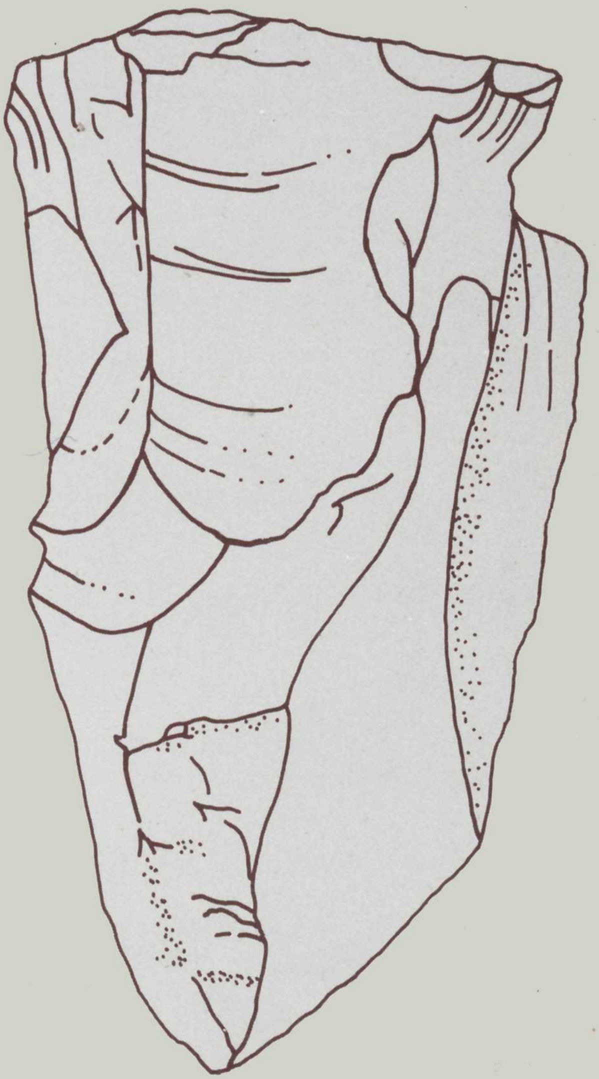
WINDOW ON THE PAST

ARCHAEOLOGICAL ASSESSMENT OF THE PEACE POINT SITE

WOOD BUFFALO NATIONAL PARK, ALBERTA



MARC G. STEVENSON

Parks Canada Parcs Canada

WINDOW ON THE PAST

ARCHAEOLOGICAL ASSESSMENT OF THE PEACE POINT SITE

WOOD BUFFALO NATIONAL PARK, ALBERTA

MARC G. STEVENSON

Studies in Archaeology
Architecture and History

National Historic Parks and Sites Branch
Parks Canada
Environment Canada
1986

Available in Canada through authorized bookstore agents and other bookstores, or by mail from the Canadian Government Publishing Centre, Supply and Services Canada, Hull, Quebec, Canada K1A 0S9.

Price Canada: $8.75
Price other countries: $10.50
Price subject to change without notice.

Catalogue No.: R61-2/9-29E
ISBN: 0-660-12041-0
ISSN: 0821-1027

Published under the authority
of the Minister of the Environment,
Ottawa, 1986.

Submitted for publication in 1984 by Marc G. Stevenson, formerly with the Archaeology Division, Prairie Regional Office, Parks Canada, Winnipeg, and now a heritage and archaeological resource consultant in Yellowknife, N.W.T.

Parks Canada publishes the results of its research in archaeology, architecture and history. A list of titles is available from Research Publications, Parks Canada, 1600 Liverpool Court, Ottawa, Ontario K1A 1G2.

CONTENTS

PRÉCIS

La récente évaluation archéologique du site de Peace Point, situé dans le parc national Wood Buffalo qui chevauche la frontière entre l'Alberta et les Territoires du Nord-Ouest, a permis de mettre au jour une ressource archéologique offrant une occasion unique d'éclairer non seulement la dynamique culturelle du passé de la région mais aussi le mode de vie des chasseurs-cueilleurs nordiques en général.

Le rapport présente les résultats des fouilles effectuées, en 1980 et 1981, à Peace Point et dans les environs. L'enregistrement et l'évaluation des données fournies par le site de Peace Pointe en particulier, ont été faits à un moment particulièrement opportun, en raison des dommages causés au site par l'érosion et le bouleversement culturel.

Ce rapport ne prétend apporter aucune conclusion définitive sur le site mais vise simplement à faire ressortir son importance, à présenter les principales découvertes qu'on y a faites et à situer dans leur contexte le potentiel de contributions culturelles, méthodologiques et théoriques qu'il fournit.

Les auteurs ne cherchent pas à excuser la façon dont les données ont été découvertes et interprétées. En effet, si on avait employé l'épistémologie et les méthodes de fouille traditionnelles (c'est-à-dire en découpant le site en carrés et en niveaux arbitraires pour en extraire les fossiles directeurs classiques), l'importance du site aurait pu être sous-estimée, les véritables outils étant rares et les résidus de débitage et de taille constituant la plus grande partie des vestiges recueillis. De plus, en utilisant des méthodes traditionnelles, on aurait, certes, pu couvrir une plus grande superficie et peut-être même mettre au jour un plus grand nombre de fossiles directeurs, mais on aurait obtenu une information beaucoup moins significative sur le potentiel du site.

Dans le chapitre II, un bref examen de l'archéologie et de la préhistoire du nord-est de l'Alberta, les auteurs abordent le problème de la compréhension limitée que nous possédons, à l'heure actuelle, de la dynamique culturelle de la préhistoire de la région. Le manque de sites stratifiés riches d'information est l'une des principales raisons du peu de progrès réalisés jusqu'à ce jour dans le nord-est de l'Alberta. Il est essentiel de connaître ces questions pour comprendre l'importance de Peace Point.

Le chapitre III décrit les premières découvertes réalisées à Peace Point, et précise et justifie l'importance culturelle et historique attribuée au site. On y étudie aussi l'histoire du peuplement et des fouilles qui y ont été menées ainsi que les caractéristiques actuelles et préhistoriques de l'environnement local.

Le chapitre IV présente les principaux résultats des fouilles effectuées dans les environs de Peace Point en 1980. Il met en lumière la fonction, le rôle et l'histoire du site en les plaçant dans les contextes locaux et régionaux. À cet égard, la diversité des pointes de projectiles tirées du site des dunes du lac One et les données lithiques provenant des fouilles de la rivière de la Paix ont été révélatrices. Elles suggèrent que divers groupes culturels pourraient avoir exploité les basses-terres du cours inférieur de la rivière de la Paix depuis plusieurs milliers d'années. Ils auraient surtout utilisé le site de Peace Point et, dans une moindre mesure, plusieurs autres sites semblables, le long de la rivière, comme importants lieux de travail et de résidence.

Le chapitre V expose en détail les résultats de la fouille de sauvetage et d'évaluation exécutée en 1981 sur le site de Peace Point. Les données sont étudiées par niveaux naturels, et on énonce des idées et des postulats pour expliquer les constantes qu'on observe dans leur répartition à chaque niveau et entre les niveaux. La plupart de ces explications devraient être considérées comme des hypothèses de travail qu'on révisera ou rejetera lorsqu'on possédera un plus grand nombre de données. Un bon nombre de ces explications reposent sur l'hypothèse que la plupart des pièces extraites de presque tous les niveaux d'occupation représentent des épisodes d'occupation isolés ou reliés entre eux – hypothèse suggérée par les données, mais qui doit être confirmée par d'autres moyens comme la reconstitution des objets originaux. Malgré ces incertitudes, c'est néanmoins ce chapitre qui révèle le potentiel réel du site. C'est avant tout le grand nombre de strates qu'on y trouve, ainsi que leur netteté et leur intégrité presque parfaites, qui assurent l'importance du site de Peace Point.

Au chapitre VI, on tente de faire ressortir plusieurs tendances générales dont témoignent les données et de comparer plusieurs des planchers d'occupation les plus productifs de l'unité avec d'autres sites de la région et des environs. Le changement concernant les techniques relatives aux nucléus préparés est peut-être la mutation la plus intéressante qu'on constate. On essaie de comprendre l'évolution et la stabilité culturelles inscrites dans les données en recherchant les variations ou les changements survenus dans l'utilisation du site et dans les modèles de déplacements. Bien que le chapitre n'ait pour but que de démontrer l'utilité et la fécondité de ce genre de chronologies culturelles et historiques, une importante tendance se dégage: la variabilité des données recueillies à Peace Point pourrait s'expliquer, en grande partie, par la différence entre l'utilisation du site par des groupes de chasseurs qui cherchent au hasard en se cachant pour recueillir le maximum de ressources et d'autres qui se placent de façon à tirer parti de l'information qu'ils possèdent déjà sur la répartition des ressources.

Dans le chapitre VII, on explore quelques questions théoriques importantes. On expose deux modèles complémentaires destinés à expliquer les constantes dans la répartition des artefacts qu'on croit dues aux processus de formation du site humain durant les périodes d'occupation. On analyse l'influence de ces modèles sur notre connaissance du mode de formation des sites de travail et de résidence. On y trouve aussi un modèle permettant de distinguer les activités et le comportement des hommes et des femmes dans les camps de base des chasseurs-cueilleurs nordiques. Les hypothèses permises par ce dernier modèle sont examinées séparément à l'aide de données provenant du site Cold de Port Refuge dans l'Extrême-Arctique. On analyse aussi l'influence de ce modèle sur l'explication du comportement et de l'organisation sociale des occupants du site comparés aux autres chasseurs-cueilleurs de la préhistoire.

Le site de Peace Point est une ressource archéologique tout à fait exceptionnelle et très productive. Aux employés de Parcs Canada, il offre une excellente occasion d'informer les visiteurs sur l'évolution de la relation entre l'homme et l'environnement local. Aux autochtones de la région, il donne une chance de comprendre et d'apprécier leur propre patrimoine culturel. Aux archéologues de la région, il fournit la meilleure occasion qui se soit présentée jusqu'à maintenant de construire une chronologie régionale pour le nord-est de l'Alberta. Enfin, aux archéologues et aux autres préhistoriens, il offre une occasion unique de formuler, de vérifier et de raffiner de nombreuses idées et hypothèses touchant le mode de vie humain le plus universel et le plus réussi jusqu'à ce jour – celui des chasseurs-cueilleurs.

ACKNOWLEDGEMENTS

Numerous people have contributed in a variety of ways to this report. I am at first grateful to James Moore (Senior Conservation Scientist, Parks Canada, Ottawa) for arranging the radiocarbon, floral and faunal analyses. I would like to thank Heather Nicol, who, under the direction of Stephen Cumbaa (Zooarchaeological Identification Centre, Ottawa) spent more time on the faunal analysis than was contracted. I would also like to thank Liz Todd for typing, and Joanne Thompson for editing, preliminary drafts of the manuscript. Kathryn Stevenson deserves special credit for the figures in this report and for maintaining her patience while preparing them. Several chapters have benefitted directly from conversations with Gary Adams, John Brandon, Chris Hanks, Jack Ives, Bob Janes, Kevin Lunn, Jim Millar, Doug Proch, Kathryn Stevenson and Steve Sharp. The substantive and editorial suggestions by Bruce Fry, Charles Lindsay and Elizabeth Snow are also appreciated. I am especially grateful to Doug Proch for his continuing support in the field, office and laboratory. Not only did Doug serve as a technician, consultant and an editor when required, but he also undertook, in consultation with Steve Zolati, the soils analysis. Thanks are also due Bernie Lieff, Al Gibbs, Bob Redhead, Jim Johnston and the rest of the wardens and staff of Wood Buffalo National Park for their support and understanding. Finally, I would like to thank David Burley and Tom Heggie for recognizing the need for follow-up at Peace Point.

CHAPTER I
INTRODUCTION

Archaeologists from Parks Canada's Prairie Region in 1980 conducted the first of two years of archaeological survey and assessment proposed for Wood Buffalo National Park, Alberta and the Northwest Territories. This reconnaissance, the first of its kind in the park, was initiated for the specific purpose of providing baseline data on archaeological resources for management planning purposes. The primary objectives of this research were to find sites, assess their archaeological significance and recommend measures for protection, avoidance and interpretation. Although a number of complementary prospecting and stratified sampling procedures (Stevenson 1981a) were employed initially to locate sites during the first year of survey, the investigation of two highly visible sites previously identified by park staff was considered to have a high priority. The recording and assessment of one of these sites, Peace Point, was judged particularly timely because of damage caused by natural erosion and cultural disturbance.

This report is designed primarily to outline the substantive findings resulting from archaeological investigations at Peace Point in 1980 and 1981. By no means a definitive statement on the site or its archaeological significance, this report is intended merely to a) illuminate the importance of the site, b) present major research findings from each season of work, and c) put the cultural, methodological and theoretical contributions the site promises to offer in proper perspective.

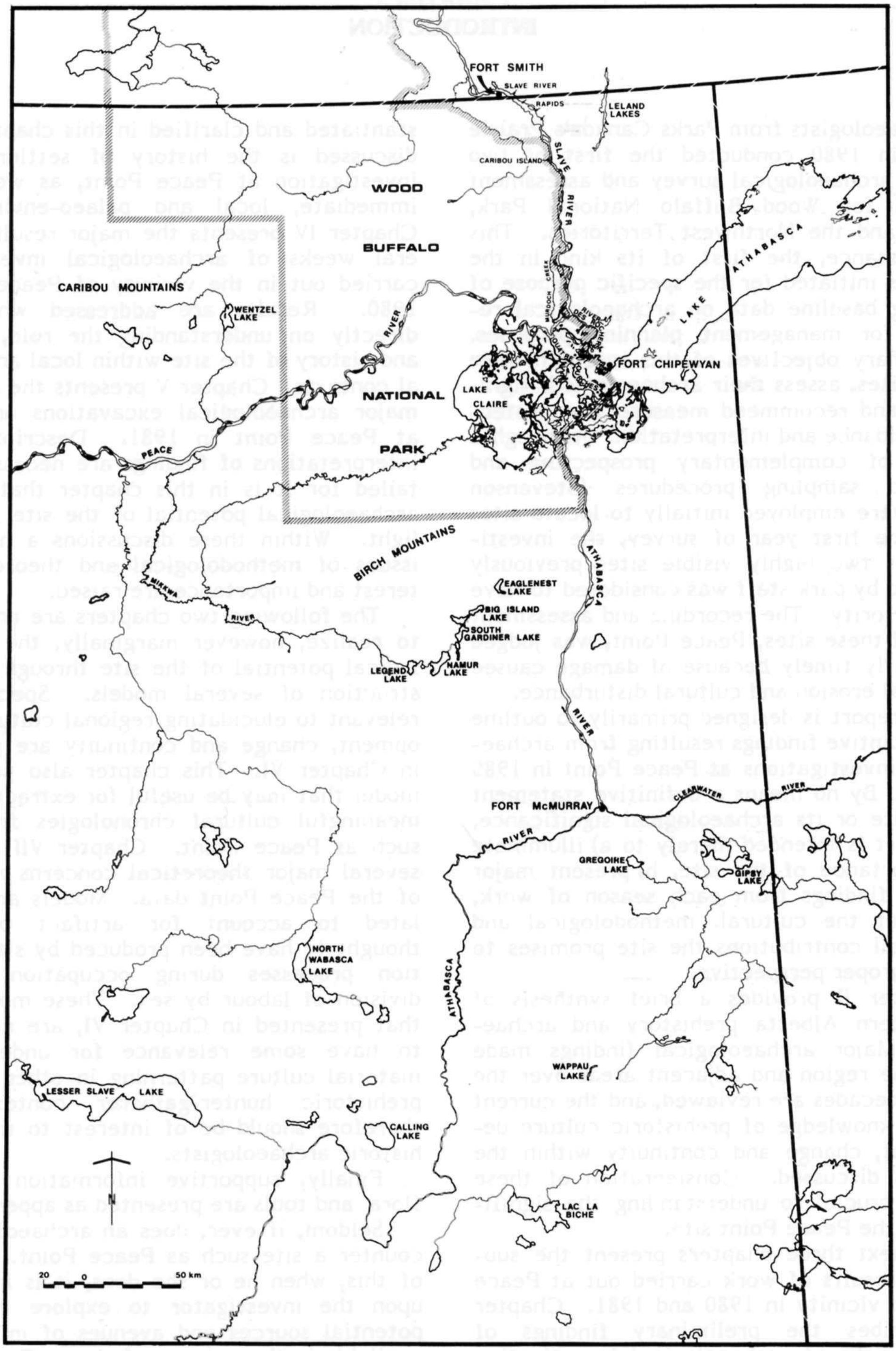
Chapter II provides a brief synthesis of northeastern Alberta prehistory and archaeology. Major archaeological findings made within the region and adjacent areas over the last few decades are reviewed, and the current state of knowledge of prehistoric culture development, change and continuity within the region is discussed. Consideration of these issues is crucial to understanding the significance of the Peace Point site.

The next three chapters present the substantive results of work carried out at Peace Point and vicinity in 1980 and 1981. Chapter III describes the preliminary findings of several weeks of archaeological investigation conducted at Peace Point in 1980. The cultural-historical significance of the site is substantiated and clarified in this chapter. Also discussed is the history of settlement and investigation at Peace Point, as well as the immediate, local and palaeo-environments. Chapter IV presents the major results of several weeks of archaeological investigations carried out in the vicinity of Peace Point in 1980. Results are addressed which bear directly on understanding the role, function and history of the site within local and regional contexts. Chapter V presents the results of major archaeological excavations undertaken at Peace Point in 1981. Descriptions and interpretations of findings are necessarily detailed for it is in this chapter that the real archaeological potential of the site comes to light. Within these discussions a number of issues of methodological and theoretical interest and importance are raised.

The following two chapters are an attempt to realize, however marginally, the archaeological potential of the site through the construction of several models. Specific data relevant to elucidating regional culture development, change and continuity are presented in Chapter VI. This chapter also provides a model that may be useful for extracting more meaningful cultural chronologies from sites such as Peace Point. Chapter VII addresses several major theoretical concerns rising out of the Peace Point data. Models are formulated to account for artifact patterning thought to have been produced by site formation processes during occupation and by division of labour by sex. These models, like that presented in Chapter VI, are considered to have some relevance for understanding material culture patterning in other northern prehistoric hunter-gatherer contexts, and therefore should be of interest to many prehistoric archaeologists.

Finally, supportive information on soils, flora and tools are presented as appendices.

Seldom, if ever, does an archaeologist encounter a site such as Peace Point. Because of this, when he or she does, it is incumbent upon the investigator to explore the many potential sources and avenues of information available in these types of sites. To this end, it is hoped that at least some of this potential has been recognized and, in part, realized.



1 Northeastern Alberta, with locations of major areas discussed in text.

CHAPTER II
NORTHEASTERN ALBERTA ARCHAEOLOGY AND PREHISTORY

The prehistory of that area of the western boreal forest of Canada incorporating northeastern Alberta is at present poorly understood. There are, in fact, few regions south of 60° latitude that we know less about. Despite the increase in field work in recent years, prehistorians remain frustrated in their attempt to illuminate prehistoric cultural dynamics within the region. To understand how this situation came about, it is pertinent to provide here a summary of work that has been undertaken within northeastern Alberta and adjacent areas.

The first section of this chapter summarizes major archaeological investigations carried out over the last two decades in northeastern Alberta (arbitrarily defined here as that area of Alberta north and east of the Swan Hills). The following section presents several cultural-historical chronologies, derived from research in adjacent areas, which may bear on understanding cultural development, change and continuity within the region. The final section of this chapter provides a discussion intended to shed light on the nature of the archaeological record in northeastern Alberta.

Archaeological Research in Northeastern Alberta

The first work of any significance in northeastern Alberta took place between 1966 and 1968 at Calling Lake, 225 km north of Edmonton (Fig. 1). There Gruhn (1981) excavated four quartzite workshop/habitation sites lacking in precise stratigraphic definition, although lanceolate and stemmed projectile points and corner- and side-notched projectile points tended to occur in the lower and upper levels respectively of two sites. Bifaces, end scrapers, flake scrapers, choppers, hammerstones and blades, some of which Gruhn believed to be microblades, were also recovered from each site. In the absence of better chronological control, Gruhn (1981) concluded that the Calling Lake materials suggest Archaic (Oxbow, McKean and Duncan) and Late Prehistoric (Pelican Lake, Besant and Prairie Side-notched) Plains affinities with later, more northerly derived Taltheilei tradition influences.

During the early 1970s Wright (1975) surveyed the shores of Lake Athabasca, recording close to 50 sites, most of which were small scatters and subsurface distributions of quartzite debitage. Several apparently productive sites with some degree of cultural deposition were excavated, including the Big Bay beach site — the only site to produce clear-cut cultural stratification. Despite considerable excavation, only four rather sparse discontinuous living floors were found at Big Bay. Two strata produced Besant-like projectile points, with a radiocarbon date of A.D. 690 ± 170 (GAK-3798) coming from one level. Chi-thos, hammerstones, spokeshaves, abraders, flake knives, bifaces, scrapers, cobble tools, linear flakes and wedges (thick multipurpose tools produced by bipolar flaking [Wright 1975: 41]) were the most common tools found during the survey. A small number of projectile points are suggested to share similarities with Agate Basin, Oxbow, Besant, Pelican Lake, Late Shield Archaic, Arctic Small Tool and Early and Late Taltheilei. Wright went on to propose that the western margins of the lake were inhabited by northern plains bison-hunting groups, while the eastern margins were inhabited by boreal forest caribou-hunting cultures.

Attendant with the development of the tar sands area on the Athabasca River north of Fort MacMurray in the early 1970s, a number of Syncrude leases were surveyed for archaeological sites. In 1973 a survey of lease No. 17 produced 28 sparse lithic scatters, most of which were found within .5 km of four or more plant communities (Syncrude Canada Limited 1973). However, the most important site discovered was the Beaver Creek (more properly known as Beaver River) quartzite (now considered to be a sandstone [Fenton and Ives 1982]) quarry site on Syncrude lease No. 22. Over 30,000 lithic specimens were recorded. While most of the artifact assemblage consisted of undiagnostic shatter and debitage, bifaces and primary cores, hammerstones and utilized flakes were also found. Even though an Agate Basin-like projectile point was recovered away from the main quarry area, two

Besant-like projectile points suggest that most of the site may be Late Prehistoric in age (Syncrude Canada Limited 1974).

In 1975 a number of archaeological surveys were conducted in northeastern Alberta. At Lac La Biche McCullough (1976, 1977) located close to 200 lithic scatters, considered to be workshop/habitation sites dating to the Middle and Late Prehistoric periods. While most sites contained high frequencies of bifaces, end scrapers, flake scrapers and split pebbles, projectile points bearing resemblances to Agate-Basin, Oxbow, McKean, Besant, Pelican Lake, Avonlea and Taltheilei forms were also found. In most respects, including the appearance of pottery, Gruhn (1981) feels that the Lac La Biche materials are similar to those found at Calling Lake. Also in 1975 Sims conducted a brief survey of Namur and South Gardiner lakes in which he recorded a large unstratified site at Gardiner Lake Narrows (Ives 1981a, b). Perhaps the most important work in 1975 was that of Donahue (1976a, b). While Donahue carried out brief inspections of parts of the Peace, Athabasca and Clearwater rivers (locating, respectively, 7, 12 and 2 relatively unproductive sites in the process), he found 49 sites in the Birch Mountains and 22 sites in the Caribou Mountains. Although most sites in the latter two areas were thin surface scatters or subsurface accumulations of lithic debitage, at least one site in each area appeared to be fairly productive. In the Birch Mountains, the Eaglenest Lake Portage site produced projectile point forms reminiscent of Pelican Lake and those found in the more northerly derived Mackenzie complex and Late Taltheilei tradition. In the Caribou Mountains the Wentzel Lake site produced four cultural strata. Even though diagnostic artifacts were absent and lithic materials were sparse relative to the area sampled, radiocarbon dates (from the highest to lowest levels: 1440 $\pm$ 100, 2260 $\pm$ 110, 4100 $\pm$ 130 and 5220 $\pm$ 140 B.P. [R.L. 529-532]) indicated that the site had been intermittently occupied for the last 5000 years. Bipolar cores, thinning flakes, bifaces, cortex spall tools, unifaces, scrapers and blade-like flakes were the most notable artifacts found in the Birch and Caribou mountains. Donahue attributed the greater frequency and productivity of sites in the Birch Mountains, vis à vis sites in the Caribou Mountains, to the less productive and diverse nature of resources in the latter area.

