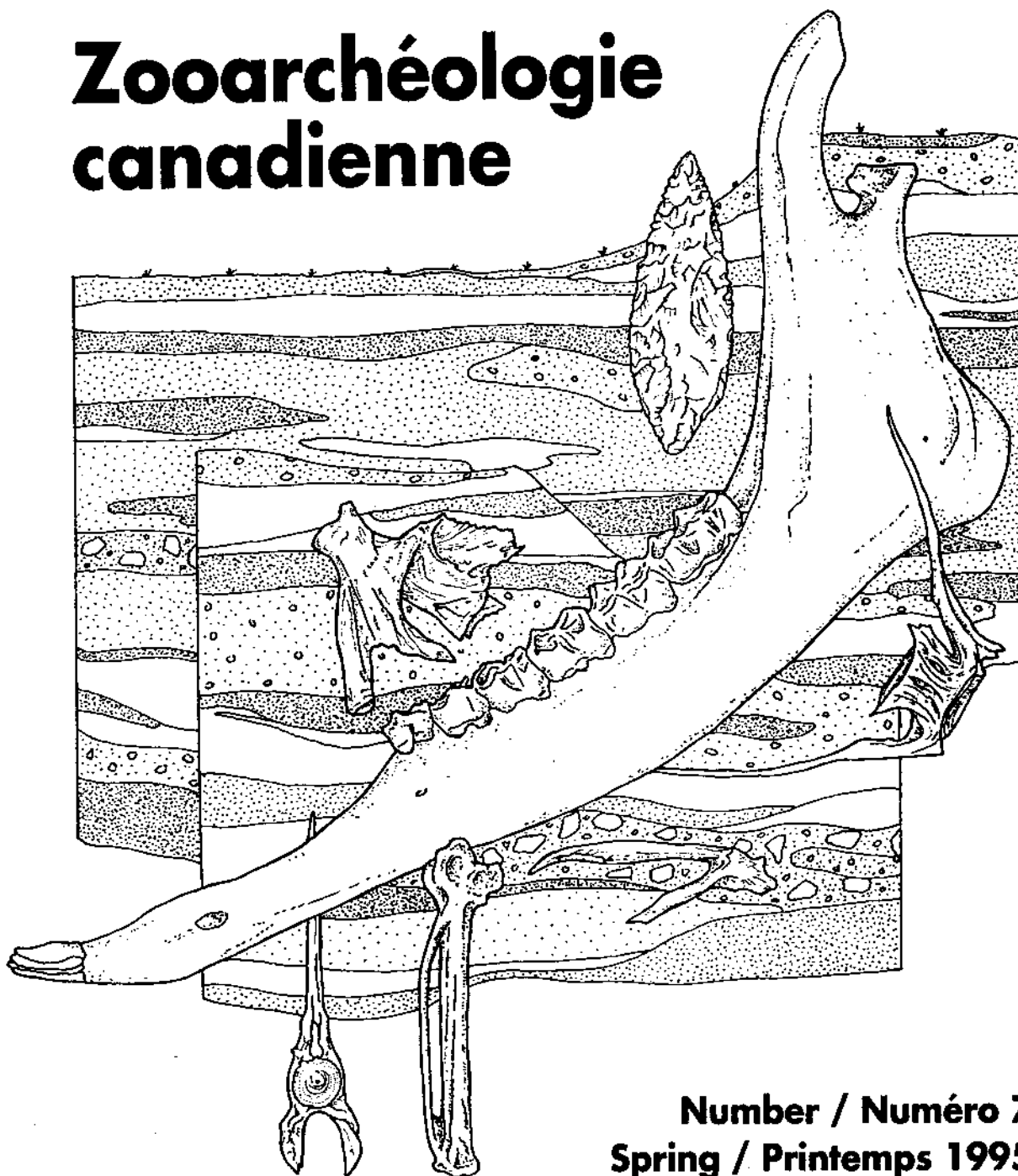


Canadian Zooarchaeology

Zoarchéologie canadienne



Number / Numéro 7
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**EDITOR'S NOTE/NOTE DE
L'EDITEUR**

We've been really gratified by the response to our request for short biographies by researchers interested in zooarchaeology in Canada. A quick browse through the listings show that there is a wide variety of interests and research being carried out. We hope this listing will be of help in acquainting people with others who have similar research interests.

In this issue we reprint the first part of an article on BC zooarchaeology by Jonathan Driver, which originally appeared in BC Studies, in 1993. The article takes a slightly different approach from other regional histories, by presenting BC zooarchaeological research in light of current theoretical and methodological concerns. Part 2 will come out in the Fall issue.

A productive spring and summer to everyone. Thanks to Donna Naughton who put this issue together.
Kathlyn Stewart, Editor

******NOTICE******

*New phone and fax for Canadian
Zooarchaeology
phone -(613)941-4409
fax -(613) 954-4724*

Canadian Zooarchaeology is published twice a year at the Canadian Museum of Nature. News, letters, articles, books or papers for review should be sent to:

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Canadian Museum of Nature,
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Ottawa, Ontario, K1P 6P4

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Cover drawn by Debbie Yee Cannon

**ZOOARCHAEOLOGICAL
RESEARCHERS: CURRENT
RESEARCH INTERESTS AND
PUBLICATIONS**

Balkwill, Darlene McCuaig
Canadian Museum of Nature, P.O. Box
3443, Station D, Ottawa, Ontario, K1P
6P4

Research Interests:

Prehistoric coastal subsistence strategies
in northern North America; comparative
osteology of passerine birds;
comparative osteometrics of ptarmigan
and grouse; palaeoenvironmental
reconstruction.

Publications:

**Balkwill, Darlene McCuaig & Rick,
Anne Meachem - 1994 - Siglit
subsistence: Preliminary report
on faunal remains from a large
midden at the Gupuk Site (NiTs-
1), Mackenzie Delta, N.W.T.
pp.93-114 In: Jean-Luc Pilon
(ed.) Bridges across time :the
NOGAP Project. Canadian
Archaeological Association
Occasional Paper No.2**

**Rothschild, Nan A. and Balkwill,
Darlene - 1993 - The meaning of
change in urban faunal deposits.
Historical Arch. 27(3):71-89**

Berg, Debbie
Department of Anthropology, Erindale
College, University of Toronto, 3359
Mississauga Road, Mississauga, Ontario,
L5L 1C6

Research Interests: Faunal remains
from Ontario; osteological differences
among the different sucker species in
Ontario; sexual dimorphism of Ontario
mustelids.

Black, David W.
Department of Anthropology, University
of New Brunswick, P.O. Box 4400,
Fredericton, New Brunswick, E3B 5A3

Research Interests:

Seasonality; growth increment analyses;
shell midden interpretation; quantitative
analyses of shellfish assemblages.

Publications:

**Black, David W. - 1993 - What images
return: A study of the
stratigraphy and seasonality of a
shell midden in the Insular
Quoddy Region of New
Brunswick. N.B. Archaeology
Series, Ms. #27. Fredericton:
Dept. of Municipalities, Culture
and Housing.**

Boyko, Wayne C.J.
Commander, U.S. Army, XVIII ABN
Corps and Fort Bragg, Attn: AFZA-
PW-DP (Wayne Boyko) Fort Bragg,
North Carolina, 28307-5000

Research Interests:

Mississippian culture subsistence
systems; settled village subsistence on
the northern Plains; cultural change
correlations with man-induced
environmental change.

Publications:

**Boyko, Wayne C.J., Hatch, James W.
& Bonhage-Freud, Mary Theresa
- in press - Late Mississippian
households in the Oconee Valley,
piedmont, Georgia. In: Cobbs, C.
& Muller, J.(eds.), Mississippian
Household Economies.**

Brink, Jack

Archaeological Survey, Alberta
Provincial Museum, 12845-102 Ave.,
Edmonton, Alberta, T5N 0M5

Research Interests:

Creation and application of Utility
Indices in archaeology; large herbivore
biology and behaviour; modelling animal
carcass use by aboriginal hunters; bison
hunting and processing; historical
records and models of economic
anatomy.

