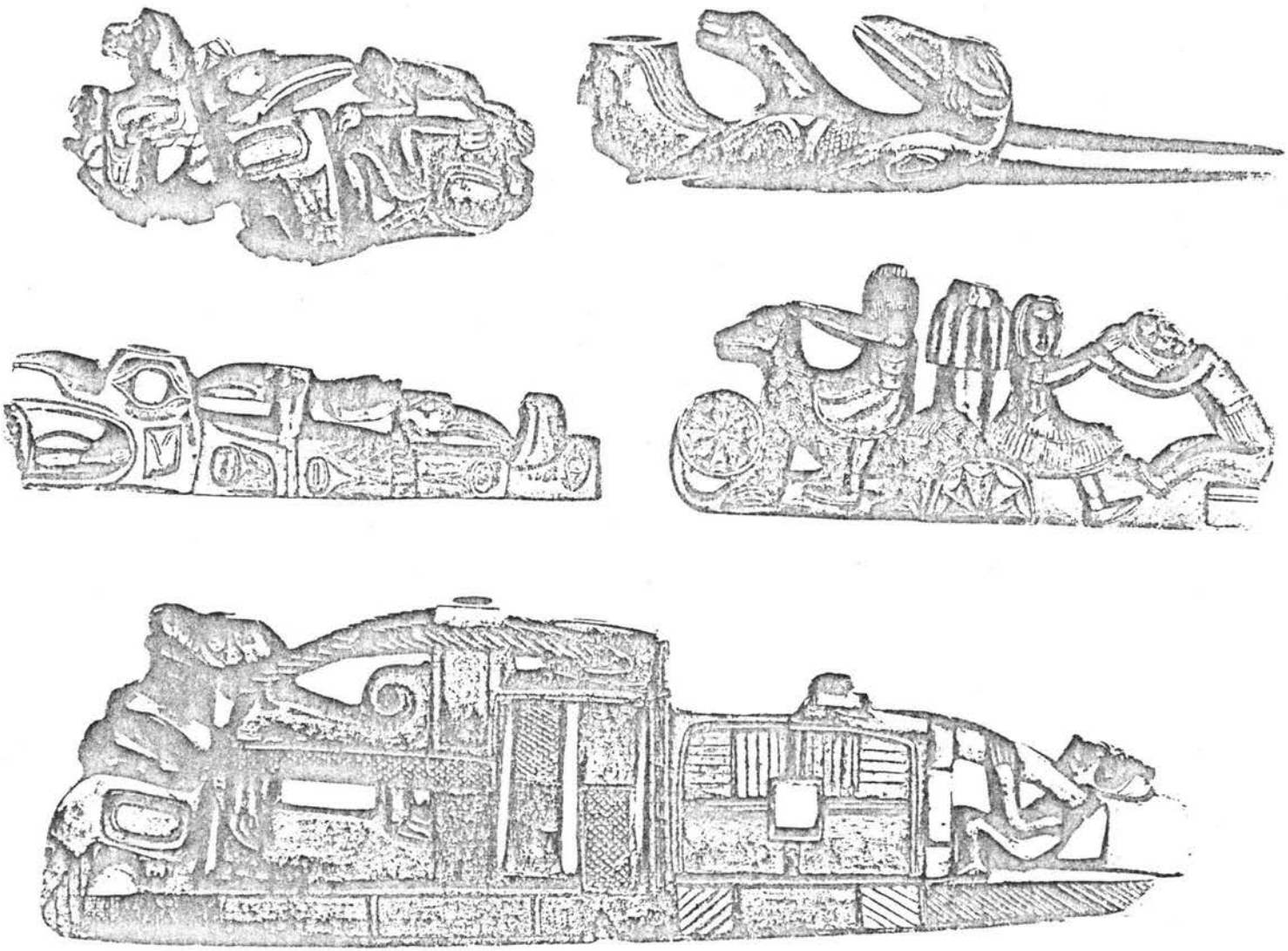
NOTE: The Centennial Museum and Maritime Museum will be closed in the morning and most evenings during the fall and winter. New hours: Noon - 5 p.m. Mon. through Fri; noon - 8 p.m. weekends and holidays.

Vancouver City College, Langara

"Archaeology of the Lower Mainland". Illustrated lecture, Tuesday, Oct. 19, 7:30 p.m.

"Masks of West Coast Indian Culture". Illustrated lecture, Tuesday, Oct. 26, 7:30 p.m.

The Archaeological Society of B. C. offers its sincere sympathies to the family of the late Gordon Bowes. Mr. Bowes was a founder member of the Society, as well as being active in the Vancouver Historical Society and his tragic death deprives us of a loyal and active member.



Five rarely-seen argillite pipes, in a private collection in England. The owner, who passionately collects all sorts of pipes, found them in the London-area after the Second World War, but knows little of their provenience. By permission...