Follow-up work was carried out by Ives (1977a, b) and Conaty (1977, 1978) at the Eaglenest Lake Portage and Wentzel Lake sites in 1976. The recovery of over 6600 lithic artifacts, several hundred tools (including bifaces, scrapers, chi-thos, core/spall tools, hammerstones and bipolar core/pebbles) and several projectile points reminiscent of Besant, Oxbow and Late Taltheilei, led Ives to suggest that the Eaglenest Lake Portage site was a fairly recent occupation characterized by Late Taltheilei tradition artifacts with an enigmatic hint of earlier plains influences present. In spite of the fact that very few tools and very little debitage were recovered from the Wentzel Lake site, Conaty (1978), on the basis of a couple of projectile points and other evidence, concluded that the site contained only three cultural components, with the lower component being related to the precursors of the Early Taltheilei tradition and the upper ones sharing some similarities with Northern Plains Archaic cultures.

Also as a consequence of Donahue's initial reconnaissance, Pollock (1977, 1978) returned to the Clearwater River area in 1976. Although 15 small unproductive sites were recorded, several were the focus of controlled excavations. While the more promising sites produced flake scrapers, bifaces and bipolar pebble cores, two disturbed sites on Gregoire Lake yielded projectile points similar to those found in Oxbow, Besant and Avonlea. From external comparisons and this rather sparse evidence Pollock (1978) went on to infer a preliminary cultural chronology for northeastern Alberta in which Agate Basin is followed by Acasta Lake, earliest Taltheilei, Oxbow, McKean/Duncan/Hanna, Pelican Lake, Taltheilei, Besant, an unnamed Birch Mountain phase, Clearwater Lake and finally aboriginal Cree, Chipewyan and Beaver/Sarsi/Slave.

Pollock (1977, n.d.) also conducted in 1976 a brief archaeological reconnaissance of the Slave River Rapids and Leland Lakes, finding 16 prehistoric and 15 historic sites in the process. The most significant prehistoric site found was a thin, shallowly deposited, multicomponent site at Leland Lake Narrows. Projectile points recovered during the survey are thought to be similar to Agate Basin, Shield Archaic and Late Taltheilei forms.

In addition to large-scale excavations at the Wentzel Lake and Eaglenest Lake Portage sites in 1976, a major excavation was undertaken at the Gardiner Lake Narrows site. Similar to the Eaglenest Lake Portage Site, this site is a large unstratified multicomponent site on which Sims (Ives 1981a, b) found several thousand lithic artifacts and hundreds of tools, including projectile points, scrapers, bifaces, net weights, chi-thos, cores, hammerstones, anvils and choppers.

In the following year Sims excavated a small mixed site on the shores of North Wabasca Lake (Gruhn 1981). While large amounts of debitage and the usual inventory of end scrapers, flake scrapers, bifaces, flaked pebbles, bipolar cores and hammerstones were recorded, a radiocarbon date of 770 ± 70 B.P. (DIC-1066) was also obtained from the site. Apart from Pollock's (1978) investigation of a Late Prehistoric/Early Historic site on Wappau Lake, in which aboriginal ceramics were found, very little work was conducted in northeastern Alberta during the late 1970s.

In 1980 Lesser Slave Lake was the focus of three separate archaeological surveys. While French (1980) and Fedirchuk (1981) recorded several relatively unproductive sites, Le Blanc (1981), in a survey of the western margins of the lake, found 56 sites, most of which were surface scatters and isolated finds, though subsurface testing located 10 undisturbed sites. The Alsands tar sands area was also a focus of survey activity in 1980. Although Conaty (1980) and Mallory (1980) found only a few sites each, Mallory's work recorded three features — possible stone boiling pits — in one site, whereas Conaty's survey demonstrated that sites can occur considerable distances from drainages in the midst of muskeg terrain (Ives 1981b).

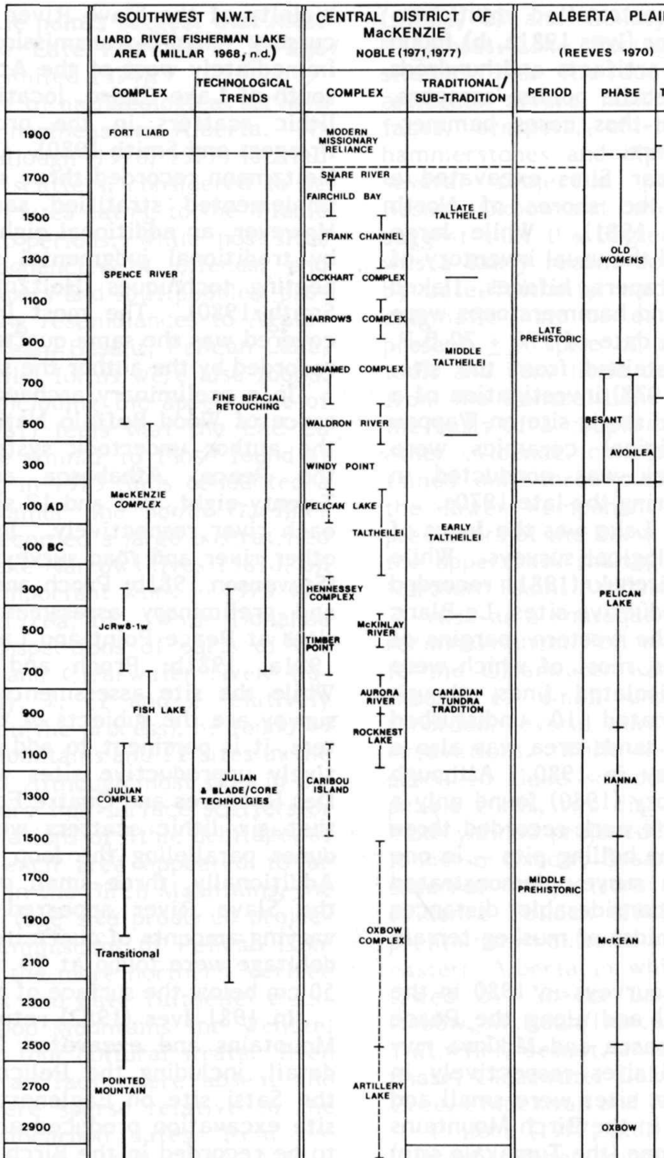
Ives also undertook surveys in 1980 in the Birch Mountains (1981a) and along the Peace River between the Wabasca and Mikkwa rivers, locating 7 and 25 sites respectively in each area. Though most sites were small and unproductive, two sites in the Birch Mountains are noteworthy in that one (the Tumaxale site) was found under a peat bog while the other (the Pelican Beach site), although very low in artifact density, was the first site in the Birch Mountains to demonstrate clear-cut stratigraphy. Dates of 2030 ± 105 B.P. (S-1973) and 1280 ± 95 B.P. (S-1974) have obtained from each site respectively. Ives also recovered during his survey projectile points similar to those found in Early Taltheilei, Oxbow and McKean (1981a).

Heitzmann in 1980, in conjunction with a feasibility study of the impoundment area resulting from proposed dam construction in the vicinity of the Slave River Rapids, undertook cursory hydro-transmission line surveys immediately west of the Athabasca River and south of Lake Claire, locating only two small lithic scatters in the process (Heitzmann, Priegert and Smith 1980). On the Slave River Heitzmann recorded three sites using a poorly implemented stratified sampling procedure. However, an additional eight sites were found by traditional judgmental sampling or prospecting techniques (Heitzmann, Priegert and Smith 1980). The most important site discovered was the same quartz quarry previously recorded by the author the same year.

In a preliminary archaeological reconnaissance of Wood Buffalo National Park in 1980 the author undertook systematic surveys of the Peace, Athabasca and Slave rivers. Twenty-eight, two and 12 sites were found on each river respectively. In addition, several other river and road surveys were carried out (Stevenson 1981b; Proch and Stevenson 1982), and preliminary assessments were made of sites at Peace Point and Lake One (Stevenson 1981a, 1981b; Proch and Stevenson 1982). While the site assessments and Peace River survey are the subjects of the next two chapters, it is pertinent to add here that 11 relatively unproductive sites were found on the Des Rocheres and Quatre Fourches rivers, and that six lithic scatters were found on sand dunes paralleling the loop road in the park. Additionally, three small subsurface sites on the Slave River appeared to be stratified; varying amounts of quartzite, quartz and chert debitage were found at 20 to 30 cm and 40 to 50 cm below the surface of all three sites.

In 1981 Ives (1982) returned to the Birch Mountains and excavated four sites in some detail, including the Pelican Beach site and the Satsi site on Eaglenest Lake. The Satsi site excavation produced a hearth — the first to be recorded in the Birch Mountains — and a variety of stemmed and notched projectile points considered to be no older than 3000 years (Ives 1982). Several years of work in the Birch Mountains led Ives to conclude that although some Archaic and Late Prehistoric plains influences can be detected in the Birch Mountains, most materials shared formal similarities with those found in the later prehistoric complexes of the central and southwest District of Mackenzie (Ives 1981a).

Also in 1981 the author returned to the Peace Point site to carry out a more accurate and thorough assessment of the site. The



2 Regional culture chronologies proposed for regions adjacent to northeastern Alberta.

results of this investigation are the major subject of this report, and thus will not be discussed here.

With the exception of Ronaghan's (1981) discovery of a small buried site containing two microcores, recent work in the Alsands lease area has proven to be relatively unproductive (see McCullough and Wilson 1982). Ives and Le Blanc (pers. com., 1982) returned to the microcore site in 1982 and recovered additional evidence of a well-developed microcore industry. The site is considered to be a single component site of considerable antiquity (Le Blanc, pers. com., 1982).

The author returned to Wood Buffalo National Park in 1982 to carry out the preliminary archaeological survey and inventory begun in 1980. Although few significant new discoveries were made, survey and excavation along the Slave and Peace rivers proved informative, and will surely augment previous research (Stevenson and Proch n.d.).

Archaeological Research in Areas Adjacent to Northeastern Alberta

Although Minni's (1976) research in the Black Lake area of northern Saskatchewan, Bryan and Conaty's (1975) excavation of the Karpinsky site near Wanham, and Thompson's (1973) work in the Ski Hill area of northwestern Alberta may have some relevance for understanding northeastern Alberta prehistory, of greater significance are Reeves's (1970), Noble's (1971, 1977) and Millar's (1968, 1981) proposed cultural sequences for the Alberta plains and the central and southwest District of Mackenzie respectively.

All three chronologies acknowledge the presence of Agate Basin/Plano materials; however, only Millar and Reeves recognize the presence of earlier cultures in their respective research areas. Yet evidence of man in the southwest Northwest Territories before 8000 years ago is not unequivocal. Reeves's Early Prehistoric period begins with Clovis and Folsom-Midland, and ends with the Alberta-Cody and Lusk/Frederick complexes. Each is defined by a distinctive type of well-flaked lanceolate projectile point that should be familiar to most.

Both Reeves and Nobel recognize possible cultural hiatuses between Late Palaeo-indian and the first documented Archaic complexes in the Alberta plains and central District of Mackenzie. Reeves (1973), however, prefers to fill in this gap with the Mummy Cave complex. Millar sees no cultural hiatus in the southwest Northwest Territories. Instead, a rather late-occurring Agate Basin complex is seen to precede the Early Northern Archaic. The latter, distinguished by several new technological innovations, including microcores and a variety of side- and corner-notched projectile points, is made up of three complexes beginning with Pointed Mountain and ending with the Julian complex (Millar 1981). Throughout these complexes there is a gradual disappearance of classic microcore technology and exotic lithic materials and an increase in fine bifacial tools, projectile point styles and the use of local cherts (Millar 1968, 1981, n.d.).

While the Oxbow complex, with its distinctive side-notched, basally thinned projectile point, is widely distributed across southern and central Alberta (Spurling and Ball 1981), it, like other southern Archaic complexes (i.e., Caribou Island and Pelican Lake), is only sparsely represented in the central District of Mackenzie. On the plains, Oxbow is followed by the McKean, Hanna, Pelican Lake and Avonlea phases of the Tunaxa tradition (Reeves 1970), though increasing evidence (Brumley 1975) suggests that McKean includes projectile points traditionally assigned to the Hanna and Duncan phases. Avonlea is considered to mark the appearance of pottery and the bow and arrow on the plains (Reeves 1970).

Noble (1971, 1977) proposes that, between about 3100 and 2300 years ago, the Canadian Tundra tradition, a regional variant of the Arctic Small Tool tradition, existed in the central District of Mackenzie. The Canadian Tundra tradition is composed of four complexes – Rocknest Lake, Aurora River, Timber Point and MacKinlay River. Each complex is based on, among other things, differences in projectile point styles, scraper forms and raw material types. The last complex of this tradition, MacKinlay River, is now considered to mark the beginning of the Taltheilei Shale tradition (Noble 1977) – the major prehistoric cultural expression in the area. While Noble (1971) feels that MacKinlay River and, by extension, earlier complexes of the Canadian Tundra tradition represent either a form of proto-Athabascan culture or a blended admixture of Indian and small tool cultures, there can be little doubt that these small tool complexes had well-adapted boreal forest economies.

Even though the Taltheilei tradition is now thought to be composed of 11 complexes (Noble 1977), it is best viewed in terms of its three major sub-traditions – Early, Middle and Late Taltheilei. Early Taltheilei, suggested to be the point at which the historic Caribou Eater Chipewyan and Yellowknife Indians diverged (Noble 1977), is made up of four complexes spanning a period of about 1000 years. Its most distinctive trait is a stemmed projectile point, of which four varieties have been identified, although a grey silicious shale (after which the tradition is named) becomes the major type of raw material used in the last two phases. Middle Taltheilei comprises another four complexes, but only spans a period of about 400 years. It is identified by unstemmed lanceolates and a prolific use of shale. The appearance of side-and corner-notched projectile points marks the onset of the Late Taltheilei tradition. While tools and projectile points of bone and copper become popular during Late Taltheilei, corner-notched and small stemmed projectile points disappear entirely after A.D. 1500. The historic era in the central District of Mackenzie has been divided into three complexes beginning with the introduction of trade goods and ending with the tin can.

On the plains, most of the Late Prehistoric period is represented by the Besant and Old Women's phases of the Napikwan tradition. Ceramics, basin-shaped hearths and a variety of arrow points (formerly included under the Prairie and Plains side-notched types) are characteristic of this tradition. Throughout the Early, Middle and Late Prehistoric periods on the plains, the communal hunting of bison is considered to be the dominant subsistence strategy (Reeves 1970).

In the southwest District of Mackenzie, Julian technology – a linear flake/core tool industry, made on a distinctive local chert, which emerged during the Archaic concomitant with the disappearance of true microcore technology – continues up to the Mackenzie complex. This latter complex, characterized by a proliferation of stemmed, notched and lanceolate projectile point styles, and the Spence River complex represent most of the Late Prehistoric period in the southwest District of Mackenzie. While the frequent occurrence of bone and antler tools is the most distinctive trait of the Spence River complex, the appearance of trade beads, copper and metal tools in this complex marks the transition from the prehistoric to historic eras and the beginning of the Fort Liard complex.

Discussion

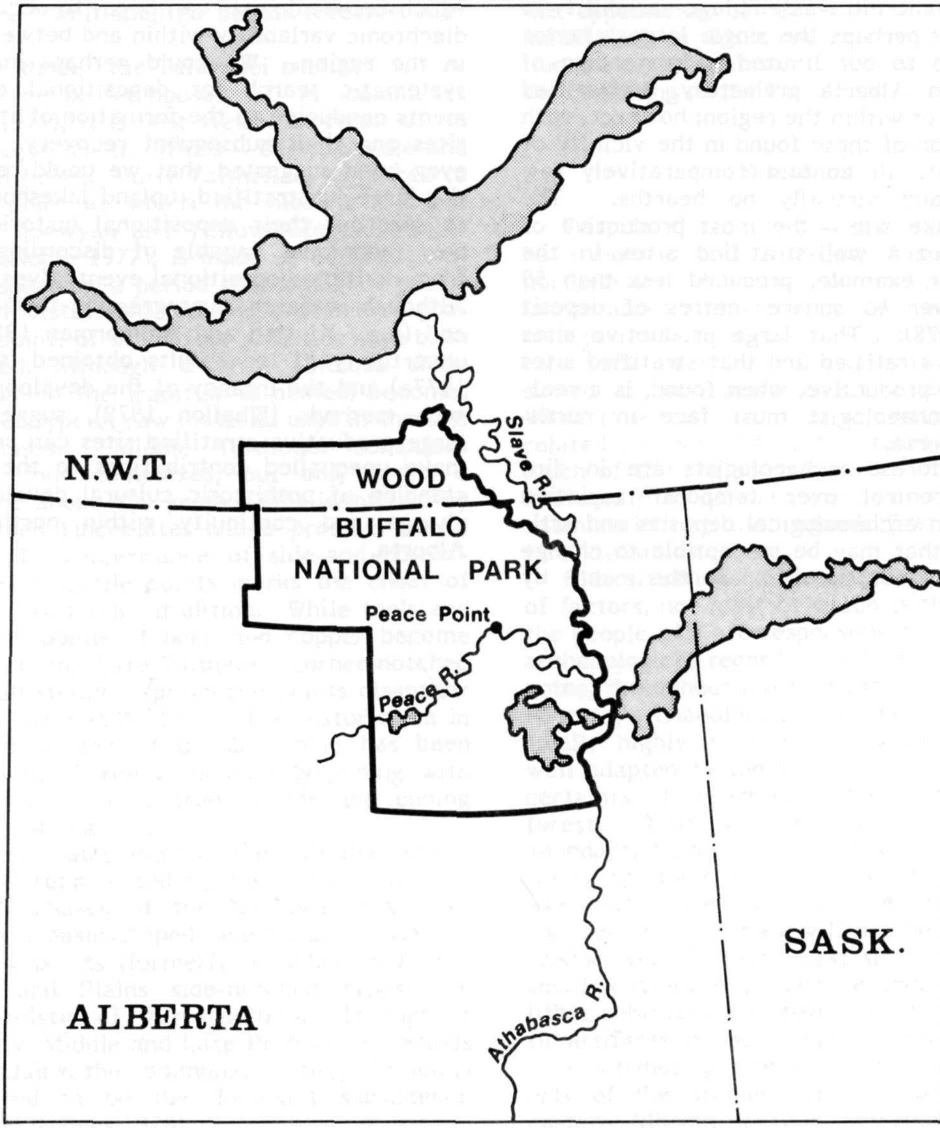
Despite the fact that hundreds of sites have been found and dozens excavated in northeastern Alberta, surprisingly little is known about prehistoric cultural development, change and continuity within the region, especially in comparison with what is presumed to be known about adjacent areas. While it seems clear that a mixture of plains-related and boreal forest cultures occurs over much of the region, our current knowledge is inadequate to attempt even the most cursory examination of the region's prehistoric cultural dynamics.

This situation has resulted from a number of factors, not least of which is the nature of the people who are responsible for the region's archaeological record. As Ives (1980, 1981b) notes, throughout most periods in northeastern Alberta, archaeological sites were produced by small, highly mobile, dispersed populations well adapted to the spatial and temporal uncertainty of resources in the northern boreal forest. That such groups do not produce abundant, highly visible remains in situations favouring their recovery is obvious. Thus when sites are found in the boreal forest, chances are that they will not be particularly productive. In fact, most sites appear to be small scatters or subsurface accumulations of lithic debitage, with few tools, fewer diagnostic artifacts and no hearths or other features.

Contributing directly to the relative poverty of the archaeological record in northeastern Alberta are the facts that the acidic soils of the boreal forest quickly destroy most bone and organic materials, and muskeg probably covers many archaeological sites, particularly earlier sites. In the latter regard, Ives's (1981a, b) Tumaxale site in the Birch Mountains is probably more the rule than the exception.

By the same token, when large productive sites that have obviously been occupied intermittently for hundreds (if not thousands) of years are found, they are situated in contexts where the formation of soil deposits is exceedingly slow. Stratigraphic development is rare, if not absent entirely. The lack of control over diachronic intra-assemblage variability in such sites is perhaps the single largest factor contributing to our limited understanding of northeastern Alberta prehistory. Stratified sites do occur within the region; however, with the exception of those found in the vicinity of Peace Point, all contain comparatively few materials and virtually no hearths. The Wentzel Lake site – the most productive of the half dozen well-stratified sites in the region – for example, produced less than 50 tools in over 40 square metres of deposit (Conaty 1978). That large productive sites may not be stratified and that stratified sites may not be productive, when found, is a reality the archaeologist must face in northeastern Alberta.

Boreal forest archaeologists are in dire need of control over temporal variation expressed in archaeological deposits and artifact types that may be susceptible to change over time. Not so clear are the means by which archaeologists can begin to account for diachronic variability within and between sites in the region. We could perhaps initiate a systematic search for depositional environments conducive to the formation of stratified sites and their subsequent recovery. It has even been suggested that we could return to the large, unstratified, upland lakeshore sites to sort out their depositional histories with new techniques capable of discerning single from multiple depositional events (Ives 1977a). Although research is progressing towards this end (e.g., Kintigh and Ammerman 1982), the uncertainty of the results obtained (see Ives 1977a) and the infancy of the development of such methods (Whallon 1979), suggest that large productive stratified sites can presently make unequalled contributions to the understanding of prehistoric cultural development, change and continuity within northeastern Alberta.



3 Location of Peace Point and Wood Buffalo National Park.

CHAPTER III
PRELIMINARY ARCHAEOLOGICAL INVESTIGATIONS AT PEACE POINT

Historical Significance

Peace Point is a prominent physiographic feature located on the left bank of the Peace River at 59°7'40"N and 120°26'30"W (Fig. 3). Although Peace Point is now more a gradual bend in the river than a point of land, it is unique on the lower Peace as it is the longest continuous expanse of level limestone (Devonian) bedrock lying above annual flood level. Peace Point is significant historically because it is the point of land after which the Peace River was named. Apparently, for reasons which have never been satisfactorily explained, the Knisteneaux Cree and the Beaver Indians (the supposed traditional inhabitants of the area) concluded a peace treaty at Peace Point in the early 1780s. While Potyondi (1979) feels that the reasons for which the treaty was initiated ultimately may be linked to smallpox decimation, Alexander Mackenzie (1967) suggested that disagreements over the ownership of the Peace Point area and the name of the river were the objects of contention. Whatever the impetus for the treaty may have been, it was finally concluded around 1782 that Peace Point would be maintained as the cultural boundary between the two groups (Mackenzie 1967).

Today Peace Point is occupied by a small group of Cree from Fort Chipewyan. While reports of settlement at Peace Point between Mackenzie's overnight stop there on October 13, 1792, and the early 20th century are rare, an older Cree informant who has lived in the area for over 60 years contends that the site has been occupied by his ancestors for several hundred years or more (Archie Simpson, pers. com., 1980). In the early to mid-1800s, when flintlock muskets were still in use, Mr. Simpson's grandfather apparently camped at Peace Point on a seasonal basis during hunting forays into the Birch and Caribou mountains. In later times people from Fort Chipewyan brought their horses to Peace Point to graze on its extensive prairie (Archie Simpson, pers. com., 1980).

Alexander Mackenzie's and Mr. Simpson's statements concerning the early use of the site by the Cree are in direct opposition to Jenness's (1963) suggestions that the entire basin of the Peace below the Smokey was occupied by the Beaver during the mid-eighteenth century, and that the Chipewyan were the Beavers' nearest eastern neighbours during this time. Much controversy has arisen over the displacement of aboriginal groups from their traditional territories at the outset of the fur trade. Although this has not been resolved, there is some agreement that during the mid-18th century the Cree, being the first to acquire firearms, displaced the Beaver to the northwest. This subsequently forced the Slave, Sekani and Sarcee to the north, west and south respectively. Smallpox and the establishment of trading posts may have further disrupted traditional boundaries, lifestyles and settlement patterns. However, the fact that territorial displacement and cultural assimilation (see Pollock 1978: 15), rather than intertribal warfare, occurred as a result of contact, argues for the existence of spatially extensive and relatively flexible sociopolitical organizations prior to the fur trade.

Immediate, Local and Palaeo-environments

While over 90 per cent of the Peace Point area is now covered by stands of trembling aspen (Populus tremuloides), small semi-open patches of shrub and grassland near the cliff face are considered to represent the last stages of a prairie-to-forest succession that began well before Raup's (1935) examination of the area in 1928 (Jeffrey 1961). At the time of Raup's visit, he noted that much of Peace Point (approximately 50 per cent) between the river margin and a river bluff several hundred metres north of the river was covered by two distinct types of prairie communities. While the more xerophytic of these consisted primarily of Stipa comata, Avena Hookeri and Koeleria cristata and was limited to the wind-swept well-drained areas near the cliff, the more mesophytic type was dominated by Agropyron trachycaubum and was located over much of the Peace Point plain (Jeffrey 1961, Raup 1935). Both prairie communities, according to Raup (1935), were caused by the desiccation of soils, which

Jeffrey (1961) has characterized as glacio-lacustrine sediments of silty-fine and fine sand with appreciable organic enrichment overlying a sporadic glacial till on Devonian gypsum and limestone.