Cannon, Aubrey

Department of Anthropology, McMaster
University, 1280 Main St. W.,
Hamilton, Ontario, L8S 4L9

Research Interests:

Variability in Northwest fishing
economies; zooarchaeological analysis of
core and auger samples from shell
midden deposits.

Publications:

Varley, Colin and Cannon, Aubrey -

1994 - Historical Inconsistencies:
Huron longhouse length, hearth
number, and time. Ontario
Archaeology 58:85-86

Cannon, Aubrey - 1995 - The Ratfish
and marine resource deficiencies
on the Northwest Coast. Can. J.
Archaeology 19:49-60

Cannon, Aubrey - 1995 - Material
Culture and Burial
Representativeness, pp. 3-17 In:
Shelley Saunders and Ann
Herring (eds.), Grave Reflections:
Portraying the Past Through
Cemetery Studies, Canadian
Scholar's Press, Toronto

Cannon, Aubrey - 1995 - The Early
Namu Archaeofauna. In: Roy L.
Carlson (ed.), Early Human

Occupation in British Columbia,
University of British Columbia
Press, Vancouver, (In press)

Casey, Joanna

Department of Anthropology, University
of South Carolina, Columbia, SC, 29208
USA

Research Interests:

Resource use in West Africa; human
ecology, origin and nature of food
producing societies.

Publications:

Casey, Joanna - 1993 - Geometric
microliths from Northern Ghana
and notes for a tentative
morphological typology. Nyame
Akuma 40:22-29

Casey, Joanne - 1993 - The Kintampo
Complex in northern Ghana:
Late Holocene human ecology on
the Gambaga Escarpment. Ph.D.
diss., University of Toronto

Casey, Joanna - 1993 - The Kintampo
Complex in northern Ghana.
Archaeology in Ghana 3:18-23

Churcher, Charles S. (Rufus)

Department of Zoology, University of
Toronto, Toronto, Ontario, M5S 1A1

Research Interests:

Quaternary mammals, chiefly of North
America and Africa; faunal remains
from Egypt and Near East from Late
Pleistocene times on; Late Cretaceous
marine reptiles.

Publications:

Churcher, C.S. - 1993 - Fossil collecting
and Government Regulation.
Science 259:581

Churcher, C.S. - 1993 - Romano-
Byzantine and Neolithic diets in
Dakhleh Oasis. Bull. Canadian

- Mediterranean Institute 13(2):1-2
- Churcher, C.S. - 1993 - Dogs from Ein Tirghi Cemetery, Dakhleh Oasis, Western Desert of Egypt, pp.39-59 In: Skeletons in her cupboard: Festschrift for Juliet Clutton-Brock, Oxbow Monograph No.34, pp.270
- Churcher, C.S. and Watson, V.- 1993- Additional fossil Equidae from Swartkrans, p.137-150 In: Brain, C.K. (ed.) Swartkrans: a cave chronicle of early man, Transvaal Museum Monograph No.8, pp.270
- Churcher, C.S. - in press - The vertebrate fauna from the Natufian level at Jebel es-Saaide (Saaide II), Lebanon. *Paleorient* - accepted for vols. 20(2) or 21(1).

Cooper, Janet C.

Faunal Archaeo-osteology Lab,
Department of Anthropology, University
of Toronto, 100 St. George St., Toronto,
Ontario, M5S 1A1

Research Interests:

Historic, protohistoric and prehistoric
material from sites in the Great Lakes
Region, North-west Coast and Arctic.

Publications:

- Cooper, Janet C. & Savage, H.- 1994 -
Zooarchaeological analysis on
Ontario sites: An annotated
bibliography. Special publication
of the Ontario Archaeological
Society, 123 pp.
- Cooper, Janet C. - 1994 - Of elbow
grease and the fragile piece.
Canadian Zooarchaeology
No.6:12-13

Corbeil, Marcel R.

Department of Anthropology and
Archaeology, University of
Saskatchewan, Saskatoon, Saskatchewan
S7N 0W0

Research Interests:

Zooarchaeology, taphonomy; site
formation, soils.

Cossette, Evelyne

Ostéothèque de Montréal, U.Q.A.M.
Laboratoire d'Archéologie, C-9400, C.P.
8888, Succursale Centre-Ville, Montréal,
Québec, H3C 3P8

Research Interests:

Late Middle Woodland in the Northeast;
hunter-gatherer subsistence including
fishing; historical zooarchaeology.

Publications:

- Cossette, Evelyne - in press - La
consummation de viande à
Montréal au XVII^e et XVIII^e
siècles. *Archéologies québécoises,*
Paléo-Québec
- Cossette, Evelyne & Quesnel, Annie - in
press - Tanneur et cornetier dans
le quartier Saint-Roch à Québec.
Archéologies québécoises, Paléo-
Québec.
- Cossette, Evelyne - in press - La pêche
et la chasse au quotidien.
Collection à Fleur de Siècles.
- Cossette, Evelyne - 1993 - The
exploitation of deer among St.
Lawrence Iroquoians, pp. 59-73
In: *Essays in St. Lawrence*
Iroquoian Archaeology. Selected
Papers in Honour of J.V. Wright.
Pendergast, J.V. & Chapdelaine,
C. (eds.), *Occasional Papers in*
Northeastern Archaeology, No.8

Courtemanche, Michelle

Ostéothèque de Montréal, Inc.,
U.Q.A.M., C-9400, C.P. 8888, Succ. A,
Montréal, Québec, H3C 3P8

Research Interests:

Fish bones (Ichthyoarchaeology).

Cumbaa, Steve

Canadian Museum of Nature, P.O. Box
3443, Station D, Ottawa, Ontario, K1P
6P4

Research Interests:

Paleoenvironments; evolution and
radiation of teleost fishes; shallow water
marine environments, especially in the
Cretaceous; early human exploitation of
vertebrates; whales and whaling.

Darwent, Christyann

Department of Archaeology, Simon
Fraser University, Burnaby, B.C., V5A
1S6 (until June '95), then Department of
Archaeology, University of Missouri -
Columbia, MO, U.S.A. 65211
(beginning in August '95)

Research Interests:

Canadian High Arctic and Greenland,
Paleoeskimo/ASTt Period.

Publications:

Darwent, Christyann - 1994 -
Zooarchaeological Analysis in the
Canadian Arctic. *Canadian
Zooarchaeology* 5:2-15

Driver, Jonathan

Department of Archaeology, Simon
Fraser University, Burnaby, British
Columbia, V5A 1S6

Research Interests:

Western Canada; American Southwest;
cultural ecology; social organization.

Publications:

Driver, J. - 1993 - Early to late
prehistoric lithic and faunal
assemblages site DjPp-8, Alberta.
Can. J. Archaeology 17:43-58

Driver, J. - 1993 - Zooarchaeology in
British Columbia. *B.C. Studies*
99:77-105

Emery, Kitty

Department of Anthropology, Cornell
University, 265 McGraw Hall, Ithaca,
New York, 14853, U.S.A.

Research Interests:

The application of a variety of
zooarchaeological techniques (including
isotopic bone chemistry and
metric/typological artifact studies) to the
study of diachronic patterns of dietary,
environmental and societal change in the
Maya lowlands of Guatemala.