Between Raup's visit in 1928 and Jeffrey's (1961) examination of Peace Point in 1959, over 75 per cent of the prairie had been invaded by trembling aspen: only the dry, well-exposed areas near the cliff maintained their original plant communities. Supporting Jeffrey's hypothesis that forest cover at Peace Point is a relatively recent development are (1) Alexander Mackenzie's 1793 observations (1967) that grasslands, supporting large herds of elk and bison, occurred over most exposed sections of the lower Peace, (2) Charles Mair's statement that he found Peace Point in 1899 to be a wide, beautiful, table-like prairie begirt with aspens (1908), and (3) Archie Simpson's communication that when he was a child, bear and buffalo could be seen grazing on the hill (bluff) behind Peace Point from across the river.

That grassland may have predominated over much of the Peace Point area throughout the past seems likely. In fact, Jeffrey (1961) has suggested that because the present limit of the aspen forest north of Peace Point is defined by the same silty-fine, organically enriched soils as those found at Peace Point, it may also demarcate the original limits of the Peace Point prairie. The possible causes for the prairie-to-forest succession at Peace Point are not known at present. However, studies by Lutz (1959) and Lewis (1977) on the traditional use of fire by northern aboriginal peoples to maintain grasslands along rivers suggest a cultural explanation. That is, the disruption of traditional burning practises during the early fur trade may have triggered the prairie-to-forest succession at Peace Point. The maturity of trees at Peace Point and the apparent documentation of forest invasion support such an interpretation.

Though the aspen forest north of the Peace River in the vicinity of Peace Point may represent one of the largest stands of aspen in Wood Buffalo National Park, the most abundant tree species in the park are white spruce (Picea glauca), black spruce (Picea mariana) and jack pine (Pinus divaricata). White spruce occurs most frequently in dense stands on the alluvial soils of the Peace, Athabasca, Slave and Birch river lowlands. Black spruce, on the other hand, is commonly found throughout most poorly drained areas of the park including the large muskeg terrain in the central area (where it is often stunted) and also on the flatter areas of the Birch and Caribou mountains. Jack pine is found on most well-drained sandy, silty and gravel soils throughout the park. It is especially common on the Peace and Athabasca sands plains. Other frequently occurring trees include larch (Larix laricina), balsam poplar (Populus balsamifera), birch (Betula papyrifera), balsam fir (Abies balsamea) as well as trembling aspen. Also prevalent are numerous herb-dominated communities such as grass and sedge marshes in the deltas of the Peace, Athabasca and Slave rivers; grasslands on the lacustrine soils west of the Slave River; and peatlands on the poorly drained, permanently frozen subsoils of the central park area.

Contributing directly to the mosaic of vegetation and diversity of wildlife within the park are various climatological, hydrological, geomorphological and geological regimes. For the most part the climate of northeastern Alberta is continental. Air masses from the Alaska-Yukon, Pacific and Arctic, which vary in temperature, moisture content and direction, all interact to influence vegetation patterns. Average temperatures of -24.4°C for January and 14.6°C in August reflect the extreme severity of winters and relative coolness of summers. The average frost-free period usually lasts less than 100 days from early June to early September, though the average effective growing season is about 142 days. Precipitation is often light as both the western air masses lose much of their moisture by the time they reach northeastern Alberta. Typically over half of this precipitation falls as rain for about four months of the year (Airphoto Analysis Associates 1979).

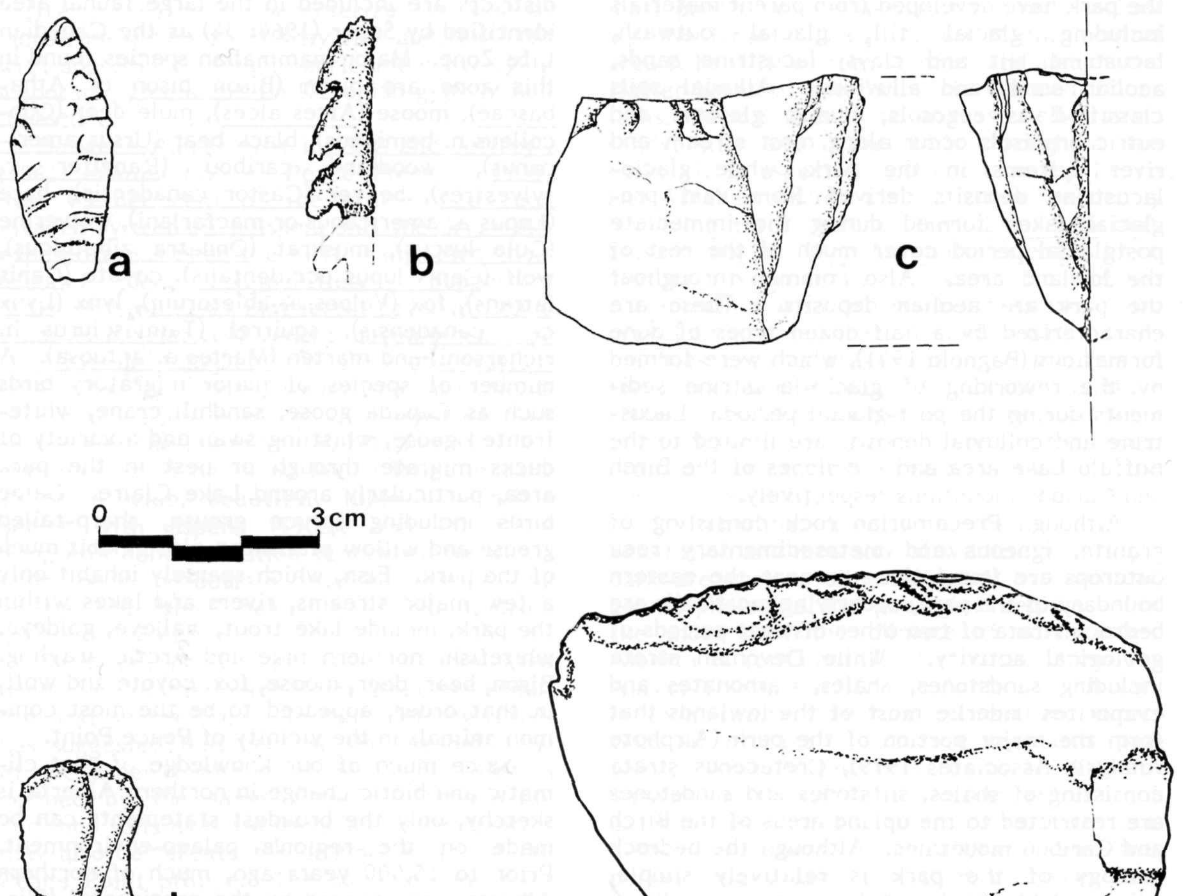
While complex, the hydrological regime of the park can be divided into two separate components. These are the Peace, Athabasca and Slave river drainage system, which incorporates the Peace-Athabasca delta, and a vast area of poor to intermediate drainage and muskeg that has been further complicated by karst topography (i.e., sink holes and underground waterways). Water from all streams and rivers in the park eventually flow northeast as part of the Mackenzie River drainage.

Wind, glacial activity, alluvial deposition, climate as well as vegetation and other factors have all contributed to the formation of soils within the park. Predominant soils of the park have developed from parent materials including glacial till, glacial outwash, lacustrine silt and clays, lacustrine sands, aeolian sands and alluvium. Alluvial soils classified as regosols, humic gleysols and eutric brunisols occur along most stream and river systems in the park, while glacio-lacustrine deposits derived from vast pro-glacial lakes formed during the immediate postglacial period cover much of the rest of the lowland area. Also common throughout the park are aeolian deposits. These are characterized by a half dozen types of dune formations (Bagnold 1941), which were formed by the reworking of glacio-lacustrine sediments during the post-glacial period. Lacustrine and colluvial deposits are limited to the Buffalo Lake area and the slopes of the Birch and Caribou mountains respectively.

Although Precambrian rock consisting of granite, igneous and metasedimentary rock outcrops are found along or near the eastern boundary of the park, underlying most soils are bedrock strata of two other distinct periods of geological activity. While Devonian strata including sandstones, shales, carbonates and evaporites underlie most of the lowlands that form the major portion of the park (Airphoto Analysis Associates 1979), Cretaceous strata consisting of shales, siltstones and sandstones are restricted to the upland areas of the Birch and Caribou mountains. Although the bedrock geology of the park is relatively simple, water-soluble rocks such as gypsum, limestone, dolomite and some shales have produced a great diversity of landforms throughout the area. Gypsum in particular, dissolving below limestone strata, has resulted in the development of sink holes and solution caves throughout much of the central area of the park.

Wood Buffalo National Park has been divided into four major land districts incorporating numerous land systems and subsystems (Airphoto Analysis Associates 1979). The land districts are the Peace/Slave/Athabasca river lowlands, the Slave or karst plain, the Birch and Caribou mountains (or Cretaceous uplands) and the Buffalo Lake lowlands/Robertson Lake uplands. These are defined on the basis of vegetation, soil types, geology and topography. While each district presents varying environmental pressures to which animal and human populations are forced to adapt, differences between these areas in terms of wildlife are noted more in frequency of occurrence than presence or absence. The wildlife of these districts are included in the large faunal area identified by Soper (1964: 34) as the Canadian Life Zone. Major mammalian species found in this zone are bison (Bison bison or Athabascae), moose (Alces alces), mule deer (Odocoileus h. hemionus), black bear (Ursus americanus), woodland caribou (Rangifer c. sylvestres), beaver (Castor canadensis), hare (Lepus a. americanus or macfarlani), wolverine (Gulo luscus), muskrat (Ondatra zibethicus), wolf (Canis lupus occidentalis), coyote (Canis latrans), fox (Vulpes a. abietorum), lynx (Lynx c. canadensis), squirrel (Tamiasciurus h. richarsoni) and marten (Martes a. actuosa). A number of species of major migratory birds such as Canada goose, sandhill crane, white-fronted goose, whistling swan and a variety of ducks migrate through or nest in the park area, particularly around Lake Claire. Game birds including spruce grouse, sharp-tailed grouse and willow ptarmigan also inhabit much of the park. Fish, which sparsely inhabit only a few major streams, rivers and lakes within the park, include lake trout, walleye, goldeye, whitefish, northern pike and Arctic grayling. Bison, bear, deer, moose, fox, coyote and wolf, in that order, appeared to be the most common animals in the vicinity of Peace Point.

Since much of our knowledge of past climatic and biotic change in northern Alberta is sketchy, only the broadest statements can be made on the region's palaeo-environment. Prior to 10,000 years ago, much of northern Alberta was covered by the continental (Wisconsin) ice sheet. At that time the unglaciated areas of southern Alberta contained predominantly a spruce forest (Ritchie 1976). This forest supported a diverse, exotic wildlife which included a large contingent of the extinct megafauna of Pleistocene North America (Churcher and Wilson 1979). As glacial ice retreated northward after 10,000 years ago, meltwater and isostatic depression resulted in the formation of vast proglacial lakes over much of the area. In north central Alberta these included Glacial lakes Peace, Tyrell and Edmonton (Taylor 1960). As ice left northeastern Alberta and as the lower Peace and Athabasca valleys became ice free, the last proglacial lake, Glacial Lake McConnell, was formed (Craig 1965). By 7000 years ago, and perhaps even earlier, all glacial remnants and proglacial lakes had been replaced rapidly by spruce forest (Ritchie 1976). Although there is some evidence to the contrary (Ritchie 1976), no significant zones



4 Artifacts recovered from Peace Point prior to 1981 excavation. Projectile point drawn from photograph.

of tundra apparently existed at the ice front as periglacial conditions lasted only briefly. While spruce-dominated forest indicates that the post-glacial climate may have been somewhat cooler and wetter than present, pollen reconstructions suggest an increasing warming trend between 9500 to 3500 years ago, reaching a maximum development between 5500 to 6000 years ago (Lichti-Federovich 1970). By this time much of the spruce forest of southern and central Alberta had been replaced by prairie. As the aspen parkland shifted northward, the northern Alberta forest took on a mixed-wood appearance with increases in pine, alder and birch. Economically important mammalian species of the boreal forest during this time may have been moose, woodland caribou and woodland bison (Ives 1981b).

Less than 6000 years ago, particularly around 3000 to 4000 years ago, a gradual deteriorization of climate, accompanied by slightly cooler and wetter conditions, favoured an increase in boreal forest elements in former parkland and prairie habitats. By 3000 years ago the boreal forest reached its southern limit accompanied by a southward shift of the forest/tundra ecotone farther north (Sorenson and Knox 1974). While temperatures in the north between 1500 and 600 years ago may have been only slightly warmer than at present (Nichols 1975), after 3000 B.P. conditions seem to have been similar to those of today, with only minor fluctuations in rainfall, temperature, and flora and fauna distributions.

Results of Investigations

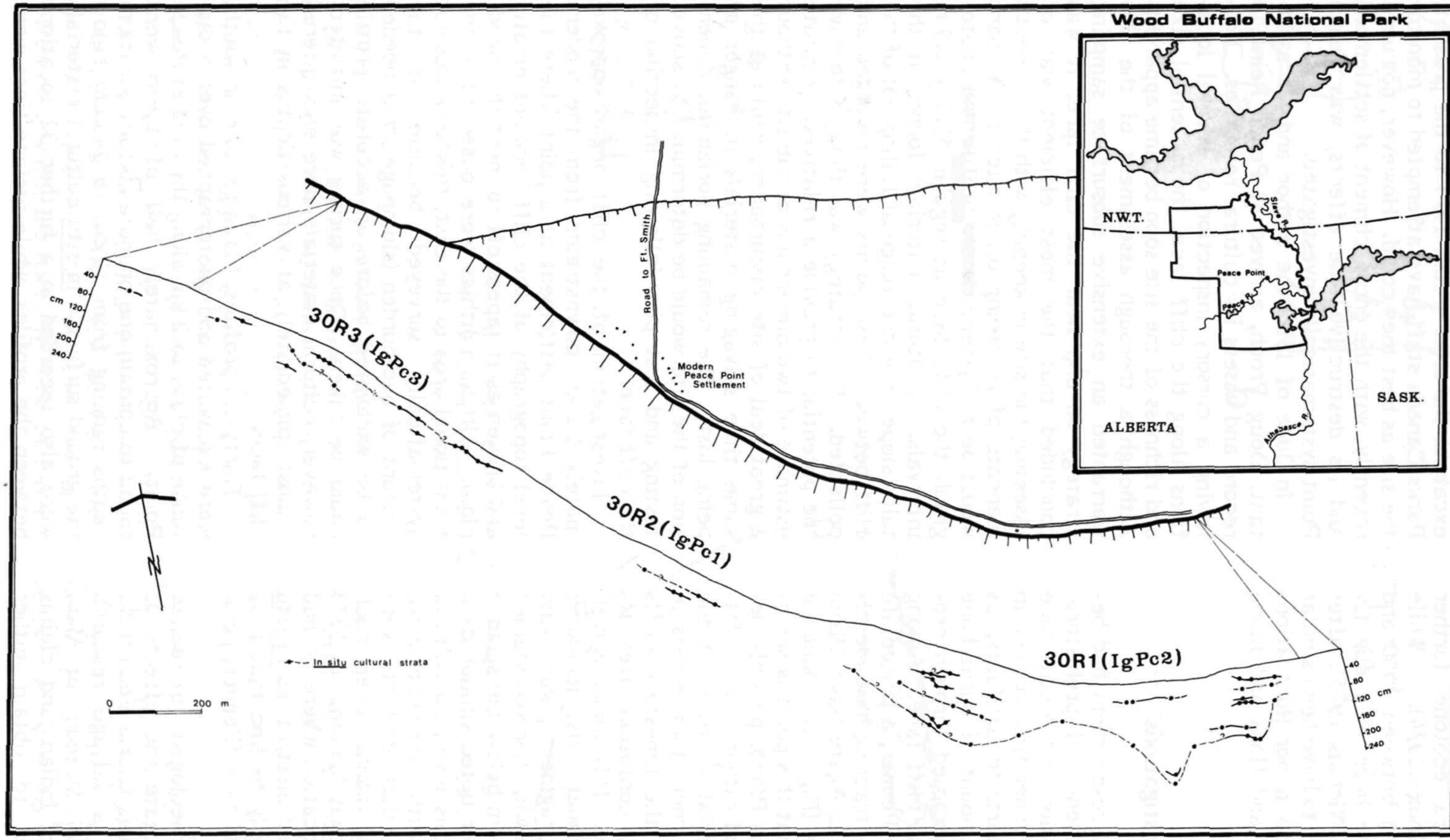
Prior to 1980, several researchers had become aware of the existence of prehistoric materials exposed by erosion of the cliff face at Peace Point. David Penner first noticed in 1972 that chert and quartzite artifacts, as well as a considerable amount of burnt bone and charcoal, had been exposed through erosional processes along the cliff face. Among the artifacts collected by Penner, a lanceolate projectile point with a contracting base identified by Fedirchuk (1973) as Agate Basin/Plano was the most interesting (Fig. 4a). Donahue (1976a), however, feels that this point is something other than Northern Plano, possibly because of its small size and rather poor craftsmanship. Since the material out of which the point is made is a local chert that occurs in small irregular veins in the limestone cliffs along the Peace River, confusion over its identity is understandable. This point, as well as other artifacts and materials, including utilized flakes and bone fragments, was found associated with a dark brown, charcoal-stained soil horizon 45 cm to 50 cm below the surface of the site. While Penner noted similar dark bands above and below this level, no cultural materials were observed within these horizons. He did notice, however, that artifacts were distributed in an irregular manner over much of the talus slope for about 0.5 km. In 1973 Penner returned to the location where he had recorded and photographed most of his in situ finds the previous year only to find that they had fallen out of the cliff face (Penner, pers. com., 1980).

One of the first archaeologists to realize the urgent need to mitigate the effects of erosion at Peace Point was Gloria Fedirchuk, who in 1973 submitted a salvage research proposal to the National Museum of Man. Unfortunately, because of Indian land claims negotiations, she failed to obtain either governmental permission or funding to excavate the site. From 1973 to the present, Parks Canada staff have attempted to monitor the site as best they could. However, not until recently, with the encroachment of settlement and its destructive side effects, was Peace Point systematically investigated.

In June of 1980 the author and his assistant, Doug Proch, arrived at Peace Point to record and assess its cultural resources. Following a cursory inspection of several locations along the cliff face, the potential size and richness of the site soon became apparent. Although a thorough assessment of the site warranted an extensive subsurface sampling strategy on and near the cliff face, it was concluded that the most efficient way of assessing the site in keeping with the project's mandate of recording other sites in the park would be to systematically profile and photograph the cliff face at regular 50.0 ± 2.5 m intervals. Cultural materials found on the talus slope or on the verge of falling out of the cliff between these points were recorded and collected. This strategy was thought to have the potential to provide a relatively accurate estimate of two dimensions of the site without a great deal of site disturbance, while at the same time salvaging materials in danger of being lost. The remaining horizontal dimension of the site would be determined by shovel testing and test pits following inspection of the cliff face.

Investigation of the cliff began approximately 1.2 km downstream from the modern Peace Point settlement at a point where the level topography of the cliff becomes erratic and broken as it tapers off to meet the floodplain. Although lithics were observed in the transitional area to the east, this area was not systematically surveyed because of the amount of overburden (slumpage) that needed to be excavated before an accurate profile could be taken. Once survey was initiated, however, cultural materials were encountered almost immediately at various depths in the cliff face.

Thirty-six profiles, 0.5 m to 1.0 m in width, were excavated and photographed over a distance of close to 2 km along the cliff at Peace Point. Approximately half of these were found to contain one or more cultural strata in depths ranging from 10 cm to 240 cm below the ground surface. In situ cultural materials were also recorded in a further 32 locations between the profiles, while surface finds were



5 Expanded cliff face profile at Peace Point showing three major areas of occupation. Borden designations in parentheses.

collected from another 22 areas along the talus slope of the surveyed area. Close to half of all locations containing in situ materials demonstrated two or more distinct cultural strata, indicating an extensive multi-component occupation over much of the Peace Point area. Over 1700 chert and quartzite artifacts were recovered during this exercise.

While numerous concentrated areas of settlement can perhaps be delineated along the cliff face, three major areas of occupation are clearly present (Fig. 5). The greatest vertical and horizontal concentration of cultural materials is located in the eastern area of Peace Point where several cultural strata were observed in most locations. A second major concentration was noted about 1.5 km upstream of this area nearer the modern Peace Point settlement. However, it demonstrated neither the intensity nor extensiveness of occupation witnessed in the latter area. With the exception of one area between these two major loci, stratified cultural deposits were rare along the cliff face at Peace Point.

Clearly, the vertical and horizontal clustering of cultural materials in the cliff suggests that Peace Point is not one site but several, each with its own particular set of advantages and disadvantages. For example, the eastern site area or cluster is situated on a level, fairly low-lying (12 m), accessible limestone cliff in relatively thick soil deposits (>1.5 m). On the other hand, the western site cluster is located on a higher (15 m), less accessible limestone cliff in relatively thinner soil deposits (<1 m). Each site will be discussed in turn.

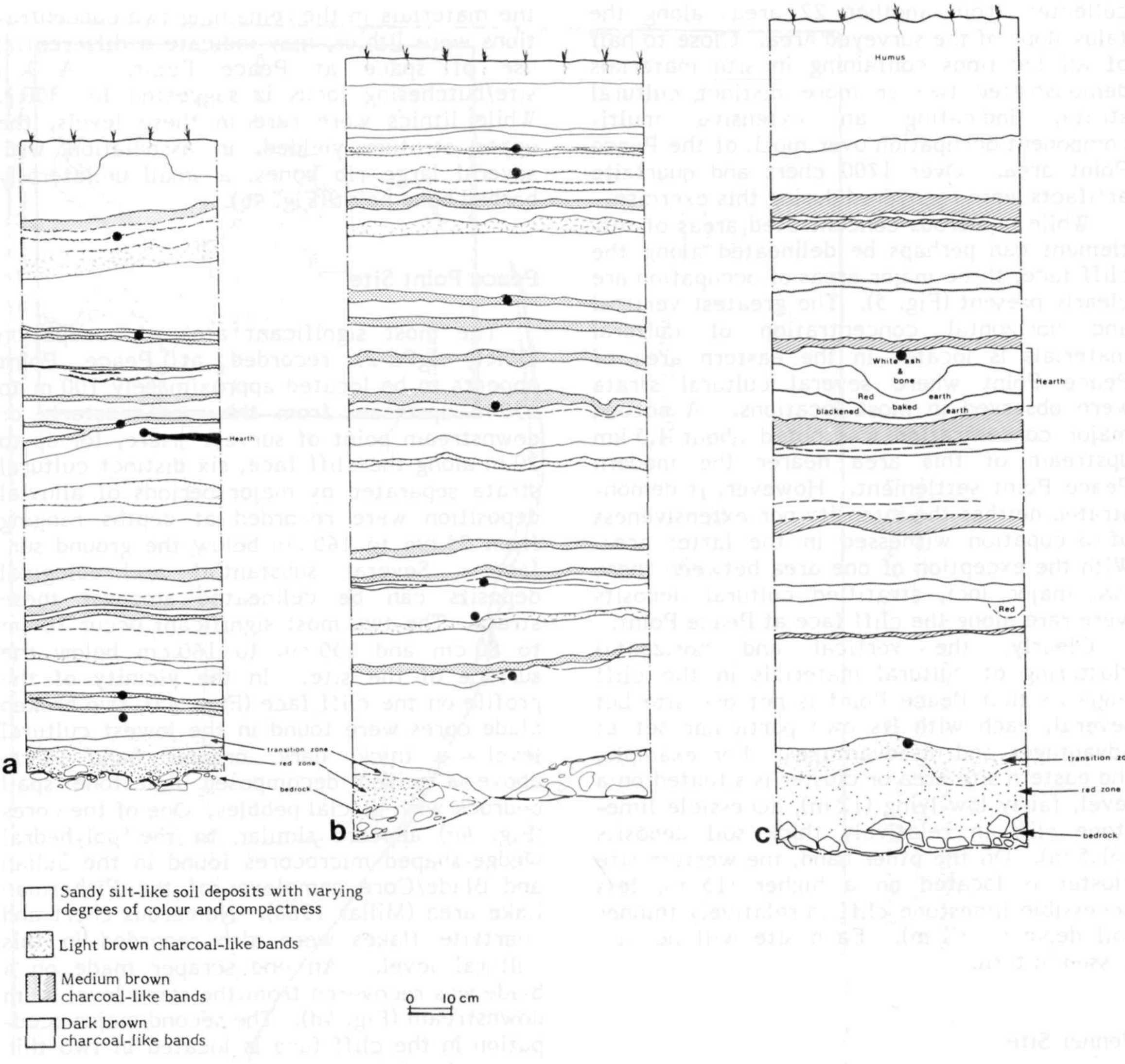
Penner Site

The location of the Penner site (3OR2, IgPc-1) leaves little doubt that it is the same as that first noted by Penner in 1972 (David Penner, pers. com., 1981). The site is represented by two discontinuous cultural strata, 40 cm and 60 cm below the ground surface. Both levels extend for several hundred metres along the cliff face. This site does not appear to be as spatially extensive, densely occupied or deeply stratified as either the western or eastern concentrations. The material remains of this site also differ from that of the latter two areas. The fact that both upper and lower strata produced thin dispersed scatters of large mammalian (bison) bone, while most of the materials in the remaining two concentrations were lithics, may indicate a differential use of space at Peace Point. A kill site/butchering locus is suggested for 30R2. While lithics were rare in these levels, the upper stratum yielded, in association with several large rib bones, a small unilaterally barbed bone point (Fig. 4b).