Publications:

Palka, Joel; Emery, Kitty; Moscoso,
Fernando; Brandon, Joe; Poché,
Kelly; Foias, Antonia and
Wright, Lori - 1993 - Resultados
de Excavaciones en Unidades
Residenciales de Dos Pilas, Petén,
en la Temporada 1992, pp. 159-
178 En: J.P. Laporte, H.L.
Escobedo, y S. Villagran de
Brady (eds.) VI Simposio de
Investigaciones Arqueológicas en
Guatemala, Instituto de
Anthropologia e Historia,
Guatemala

Emery, Kitty - 1993 - Análisis de los
Restos de Fauna de una
Residencia Elitista de Aquateca,
pp.161-164 En: J.A. Valdés, A.
Fois, T. Inomatta, H. Escobedo
and A. Demarest (eds.), Proyecto
Arqueológico Regional
Petexbatun, Informe Preliminar
No.5: Quinta Temporada 1993.

Valdés, Juan Antonio; Foias, Antonia;
Emery, Kitty; Cabrera, Tannio
and Monterroso, Nancy - 1994 -
Poder y Gloria en Petexbatun:
Nuevas evidencias para el centro
de Tamarindito. En: J.P. Laporte
and J.A. Valdés (eds.) VIII
Simposio de Investigaciones
Arqueológicas en Guatemala,
Instituto de Anthropogía e
Historia, Guatemala

Emery, Kitty - 1994 - Bone Artifact
Economies of the Maya
Lowlands: Clues from a bone tool
production locus in the
Petexbatun region. Paper
presented at the American
Anthropological Association
Meetings, Atlanta, Georgia

Emery, Kitty - 1994 - Manufactura de
Artefactos de Hueso de la Region
Petexbatun: Un taller de
producción de herramientas de
hueso del sitio de Dos Pilas,
Petén, Guatemala. En: J.P.
Laporte, H.L. Escobedo (eds.)
VIII Simposio de Investigaciones
Arqueológicas en Guatemala,
Instituto de Anthropogía e
Historia, Guatemala

Emery, Kitty - 1994 - Excavaciones en el
taller de Dos Pilas (DP1). En: A.
Demarest (ed.) Proyecto
Arqueológico Regional
Petexbatún, Informe Preliminar
No.6: Sexta Temporada 1994

Emery, Kitty - 1994 - Excavaciones en
Operaciones TA 28, 31, y 35 de
Tamarindito. En: A. Demarest
(ed.) Proyecto Arqueológico
Regional Petexbatún, Informe
Preliminar No.6: Sexta
Temporada 1994

Friesen, Max

Department of Anthropology, M'Gill
University, 855 Sherbrooke St. West,
Montréal, Québec, H3A 2T7

Research Interests:

Taphonomy; meat utility indices;
mortality profiles; zooarchaeology of
whales; zooarchaeology in an Arctic
context.

Publications:

Friesen, T. Max and Hunston, Jeffrey
R. - 1994- Washout - The Final
Chapter: 1985-86 NOGAP salvage
excavations on Herschel Island,
pp. 39-60 In: Jean-Luc Pilon (ed.)
Bridges Across Time: The
NOGAP Archaeology Project.
Canadian Archaeological
Association Occasional Paper No.
2. (*includes a brief
zooarchaeological analysis*)

Friesen, T. Max and Arnold, Charles D.
- 1995 - Zooarchaeology of a focal
resource: dietary contribution of
beluga whales to the precontact
Mackenzie Inuit. *Arctic* 48(1):22-
30

Friesen, T. Max and Arnold, Charles D.
- in press - Prehistoric beluga
whale hunting at Gupuk,
Mackenzie Delta, Northwest
Territories. In: Allen P.
M'Cartney (ed.) Native Whaling
in the Western Arctic and
Subarctic: Hunting the Largest
Animals. *Studies on Whaling* No.
2, Canadian Circumpolar
Institute, Edmonton. (to be
published spring 1995)

Gates, Christian

Département d'Anthropologie,
Université de Montréal, C.P. 6128,

Succ. A, Montréal, Québec, H3C 3J7

Research Interests:

Zooarchaeology of prehistoric sites in St. Lawrence River Valley and estuary.

Hanson, Diane K.

Department of Sociology and Anthropology, University of Puerto Rico, Apartado 23345, San Juan, Puerto Rico, 00931-3345

Research Interests:

Fish, shellfish; Northwest Coast; Aleutian Islands; Caribbean; taphonomy; coastal adaptations.

Publications:

Hanson, Diane K. - 1993 - Review of Beth Laura O'Leary's "Southern Tutchone Use of an 'Abundant' Resource". *Zooarchaeological Research News* 12(1):1-2

Hanson, Diane K. - 1995 - Subsistence during the Late Prehistoric occupation of Pender Canal, British Columbia. *Canadian Journal of Archaeology* 19:29-48

Hanson, Diane K. and van Gaalen, Hermina A. - 1995 - Subsistence information from Cherry Point Washington (45WH1). In: Megan M'Cormick and Billy Ray Roulette Jr. (eds.), *I Heard the Owl Call My Name: Papers in honour of Dr. G.F. Grabert* (in press)

Hanson, Diane K. - In press - Analysis of Marine Shellfish from Archaeological Sites in Puerto Rico: A Teaching Manual. Museum of History, Anthropology and Art, University of Puerto Rico, Rio Piedras.

Harington, C.R.

Canadian Museum of Nature, P.O. Box 3443, Stn. "D", Ottawa, Ont., K1P 6P4

Research Interests:

Ice Age vertebrates of Canada, Alaska, and Greenland; evolution and distribution of arctic and alpine mammals; Quaternary climatic change in Canada; Pliocene vertebrates of Arctic Canada.

Publications:

Harington, C.R., Anderson, T.W. & Rodriques, C.G. - 1993 - Pleistocene walrus (*Odobenus rosmarus*) from Forteau, Labrador. *Géographie physique et Quaternaire* 47:111-118

Harington, C.R., Grant, D.R. & Mott, R.J. - 1993 - The Hillsborough, New Brunswick mastodon and comments on other Pleistocene mastodon fossils from Nova Scotia. *Canadian Journal of Earth Sciences* 30(6):1242-1253

Bouchard, M.A., Harington, C.R. & Guilbault, J.P. - 1993 - First evidence of walrus (*Odobenus rosmarus* L.) in Late Pleistocene Champlain Sea sediments, Quebec. *Canadian Journal of Earth Sciences* 30(8):1715-1719

Cooke, H.B.S., Harington, C.R. & Sollows, J.D. - 1993 - Undescribed mammoth (*Mammuthus*) teeth from Georges Bank, Nova Scotia. *Proceedings of the Nova Scotia Institute of Sciences* 40:19-28

Apland, B. & Harington, C.R. - 1994 - Pleistocene bison skeleton (*Bison bison* cf. *occidentalis*) from Clayhurst Crossing, British Columbia. *Géographie physique et Quaternaire* 48:213-223

Harington, C.R. - 1993 - Review of Melvin A. Bernarde's "Global Warning....Global Warming". *Global Biodiversity* 3:38

Harpham, Shirley

Department of Anthropology, University of Alberta, 13-15 H.M. Tory; Edmonton, Alberta, T6G 2H4

Research Interests:

Archaeology and faunal reference collections (collections focus); Alberta and Arctic comparative vertebrate osteology.

Henderson, Heather

Historic Horizon Inc., 267 St. George St., #601, Toronto, Ontario, M5R 2P9

Research Interests:

Historic Period -17th - 19thC. North America, especially northeastern - Acadian and 18th -19thC Ontario.

Kooyman, Brian

Department of Archaeology, University of Calgary, Calgary, Alberta, T2N 1N4

Research Interests:

Butchering pattern analysis; ethnicity; hunting strategies; Plains; Polynesia; bison; Moa.

Kusmer, Karla

4683 Cheatgrass Lane, Sparks, Nevada, U.S.A., 89436

Research Interests:

Microvertebrate taphonomy; quantitative and sampling methodology; investigation of sea otter absence in Gulf of Georgia.

Publications:

Lepofsky, Dana and Kusmer, Karla D. - in press - Reconstructing prehistoric socioeconomies from paleoethnobotanical and zooarchaeological data: An example from the British Columbia Plateau. *Journal of Ethnobiology*.

Kusmer, Karla D. - in press - Changes in subsistence strategies at the Tsawassen site, a southwestern British Columbia shell midden. *Northwest Anthropological Research Notes*.

Murray, Maribeth S.

Department of Anthropology, McMaster University, Hamilton, Ontario, L8S 4L9.

Research Interests:

Arctic prehistory; ideology of resource use; hunter-gatherer economy.

Publications:

Murray, Maribeth S. - in press - A Zooarchaeological Approach to Palaeoeskimo Prehistory. In: Peter Rowley-Conwy, Oxbow Books

Ramsden, P. & Murray, M. - in press - Identifying seasonality in PreDorset structures in Back Bay, Prince of Wales Island, N.W.T. *Arctic Anthropology*

Nagy, Murielle

Department of Anthropology, University of Alberta, Edmonton, Alta. T6G 2H4

Research Interests:

Arctic archaeology and zooarchaeology; Pre-Dorset/Dorset Transitional sites; oral history, patterns of animal butchering and of food sharing among Inuit.

Needs-Howarth, Suzanne

Biological- Archaeological Institute,
University of Groningen, Netherlands.
Canadian address: 2 Clarendon Ave.,
#100, Toronto, Ontario, M4V 1H9

Research Interests:

Prehistoric Iroquoian subsistence,
especially around Lake Simcoe;
prehistoric food sharing and refuse
disposal; timing, location and technique
of prehistoric fish procurement; faunal
quantification techniques; effects of
recovery techniques on NISP and bone
weight.

Publications:

Needs-Howarth, S. - 1995 - Faunal
Analysis, Section 1, Exterior
House Features and Midden
Samples, pp. 110-129. In: R.F.
Williamson (ed.), The Myers
Road Site (AiHd-13). Occasional
Publication of the London
Chapter, Ontario Archaeological
Society 7 (in press)

Needs-Howarth, S. - 1995 - Quantifying
diet: An application of bone
weight allometry biomass
estimates to the Coleman Site
faunal assemblage. Submitted for
publication in Canadian Journal
of Archaeology.

Needs-Howarth, S. and Thomas, S.C. -
1995 - Seasonal variation in
fishing strategies at two Middle
Iroquoian village sites near Lake
Simcoe, Ontario. Submitted for
publication in Proceedings of the
Association for Environmental
Archaeology meeting in
Zwartsluis, the Netherlands.

Prevec, Rosemary

944 La Salle Park Road, Burlington,
Ontario, L7T 1M9

Research Interests:

Faunal analysis.

Rick, Anne Meachem

Canadian Museum of Nature, P.O. Box
3443, Station D, Ottawa, Ontario, K1P
6P4.

Research Interests:

Zooarchaeology of prehistoric and
historic sites in the Arctic and Ontario;
historic sites in upper New York State;
prehistoric sites in western
Newfoundland.

Publications:

Balkwill, Darlene McCuaig & Rick,
Anne Meachem - 1994 - Siglit
subsistence: Preliminary report
on faunal remains from a large
midden at the Gupuk Site (NiTs-
1), Mackenzie Delta, N.W.T.
pp.93-114 In: Jean-Luc Pilon
(ed.) Bridges across time :the
NOGAP Project. Canadian
Archaeological Association
Occasional Paper No.2

Rick, Anne Meachem - 1994 -
Champlain was here: animal
remains from early settlements at
Quebec and Cap Tourmente.
Canadian Zooarch. No.6:6-10

Rojó, Dr. Alfonso

Biology Department, Saint Mary's
University, Halifax, NS, B3H 3C3.

Research Interests:

Fish remains in archaeology sites
(identification etc.); osteological
collection for the use of archaeologists;
osteometry and comparative anatomy of
fish skeletons.

Publications:

Rojo, Alfonso - In press - X-rays as a tool for the identification of the vertebrae of cod, saithe cusk and haddock of the family Gadidae. *British Archaeological Reports*.

Saint-Germain, Claire

Ostéothèque de Montréal, Inc.,
U.Q.A.M., C-9400, C.P. 8888, Succ. A,
Montréal, Québec, H3C 3P8

Research Interests:

Bone Grease

Publications:

Saint-Germain, Claire - 1993 - Si vous tombez sur un os. La zooarchéologie au Québec. *Mémoires Vives* No.4:10-16

Saint-Germain, Claire - 1993 - Analyse des vestiges fauniques du Champ-de-Mars à Montréal. *Archéologiques* No.7:21-32

Simonds, Eric C.

Cultural and Natural Heritage
Management Consultants (CNHM
Group), 314 Bannerman Ave.,
Winnipeg, Manitoba, R2W 0T9

Research Interests:

Osteichthyes; North America; plains; subsistence and diet; palaeoecology, biogeography; environmental studies.

Publications:

Simonds, Eric C. - 1993 - A study of fish remains, p.142-187 *In: S. Kroker & P. Goundry* (compilers), A 3000 Year Old Campsite and Trade Centre at the Forks, The Forks Public Archaeological Association Inc., Winnipeg.

Simonds, Eric C. - 1993 - Preliminary results of the study of the fish

remains from the 1992 excavations at the Forks (DILg-33), Winnipeg. Paper presented at the 51st Annual Conference of the Plains Anthropological Society, Saskatoon.

Simonds, Eric C. - 1994 - Preliminary analysis of fish remains, p.137-186 *In: S. Kroker & P. Goundry* (compilers), A 3000 Year Old Campsite and Trade Centre at the Forks, The Forks Public Archaeological Association Inc., Winnipeg.

Simonds, Eric C. - 1994 - Socio-economic aspects of a fishing economy during the Archaic Period in the Parkland Region of the Northern Plains. Paper presented at the 52nd Annual Conference of the Plains Anthropological Society, Lubbock

Simonds, Eric C. - in press - Fish remains and archaeology: a case example from The Forks (DILg-33), Winnipeg. *In: Current Archaeology: Interdisciplinary Approaches*. Proceedings of the 33rd Annual Meeting of the Manitoba Archaeological Society, Winnipeg, 1994.

Smith, Beverley A.

Department of Sociology and
Anthropology, University of Michigan-
Flint, 422 Crub, Flint, Michigan, USA
485-02-2186

Research Interests:

Upper Great Lakes Region, Late Prehistoric and Early Historic Period; Saginaw Valley, Michigan - transition to agriculture; dog burials; ritual use of animals; 19th Century SE Michigan

civilian and military animal use.

Publications:

Smith, Beverley A. - 1994 - Chapter 8, Faunal Analysis. In: R. Stamps, B. Hawkins & N. Wright (eds.), House in the Grove: The Thomas Edison House, Port Huron, Mi. Cultural Dynamics, Rochester, Michigan.

Louis, W.A., Egan, K.C., Monaghan, G.W., Smith, Beverley A., Pratt, E.J. - in press - Environment and subsistence at the Marquette Viaduct locale of the Fletcher Site. In: M. Holman & J. Brasdler (eds.), Investigating the Archaeological Records of the Great Lakes States: Essays in honor of Elizabeth Baldwin Garland, Parker Press, Kalamazoo, Michigan

Stewart, Frances L.

Department of Anthropology, University of New Brunswick, P.O. Box 4400, Fredericton, New Brunswick, E3B 5A3

Research Interests:

Iroquoian subsistence; native and historic subsistence in Atlantic Canada; North American Subsistence Systems .