Peace Point Site

The most significant area of occupation (30R1, IgPc-2) recorded at Peace Point appears to be located approximately 100 m to 150 m upstream from the most easterly or downstream point of survey. Here, for up to 20 m along the cliff face, six distinct cultural strata separated by major periods of alluvial deposition were recorded at depths ranging from 25 cm to 160 cm below the ground surface. Several substantial archaeological deposits can be delineated amongst these strata. The two most significant occur 70 cm to 80 cm and 150 cm to 160 cm below the surface of the site. In the vicinity of the profile on the cliff face (Fig. 6a), two broken blade cores were found in the lowest cultural level – a thick, dark, organic band 15 cm above a mixed decomposed limestone spall bedrock with glacial pebbles. One of the cores (Fig. 4c) appears similar to the polyhedral wedge-shaped microcores found in the Julian and Blade/Core complexes of the Fisherman Lake area (Millar 1968). Numerous chert and quartzite flakes were also recorded in this cultural level. An end scraper made on a blade was recovered from the same level 50 m downstream (Fig. 4d). The second major occupation in the cliff face is located in two thin charcoal soil horizons. In the profile a small hearth-like feature containing over 300 g of fragmented burnt bone was found directly beneath several hundred chert flakes.

In an effort to determine the remaining horizontal dimensions of the site in this area, a 1-m-x-2-m test unit was excavated by trowel 3 m back from the cliff face (Fig. 6b). While no culturally diagnostic artifacts were found, seven cultural strata were identified. Apart from only minor differences in cultural and natural stratification, the cliff face and test pit profiles appear virtually identical. Cultural materials found in the test pit were again most abundant between 150 cm to 160 cm and 70 cm to 90 cm below the surface.



6 Cliff face and test pit profiles from the Peace Point site, 1980.

Less bone in all but the upper cultural strata is perhaps the most apparent difference between these two areas.

To entertain suspicions that cultural materials in most strata, especially the lower levels, were less concentrated further away from the cliff face, a second test pit was excavated 6 m north of the cliff face profile. This exercise yielded only four cultural levels ranging from 80 cm to 135 cm below the surface. As anticipated, the lowest cultural level was absent in this unit. Moreover, the densest concentration of materials in this test pit was recorded 80 cm to 90 cm below the surface and is represented by no more than several bone fragments and five chert flakes. Clearly, the horizontal limits of occupation in most strata had been reached.

Another important focus of occupation in this part of Peace Point was located approximately 400 m upstream from the above area. Although this area did not demonstrate the degree of stratification or the intensity of occupation recorded in the previous area, it appeared to contain both major cultural strata witnessed previously. A large quartzite side scraper (Fig. 4e) and several quartzite and chert flakes were recorded in the top of the lowest soil deposit 10 cm above bedrock, while several large hearths containing considerable amounts of ash and bone were observed 75 cm to 95 cm below the ground surface. A 1-m-x-2-m test pit was subsequently excavated by trowel 3 m back from the cliff face to a depth of 2 m to determine the remaining horizontal extent of cultural deposits in this area. Two small biface trimming flakes recorded 170 cm below the surface of this unit attest to the scarcity of cultural materials in lower occupation levels in this area. Clearly, this would seem to indicate that the accumulative effects of erosion have undermined this area of the Peace Point cliff to such an extent that only a vestige of the lower cultural component remains.

Town Site

As many as three distinct discontinuous cultural strata were recorded in the western area (30R3, IgPc-3) of Peace Point just upstream from the present settlement. Settlement appeared fairly extensive along the cliff face, though there was less stratification than at the Peace Point site. The remaining horizontal extent of the town site is also quite extensive: in situ materials were recorded more than 15 m north of the cliff. Limited shovel testing and test excavation, on the other hand, revealed that cultural materials extend no further than 10 m from the cliff face at the Penner and Peace Point sites. Whether this reflects differences in the use of space or in the inherent stability of the cliff in each area is uncertain, although the latter seems more likely.

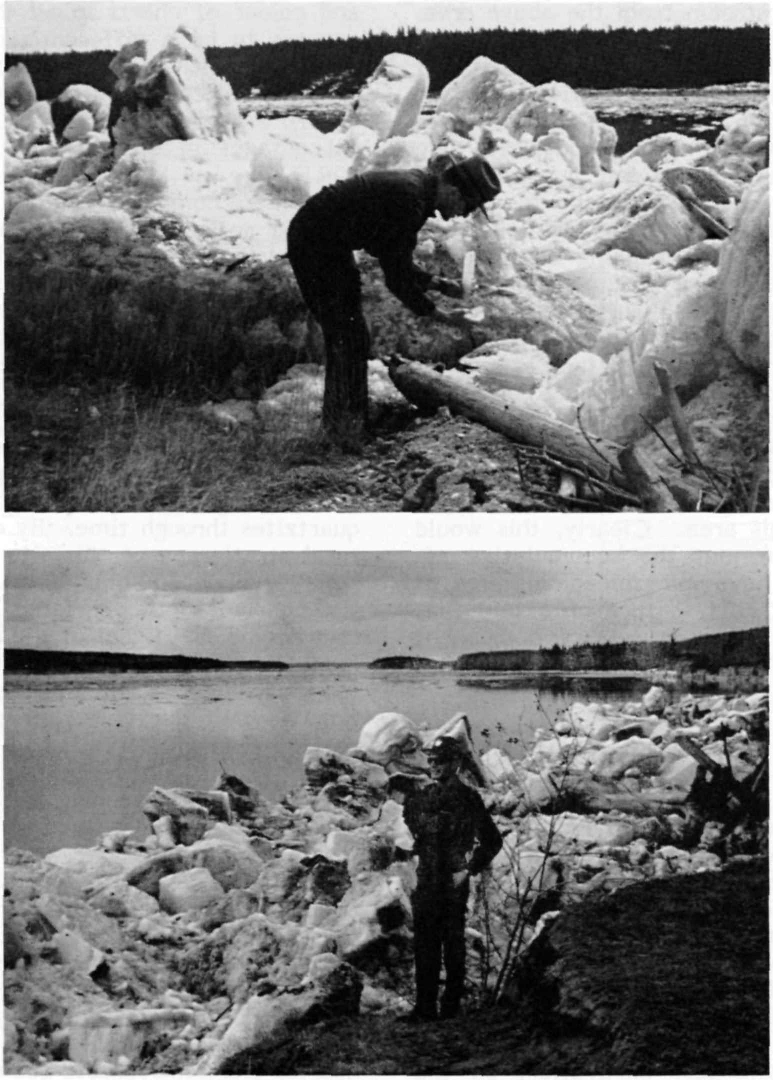
Discussion

Because of the way in which the data were collected, only the broadest statements can be made regarding inter- and intra-site variability at Peace Point. Though there is considerable variation in the grain size, texture and colour of cherts in all three sites, there appears to be a differential use of the two most frequently occurring types (a dark grey, fine-grained chert and a sandy, light grey-tan chert). Whereas both occur in almost equal percentages in all but the lower levels of 30R1, the use of the darker chert appears much more common in 30R3. This is probably more a reflection of proximity to different veins of local chert than anything else. However, since Peace Point seems to have served as a cultural boundary in early historic times, the possibility remains that it may have also functioned in a similar capacity in prehistoric times (Stevenson 1981a). Different groups might be expected to have exploited different territories, and hence different lithic sources.

Another pattern, which appears specific to 30R1, is a gradual decrease in the use of local quartzites through time. By dividing the cultural stratigrapy of this site into three arbitrary levels (>130 cm, 50 cm to 130 cm and <50 cm below the surface), this trend was found to be significant at the .001 significance level (X^2=96.7, df=2). A plausible explanation for a shift away from the use of local quartzites is that during earlier periods of occupation, when soil deposits had not accumulated to any significant extent on the cliff, the bedrock with its veneer of quartzite pebbles may have been more accessible as a source of raw material.

In the absence of comparative data, the ratio of debitage to tools (75:1), and the presence of limestone cortex on over 50 per cent of the surface of 38 per cent of these artifacts, would seem to suggest that primary lithic reduction was one of the major activities at Peace Point. Yet the presence of hearths and considerable quantities of bone in most levels, particularly the upper strata, suggest that Peace Point may have been an attractive camping locus through time. Certainly the elevated plain, which affords advantages with respect to wind exposure and overview, as well as the probable existence of an extensive prairie at Peace Point in the past, would have provided favourable conditions for habitation.

From the above, it should be clear that 30R1, 30R2 and 30R3 sites are extremely large and productive archaeological sites that can make unparalleled contributions to northern boreal forest prehistory because of their deeply stratified cultural deposits. The Peace Point site is, in fact, the most deeply



7 Pack ice eroding cultural deposits at Peace Point. Top: close-up view of erosional process; bottom: extended view with Redrock Island in background.

stratified site yet discovered in the boreal forest of northern Alberta, northern Saskatchewan and the Northwest Territories. As such, it provides a unique opportunity from which to begin to illuminate cultural development, change and continuity through time within the region. Two possible Agate Basin-like points from the Lake One dune site just south of Peace Point (see below), as well as the location of cultural levels 10 cm to 15 cm above a limestone bedrock containing small glacial boulders, also suggest that Peace Point may eventually yield some of the earliest evidence of occupation in the boreal forest region of western Canada. Greater significance is derived from the fact that it promises to provide an excellent record of technological, socioeconomic and sociocultural processes through time within the region and specifically the Peace River lowlands. Because 30R1 appears to be an extensive multi-component workshop/habitation site where bone and hearths seem well preserved and lithic reduction activities once were common, it may be especially sensitive to monitoring culture change and continuity in exploitation strategies and lithic technology. Thus, the most significant aspect of the Peace Point site is that, more than at any other site in the northern boreal forest region of western Canada, it could provide a sound basis for explicating diachronic variability within and between assemblages.

At the same time, it is apparent that sites at Peace Point are disappearing because of construction activities and natural erosion along the cliff face. While the recent construction of two boat ramps in the vicinity of 30R2 and 30R3 may have destroyed up to several hundred square metres of cultural deposit, the most destructive force is erosion by pack ice during spring break-up. Over the last decade ice shove has caused significant portions of all three sites to erode into the river: 1973 was a particularly disastrous year in this regard (Fig. 7). Attesting further to the awesome power of this erosion are David Penner's (pers. com., 1981) observations that the cliff face has changed dramatically since 1973 and Charlie Simpson's statement (pers. com., 1980) that in 1978, in the vicinity of 30R1, up to two metres of cliff face were lost to the river. Erosion may be related to hydroelectric dam control upstream, but whatever the cause, given its destructiveness and the finding that cultural materials become less abundant further away from the cliff face, the possibility looms large that these resources may soon be lost forever.

8 Lake One dune site.

CHAPTER IV
ARCHAEOLOGICAL INVESTIGATIONS IN THE VICINITY OF PEACE POINT IN 1980

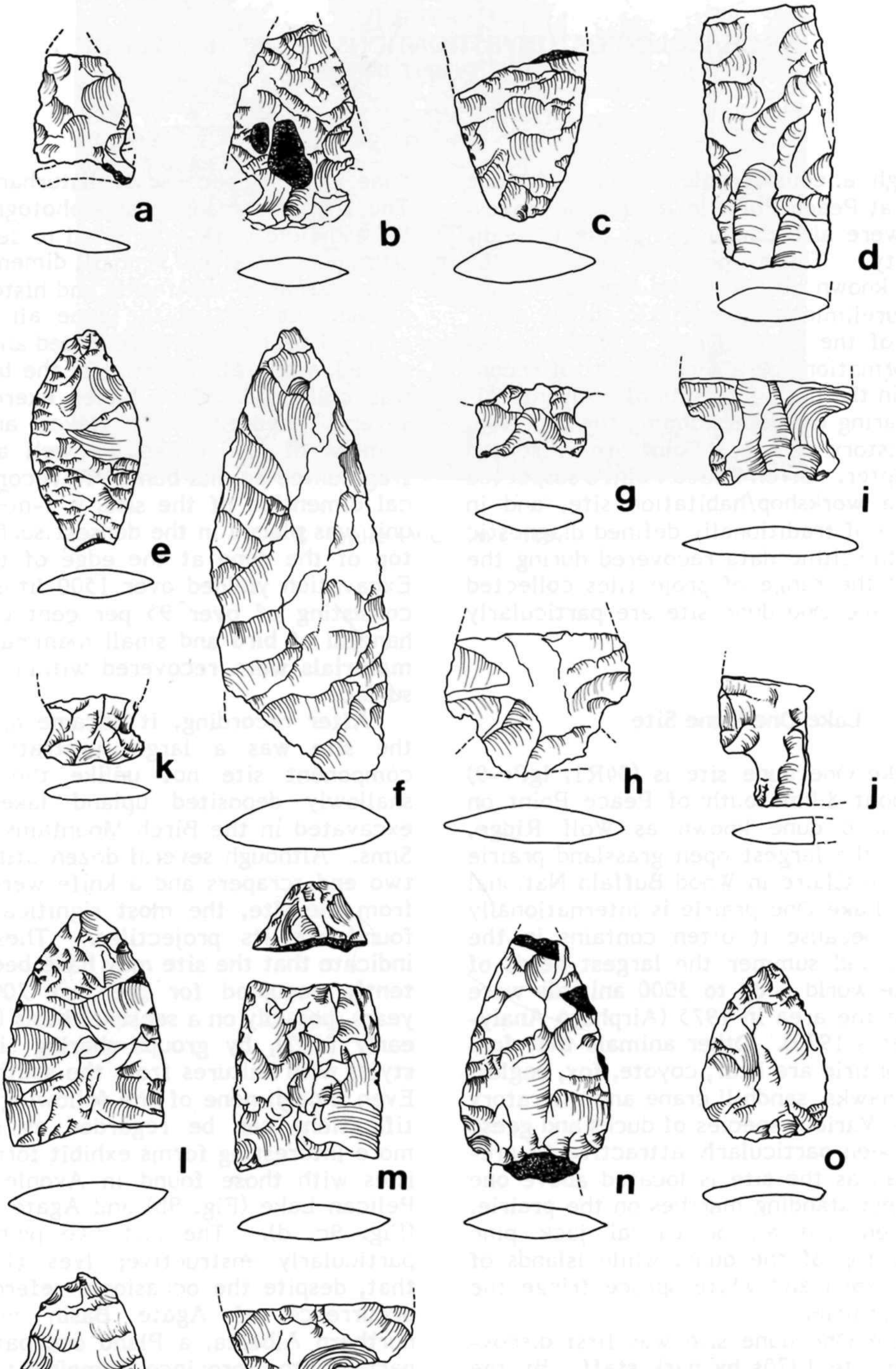
Although a considerable amount of time was spent at Peace Point in 1980, other investigations were also conducted in the immediate vicinity. These included assessing the remaining known site at Lake One and completing a preliminary systematic survey along the banks of the Peace River to gather locational information for a second year of reconnaissance in the park. Results of both investigations bearing on understanding the function, role and history of Peace Point are presented in this chapter. Given Peace Point's suspected status as a workshop/habitation site, and in the absence of traditionally defined diagnostic artifacts, the lithic data recovered during the survey and the range of projectiles collected from the Lake One dune site are particularly instructive.

Lake One Dune Site

The Lake One dune site is (34R1, IgPc-9) located about 8 km south of Peace Point on top of a sand dune known as Wolf Ridge, overlooking the largest open grassland prairie west of Lake Claire in Wood Buffalo National Park. The Lake One prairie is internationally recognized because it often contains in the late spring and summer the largest herds of bison in the world – up to 3000 animals were observed in the area in 1975 (Airphoto Analysis Associates 1979). Other animals that frequent the prairie are bear, coyote, fox, eagles, red-tailed hawks, sandhill crane and migratory waterfowl. Various species of ducks and geese may have been particularly attractive to prehistoric man as the site is located above one of the largest standing marshes on the prairie. Grass, aspen and an occasional jack pine inhabit the top of the dune, while islands of jack pine, aspen and white spruce fringe the rest of the prairie.

The Lake One dune site was first discovered in the late 1970s by park staff. By the summer of 1980 a number of individuals had collected numerous projectiles from the top of the dune and a blowout area at the end of the dune. The blowout appears to be expanding at the expense of the more stable areas of the dune, possibly because of disturbance by bison. The site was mapped and photographed (Fig. 8), and field work attempted to determine the site's horizontal and vertical dimensions, significant areas of habitation and history of occupation. On top of the dune all natural and cultural features were recorded and left undisturbed, while all material in the blowout area was collected. This latter exercise yielded several hundred chert flakes and a small number of projectiles, as well as 1.5 kg of fragmented animal bone. To record the vertical dimension of the site, a 1-m^2 excavation unit was placed in the densest surface area on top of the dune at the edge of the blowout. Excavation yielded over 1500 lithic artifacts, consisting of over 95 per cent chert, and a handful of bird and small mammal bone. All materials were recovered within 5 cm of the surface.

After recording, it became apparent that the site was a large, unstratified, multicomponent site not unlike the productive, shallowly deposited upland lakeshore sites excavated in the Birch Mountains by Ives and Sims. Although several dozen utilized flakes, two end scrapers and a knife were recovered from the site, the most significant artifacts found are its projectiles. These artifacts indicate that the site may have been intermittently occupied for the last 7000 or 8000 years, possibly on a seasonal basis (late spring-early fall?), by groups sharing similar point styles with cultures from the south and north. Even though none of the following point identifications can be regarded as secure, the more interesting forms exhibit formal similarities with those found in Avonlea (Fig. 9a), Pelican Lake (Fig. 9b) and Agate Basin/Plano (Fig. 9c, d). The last two points may be particularly instructive; Ives (1981b) feels that, despite the occasional reference to the occurrence of Agate Basin materials in northern Alberta, a Plano occupation of this part of the province remains to be documented. Given the fine parallel flaking of both points, and the ground margins and expanding diamond-shaped cross-section of the tapered point base, it is difficult to confuse these lanceolates with others found in later,



9 Projectile points from the Lake One dune site.

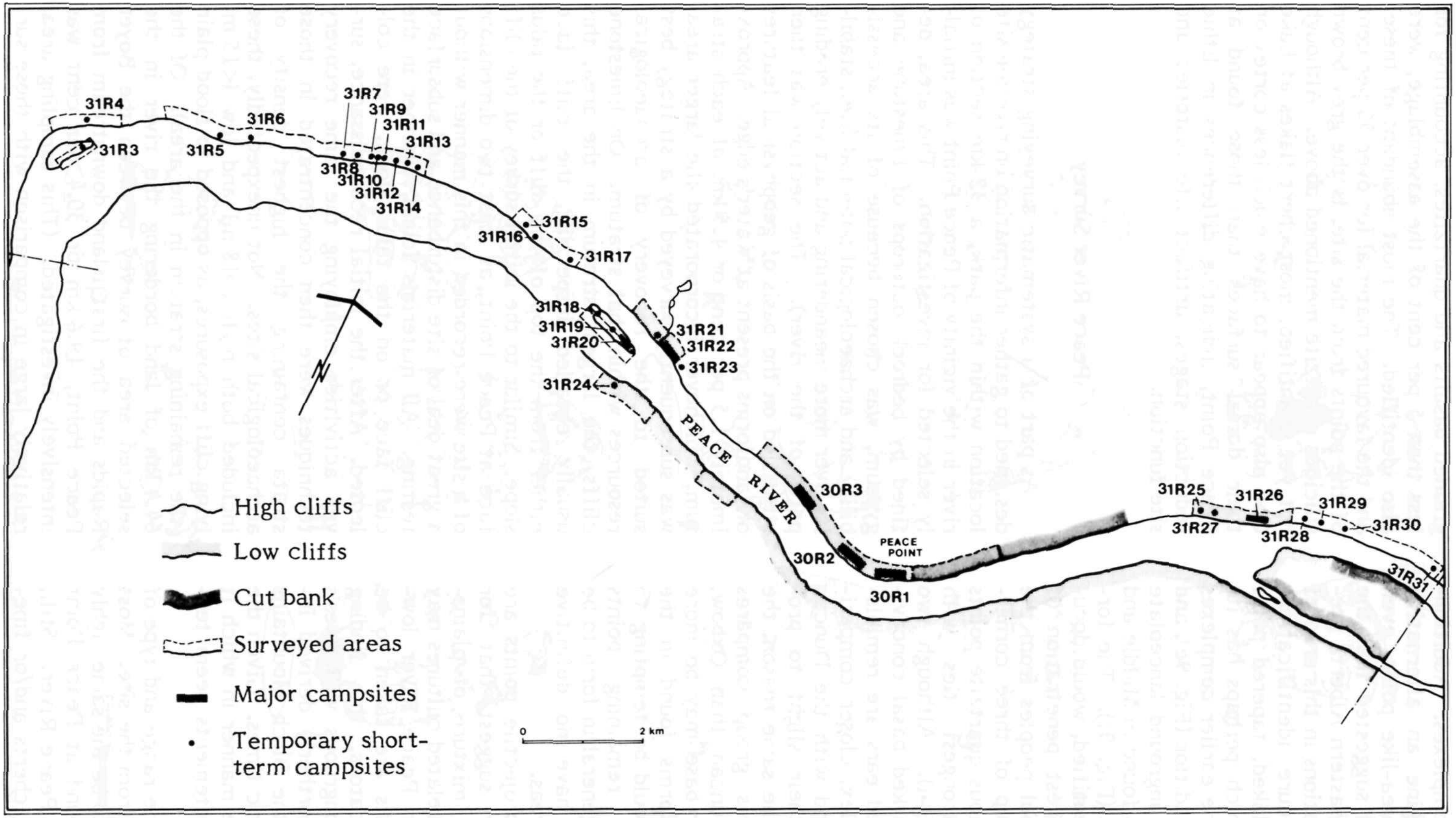
more northerly derived complexes. Additionally, it is hard to imagine an alternative explanation for the Avonlea-like point, even though Pollock (1978) has suggested that the lack of ceramics in northeastern Alberta precludes any Avonlea occupations in this area of the province. Less secure identifications include a small, finely flaked, tapered point with a concave base, which perhaps has its closest similarities with the earlier complexes of the Canadian Tundra tradition (Fig. 9e), and a large, slightly tapered, unground lanceolate point, which recalls forms found in Middle and Late Taltheilei complexes (Fig. 9f). The former point, if properly identified, would document the furthest southwest penetration of supposed Arctic Small Tool peoples from the Canadian tundra. A group of three corner-notched, grey-brown silicious quartzite points suggest perhaps the strongest ties with southern cultures (Fig. 9g-i). Although two projectile points with marked basal concavities and mildly pronounced ears are reminiscent of the Oxbow complex, closer comparisons can perhaps be found with the Duncan point style because of their slight to pronounced shoulders. For the same reason, the remaining artifact in this group compares more favourably with Duncan than Oxbow, even though its straighter base may be more characteristic of point forms found in the Hanna phase. While it would be tempting to speculate further, the remaining points (Fig. 9j-q) are either too general in form to be typologically useful, or have no definitive comparisons in adjacent areas.