Publications:

Stewart, Frances L. - 1993 - A History of Zooarchaeology in Ontario. Canadian Zooarchaeology 4:2-18

Stewart, Frances L. - 1994 - Faunal Papers at the ESAF Meeting. Canadian Zooarchaeology 5:20-22

Stewart, Frances L. - 1991 - Melanson: A central place in southwestern Nova Scotia. In: Michael Deal and Susan Blair (eds.) Prehistoric Archaeology in the Maritime Provinces, Reports in

Archaeology, Council of Maritime Premiers, N.B. Archaeological Services No. 8:221-228 (*dated 1991 but came out in spring 1994*).

Stewart, Kathlyn M.

Canadian Museum of Nature, P.O. Box 3443, Stn D, Ottawa, Ontario, K1P 6P4

Research Interests:

Quaternary vertebrates, particularly fish in Africa and Canada. Theoretical interests include taphonomy, paleoecology, paleoenvironment.

Publications:

Stewart, F.L. and K. M. Stewart - In press - The Boardwalk and Grassy Bay sites: Patterns of Seasonality and Subsistence at Prince Rupert Harbour, BC. Canadian Journal of Archaeology

Yellen, J.E., Brooks, A.S., Cornelissen, E., Mehlman, M., and K. Stewart - In press - A Middle Stone Age Worked Bone Industry from Katanda, Semliki Valley, Zaire. Science.

Stewart, K.M. - In press - Fossil fish from Manonga Valley, Tanzania: Description, paleoecology and biogeographic relationships. In: T.Harrison, (ed.) Neogene Paleontology of the Manonga Valley, Tanzania, New York, Plenum Press.

Marshall, F.B. and K.M. Stewart. - In press - Hunting, fishing and herding pastoralists of western Kenya: the fauna from Gogo Falls. Archaeozoologia.

Stewart, K.M. - 1994 - A late Miocene fish fauna from Lothagam, Kenya. Journal of Vertebrate Palaeontology 14(4):592-594

Stewart, K.M. - 1994 - Early hominid utilisation of fish resources and the implications for seasonality and behaviour. *Journal of Human Evolution* 27:229-245.

Robbins, L.H., Murphy, M.L., Stewart, K.M., Campbell, A.C. and G.A. Brook - 1994 - Barbed bone points, paleoenvironment, and the prehistory of fish exploitation in the Western Kalahari Desert, Botswana. *Journal of Field Archaeology* 21(2):257-264.

Stewart, K.M. and D.P. Gifford-Gonzalez - 1994 - An Ethnoarchaeological contribution to identifying hominid fish processing sites. *Journal of Archaeological Sci.* 21(2):237-248

Still, Leslie
283 Lanark Ave., Ottawa, Ontario, K1Z 6R6

Research Interests:

Arctic and Subarctic faunas.

Tanke, Darren

Royal Tyrrell Museum of Palaeontology,
Box 7500, Drumheller, Alberta, T0J 0Y0

Research Interests:

Compiling annotated bibliography of osteopathy past and present (excluding domestic animals and recent *Homo*) and related topics. [*Contributions from external sources welcome.*]

van Gaalen, Hermina A. (Tina)
1961 Kelso Court, Coquitlan, British
Columbia, V3J 2B6

Research Interests:

Analysis of fish, bird, mammal and some shellfish remains from B.C. archaeological sites/ Northwest Coast; development of a zooarchaeological comparative collection (*Contributions greatly appreciated*).

Walker, Ernest, G.

Department of Anthropology, University of Saskatchewan, 9 Campus Drive, Saskatoon, Saskatchewan, S7N 5A5

Research Interests:

Zooarchaeology; human osteology; Plains; Southwest.

Yasui, Catherine

Department of Archaeology, Simon Fraser University, Burnaby, British Columbia, V5A 1S6

Research Interests:

Regional or 'landscape' approach to subsistence studies; Northwest coast (Queen Charlotte Islands and northern Vancouver Island); regional sampling; geographic information systems (GIS); logistical strategies and mobility patterns.

Publications:

Yashui, Catherine and Acheson, Steven
- 1995 - Village 'Far Enough': evidence of Kwakwaka'wakw Settlement on Triangle Island, B.C. *The Midden* (in press-April issue)

ZOOARCHAEOLOGY IN BRITISH COLUMBIA (Part 1)

by Jonathan C. Driver

This article is an abridged version of "Zooarchaeology in BC" published in BC Studies no.99, Autumn 1993, p.77-105.

It will be presented in two parts with Part 2 published in Canadian Zooarchaeology in the Fall 1995 issue.

INTRODUCTION

The concept that the interaction between human society and the environment played a significant role in structuring non-economic aspects of culture (especially social organization) became prominent in the processual archaeology of the 1960s and 1970s (Trigger 1989) and continues to be a significant theoretical concept in North American archaeology. Grounded in cultural ecology (Steward 1955) and cultural materialism (Harris 1979), archaeological theory which links resource structure, subsistence methods, paleoeconomies, settlement patterns, and social organization has had an important role in discussions of the development of prehistoric societies in British Columbia. Most archaeologists who have attempted to explain the development of culturally complex hunter-gatherer societies on the British Columbia coast have commented on the significance of the maritime resource base. The best known of these discussions is Fladmark's (1975) proposal that stabilization of sea levels at about 5,000 years ago resulted in increased productivity of salmon and other resources, thus allowing sedentary

settlements and denser populations to develop along the coast. This theme of resource stability and abundance has been echoed by other writers such as Matson (1976; 1981; 1983; 1992), Burley (1980), and Ames (1985), all of whom see the foundation of cultural complexity in the nature of the coastal resource base. In the Interior Plateau the transition from mobile camps to semi-permanent pit-house villages has also been linked to the development of salmon fisheries along interior rivers (Hayden 1992; Hayden and Ryder 1991; Richards and Rousseau 1987). Given this emphasis on the resource base it is clearly important to obtain archaeological data which reflect human use of the environment, and the most direct evidence of this will be the preserved remains of plants and animals recovered from archaeological sites. The lack of abundant wild plants with significant protein and carbohydrates in most of B.C. means that animals were the main source of food in prehistoric times.

Animal bones and shells are recovered commonly from archaeological sites in B.C., and since the 1960s the term 'zooarchaeology' has been used to describe a set of methods to identify and analyse such remains. However, the study of animal remains from archaeological sites has little to do with zoology, and zooarchaeology shares the goals of other subfields of archaeology--to increase our understanding of what happened in the past. On most archaeological sites in B.C. where faunal remains are found, people are responsible for bringing bones and shells to the site, usually because the animals were used as food. Most

zooarchaeological analyses can contribute to other archaeological problems, and the potential of these studies in B.C. will also be mentioned.

The goals of this paper are a) to review some of the achievements of B.C. zooarchaeology in the past fifteen years; and b) to suggest future directions for zooarchaeological analyses in B.C. In developing this paper I have not reviewed all of the faunal studies in B.C., mainly because so many are presented in unpublished site reports written to fulfil archaeological permit requirements. I have sampled these reports but I have not read all of them. The same applies to the numerous (and weighty) theses produced by graduate students in B.C. over the last fifteen years. Thus, this paper relies mainly on published books, chapters, and articles. As will become apparent, most attention is given to the southern B.C. coast, because it is here that the greatest numbers of faunal assemblages have been reported. Less attention is given to sites in the southern interior, and virtually no mention is made of sites in northern B.C., because very few faunal assemblages have been recovered from that area. Most examples will be drawn from prehistoric sites occupied by First Nations People.

ZOOARCHAEOLOGY

Zooarchaeology has developed rapidly over the past fifteen years, reflecting the renewed importance given to animal bone studies in archaeology in general. There are a number of analytical areas where zooarchaeology is generally considered to make an important contribution to archaeology.

Among these are: reconstruction of past environments; the study of subsistence; and analysis of human social organization. For each of these topics a general discussion of the potential of zooarchaeology will be followed by a brief analysis of the situation in B.C.