The Lake One dune projectile points are significant because they suggest that for several thousand years a mixture of plains-related and boreal-forest-related cultures may have exploited the lower Peace River lowlands. If projectile points are taken to be culturally sensitive indicators, this finding would appear to be incongruous with Ives's (1981a, b) finding that northerly derived influences predominate in the Birch Mountains area during Late Prehistoric times. Given the size of the sample and the manner in which it was collected, further statements seem tenuous.

Also noteworthy are the range and type of lithic materials collected from the site. Most chert at the site appears to be the same highly variable type of chert found at Peace Point and other sites along the Peace River. Still, 14 other distinct types of cherts and/or fine-grained basalts and quartzites, accounting for less than 5 per cent of the assemblage, were also identified. The most abundant of these, and the favoured material for over 50 per cent of the points from the site, is the grey-brown silicious quartzite mentioned above. Although not yet quantified, most chert flakes at Lake One also appear to have much less cortex on their dorsal surfaces than those found at Peace Point, indicating differences in lithic reduction stages, artifact life histories and site function.

Peace River Survey

As part of a systematic surveying strategy designed to gather information on riverine site location within the park, a 32-km section of river in the vicinity of Peace Point was initially selected for investigation. This area, defined by bedrock outcrops of limestone and gypsum, was chosen because of its accessibility and archaeological potential (i.e., stability over more meandering and actively eroding parts of the river). The section was then stratified on the basis of geophysical features or landforms present at water's edge. Approximately 1.5 per cent or 1.5 km of each stratum, whichever incorporated the larger area, was subsequently surveyed by a strategy best suited to the recovery of archaeological resources within that stratum. On limestone cliffs, the largest stratum in the area, this usually entailed inspecting the cliff face either from the top of the cliff or the talus slope. Similar to the initial survey of the cliff face at Peace Point, at least two dimensions of a site were recorded in this manner without a great deal of site disturbance and subsurface testing. All materials found, whether in the cliff face or on the talus slope, were collected. After the initial reconnaissance, survey activities employing the same recovery techniques were then concentrated in those strata containing the highest density of archaeological sites. Not unexpectedly, these included both high (>18 m) and low (<15 m) lying cliff exposures, as opposed to flood plain (the remaining stratum in the area). Of the 64.4 km of land bordering the river in the selected area of survey between the Boyer Rapids and the first island downstream from Peace Point, 19.6 km or 30.4 per cent was intensively investigated. (This sampling area, relatively large in comparison with those sur-

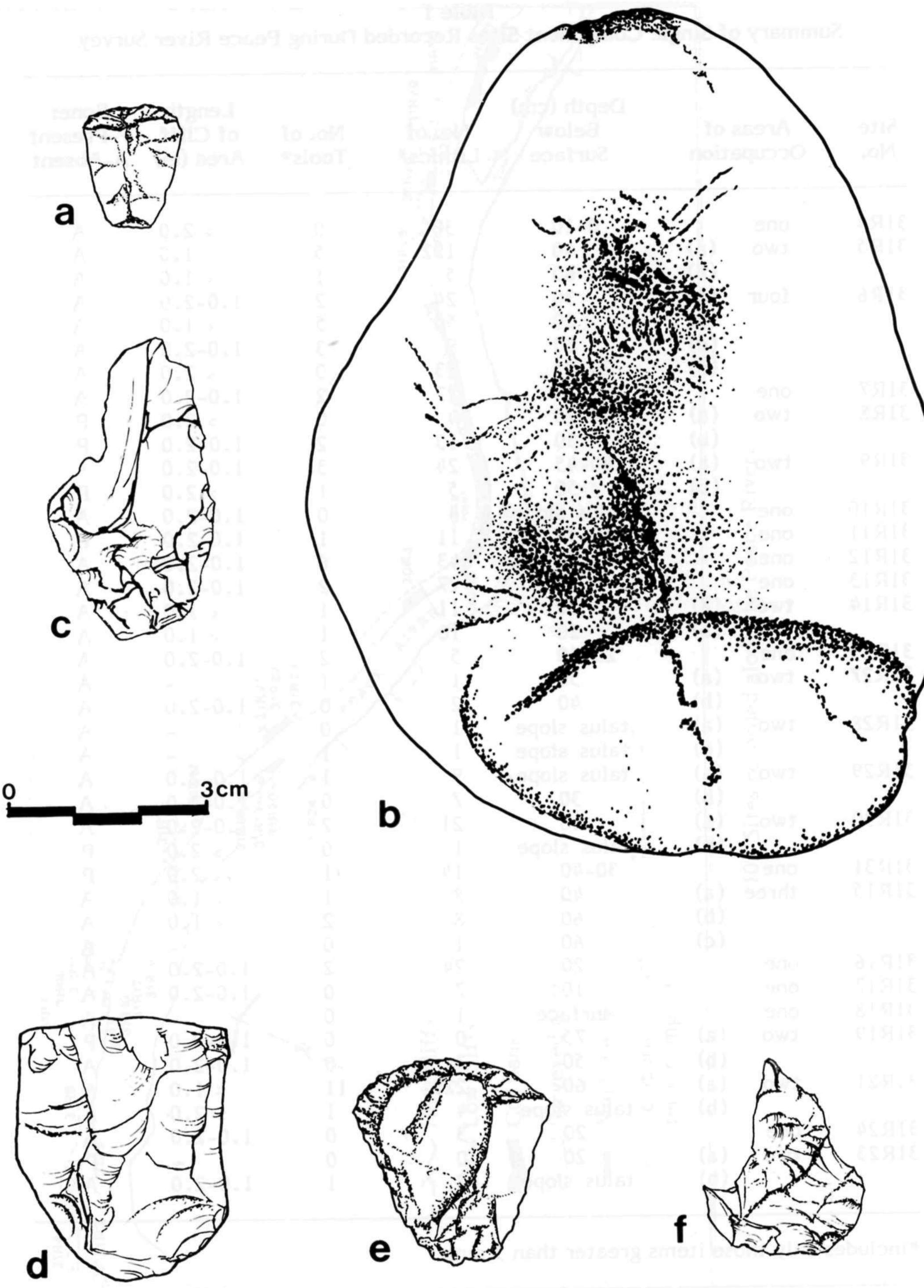


10 Sites recorded along the Peace River.

Table 1
Summary of Single Component Sites Recorded During Peace River Survey

Site No.	Areas of Occupation		Depth (cm) Below Surface	No. of Lithics*	No. of Tools*	Length of Cliff Area (m)	Bone: P-Present A-Absent
31R4	one		0-10	30	0	> 2.0	A
31R5	two	(a)	40	192	5	< 1.0	A
		(b)	60	5	1	< 1.0	A
31R6	four	(a)	30	24	2	1.0-2.0	A
		(b)	20	50	5	< 1.0	A
		(c)	30	9	3	1.0-2.0	A
		(d)	20-25	13	0	> 2.0	A
31R7	one		20	27	2	1.0-2.0	A
31R8	two	(a)	25	4	0	> 2.0	P
		(b)	30	13	2	1.0-2.0	P
31R9	two	(a)	40-45	24	3	1.0-2.0	A
		(b)	50	5	1	> 2.0	P
31R10	one		talus slope	4	0	1.0-2.0	A
31R11	one		30-35	11	1	1.0-2.0	P
31R12	one		50	43	6	1.0-2.0	A
31R13	one		35	27	2	1.0-2.0	A
31R14	two	(a)	20	11	1	< 1.0	A
		(b)	20	10	1	< 1.0	A
31R25	one		25-30	5	2	1.0-2.0	A
31R27	two	(a)	50	1	1	-	A
		(b)	40	2	0	1.0-2.0	A
31R28	two	(a)	talus slope	1	0	-	A
		(b)	talus slope	1	1	-	A
31R29	two	(a)	talus slope	9	1	1.0-2.0	A
		(b)	30	7	0	1.0-2.0	A
31R30	two	(a)	40	21	2	1.0-2.0	A
		(b)	talus slope	1	0	> 2.0	P
31R31	one		30-40	14	1	> 2.0	P
31R15	three	(a)	40	8	1	< 1.0	A
		(b)	60	8	2	< 1.0	A
		(c)	60	1	0	-	A
31R16	one		20	24	2	1.0-2.0	A
31R17	one		10	7	0	1.0-2.0	A
31R18	one		surface	1	0	-	A
31R19	two	(a)	75	0	0	1.0-2.0	P
		(b)	50	3	0	1.0-2.0	A
31R21	two	(a)	60	229	11	< 1.0	A
		(b)	talus slope	4	1	> 2.0	A
31R24	one		20	3	0	1.0-2.0	A
31R23	two	(a)	20	0	0	-	P
		(b)	talus slope	2	1	1.0-2.0	A

*includes only those items greater than 5 mm.



11 Major tools recovered during Peace River survey.

veyed on the Slave and Athabasca rivers, reflects the relative density of sites recorded in the survey area. Of the three major rivers in the park, the Peace River proved to be the most productive.) The remainder of this chapter presents the major results from this survey, and concentrates on those findings that may be relevant to understanding the function and role of Peace Point within a local context.

Although balancing precariously over 30-m cliffs posed some obvious difficulties for survey, several weeks of intensive cliff face inspection upstream and downstream of Peace Point located 28 prehistoric sites, bringing the known number of sites for this area of river to 31. With one exception, all sites occur on the left bank of the Peace River (Fig. 10). While this undoubtedly reflects the greater amount of work conducted on the left bank, a chi-square test employing the number of lithics found per area surveyed indicates that there is a significant difference in the intensity of utilization between the north and south sides of the Peace River ($X^2=162.3$, df=1, $p<.001$). Similar trends have also been observed by Spurling (1980) further upstream on the Peace River in northeastern British Columbia. In both areas the greater heat retention capabilities of the more open aspen and shrub dominated south-facing left bank may have suffered certain advantages over the heavily wooded, spruce-dominated, north-facing banks.

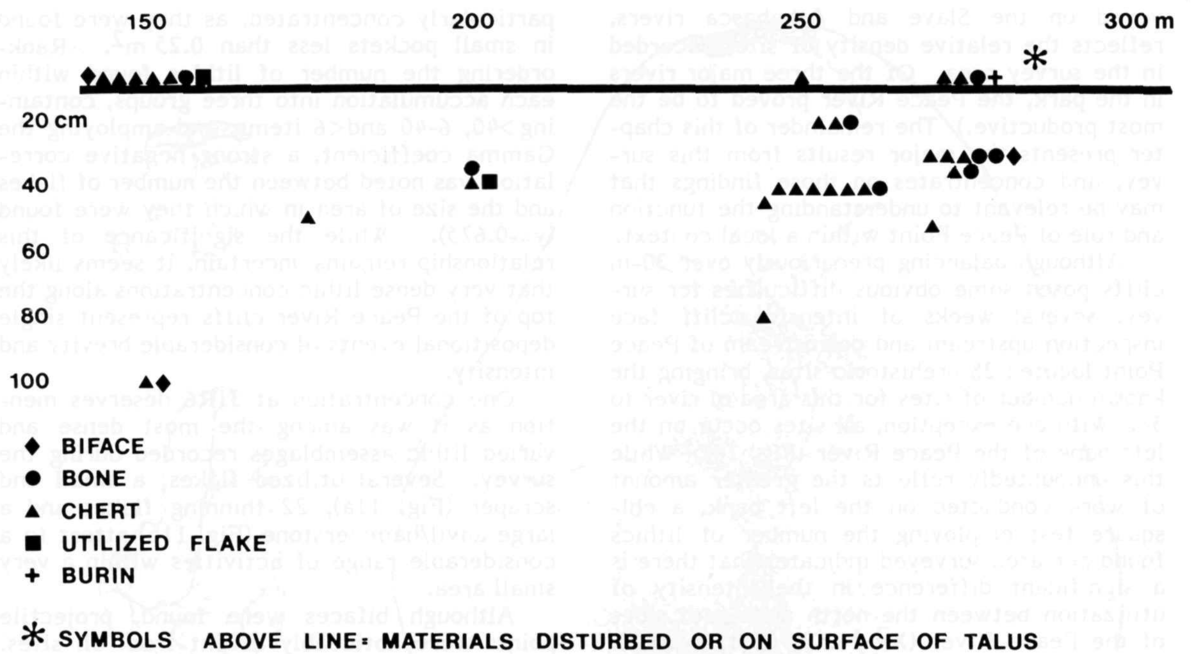
Of the 28 sites recorded, all but four appear to be small sites of limited spatial and temporal occupation. The remaining sites are stratified in a manner similar to those found at Peace Point. Of the 24 single-component sites, at least 12 contained two or more areas of occupation within 50 m of each other. Occurrences of materials further apart than this distance were arbitrarily assigned separate site designations. Included within these sites are 5 isolated finds, 11 relatively sparse accumulations and 25 relatively dense concentrations of lithic artifacts and other materials. Depths ranged from the surface/subsurface contact zone to just above bedrock (<u>see</u> Table 1 for site summary). With the exception of several scatters, which appeared to be distributed over a considerable distance (>10 m) along the cliff face, all lithic accumulations appeared to be very concentrated. In fact, most lithic artifacts were found to be distributed over an area less than 2 m along the cliff face. Those accumulations containing more than one hundred lithics seemed to be particularly concentrated, as they were found in small pockets less than 0.25 m^2. Rank-ordering the number of lithics found within each accumulation into three groups, containing >40, 6-40 and <6 items, and employing the Gamma coefficient, a strong negative correlation was noted between the number of flakes and the size of area in which they were found ($\gamma=-0.675$). While the significance of this relationship remains uncertain, it seems likely that very dense lithic concentrations along the top of the Peace River cliffs represent single depositional events of considerable brevity and intensity.

One concentration at 31R6 deserves mention as it was among the most dense and varied lithic assemblages recorded during the survey. Several utilized flakes, a small end scraper (Fig. 11a), 22 thinning flakes and a large anvil/hammerstone (Fig. 11b) attest to a considerable range of activities within a very small area.

Although bifaces were found, projectile points were noticeably absent from all sites. Major artifacts recorded from both single component and stratified sites during the survey are shown in Figure 11.

Of the four sites at which cultural stratification was observed, all but one was located on cliffs less than 12 m above present river level. On the other hand, all single component sites were located on cliffs greater than 15 m in height. Taking into account the three sites at Peace Point, the significance of this difference ($X^2=19.86$, df=1, $p<.01$) seems to indicate that low-lying cliffs were favoured over higher exposures as habitation loci through time.

The one exception to this pattern, 31R3, is located on the high cliffs on the eastern end of the island adjacent to Boyer Rapids. The site appears to be an extensively, but discontinuously, occupied workshop spread along the top and talus slope of the cliff for 400 m. At least two areas of the site produced superimposed cultural strata for a distance of several metres at depths of 5 cm to 15 cm and 30 cm below the surface of the cliff face. Although containing less than 50 chert flakes, both upper cultural strata were the more productive levels in each location. Both assemblages also produced (in order of occurrence) core reduction flakes and shatter, biface thinning flakes and utilized flakes. The most easterly area of the site was also found to be the most concentrated. While several flakes and an extensively battered bipolar hammerstone

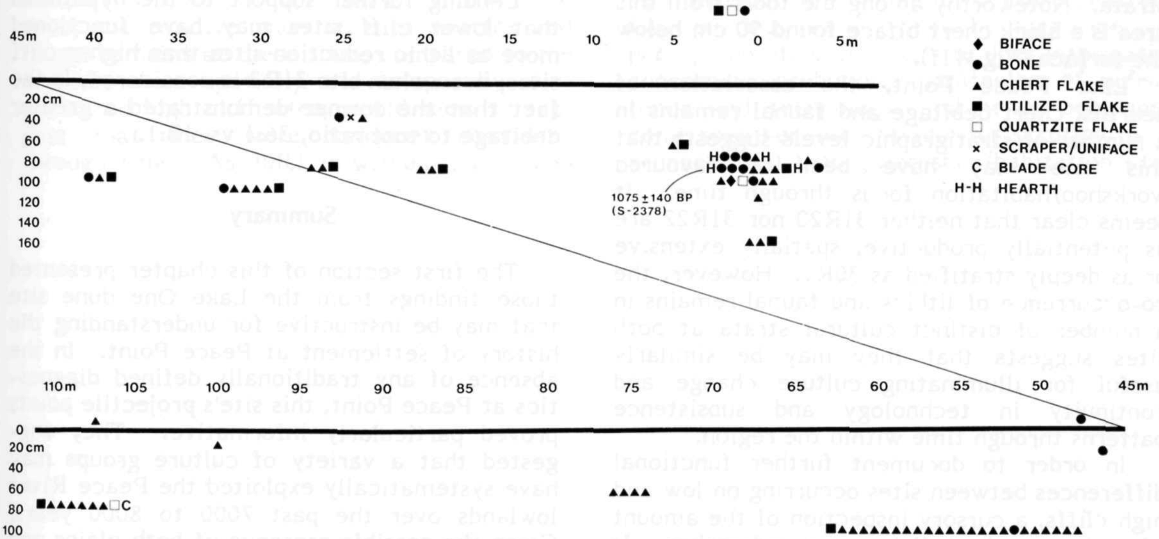


12 Schematic representation of cliff face profile from 31R22 (Match Creek).

were found on the surface, a small pocket of lithics was recorded at 10 cm to 15 cm below the surface in the cliff face. This small dense lithic concentration contained over 300 chert flakes consisting primarily of biface thinning and shatter (53%), core and shatter (35%) and blade-like (12%) flakes, as well as two crude biface fragments and five utilized flakes. The extensive and stratified nature of this site, the general absence of hearths and bone, and a debitage to tool ratio of 30:1 suggest that the site may have been a favoured lithic workshop through time.

Similar to the above site, 31R26 was also found to be stratified in two areas. However, materials were generally sparse and were concentrated at depths of 30 cm to 35 cm and 120 cm, and 20 cm to 25 cm and 80 cm to 90 cm below an irregular ground surface in each location. The proximity of these two areas (3 m) suggests that their upper and lower strata may be related. While limited numbers of core/tool reduction and biface thinning flakes occurred in each level, a bipolar chert core and two multi-directional red quartzite cores were found in the upper and lower strata respectively.

Perhaps the most significant sites recorded during the survey were 31R20 and 31R22, located several kilometres upstream from Peace Point. The latter site is situated on a low-lying cliff 200 m downriver from a small stream referred to by the native inhabitants of the area as Match or Flint Creek. Both lithic and faunal remains were found distributed in a discontinuous manner at various depths in numerous dark bands for 150 m along the cliff face (see Fig. 12 for a schematic representation). A small, lithic scatter found on the talus slope first drew attention to the site. This scatter contained several bifaces, one of which is illustrated (Fig. 11c). An additional biface was found immediately above this scatter 100 cm below the surface (Fig. 11d) and may be associated. A second area of occupation was recorded 25 m downstream, 0.50 cm below the surface. Although not as productive, primary reduction and thinning flakes and shatter as well as bone were also found in this concentration. The most significant area of occupation, however, appears to be located 50 cm to 75 m downstream. Here, bone and chert were found at varying depths ranging from 15 cm to 80 cm below the surface in two



13 Schematic representation of cliff face profile from 31R20 (Redrock Island). The radiocarbon date was performed on bone collagen and is uncorrected.

well-stratified contexts. The densest cultural level in the upstream location is situated 45 cm below the surface and is represented almost exclusively by thinning flakes. The most significant level in the downstream area is located 30 cm to 35 cm below the surface and, like other locations, contained chert debitage, bone and several tools. While not as productive or as extensively and intensively occupied as 30R1 and 30R3, the association of chert debitage and faunal remains in up to four distinct cultural levels suggests that this site may have also been a favoured habitation site on numerous occasions throughout the past.

Without question, the most productive site recorded during the survey was 31R20. The site spans a distance of over one hundred metres along the lower south-facing cliff exposure on the east end of Redrock or *Flintrock Island* across from Match Creek. Cultural materials in numerous discontinuous dark bands were recorded at depths ranging from 15 cm to 140 cm below the surface for almost its entire length (Fig. 13). At the intersection of the lower and higher cliffs on the island, a concentration of 60 artifacts consisting mainly of primary core/tool reduction (55%) and thinning (43%) debitage was recorded 60 cm to 75 cm below the surface. A small blade-like core and seven utilized flakes were also noted in this distribution. The most concentrated area of the site appears to be located about 50 m downstream, 90 cm below the surface. Here, for up to 10 m, a thick band (2 cm to 4 cm) of chert flakes and a small amount of bone was observed in the cliff face. A sample of over 100 items collected from 25 cm of this band consisted predominantly of primary reduction and thinning flakes and shatter.

A concentration of fragmented bone and 40 chert flakes, seven of which were utilized, was located 15 m downstream, 90 cm below the surface, and represents the highest ratio of tools found in any level of the site. While a fine-grained basalt end scraper (Fig. 11e) was found with a considerable amount of bone 25 m downstream, 30 cm below the surface, the most significant area of occupation occurred at the easternmost extension of the cliff at its lowest point. In this area, up to four distinct cultural strata were discerned for several metres along the cliff face at depths of 65 cm, 80 cm, 90 cm and 150 cm below the surface. While hearths, chert debitage and bone were clearly visible in the upper two dark bands, chert debitage dominates the lower strata. Noteworthy among the tools from this area is a black chert biface found 90 cm below the surface (Fig. 11f).

Like Peace Point, the association of hearths, chert debitage and faunal remains in a number of stratigraphic levels suggests that this site may have been a favoured workshop/habitation focus through time. It seems clear that neither 31R20 nor 31R22 are as potentially productive, spatially extensive or as deeply stratified as 30R1. However, the co-occurrence of lithics and faunal remains in a number of distinct cultural strata at both sites suggests that they may be similarly useful for illuminating culture change and continuity in technology and subsistence patterns through time within the region.

In order to document further functional differences between sites occurring on low and high cliffs, a cursory inspection of the amount of cortex on chert flakes was undertaken. It was hypothesized that if sites on low-lying cliffs served more as primary lithic reduction foci than those on higher cliffs, then there would be a greater amount of cortex on the dorsal surfaces of chert flakes. For the same reason, it was also postulated that flakes from sites on lower cliffs will tend to be larger and to demonstrate fewer dorsal flake scars, but these analyses were not undertaken. Employing the Kolmogorav-Smirnov two-sample test for rank-ordered data, lithics from all low-lying cliff sites, including those from Peace Point, were found to have significantly greater amounts of cortex on their dorsal surfaces than flakes from sites on higher cliffs.

Lending further support to the hypothesis that lower cliff sites may have functioned more as lithic reduction sites than higher cliff sites, even when site 31R3 is considered, is the fact that the former demonstrated a greater debitage to tool ratio, 36:1 vs. 18:1.

Summary

The first section of this chapter presented those findings from the Lake One dune site that may be instructive for understanding the history of settlement at Peace Point. In the absence of any traditionally defined diagnostics at Peace Point, this site's projectile points proved particularly informative. They suggested that a variety of culture groups may have systematically exploited the Peace River lowlands over the past 7000 to 8000 years. Given the possible presence of both plains and boreal-forest-related cultures within the area over the last several thousand years, the value of the Peace Point site for sorting out the later prehistory of northeastern Alberta should be obvious.

Peace Point was suspected of being a favoured workshop/habitation focus, and comparative data gathered from the Peace River survey appear to have confirmed this notion. Of the two major types of sites recorded in the area, analysis indicated that stratified low-lying cliff sites at Peace Point and elsewhere may have served more as primary lithic reduction workshops than smaller, single-

Table 2
Cortex Ratios, Flakes from High and Low Cliff Sites

Percentage of Cortex	High Cliff Sites Raw	High Cliff Sites Cum. %	Low Cliff Sites Raw	Low Cliff Sites Cum. %	Diff.
0-25	780	.637	1013	.400	.237
26-50	165	.772	292	.515	.256
51-75	117	.867	235	.608	.259
76-100	162	1.000	991	1.000	
	1224		2531		0

d = .259 > .059, p = 0.01

component sites on high cliffs. At the same time, the relative abundance of hearths and faunal remains at these sites, compared to the smaller, more spatially and temporally concentrated high cliff sites, would seem to suggest that they were favoured campsites through time. As 30R1 is without parallel in size, productivity and depth of cultural stratification, this would indeed be fortunate. In perhaps no other type of site does information concerning prehistoric strategies of subsistence and technology, and hence behaviour, come together more vividly for scrutiny by an archaeologist than a workshop/habitation site.

CHAPTER V
ARCHAEOLOGICAL INVESTIGATIONS AT THE PEACE POINT SITE IN 1981

In recognition of the potential archaeological importance and vulnerability of Peace Point, Parks Canada temporarily postponed survey in other areas of the park in 1981 in order to conduct a more thorough salvage-assessment of its sites. The project's main goals were to accurately determine the archaeological significance and interpretive potential of these sites and to salvage some of their more sensitive and significant areas. This chapter presents the substantive results of excavations carried out at Peace Point during the summer of 1981.