Palaeoenvironments

Most knowledge of environmental development in B.C. since the end of the last ice age derives from palynology and geomorphology. Palynological analysis has documented the evolution of the coastal rain forest community (Hebda and Mathewes 1984), and has identified the early post-glacial vegetation communities in the Peace River region (White 1983). Geomorphological analysis has been in the forefront of debates about the "ice free corridor" as a route for the peopling of the Americas (e.g., Bobrowsky and Rutter 1992), has been used to reconstruct coastal environments and resources (Fladmark 1975, 1983), and is important in understanding the evolution of such features as the Fraser Delta (Williams and Roberts 1989).

As fossil remnants of past ecosystems, animal remains have potential for understanding the environments in which humans lived (e.g., Lundelius *et al.* 1983; Graham, Semken and Graham 1987), although some caution is required in their interpretation (e.g., Grayson 1981). However, relatively little use has been made of this potential in B.C. archaeology. To some extent this is because the majority of the sites excavated in B.C. date to within the last few thousand years, and there appears

to have been little change in animal populations over that period (with the exception of the last two hundred years of Euro-Canadian impact). This is not to say that no environmental change occurred, or that environmental change would be undetected. For example, Cannon (1991) has proposed that the salmon resources available at Namu on the central coast increased after 6000 BP, tending to confirm Fladmark's (1975) hypothesis concerning the effects of stabilization of the B.C. coastline. Cannon has also proposed that estuary development on the Namu River reduced salmon productivity in later prehistory. The availability of salmon in interior rivers has long been proposed as a contributing factor in the development of semi-sedentary pit-house villages (Fladmark 1986; Kuijt 1989; Richards and Rousseau 1987), and a catastrophic reduction in the resource caused by a major slide on the Fraser River has been blamed for an episode of prehistoric "cultural collapse" near Lillooet (Hayden and Ryder 1991).

It is likely that the environments of the early post-glacial period were the least similar to modern environments, but there has been relatively little analysis of prehistoric faunas in the 11,000 to 5,000 BP range. There is virtually no evidence for the co-existence of humans with extinct fauna in B.C. Most of the mammoth skeletons which have been found date prior to the last glacial maximum, and there is no evidence for a human presence in B.C. until after the last glaciation. Currently the only evidence for early post-glacial faunas from an archaeological context is from Charlie Lake Cave, near Fort St. John. This site is unique in B.C.

because it consists of a deep, stratified sequence of deposits spanning the post-glacial period. The site contains naturally deposited terrestrial fauna (mice, voles, birds, etc.), the remains of animals hunted by humans, and stone and bone artifacts. Of special importance is the Paleoindian component, radiocarbon dated to about 10,500 BP, which contains a basally thinned projectile point and other artifacts (Fladmark, Driver and Alexander 1988). Associated with this component are bones of an extinct bison species which was hunted nearby, while naturally deposited bones include ground squirrel, jackrabbit, and cliff swallow. This early post-glacial fauna probably inhabited a grassland environment very different from the modern vegetation of the Peace River area. The grassland environment and its fauna survived until about 10,000 BP, when boreal forest and associated animals replaced the grassland rather quickly (Driver 1988; Driver and Hobson 1992).

It is likely that in most of British Columbia, the 'typical' faunas were established fairly quickly after deglaciation, although, as noted above, the first important salmon runs into southern interior rivers may have developed within the last five thousand years. However, the situation on the coast was probably more complex, mainly because relative sea levels were generally unstable until about five thousand years ago. There was clearly a human population living on the coast from early in the post-glacial period (Carlson 1990; Fladmark 1986; Fladmark, Ames and Sutherland 1990), but virtually nothing is known about

either the coastal resources available to them or the manner in which these resources were exploited. This seems to be because preservation conditions for bone were poor until significant quantities of shellfish were deposited routinely on sites, reducing the acidic soil conditions which tend to destroy bones.

By the time shellfish collection was a significant part of prehistoric subsistence, the resource base was fairly similar to today's, and we still lack knowledge about pre-5,000 BP maritime adaptations in most places. In a recent summary, Matson (1992:375-380) describes only four Northwest Coast sites which contain faunal remains and date before 4,500 BP -- The Dalles in Oregon, Glenrose Cannery and Bear Cove in B.C., and Chuck Lake Cave in Alaska. Namu, on the central coast of B.C., should also be added to this list (Cannon 1991). These sites demonstrate that a wide variety of maritime species was being exploited prior to 5,000 BP, although salmon was much less important than in later sites, and land mammals may have been more important. Until more sites with early faunas are excavated we will not see a significant change to our understanding of early animal resources in B.C. Although one can search systematically for early sites with good faunal preservation, it is probable that such sites will emerge through chance finds rather than systematic fieldwork.

However, it is possible to broaden knowledge about the later environments of B.C. through more detailed studies of the later faunas. There are a number of ways in which this could be approached. Ethnographic and historic records of

faunal distribution could be viewed more critically when reconstructing the resource base of prehistoric B.C. For example, in the Peace River region moose is regarded as the prime big-game animal in virtually all ethnographies. However, records from the fur trade and from excavations of fur-trade sites demonstrate that bison and elk were important resources in the region (Williams 1978). Faunal data from historic and prehistoric sites in the same area demonstrate that passenger pigeon was common, although it was rarely recorded in historic times (Williams 1978; Driver and Hobson 1992). Similarly, analysis of ethnographic data on whale hunting on the west coast suggests that humpbacks were the main prey species until they were almost exterminated by nineteenth and twentieth century whalers (Kool 1982); modern data concerning whale abundance would no doubt suggest the grey whale as the primary west coast species.

Secondly, evidence for smaller-scale environmental change could be sought in more detailed studies of species which are sensitive indicators of past conditions. For example, shellfish on coastal sites were probably harvested from local beds, and might provide evidence for changing beach environments. Some fish species have fairly specific habitat requirements, and these could also be used to assess changing local environments around coastal sites.

Diet

Undoubtedly the main *raison d'être* for zooarchaeology has been to

reconstruct diet (what people ate) and subsistence (how people obtained food). However, the most important development in this field in the past decade has not been zooarchaeology, but in the chemical analysis of human skeletons, specifically the ratios of two stable isotopes of carbon in preserved bone collagen, as noted in the introduction to this volume. The ratio of ^{13}C to ^{12}C is slightly higher in marine animals than in land animals. If people (or other carnivores) consume a diet which is exclusively marine, their bone collagen will contain relatively more ^{13}C than people who only eat land animals. Thus the relative amount of ^{13}C in human bone can be used to show what proportion of the diet consisted of marine foods and what proportion of the diet consisted of terrestrial foods (Chisholm 1986; Chisholm, Nelson and Schwarcz 1983). While this method of analysis is certainly open to refinement, it has provided extremely useful data for archaeologists, and the supposed 'problems' with the method mentioned by Isaac (1988) seem to stem from misunderstanding of the status of salmon as an anadromous species. Analysis of prehistoric skeletons from the B.C. coast confirms what one would suspect from the ethnographies -- that virtually all of the protein consumed by coastal people was obtained from the ocean. Analysis of human skeletons from the interior has demonstrated a reliance on marine resources ranging from about 40% to 60% along the major salmon rivers. As salmon were presumably the only significant marine species being consumed, this provides us with an estimate of the importance of prehistoric salmon consumption in the

interior. Interestingly, the earliest southern interior skeleton, the Gore Creek specimen dated at about 8,000 BP, had a ^{13}C value which suggests a diet with a minimal marine content and hence little reliance on salmon (Chisholm and Nelson 1983).