Goals and Methodology

With a crew of two archaeologists, aided at times by one to three local native students, it soon became apparent that to realize the above objectives the project had to rely heavily on information gathered in 1980. It was decided that excavation would first proceed in what was believed to be the densest or more deeply stratified area of 30R1, just upstream of where the survey first began the previous year. The project sought to establish the age, kind, intensity, cultural affiliation and degree of structural integrity of each cultural level recorded previously in this vicinity. Following this, areas of Peace Point that had previously yielded considerable accumulations of materials exposed by erosion would be intensively investigated. The project had planned, by the end of the field season, to excavate one 4-m-by-2-m and at least two 2-m-by-2-m units.

Field work first began by placing the larger of these units along the cliff in such a way as to incorporate, as excavation proceeded downward, the cliff face profile that had proven to be the most productive in 1980. Digging proceeded in natural levels by hand trowel and more delicate excavating equipment, with shovels being used only in thicker sterile levels. Natural strata were defined in the field on the basis of changes in colour, texture and compactness. In total, close to 45 distinct natural levels were recorded in thicknesses ranging from 1.5 cm to 20 cm. Generally these strata could be subdivided into levels containing cultural materials and those that did not. Without exception, all artifacts and features were found in association with thin, dark, organically enriched (charcoal) bands considered to represent past soil surfaces or palaeosols (see Appendix A). On the other hand, no prehistoric cultural materials were found in the lighter, relatively thicker sediments that appear to be exclusively flood deposited in origin. Among other things, this suggested that vertical displacement or translocation of artifacts from occupation surfaces over time had been virtually nonexistent.

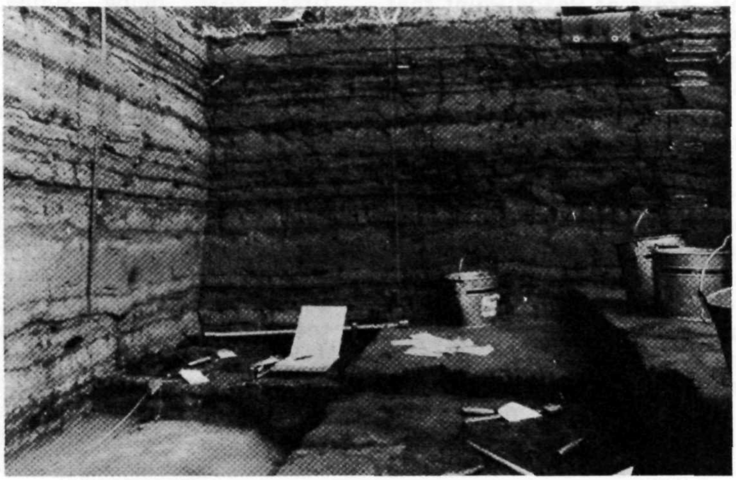
All cultural materials, including lithic debitage and faunal remains greater than 6 mm in any one dimension, were assigned separate three-dimensional proveniences and direction (long axis orientation) co-ordinates and placed individually in plastic bags. Artifacts and bone smaller than 6 mm were collected from each level in units ranging from 0.25 m^2 to 1.0 m^2, depending on density, and placed collectively in plastic bags. Soil, whether associated with natural or cultural strata, was screened through 6-mm mesh, while all features, including hearths as well as dense lithic and faunal concentrations, were gently dry sieved through 1.2-mm mesh. Soil samples were systematically retained from most levels in both 1980 and 1981, with those from the first year being subjected to analysis. Although the decision to fine screen was usually left up to the archaeologist, fine screening was undertaken where information and artifact loss seemed imminent. Because of the nature of occupation in this area of the site, almost all of some levels were fine screened, while others received no fine screening at all. Approximately 100 per cent and 90 per cent of all materials greater than 6 mm and 1.2 mm in size respectively are estimated to have been recovered using these techniques. Artifacts and bone less than 6 mm escaping detection in the ground but recovered in screens were assigned to their respective excavation blocks, which ranged from 0.5 m^2 to 1.0 m^2. It was felt that by employing this methodology this unit with its half dozen or so cultural levels could be successfully excavated within a five-week period, leaving an equivalent amount of time for salvage work in other areas of Peace Point. Unfortunately, this was not to be the case.

Results of Excavation
Analyses of Occupation Surfaces

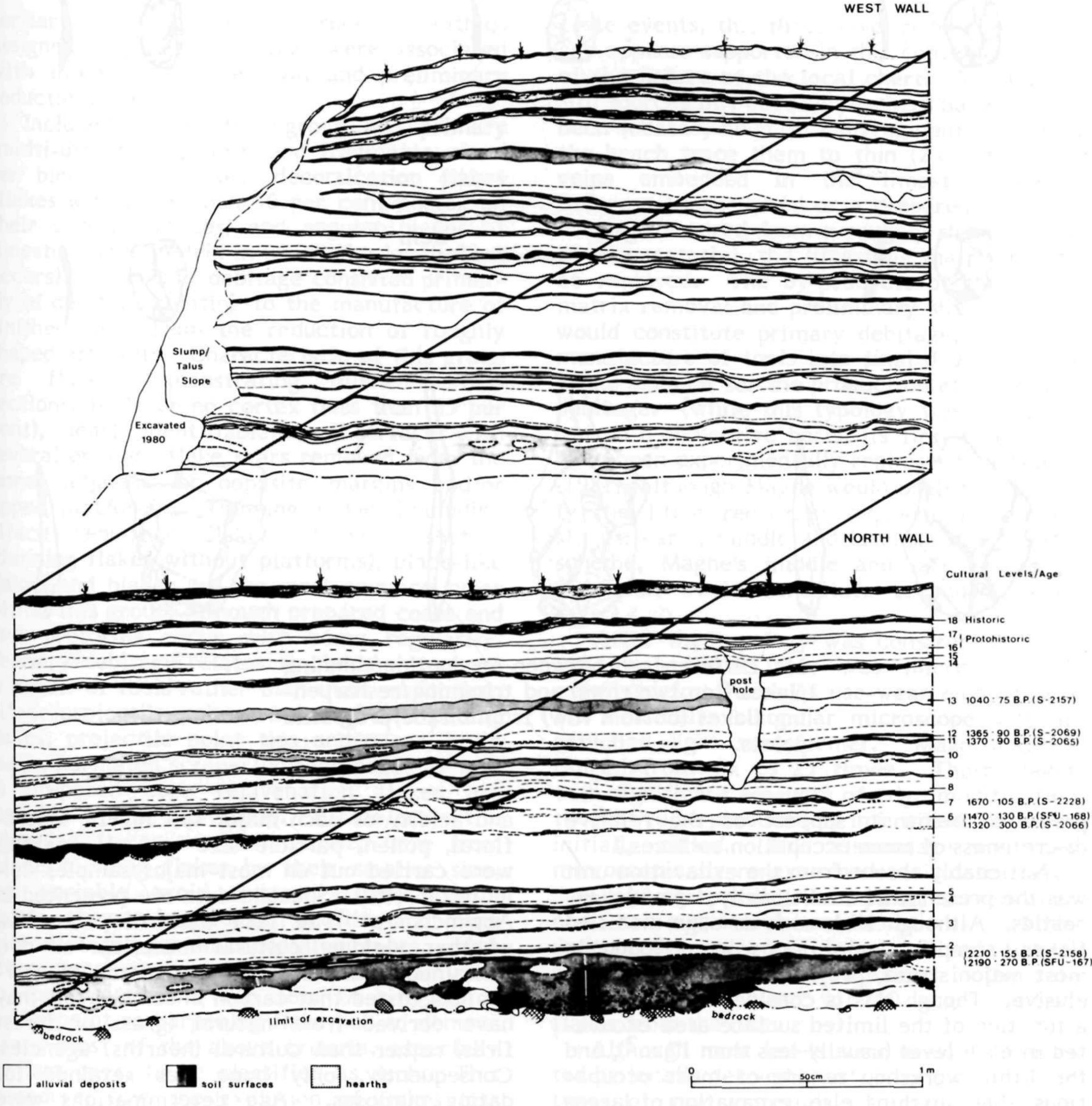
Although up to seven cultural levels had been previously identified in this area of 30R1, it soon became apparent that as controlled excavation proceeded down and out towards the cliff face, many more cultural strata were present than originally thought. Consequently, excavation proved costly in terms of the amount of time required to complete this unit, thus precluding excavation in other areas of the site.

Perhaps the most significant result of the salvage assessment of Peace Point in 1981 was the discovery that certain limited areas of 30R1 contain at least 18 distinct occupation surfaces dating from the Historic era through Protohistoric and Late Prehistoric to Middle Prehistoric times (Fig. 14). Of these, at least seven appear to represent living floors of considerable duration or intensity of occupation. Others appear to relate only to isolated lithic reduction and resharpening events or the disposal of food (bone) refuse. The frequent association of hearths, chert debitage and faunal remains in most major levels, together with a general lack of finished tools, also left little doubt that this area of the site served primarily as a workshop/habitation locus.

At the same time, a number of major occupation surfaces appeared to represent synchronic events (i.e., single or related episodes of deposition as opposed to palimpsests of occupations). This was suggested by a general lack of hearth or feature superimposition or crowding, an abundance of relatively discrete lithic clusters indicative of single reduction events, substantial areas within some levels where no space was utilized and the fact that artifacts were not found vertically displaced from their depositional surfaces by more than 5 cm. (Evidence of multiple occupation would be expected to produce superimposition and/or crowding of features, a general blurring of activity sets or areas through a more exhaustive use of space [i.e., lack of internal site structure (see Binford 1980: 9)] and relatively thicker cultural deposits.) In fact, most cultural materials were found concentrated either on or within 3 cm of the surface of a palaeosol. While most occupational surfaces might be suspected to represent single events, the possibility that some levels may contain the discard of two or more unrelated events cannot be discounted. By the same token, occupation surfaces relating to single depositional events may be more the rule than the exception in this area of Peace Point. Emphasizing such a possibility is the tendency for hunter-gatherers to avoid camping on the debris of previous occupations (e.g.,

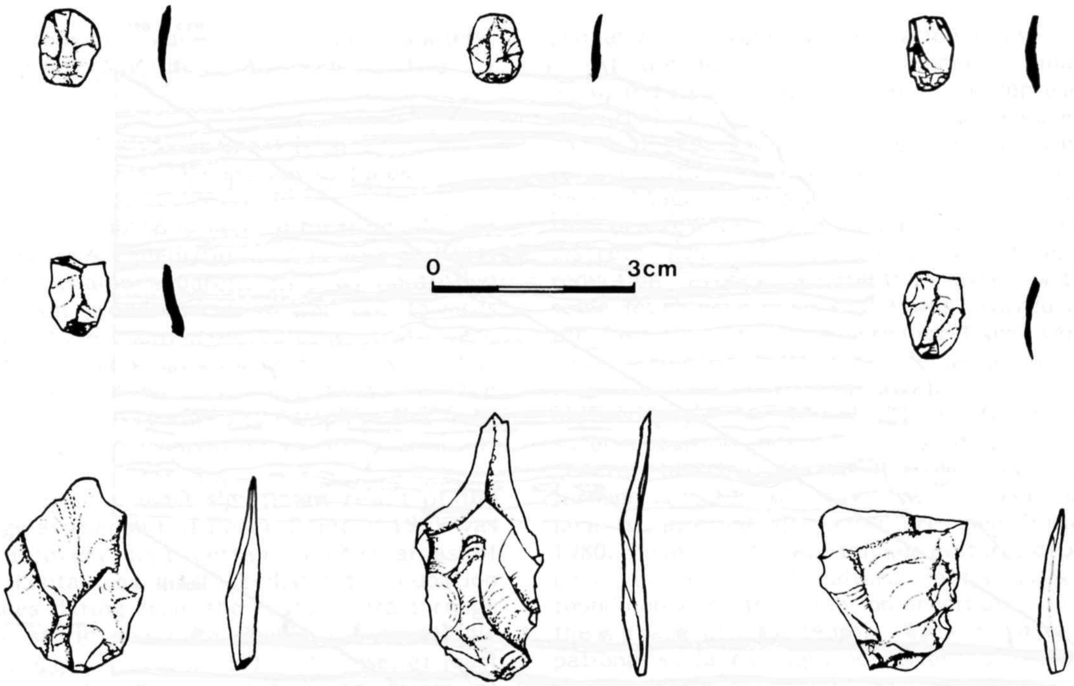


14 North and west walls of 1981 excavation unit at Peace Point site.



15 North and west walls of excavation units with cultural levels, associated ages, and uncorrected radiocarbon dates from bone collagen.

see Yellen 1977: 67), the vast level topography suitable for occupation along the Peace Point cliffs, which would have placed virtually no restrictions on settlement, and a relatively rapid rate of sedimentation (see below). Thus, while acknowledging the possibility of unrelatedness, most materials on most occupational surfaces are expected to be the result of single or related depositional events, and are subsequently treated as such. (Evidence, in the form of repetitive artifact patterning, is



16 Differences between reduction/thinning flakes (top two rows) and trimming/resharpening flakes (bottom row) from biface/projectile points.

presented below in support of the relative discreteness of some occupation surfaces.)

Noticeably absent from the excavation unit was the presence of traditionally defined diagnostics. Although tools such as edge-modified flakes, scrapers and bifaces were found in most major strata, projectile points remained elusive. Though this is considered to be more a function of the limited surface area excavated in each level (usually less than 12 m^2), and the lithic workshop nature of most occupations, than anything else, excavation of larger areas could conceivably yield projectile points in most cultural levels.

Over 6270 lithic artifacts, 5680 individual faunal specimens and 280 tools greater than 6 mm in size were recovered from 18 stratigraphically distinct cultural levels (Fig. 15) incorporating over 190 m^2 of occupational surface in 21 m^3 of deposit. Materials from the unit were subjected to several types of studies including soil, radiocarbon, faunal, lithic and distributional analyses. The soil analyses sought to determine the content, composition and acidity of each major soil level. Macrofloral, pollen, particle size and pH analyses were carried out on most major samples collected in 1980. Specific data are presented in Appendix A. The fact that all palaeosols, whether yielding cultural materials or not, contained small dispersed fragments of charcoal suggested that carbon in some levels may have derived from natural (grass or forest fires) rather than cultural (hearths) agencies. Consequently, only bone was retained for dating purposes. Age determinations were conducted on collagen and faunal identifications were carried out prior to treatment. The faunal analysis (conducted by the Zooarchaeological Identification Centre, National Museum of Natural Sciences, Ottawa) was undertaken to identify the types of animals associated with each level and season of occupation.

An analysis was also carried out in order to determine the type, function and raw material of each lithic item from each level. Initially a typology consisting of primary, secondary and tertiary debitage was constructed. Lithics assigned to primary debitage were associated with initial matrix removal and preliminary reduction.

Included within this group are primary (multi-directional) cores and fragments, shatter blocks and flakes, decortication flakes (flakes with more than 50 per cent cortex on their dorsal surfaces) and angular pieces of limestone (the matrix in which the local chert occurs). Secondary debitage consisted primarily of debitage relating to the manufacture of finished tools from the reduction of roughly shaped artifacts. Characteristic of this group are flakes demonstrating thinned cross-sections, little or no cortex (less than 25 per cent), clearly identifiable dorsal surfaces with several or more flake scars removed from the same, adjacent or opposite margins and/or lipped platforms. Thinning flakes (including biface reduction flakes), thinning shatter (thinning flakes without platforms), blade-like flakes and blades are the most common types within this group, although prepared cores and tool preforms occur with some regularity. Tertiary debitage relates to the maintenance or repair of tools rather than their production. Biface/projectile point trimming/resharpening flakes, projectile point tips and edges, burin spalls, burinated scraper/uniface edges as well as prepared core rejuvenation flakes are included within this group. Biface/projectile trimming flakes are distinguished here from biface thinning flakes by their smaller size, less variable ovoid shapes, smaller dorsal facets, thinner longitudinal profiles and more microdamaged proximal dorsal surfaces, which often demonstrate evidence of bifacial work on lipped platforms (Fig. 16). (A biface/projectile point resharpening flake had to demonstrate most of the above criteria, especially the last ones, to be classified as such. This procedure, like the exclusion of flakes less than 6 mm, obviously has the effect of underestimating the amount of tertiary debitage on most occupation surfaces. Some consolation to this problem may be found in the fact that small pieces of shatter from earlier stages of lithic reduction were undoubtedly also excluded from the analysis. Thus, if the lithic profiles for each level are biased, they are probably biased in the same direction.)

While it seems obvious that the life history of a stone tool from initial procurement to final resharpening may be more a process of continual transformation than a series of discrete events, this three-level reduction typology appears supported in this context because of the nature of the local chert. Although in situ sources of Peace Point chert have not yet been located, nodules and fragments found on the beach trace them to thin (2 cm to 5 cm) veins embedded in the limestone cliffs. Before a finished tool or a prepared core can be manufactured from a roughly shaped piece of this material, the limestone matrix has to be removed. The by-products of the initial matrix removal and preliminary shaping stage would constitute primary debitage, while the manufacture of tools into final desired forms would account for the production of secondary debitage. (While this typology was constructed on a subjective basis, its first two stages have been experimentally replicated by Magne [1981], although Magne would prefer to classify the lithic reduction sequence into three stages: early, middle and late. In this present scheme, Magne's middle and late stages of reduction would constitute secondary debitage.)

After the typology was constructed, each individual lithic item was microscopically examined for traces of use-wear employing a M5 Wild Leitz binocular microscope with an attached light transformer. Magnifications ranged from six to 25 times. Those flakes with significant amounts of edge modification thought to be produced by intentional use were initially culled. This assemblage was then microscopically re-examined to isolate flakes damaged by possible trampling, screen-wear and non-purposeful modification. While undoubtedly rejecting some utilized flakes, greater confidence can be placed in the cultural origin of close to 250 edge-modified flakes from the unit.

Although most levels were heavily dominated by locally derived chert, a number of other types of raw materials of non-local origin were also present in most major levels. In order to document shifts in raw material procurement, and perhaps subsistence-settlement strategies, given that lithic procurement might be embedded within other subsistence strategies (see Binford 1979), a study of the diversity of types was undertaken. Lithics were visually classified as to colour, veining, grain and inclusions. While most non-local lithics were easily distinguishable by their overall homogeneity in colour and structure, the lack of homogeneity in these criteria was the precise defining characteristic of Peace

Point chert. Although differentially coloured and textured varieties are common, the latter chert can be basically described as a tan-grey to dark brown fine-grained chert frequently banded with limestone and/or mottled in colour and texture.

In an effort to delineate specific areas of activity or sets of activities on major living floors, a distributional analysis of features, tools and major artifact classes was undertaken. Much controversy has arisen recently over the search for activity patterning in hunter-gatherer sites (see Yellen 1977: 97, 134; Binford 1978a: 353-60). At issue is the notion that activities are spatially segregated or arranged by type within single camps. Yellen (1977: 97) points out from his experience with the !Kung Bushmen that this is an erroneous assumption. Most activities need not be performed by special-purpose job-specific groups, nor may individual tasks be spatially segregated from one other. In his experience most tasks were carried out in more than one place and social context, and in any single area one could find the remains of many activities all jumbled together.

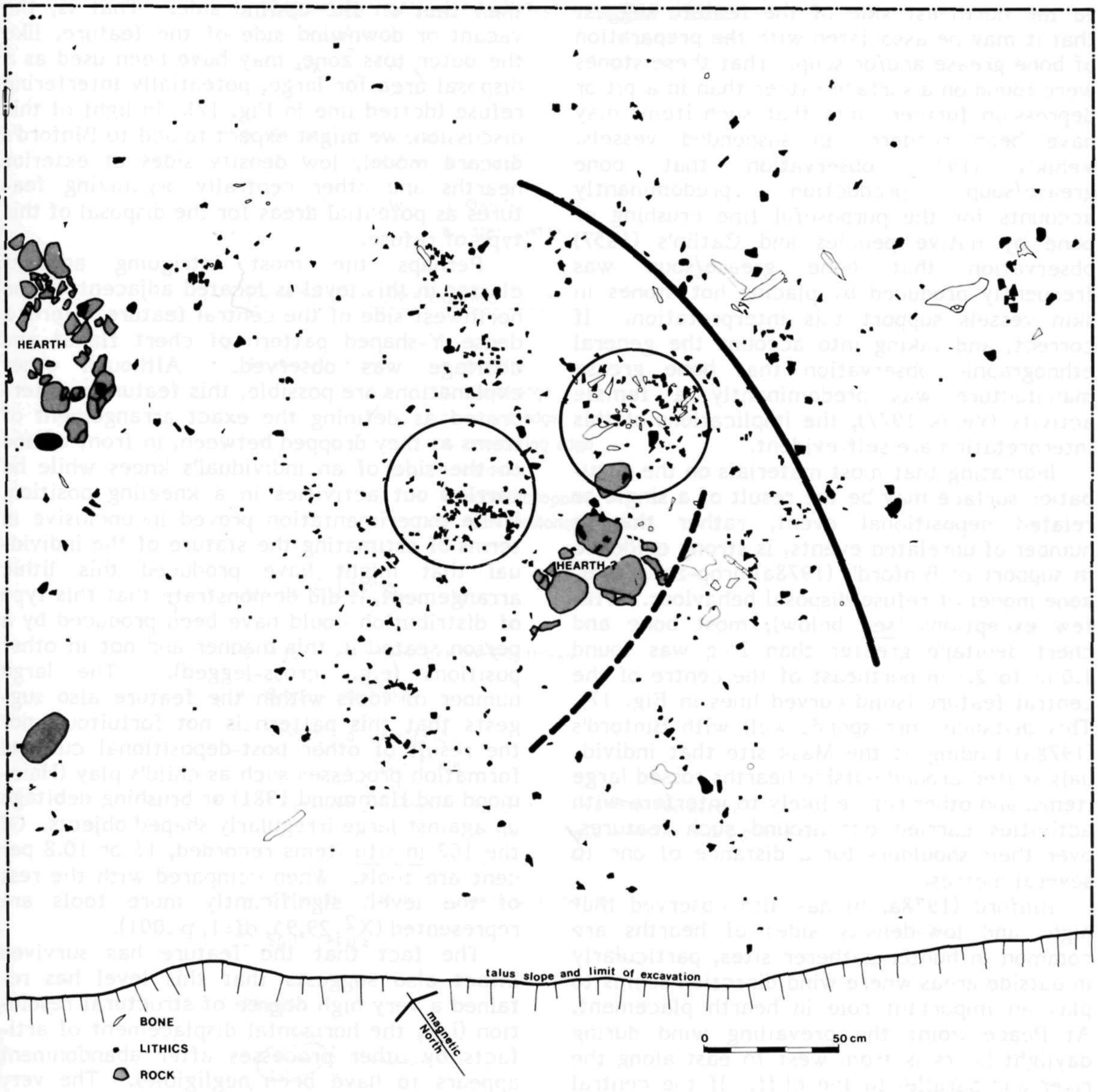
However, Binford's (1978a, b) recent ethnoarchaeological observations at the Mask site, a Nunamiut Eskimo hunting stand, have successfully defended the search for discrete artifact and activity patterning in hunter-gatherer sites. While he agrees with Yellen's observations, the conclusions drawn from them are thought to be misleading. Binford claims that there is good reason to believe that activities are often segregated in time and space within a single camp (Binford 1978a). Certain activities require more or less space, time and participants to complete, and produce more or less debris and disruption for the performance of other activities. Clear association of particular activities with specific places, for example, were noted at the Mask site. At any one time, different activities conducted simultaneously were independently organized in space, and over time there was a statistical tendency for given activities to be repeatedly localized in the same places, although these loci would not be exclusively used for a single activity. Clearly then, there appears to be a basis in reality for seeking patterns in archaeological remains which derive from the spatial segregation of activities.

In recognition of the site's uncommon structural integrity and resolution, a number of ideas and hypotheses of methodological or theoretical interest are forwarded to account for the data presented. The more substantive of these are addressed in broader archaeological perspective in subsequent chapters. All plausible interpretations should be regarded as working hypotheses subject to and requiring further research and revision as more data become available. Occupation surfaces are discussed from the earliest to the most recent, or lowest to highest. Distribution analyses are followed by discussions of significant tool types, debitage classes, raw material types and faunal remains.

Level 1

Level 1 (30R1H9) is located approximately 160 cm to 170 cm below the present ground surface, 10 cm to 15 cm above a bedrock composed primarily of bedded limestone and secondarily of decomposed limestone and small glacial boulders. Close to 1250 individual faunal and lithic items greater than 6 mm in size were found. These were distributed over an uneven soil surface varying in colour from black to orange, and in texture from fine silty sand to coarse-grained sediments containing parent material. The location of this cultural deposit with respect to its depth below the surface and height above bedrock, as well as its occurrence in both river-deposited and bedrock-derived sediments, indicates that occupation of the cliff began shortly after the time when the Peace River first flooded its banks in the area. Initially this was suspected to be early post-glacial times, i.e., 7000-8000 years ago (Stevenson 1981a, b). However, two uncorrected radiocarbon determinations on fragmented burnt bone and large unburnt ungulate bone produced estimates of 2210 $\pm$ 155 B.P. (S-2158) and 2190 $\pm$ 270 B.P. (SFU-167) respectively, leaving little doubt that occupation first began on the lower Peace Point cliffs shortly after 2500 years ago or in late Middle Prehistoric times. Moreover, these age determinations and the depth of deposits indicated that sediments at the Peace Point site accumulated at a relatively rapid rate, averaging 10 cm every 140 years, over the last 2500 years.

From Figure 17, it is apparent that there are several discrete artifact clusters within the level. Perhaps the most obvious are two distinct accumulations of red coarse-grained granitic boulders near the centre and west



17 Archaeological remains from level 1.

wall of the unit. Differences in the number, size, arrangement and fragmentary nature of rocks making up these features suggest different functions and uses of space. Although no ash or other direct evidence of burning (e.g., concentrated accumulations of charcoal) was noted within the westernmost feature, its roughly oval shape and fragmented (thermally fractured) rocks suggest that it represents the remains of a prepared hearth. On the other hand, the larger, less numerous, less fragmentary rocks of the central feature indicate that if it was a hearth, it was not prepared to the same extent as the hearth near the west wall. Whatever its function, there can be little doubt that it was a focal point around which activities were structured. The large number of small, broken, long bone fragments adjacent to the northeast side of the feature suggest that it may be associated with the preparation of bone grease and/or soup. That these stones were found on a surface rather than in a pit or depression further hints that such items may have been rendered in suspended vessels. Vehik's (1977) observation that bone grease/soup production predominantly accounts for the purposeful fine crushing of bone by native peoples and Catlin's (1857) observation that bone grease/soup was frequently produced by placing hot stones in skin vessels support this interpretation. If correct, and taking into account the general ethnographic observation that bone grease manufacture was predominantly a female activity (Vehik 1977), the implications of this interpretation are self-evident.

Indicating that most materials on the occupation surface may be the result of a single or related depositional event, rather than a number of unrelated events, is strong evidence in support of Binford's (1978a) drop-zone/toss-zone model of refuse disposal behaviour. With few exceptions (see below), most bone and chert debitage greater than 25 g was found 1.0 m to 2.1 m northeast of the centre of the central feature (solid curved lines in Fig. 17). This distance corresponds well with Binford's (1978a) finding at the Mask site that individuals seated around outside hearths tossed large items, and other refuse likely to interfere with activities carried out around such features, over their shoulders for a distance of one to several metres.

Binford (1978a, b) has also observed that high- and low-density sides of hearths are common in hunter-gatherer sites, particularly in outside areas where wind direction seems to play an important role in hearth placement. At Peace Point the prevailing wind during daylight hours is from west to east along the river and parallel to the cliff. If the central feature was an exterior hearth, this would account for the general lack of refuse on the southeast side of this feature, as well as the scarcity of refuse on the downwind side of the prepared hearth. Even if the former feature represents only boiling stones used in the production of bone grease/soup, this explanation may still hold since some form of pollutant would have been given off such that the upwind side of the feature would have been more desirable than the downwind side. This may also account for the reason why refuse downwind of this feature tends to be larger than that on the upwind side. That is, the vacant or downwind side of the feature, like the outer toss zone, may have been used as a disposal area for large, potentially interfering refuse (dotted line in Fig. 17). In light of this discussion, we might expect to add to Binford's discard model, low density sides of exterior hearths and other centrally organizing features as potential areas for the disposal of this type of refuse.

Perhaps the most intriguing artifact cluster in this level is located adjacent to the northwest side of the central feature. Here, a dense Y-shaped pattern of chert flakes and debitage was observed. Although other explanations are possible, this feature is interpreted as defining the exact arrangement of items as they dropped between, in front of and to the side of an individual's knees while he carried out activities in a kneeling position. While experimentation proved inconclusive in terms of estimating the stature of the individual that might have produced this lithic arrangement, it did demonstrate that this type of distribution could have been produced by a person seated in this manner and not in other positions (e.g., cross-legged). The large number of tools within the feature also suggests that this pattern is not fortuitous, nor the result of other post-depositional cultural formation processes such as child's play (Hammond and Hammond 1981) or brushing debitage up against large irregularly shaped objects. Of the 102 in situ items recorded, 11 or 10.8 per cent are tools. When compared with the rest of the level, significantly more tools are represented (X^2=29.95, df=1, p<.001).

The fact that the feature has survived intact also suggests that this level has retained a very high degree of structural resolution (i.e., the horizontal displacement of artifacts by other processes after abandonment appears to have been negligible). The very presence of the feature further suggests that it may relate to one of the last episodes of activity on the site as it was not displaced or disturbed by scuffing, trampling or other human activities during occupation.

The unusual nature of this feature can be measured against the fact that studies reporting lithic patterns hypothesized to delineate such seating arrangements are extremely rare. In fact, known to the writer is only one such account — Gardner 1974. Such features are important for understanding not only the position and direction of individuals and their

Purposefully Retouched and/or Prepared Tools

1. Biface a. finished
b. preform

2. Scraper a. finished
b. preform or uniface

3. Retouched flakes a. end/tip
b. lateral edge

Expedient or Unretouched Tools

4. Utilized flakes a. end/tip
b. dorsal edge
c. ventral edge
d. alternating edge
e. bifacial
f. cobble chopper
g. hammerstone

Other Artifacts

5. Biface resharpening/trimming flakes

6. Blade-like flakes

7. Blades a. microblade
b. macroblade

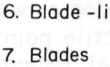
8. Cores/core fragments a. primary(multidirectional) core
b. secondary(unidirectional & bipolar) core
c. microcore

9. Reduction or thinning flakes and shatter

10. Split pebble

Hearth

Refitted artifacts



18 Legend for artifact classes in level plans.

relationships with other features and activities, but also what activities were conducted virtually at the same time in the same place. Two formally prepared tools (graver-like implements with intentional retouch), eight expediently used flakes with varying degrees of edge and end modification, and a bifacially modified flake with extensive wear-polish attest to a considerable range of sequentially occurring activities in this area. Engraving medium to hard materials, scraping soft to medium surfaces and sawing or slicing soft materials are indicated.

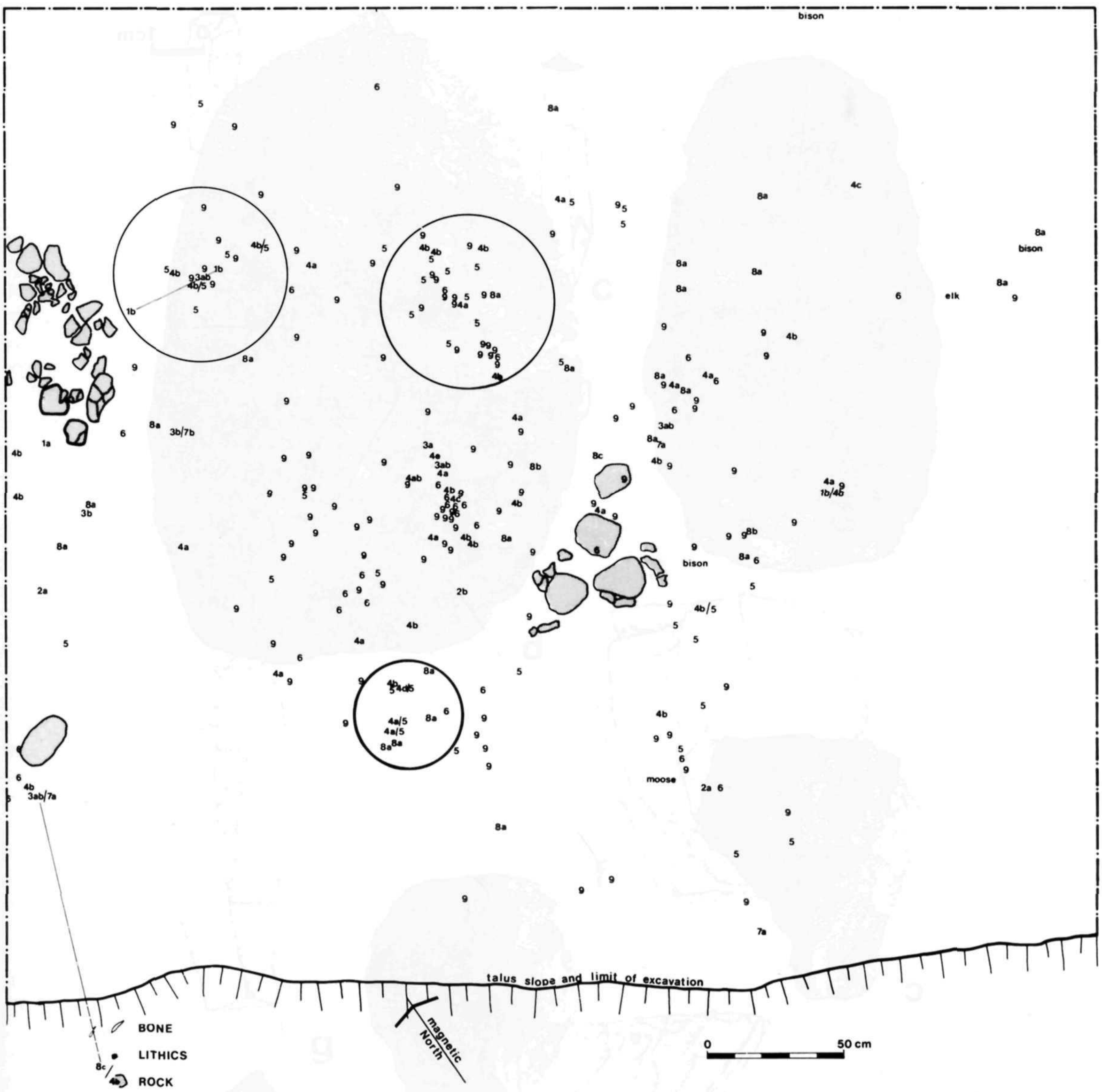
The large percentages of primary (68%) and secondary (30%) debitage in this feature further suggest that early stage core/tool reduction was the primary activity. The association of large numbers of tools with large amounts of primary debitage is not an uncommon phenomenon in hunter-gatherer sites (e.g., Straus et al. 1981). This relationship is considered by some (e.g., Goodyear 1981) to represent tool replacement as opposed to tool maintenance phases in the subsistence-settlement systems of hunter-gatherers. It may be then postulated that this feature represents an early stage lithic reduction sequence for the immediate or eventual replacement of tools, in which the expedient use of this activity's by-products, for several tasks, occurred. Such a feature is precisely the type of archaeological correlate one might expect to characterize a "gearing up" phase for anticipated needs at future locations (see Binford 1979: 268, for discussion). That the arrangement may have been produced during a final or abandonment phase of occupation follows from its high degree of structural resolution. (The possibility that early stage core/tool reduction and tool replacement activities may characterize final episodes of activity on workshop/habitation sites is explored in greater detail in a following chapter.)

There has been a general tendency throughout much of the archaeological literature to address activity patterning only in terms of the distribution of finished or prepared tools. This would appear to make little sense given that the by-products of stone tool manufacture and maintenance constitute much, if not most, of the record prehistoric archaeologists seek to understand. The plotting of both tools and major debitage classes in this level has revealed further patterning that significantly increases our ability to interpret the archaeological record. (The legend for artifacts in level plans is presented in Figure 18.)

First, there appear to be several more fairly discrete clusters where numerous activities were carried out (Fig. 19). One of these is located on the east or downwind side of the prepared hearth and may be associated with a decrease in smoke production or a change in wind direction. Within this particular cluster of chert artifacts, a large broken biface preform (Fig. 20a), five biface/projectile point resharpening/trimming flakes (two of which appear minimally utilized), a retouched or backed graver-like flake and two expediently utilized flakes were recorded. Since neither the parent tools of the resharpening flakes nor the reduction flakes struck prior to the shaping of the preform were found, the maintenance of a biface/projectile point and the intended production of a biface from a preform that had been prepared elsewhere is indicated. However the occurrence of a retouched flake and several utilized flakes suggests that other activities were also being carried out. Biface/projectile point resharpening flakes and thinning flakes also occur in an adjacent artifact cluster and similarly suggest the production as well as the maintenance of biface/projectile points. Again, the occurrence of several expediently utilized flakes indicates that activities other than the manufacture and repair of bifacial implements were being conducted in this area. The other discrete lithic cluster is located just west of the central rock feature. It also contains utilized flakes and biface resharpening flakes but is more similar to the former concentration in that tertiary flakes are utilized. (While other specific activity loci or sets can perhaps be recognized, only the broader patterns will be addressed.)

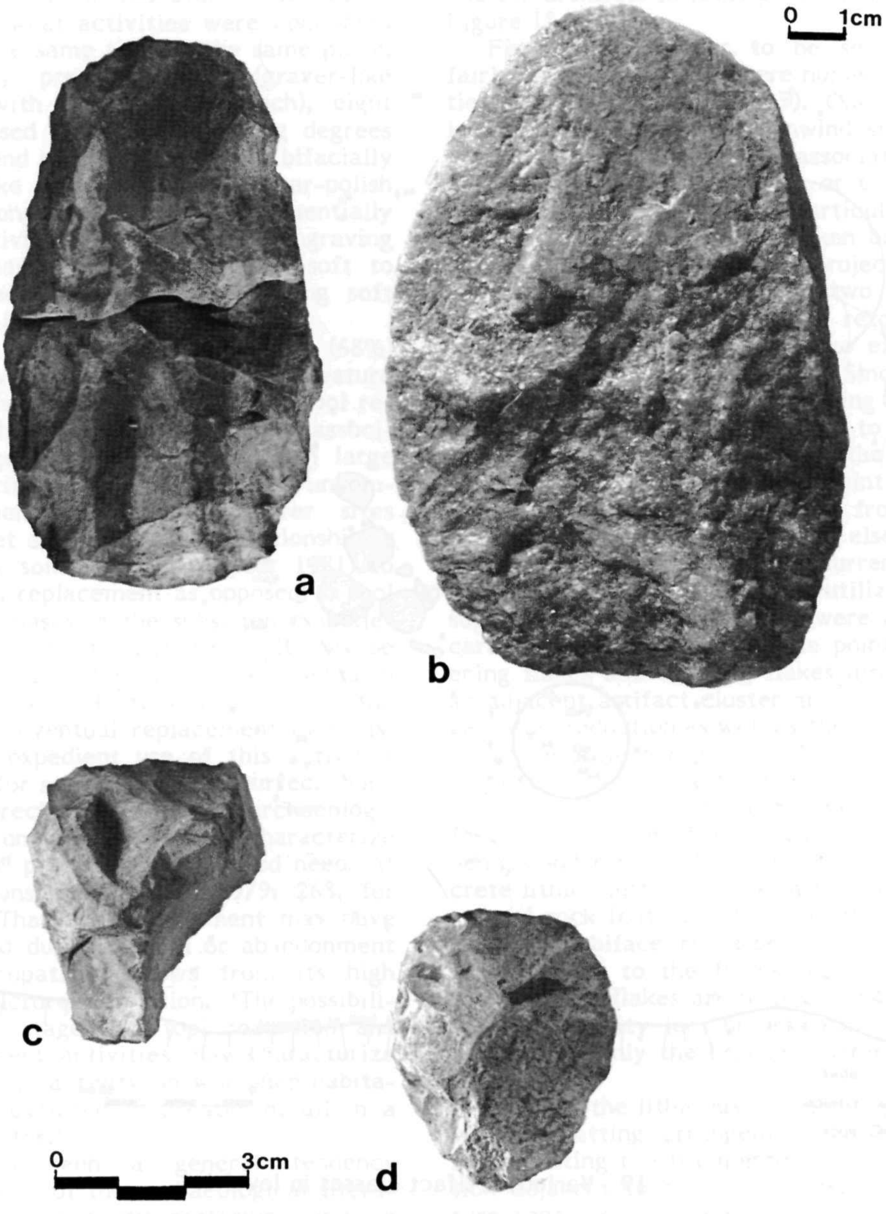
Neither the lithic distribution hypothesized to be a sitting arrangement nor that area incorporating the fragmented bone concentration adjacent to the central hearth-like feature contained debitage relating to the maintenance or repair of biface/projectile points. Given that hunting in all northern hunter-gatherer societies was predominantly, if not exclusively, a male activity, and in light of the interpretation that the central hearth-like feature and adjacent bone concentration may be associated with the production of bone grease/soup by women, such a finding is indeed intriguing.

A final spatial pattern of some interest



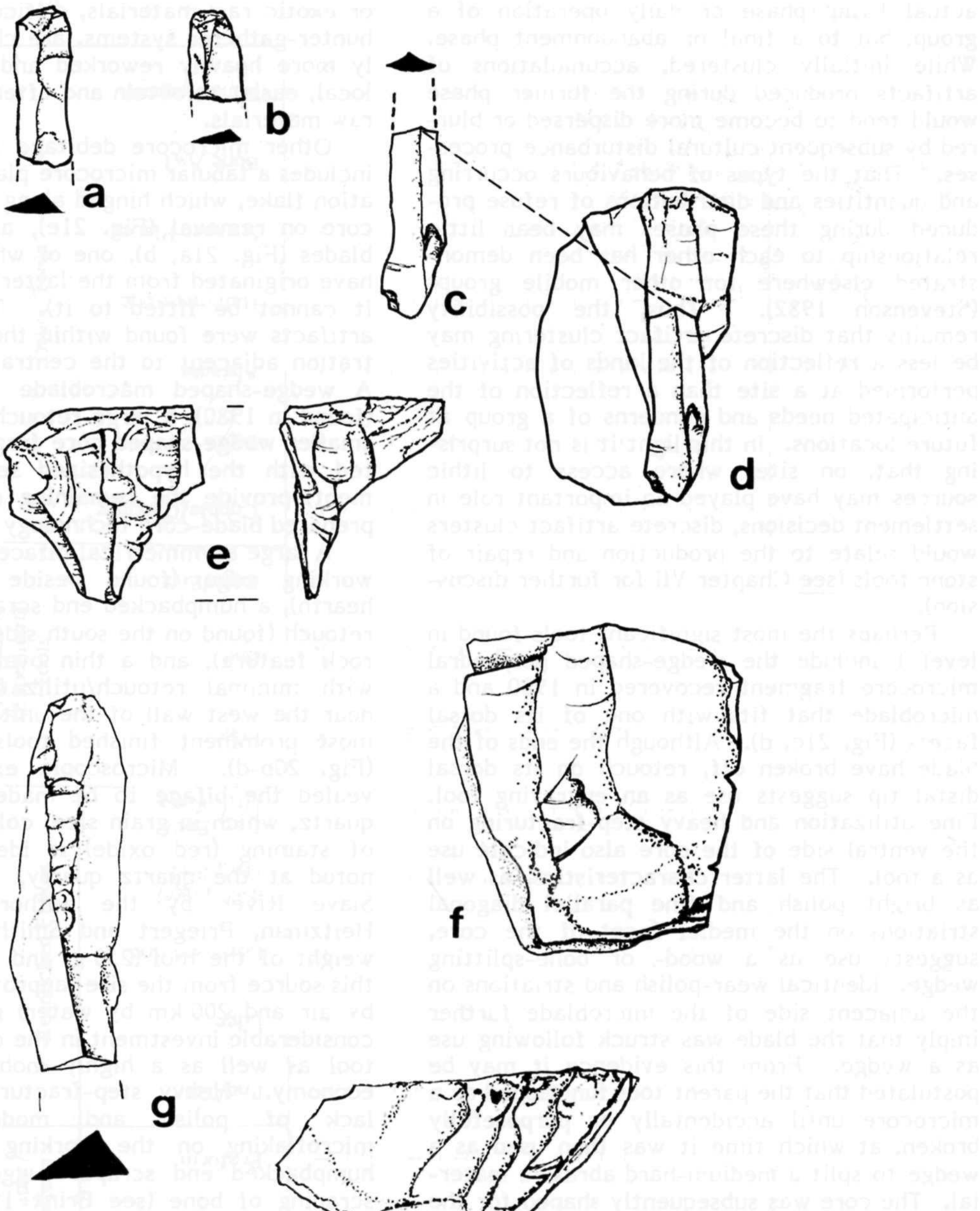
19 Various artifact classes in level 1.

concerns the occurrence of formal tools with the prepared hearth. Of the 71 tools in this level, 15 or 21.1 per cent are tools prepared or fashioned into desired shapes prior to use or intended use. The remainder represent expediently employed tools. While tools associated with (located within 1 m) the prepared hearth are evenly divided between formal and expedient varieties, only 18.75 per cent of the tools associated with the central rock feature have been prepared. In terms of the types of tools associated with each feature, the prepared hearth appears to have significantly more finished tools (X^2=6.32, df=1, p<.05). While chance alone cannot be ruled out, these differences may imply that the performance of activities around prepared hearths, and other long-term (i.e., more permanent) centrally



20 Bifaces and scrapers from level 1. Figure 20b is at a slightly reduced scale.

organizing features, may become more structured with time during occupation of a site. In other words, increased spatial and temporal ordering or scheduling of activities may be expected to have been met with a corresponding increase in the regularity and repetitiveness with which activities were performed. Conceivably, this would tend to be marked by a decrease in the use of ad hoc tools for expedient tasks.



21 Artifacts displaying microcore and macroblade characteristics from level I.

The very existence of discrete artifact clustering in the vicinity of hearths and other features around which activities were carried out suggests that disturbance from human activities during subsequent occupation was negligible. The conclusion drawn from this premise is that when discrete artifact clusters are found, they may relate not so much to the actual living phase or daily operation of a group, but to a final or abandonment phase. While initially clustered, accumulations of artifacts produced during the former phase would tend to become more dispersed or blurred by subsequent cultural disturbance processes. That the types of behaviours occurring and quantities and distributions of refuse produced during these phases may bear little relationship to each other has been demonstrated elsewhere for other mobile groups (Stevenson 1982). Thus, the possibility remains that discrete artifact clustering may be less a reflection of the kinds of activities performed at a site than a reflection of the anticipated needs and concerns of a group at future locations. In this light it is not surprising that, on sites where access to lithic sources may have played an important role in settlement decisions, discrete artifact clusters would relate to the production and repair of stone tools (see Chapter VII for further discussion).

Perhaps the most significant tools found in level 1 include the wedge-shaped polyhedral microcore fragment recovered in 1980 and a microblade that fits with one of its dorsal facets (Fig. 21c, d). Although the ends of the blade have broken off, retouch on its dorsal distal tip suggests use as an engraving tool. Fine utilization and heavy step-fracturing on the ventral side of the core also indicate use as a tool. The latter characteristics, as well as bright polish and fine parallel diagonal striations on the medial facet of the core, suggests use as a wood- or bone-splitting wedge. Identical wear-polish and striations on the adjacent side of the microblade further imply that the blade was struck following use as a wedge. From this evidence it may be postulated that the parent tool functioned as a microcore until accidentally or purposefully broken, at which time it was then used as a wedge to split a medium-hard abrasive material. The core was subsequently shaped for the removal of a final blade and then both objects were employed for other functions, possibly engraving and scraping. This recycling appears puzzling since the local chert is readily available. The core, however, is made of an exotic material (a pale green chert with numerous small, dark, linear and large, tan, curvilinear inclusions) that is more homogeneous than the local chert. This fact probably accounts for the extreme case of recycling — Joslin-Jeske (1982) has noted that rare or exotic raw materials, difficult to obtain in hunter-gatherer systems, are characteristically more heavily reworked and recycled than local, easier to obtain and often less desirable raw materials.

Other microcore debitage from this level includes a tabular microcore platform rejuvenation flake, which hinged along the face of the core on removal (Fig. 21e), and two microblades (Fig. 21a, b), one of which appears to have originated from the latter core (although it cannot be fitted to it). The latter two artifacts were found within the bone concentration adjacent to the central rock feature. A wedge-shaped macroblade core fragment (found in 1980), a large retouched blade and a smaller wedge-shaped core fragment (associated with the hypothesized seating arrangement) provide the remaining evidence for a prepared blade-core technology (Fig. 21f-h).