The examination of human diet through stable isotope analysis should allow us to test some quantification methods in zooarchaeology. For interior sites, Chisholm (1986) and Lovell *et al.* (1986) report that late prehistoric human skeletons from the Lillooet area yield results which suggest that about 60% of protein was supplied by salmon. Langemann (1987) has analyzed the fauna from house-pit sites in the same area. The two largest samples she discussed are from the Bridge River site (EeRl-4) and from house-pit 6 in the Bell site (EeRk-4). Data on number of bones (NISP) and minimum number of individuals (MNI) are presented in Table 1. Two meat weights are then calculated for each species. The maximum meat weight assumes that each bone is all that remains of a single individual, and is calculated by multiplying NISP by a typical live weight for a modern animal. The minimum meat weight is calculated by multiplying the minimum number of individuals by the same live weight. (Live weights do not, of course, represent the amount of usable meat, but they provide a rough estimate of relative importance based on the size of the animal). Having calculated meat weights, one can then calculate the percentage represented by salmon. It can be seen that minimum meat weights suggest about 10% salmon consumption for both sites, while maximum meat-

weight values vary between 46% and 75% consumption of salmon. While it would be premature to conclude that NISP multiplied by meat weight is a useful measure of the dietary importance of a species, it is clearly the case that MNI multiplied by meat weight does not provide a means of estimating the relative importance of salmon in the diet.

A similar exercise could be performed on coastal sites, although very few sites in fact have MNI and NISP calculations reported for all classes of data. Based on Chisholm's work, we would expect coastal sites to demonstrate at least 85% reliance on marine resources. I have chosen a site just south of B.C. as a test of this proposition. Wigen and Stucki (1988) have reported in some detail on the Hoko River rockshelter. The largest faunal assemblage is from depositional period 5, within the Gulf of Georgia Phase. Calculating minimum and maximum meat-weight figures in the same way as described above, the figures would suggest an 85% reliance on marine foods if the calculation is based on NISP multiplied by meat weight, and about 75% reliance on marine foods based on MNI multiplied by meat weight. Even with this very large sample (and a very rapid and probably crude calculation) it appears that MNI values are further from the expected results than values calculated from NISP. This might be exacerbated on small assemblages, where MNI tends to overemphasize the importance of rarer species (Grayson 1984).

Regional studies in zooarchaeology are still much less common than site-based studies, but

they are becoming increasingly prevalent as more individual site reports are accumulated (e.g., Driver 1985; Leonard 1989; Styles 1981). The main advantage to such studies is that they emphasize large-scale trends in faunal data. Provided that methods of quantification are consistent between sites, one can detect both temporal and spatial variation in assemblages which allow one to suggest the direction of change, if not its magnitude. In B.C. there have been relatively few regional studies, for two reasons. First, considering the size of the province, there are still relatively few sites excavated, although a few regions have a long history of excavation. Second, the methods of data presentation have been quite varied over the years, making it difficult to integrate data from different excavation projects. Hanson (1991) described twenty-one Strait of Georgia sites from which faunal data were reported. Of these, only thirteen had data on fish bone, and only eight had frequency data, not always quantified in the same fashion. Mitchell (1988) has produced one of the most comprehensive regional faunal studies, for the Queen Charlotte Strait area, mainly because the analyses were undertaken using similar methods. Mitchell reported on two early faunal assemblages, dating 3,000 to 500 BC (Obsidian Culture), and a larger sample of later assemblages, dating about AD 300 to the contact period (Queen Charlotte Strait Culture). Quantification was based on meat weights derived from MNI estimates, and demonstrated significant shifts in species use. For mammals, there was a change from deer to sea mammals, and for fish there was an increased use of

salmon in the later period sites. The assemblages from Queen Charlotte Strait were then compared with assemblages from other areas. Problems were encountered when doing this, because methods of data reporting varied. However, Mitchell concluded that the Queen Charlotte Strait region demonstrated a shift in faunal utilization which was not documented elsewhere, and ascribed the shift to a change in the ethnic groups who occupied the region.

From the Interior, Kuijt (1989) summarized data for Middle and Late Prehistoric assemblages, and demonstrated that the shift to salmon seen in isotopic analyses of human skeletons was visible in the faunal assemblages. However, Langemann's (1987) study of inter-site variability for the Late Prehistoric period did not detect patterned differences between pit-house sites, probably because most of the sites were from a fairly small area, where environmental and cultural differences would be minimal.

There remains a good potential for more detailed regional studies in British Columbia. Unfortunately, a lot of the earlier reported faunal data may be of limited value, because of the way in which the data were reported or quantified, and also because certain classes of animals (notably fish and shellfish in coastal sites) were often not reported in detail. However, much of the data reported in the 1980s and 1990s will serve as a base on which regional studies can be built.

A final problem concerning quantification is the question of sample size. It is a general expectation of ecology that as one identifies more animals in an ecosystem one will find

more species. The same is true for archaeological assemblages of artifacts or animal bones-- the larger the sample the greater the diversity. This means that comparison of samples of widely different sizes can result in erroneous assessments of species diversity. For example, Matson (1992:405) has suggested that there is evidence at the Crescent Beach site for a decrease in species diversity from St. Mungo phases to Locarno Beach and Marpole phases. This is based on analysis of fish remains from the South Trench excavation area. However, sample size also decreases through time in this particular excavation unit, and all the assemblages with more than five hundred identified fish bones occur in St. Mungo and early Locarno Beach phase layers. In this excavation area the largest assemblages are from the later layers, and this results in apparently greater diversity in Locarno Beach than in St. Mungo. Plotting assemblage size against number of taxa for all assemblages at the Crescent Beach site (Figure 1) demonstrates the typical curvilinear relationship between taxonomic diversity and sample size (Fisher, Colbert and Williams 1943; Leonard 1989; Bobrowsky 1982). Thus to investigate regional variation in faunal assemblages, diet, and subsistence it will be necessary to utilize assemblages which are large enough to include most of the exploited species.

Subsistence Strategies

Subsistence encompasses the various behaviours whereby food is obtained. Zooarchaeologists employ a variety of techniques to analyze the bone

or shells of commonly occurring species to determine what strategies were used by people to obtain the animals, including what season animals were procured.

There has been virtually no study of seasonality on interior sites, although it is commonly assumed that pithouse villages were occupied during the winter. There has been greater attention to this problem on the coast, and seasonality estimates, while not routine, are becoming a more common component of faunal analyses. For example, Ham (1982) proposed a February/March occupation for the Crescent Beach site, based on shellfish seasonality and the presence of herring (which spawn in early spring). Coupland (1991) reached similar conclusions for the Point Grey site. Ham (1984) used the fish assemblages to suggest occupation from May to June and August to September at the St. Mungo site. Eldridge (1987) proposed occupation from late winter to early fall at a site on Denman Island. Bernick and Wigen (1990) proposed a fall to early winter seasonality for a salmon fishing station at the mouth of the Little Qualicum River. Cannon (1991) used a variety of data to suggest that Namu was a winter village site.

The whole question of prehistoric settlement patterns and the seasonal round on the coast remains a challenge to archaeologists. Ethnographic data suggest a complex settlement pattern, with some variation in different regions (Burley 1980; Mitchell 1983). However, the time depth of this pattern is unknown (Matson 1992). Analysis of settlement patterns can potentially contribute to better understanding of

prehistoric social and political organization. In order to investigate the time-depth of these patterns it is essential to have seasonality data for contemporaneously occupied sites, so as to be able to distinguish functionally and seasonally distinct locations. Seasonality data are also essential for regional dietary studies of the type described above.

Relatively few such population studies have been undertaken on faunal assemblages from sites in British Columbia. Most interior sites produce too small a sample to permit this. On coastal sites the most common bones are from fish, and there has been less attention paid to the implications of fish populations than land animal populations. This is probably because the sea is viewed as an inexhaustible repository of resources, upon which prehistoric people could have had little effect. Nevertheless, it would be interesting to at least examine the population structure of some species, such as clams, to ascertain the effect of human exploitation.

Another relatively recent development in subsistence studies has been the concept of utility (Lyman 1992). This has mainly been applied to studies of large animals, where it can be assumed that different parts of the animal have different values for the hunter. The kill of a large animal allows hunters to decide which portions of the animal to transport away from the kill location to another site. Thus, decision-making could be reflected in the portions of a skeleton present at an archaeological site. Virtually no application of this concept has been made on archaeological assemblages

from British Columbia, although utility indices have been developed for sea mammals (e.g. Lyman 1991; Lyman, Savelle and Whitridge 1992). Some of the commonly used data presentation methods in utility studies have been criticized recently (Ringrose 1993 : 141-151), but the overall concept is likely to advance analysis of animal procurement economies.

Finally, we can consider the potential for zooarchaeological studies to contribute to ecological modelling. This approach has not yet been used extensively in conjunction with faunal remains from sites in British Columbia. However, Croes and Hackenberger (1988) have attempted the first type of modelling for the Hoko River region in Washington, and the potential clearly exists for similar studies in British Columbia. Bernick (1983) has attempted a site catchment study for one site.

Monks (1987) has drawn attention to an interesting ecological phenomenon on the British Columbia coast. He argues that maritime oriented hunter-gatherers exploited food chains rather than single species. As an example, he uses the Deep Bay site where humans exploited the food chain associated with the herring spawning season. Herring attracted a variety of predators, which in turn attracted other predators. Humans exploited the herring, but also harvested herring predators. This makes sense in terms of patch-use theory, which proposes that foragers will utilize a locale until the energy costs of remaining exceed the energy costs of finding and exploiting a new patch. Monks suggests that we should turn our attention to the use of food chains rather than individual species in order to understand the subsistence decisions made by people living on the British Columbia coast.

Figure 1. Relationship between assemblage size (NISP) and number of taxa for assemblages at Crescent Beach. (Data from Matson 1992: Tables 1 and 2)

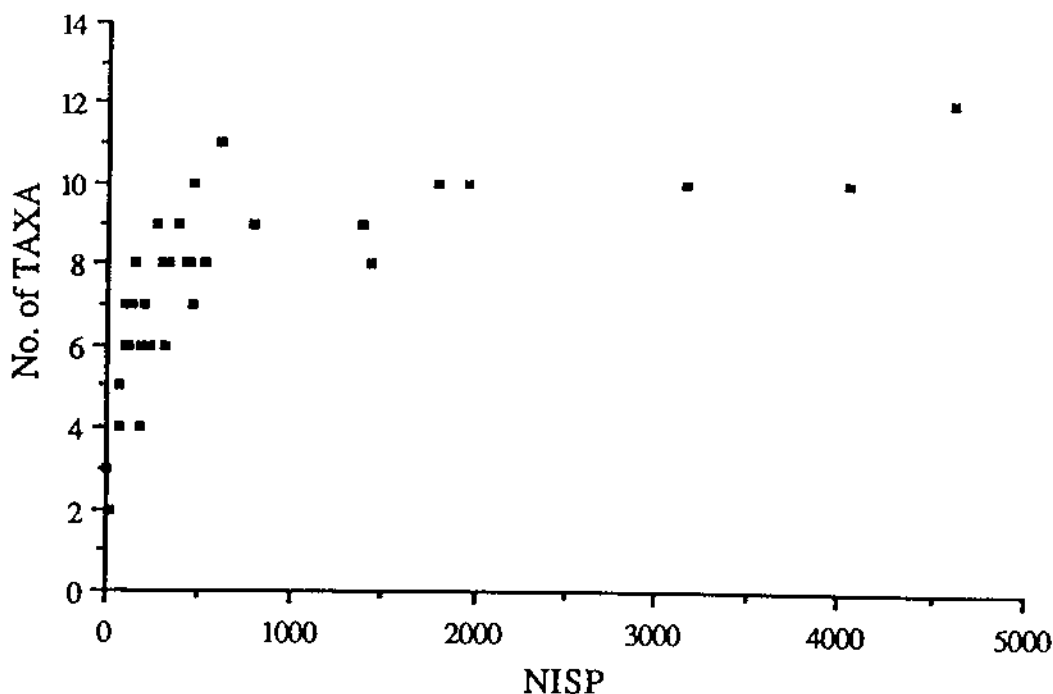


Table 1. Faunal data from two sites in the Lillooet region (after Langemann 1987)

<u>Bridge River Site (EeRl 4)</u>				
Species	NISP	MNI	Maximum Meat (kg)	Minimum Meat (kg)
Beaver	3	2	60	40
Deer	17	5	1190	350
Salmon	934	11	3736	44
% salmon	98%	65%	75%	10%
<u>Bell Site (EeRk 4:6)</u>				
Species	NISP	MNI	Maximum Meat (kg)	Minimum Meat (kg)
Snowshoe hare	3	1	4.5	1.5
Beaver	50	3	1000	60
Deer	78	4	5560	280
Sheep	12	2	840	140
Salmon	1566	14	6264	56
% salmon	92%	58%	46%	10%

Note: Assumed average weights are 1.5kg (hare), 20kg (beaver), 70kg (deer & sheep), 4kg (salmon)

(Editors Note: The remainder (Part II) of "Zooarchaeology in British Columbia" will be printed in Canadian Zooarchaeology No.8, fall 1995. Part II will include a discussion on Zoogeography and Social Organization, as well as the References Cited.)

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**FORTHCOMING CONFERENCES/
CONFERENCES A VENIR**

◆ ◆ ◆ **Hidden Dimensions: The
Cultural Significance of Wetlands
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April 26-30, 1995. Programme
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Museum of Anthropology, 6393 N.W.
Marine Dr., Vancouver B.C., V6T 1Z2
(604) 822-6530, fax (604) 822-2974.
Email stenenso@unixg.ubc.ca

◆ ◆ ◆ **OAS Call For Papers**

1995 Annual Symposium of the **Ontario
Archaeological Society** is being hosted by
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13-15, 1995. Participants with papers,
titles, and abstracts should contact:
▶ William Ross, Staff Archaeologist,
North Central Region Archaeological
Laboratory, Ministry of Culture,
Tourism and Recreation, 1825 East
Arthur Street, Thunder Bay, Ontario,
P7E 5N7
phone- (807) 475-1551
fax- (807) 623-7926

◆ ◆ ◆ **CAA**

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Association** meeting will be held May 3-
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Symposia/sessions are being planned on
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- Paleo-ecology
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Contact: ▶ Diana E. French
CAA Conference Chair
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333 College Way, Kelowna, B.C.
V1V 1V7
phone (604) 762-5445 local 7363
fax (604) 470-6001

◆ ◆ ◆ SPNHC

Society for the Preservation of Natural History Collections 10th Annual Meeting
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Registration - ► Brad Millen
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BIBLIOGRAPHY**

by Janet C. Cooper & Howard G. Savage

Includes more than 400 Site entries,
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faunal analyst addresses.

The information is available on
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!!!!!!! Announcing A New Publication  
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Black, David W. - 1993 - What Images  
Return: A study of the stratigraphy and  
seasonality of a shell midden in the  
insular Quoddy Region of New  
Brunswick.

For details and copies contact:  
Archaeological Services, Cultural  
Affairs, Dept. of Municipalities,  
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Fredericton, NB E3B 5H1

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Notice

A group of zooarchaeologists
working in and around Toronto has
recently formed a working group called
*"The Association of Professional
Zooarchaeologists of Ontario"*.
For information, please contact:

Suzanne Needs-Howarth,
2 Clarendon Ave., #100,
Toronto, Ontario, M4V 1H9
e-mail:75304.2724@CompuServe.COM