A large asymmetrical biface with a sinuous working edge (found beside the prepared hearth), a humpbacked end scraper with steep retouch (found on the south side of the central rock feature), and a thin ovate end scraper with minimal retouch/utilization (recovered near the west wall of the unit) represent the most prominent finished tools in this level (Fig. 20b-d). Microscopic examination revealed the biface to be made of a massive quartz, which in grain size, colour and degree of staining (red oxide) is identical to that noted at the quartz quarry, 32R19, on the Slave River by the author (1981b) and Heitzman, Priegert and Smith (1980). The weight of the tool (250 g) and the distance of this source from the site (approximately 80 km by air and 200 km by water) may indicate a considerable investment in the curation of this tool as well as a highly mobile subsistence economy. Heavy step-fracturing, a general lack of polish and moderate ventral microflaking on the working edge of the humpbacked end scraper suggest use in the scraping of bone (see Brink 1978). Bifacial microflaking on the stem of this tool provides evidence for hafting. A more acute angle and a lesser degree of microflaking on the working edge of the thin ovate end scraper suggest scraping of softer, less abrasive materials.

Within the more expedient tool class, two sub-groups, accounting for over 21.4 per cent of the unfinished tools in this level, can be delineated. These include seven small blade-like flakes with steep (>60°) dorsal end modification and five relatively thick flakes with

Table 3
Summary Table of Tools From Occupation Surfaces at the Peace Point Site

Level	Prepared (Retouched) and Finished Tools									Unprepared (Expedient) Tools			Other Tools							
	Biface/ Projectile		Scraper/ Uniface		Retouched Flakes															
	Finished	Preform	Finished	Preform	End/Tip	Edge	Edge and End	Ret. Edge/ Util. End	Ret. End/ Util. Edge	Edge	End	Edge/End	Cobble/Chopper	Burin	Abrader	Hammerstone	Scraper Planes	Bone Awl	Bone Harpoon	
1	1	2	2	1	1	3	1	4	-	30	23	2	-	1	-	-	-	-	-	71
2	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1
3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
5	1	1	2	1	-	1	1	3	-	19	12	2	1	-	-	-	-	-	-	44
6	2	-	3	-	-	1	-	-	-	5	3	-	-	-	-	-	1	-	-	15
7	1	1	8	1	1	6	-	-	3	39	24	3	-	2	-	-	-	1	1	91
8	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1
9	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1
10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
11	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	2
12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
13	3	1	-	-	-	-	-	-	-	18	7	2	-	-	-	-	1	-	-	32
14	-	-	-	-	-	-	-	-	-	8	5	-	-	-	-	-	-	-	-	13
15	-	-	-	-	-	-	-	-	-	1	2	-	-	-	-	1	-	-	-	4
16	-	-	-	-	-	-	-	-	1	2	-	-	-	-	1	-	-	-	-	4
17	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	3
18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Total																				282

Table 4
Summary Table of Debitage Profiles From Occupation Surfaces at Peace Point*

Level	Primary Debitage			Secondary Debitage					Tertiary Debitage					
	Limestone shatter and fragments	Shatter blocks and flakes, decortication flakes and non-descript fragments	Primary (multidirectional) cores and fragments	General thinning/ reduction flakes	Blade-like flakes	Blades	Prepared unidirectional and bipolar cores or fragments	Tool preforms or fragments	Biface/projectile resharpening flakes	Burinated scraper/ uniface edge	Burin spall	Prepared core rejuvenation flake	Projectile point tip or edge	
1	257	495	27	259	45	5	7	3	39	-	1	1	-	1139
2	1	12	1	1	1	-	-	-	-	-	-	-	-	16
3	3	4	1	1	-	-	-	-	-	-	-	-	-	9
4	-	2	-	2	-	-	-	-	-	-	-	-	-	4
5	257	925	35	304	34	2	7	2	55	1	-	3	-	1625
6	26	158	2	34	1	-	1	-	12	-	-	1	2	237
7	154	1244	23	472	8	-	6	2	102	1	1	-	1	2014
8	-	1	-	2	-	-	-	-	1	-	-	-	-	4
9	3	11	-	1	1	-	-	-	2	-	-	-	-	18
10	3	6	-	3	-	-	-	-	1	-	-	-	-	13
11	4	7	-	3	-	-	-	-	-	-	1	-	-	15
12	5	4	-	2	-	-	-	-	-	-	-	-	-	11
13	146	522	6	60	28	-	16	1	-	-	-	-	1	780
14	2	84	-	47	-	-	2	-	56	-	-	-	-	191
15	4	37	-	10	-	2	1	-	1	-	-	-	1	56
16	21	43	-	7	1	-	1	-	1	-	-	-	-	74
17	5	46	-	11	-	-	1	-	2	-	-	-	-	65
18	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Finished bifaces and scrapers are not included.

Table 5
Summary Table of Lithic Material Types from Occupation Surfaces at the Peace Point Site

	Cherts							Quartzites					Other							
Level	No. 1 Peace Point chert	No. 2 (pink, fine-grained translucent)	No. 3 (red and tan banding, fine-grained)	No. 4 (black, fine-grained)	No. 5 (tan to brown, mottled, fine-grained, translucent)	No. 6 (green, dark and tan inclusions)	No. 7 (light brown, fine-grained)	No. 1 (greyish brown, medium grained)	No. 2 (spotted, tan, coarse-grained)	No. 3 (grey, medium-grained)	No. 4 (off white to red, medium-grained)	No. 5 (salt and pepper, medium-grained)	Shale/basalt (black, coarse-grained, bedded)	No. 1 Basalt (black, medium-grained)	No. 2 Basalt (black, fine-grained, pebble)	Petrified wood	Massive quartz (blue-grey, iron stain)	Quartz (white-grey)	Granite (red, coarse)	Sandstone
	a	b	b	b	b	b	b	b	b	b	a	b	b	b	b	b	c	c	a	b
1	1062	-	-	20	-	3	-	-	-	-	51	-	-	2	-	-	1	3	-	-
2	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	1623	-	-	-	-	-	-	-	-	-	5	-	-	-	-	-	-	-	-	-
6	132	2	-	4	-	-	3	12	-	1	68	-	-	10	2	-	-	-	-	6
7	1891	8	18	2	3	-	-	27	2	-	58	2	1	2	6	-	-	-	1	-
8	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	17	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
10	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	14	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-
12	9	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-
13	768	-	-	-	1	-	-	2	1	-	2	-	-	-	-	8	-	-	-	-
14	171	-	-	-	2	-	-	15	-	-	-	-	-	-	2	-	-	1	-	-
15	42	-	-	-	-	-	-	8	-	-	-	-	-	-	3	-	-	1	-	1
16	69	-	-	-	-	-	-	-	-	-	5	-	-	-	-	-	-	-	-	-
17	65	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

a Local to the lower Peace River lowlands (source identified).
b Not local to the lower Peace River lowlands (source unidentified).
c Not local to the lower Peace River lowlands (source identified).

Table 6
Summary Table of Faunal Remains from Occupation Surfaces at the Peace Point Site

Levels	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
MAMMALS																		
Small rodent (Rodentia)	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Snowshoe hare (Lepus americanus)	1	1	15	-	-	1	-	-	-	-	-	4	-	-	-	-	-	-
Beaver (Castor canadensis)	10	3	18	1	-	-	8	19	-	-	-	7	-	-	-	-	-	-
Lemming/vole (Microtinae subfamily)	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Muskrat (Ondatra zibethicus)	12	2	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
River otter (Lontra canadensis)	-	-	-	-	-	1	-	3	-	-	-	-	-	-	-	-	-	-
Black bear (Ursus americanus)	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Grizzly bear (Ursus arctos)	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
Caribou (Rangifer tarandus)	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Moose (Alces alces)	-	-	4	-	-	-	-	-	-	-	-	1	1	1	-	-	-	3
Elk (Cervus canadensis)	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Bison (Bison bison)	1	3	-	-	1	17	4	-	-	-	-	5	2	-	-	-	-	4
Large artiodactyl	4	1	-	-	-	-	-	3	-	-	-	1	2	-	-	-	-	1
Large mammal	15	9	92	1	1	6	26	39	-	2	1	19	17	-	-	2	-	51
Medium to large mammal	10	-	46	-	-	1	7	8	2	-	-	85	156	-	-	-	-	30
Medium mammal	11	1	6	1	-	1	18	2	-	-	-	-	-	-	-	-	-	-
Small mammal	5	2	48	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-
Unidentified mammal	345	226	1855	4	59	2	303	518	3	23	4	539	198	64	1	5		10

Table 6 continued

Levels	**18**	**17**	**16**	**15**	**14**	**13**	**12**	**11**	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**
BIRDS																		
Trumpeter swan (Olor buccinator)	-	-	1	-	-	-	-	-	-	-	-	-	-	2	-	1	-	-
Canada goose (Branta canadensis)	1	1	-	-	-	-	-	-	3	1	-	-	-	-	-	-	-	-
Grouse/ptarmigan (Tetraonidae family)	-	-	2	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-
Woodpecker/flicker (Picidae family)	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thrush/solitaire/bluebird (Turdidae family)	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Large bird	2	2	1	-	-	-	-	-	2	-	-	-	-	-	-	77	-	-
Medium to large bird	11	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Small bird	-	-	2	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-
Medium bird	-	-	13	2	2	2	1	-	-	-	-	-	-	-	-	-	-	-
Unidentified bird	12	31	40	-	-	-	-	4	1	-	-	-	-	26	-	-	-	-
FISH																		
Goldeye (Hiodon alosoides)	-	3	29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Northern pike (Esox lucius)	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Minnow (Cyprinidae family)	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Walleye/yellow perch (Percidae family)	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Unidentified fish	8	2	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MOLLUSC	-	-	-	-	-	-	-	-	-	-	-	17	14	1	-	1	-	-
CLASS UNCERTAIN	24	20	14	-	2	1	13	4	1	-	-	-	1	150	-	-	-	-
TOTAL BONE	477	316	2248	9	65	32	386	602	12	26	5	678	391	246	1	86	0	101

steep modification on one side of an angulated tip. At least one tool within each group has been retouched on a lateral edge, presumably for ease of handling. Other noteworthy tools include a small multi-tip graver, a pseudo-burin, a backed single-tip graver, a spokeshave and a utilized biface preform.

In general appearance, the tools from level 1 indicate a heavy emphasis on woodworking, boneworking and engraving or scoring tasks. A summary table for all prepared or finished and expediently utilized tools from each level is presented in Table 3.

As seen in Table 4, artifacts from level 1 are heavily dominated by primary (68.4%) and secondary (28.0%) debitage, while by-products of tool maintenance and repair are comparatively rare (3.6%). Given the site's presumed status as a workshop/habitation focus, this finding was not unexpected. The ratio of production to maintenance debitage (28:1) is especially instructive as it attests to the overwhelming emphasis on tool production. Notwithstanding the exclusion of very small lithic items in all three categories, the lack of tertiary debitage further suggests that occupation may have been relatively brief. Sites occupied for longer periods of time (e.g., until resources were depleted within a catchment area or foraging radius) would be expected to show more evidence of tool repair and maintenance. This assumes that it was still easier to refurbish or repair a used or damaged tool than to make a new one, despite the availability of local chert. The suggestion that tertiary debitage may be an indicator of the length of occupation on sites incorporated into the subsistence-settlement systems, because of access to workable lithic material, is not unlike Yellen's (1977) observation that the longer a site is occupied, the greater the accumulation of evidence there will be from maintenance activities.

While 93 per cent of the lithics in this level fall within the range of variation of Peace Point chert, six other types of raw material were recorded (Table 5). These include the green chert and massive quartz referred to above, as well as a local medium-grained quartzite and a variety of non-local materials including a black fine-grained chert, a granular basalt and a silicious large-grained grey quartz. The local quartzite, which originally derives from small boulders in the glacial veneer, varies in colour from white to pink/red. The latter colour variation may reflect varying degrees of heat treatment prior to shaping. The grey quartz is identical in all respects to that material recorded by the author in 1980 at a small quarry/workshop (32R15), 10 km upstream of site 32R19, and several other sites on the Slave River. This material as well as the quartz biface would appear to indicate direct contact with the middle reaches of the Slave River. Noticeably absent from this level, however, is the variety of quartzites observed in the upper levels and sites in the Birch Mountains.

The types of faunal remains present support the proposition that the group responsible for the deposition of level 1 may have been relatively broad ranging or mobile. Without exception, of the 101 bones recorded, all elements identifiable to species were those of moose, bison and elk. (The presence of elk, not found in the area today, suggests that the local environment possessed more open parkland than present. That the identification of this species was based upon a relatively small inominate, with an acetabulum diameter of less than 4.5 cm, may also suggest a late summer and/or fall occupation. Although not a reliable indicator, this measurement is smaller than the 5 cm noted for an elk calf killed in late October [Jack Dubois, pers. com., 1982].) Less diagnostic remains include those of large artiodactyl, large mammal and medium/large mammal (Table 6). Although pitted and weathered, a few delicate faunal elements could still be identified: differential preservation of mammal bone seems not to have been a significant factor in determining assemblage composition.

When the types and diversities of lithics and faunal remains are considered together, the implication is one of a broad-ranging procurement strategy based upon the exploitation of large game.

Level 2

A small dispersed distribution of lithic debitage was found immediately above the lowest cultural level, 157 to 163 cm below the surface, in a thin, dark, organically enriched palaeosol (30R1H10). Although usually separated from the underlying cultural deposit by up to 5 cm or more of sterile silty sand, contact with the lower dark soil horizon may have occurred in a few places. Only in the centre of the unit, however, may mixing of these levels have occurred.

The extremely small sample of lithic debitage (n=16) precludes any form of detailed analysis, but one of the two major sub-classes of expediently employed tools in level 1 continues into this level. A relatively thick flake with steep modification on one side of an angulated dorsal tip attests to a certain continuity in activities performed in level 1. Relevant data are presented in Tables 3, 4, and 5.

Level 3

An 8-cm-to-12-cm sterile deposit of poorly developed tan silty sand separates the level 3 (30R1H11) cultural layer from level 2. Like level 2, a small amount of primary chert debitage (n=9) was found in a thin organically enriched band. Associated with this debitage, however, was a considerable amount of unburnt bone (n=86). Regrettably, most of this bone fragmented badly upon removal from its matrix, leaving few identifiable remains. However, large mammal, mollusc and trumpeter swan (Olor buccinator) were identified. The last species, which does not occur in the area today, points towards either a late spring or early fall occupation, although a summer availability of this species in the area cannot be discounted.

Level 4

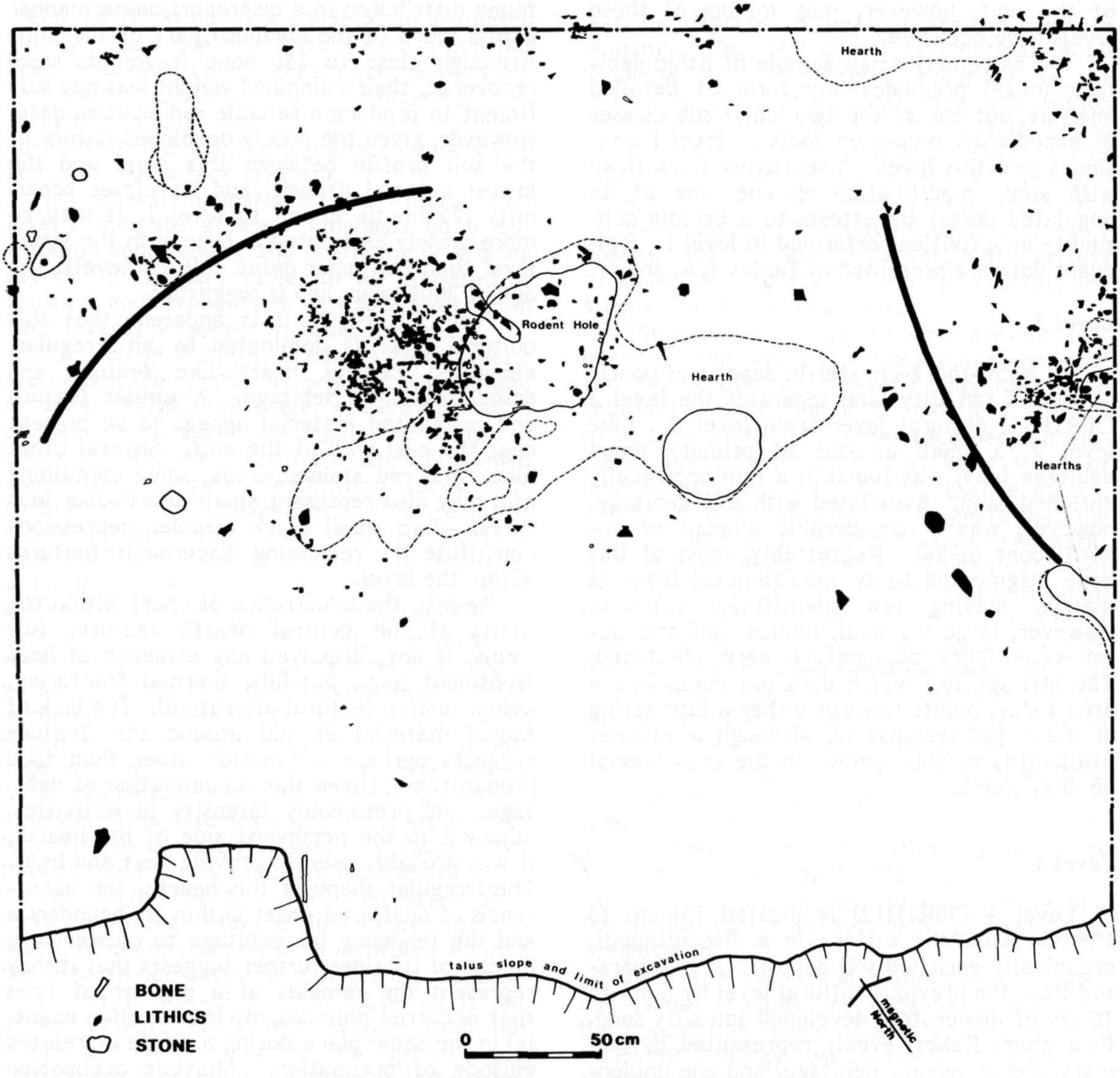
Level 4 (30R1H12) is located 136 cm to 139 cm below the surface in a discontinuous, organically enriched soil deposit. It is separated from the previous cultural level by 6 cm to 10 cm of moderately developed tan silty sand. Four chert flakes, evenly represented by primary and secondary debitage, and one unidentifiable mammal bone constitute the total artifact assemblage.

Level 5

This occupation surface (30R1H13) is located 134 cm to 138 cm below the surface in a thin organically enriched palaeosol, which appears to be one of the most heavily charcoal-stained cultural levels in the profile. It is separated from level 4 by an equally thin deposit of sterile tan silty sand. Six hearth-like features, 1600 artifacts and 44 tools were found distributed in a disproportionate manner across much of the northern part of the unit. Although close to 250 bone fragments were recovered, their combined weight was not sufficient to produce a reliable radiocarbon date. However, given the poorly developed nature of the soil profile between this level and the lowest cultural deposit, and its closer proximity (25 cm to 30 cm) to level 1, it may be more closely associated in time with the latter level than the upper dated cultural levels. An age of 2000 years ago is suggested.

From Figure 22 it is apparent that this cultural layer is dominated by an irregular, elongated central hearth-like feature and associated lithic debitage. A similar feature and associated material appear to be present near the east wall of the unit. Several other black and red stained areas, some containing ash, may also represent small hearth-like features. Two small black circular depressions constitute the remaining discernable features within the level.

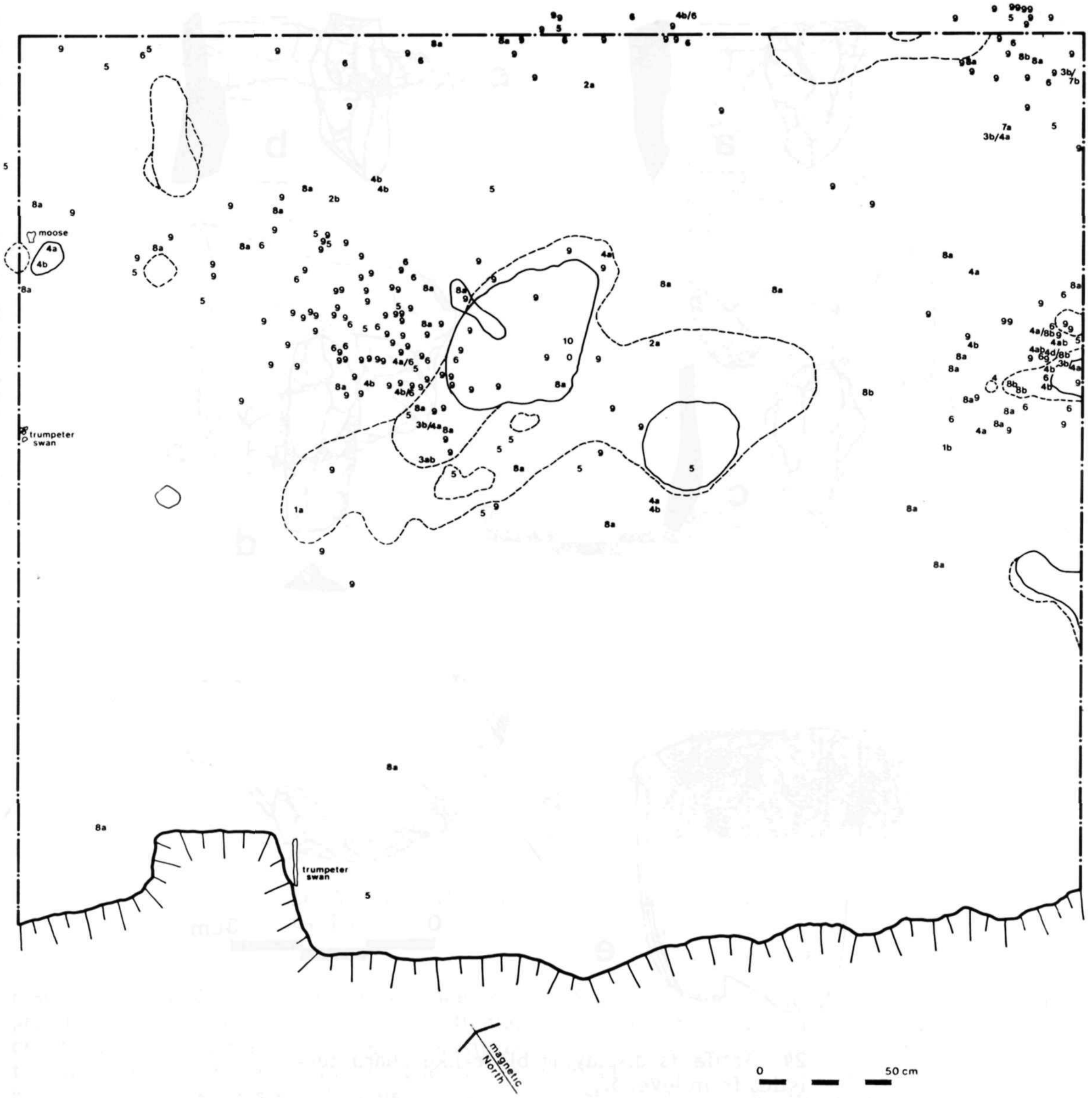
Despite the occurrence of chert within the limits of the central hearth feature, few items, if any, displayed any evidence of heat treatment (e.g., pot-lids, thermal fracturing, colour and/or textural alteration). The lack of faunal material in and around this feature suggests perhaps a function other than food preparation. Given the accumulation of debitage, and presumably intensity of activities, adjacent to the northwest side of the hearth, it was probably used to provide heat and light. The irregular shape of this hearth, the occurrence of unaltered chert within its boundaries and the tendency for debitage to cluster only on one of its sides further suggests that it may represent the remains of a number of fires that occurred only roughly (rather than exactly) in the same place during a single or related episode of occupation. Multiple occupation would be expected to produce less structured associations between hearths and artifacts. Yet the unaltered nature of chert debitage and tools within this feature implies deposition after firing. A progressive placement of hearths towards the east, perhaps because of refuse build-up on the upwind side of the feature, is indicated: two prominent 5-cm to 8-cm circular depressions of burnt red soil provide evidence for at least two intense firing episodes. Again, air temperature, wind direction and wind velocity may have been important in determining the arrangements



22 Archaeological remains from level 5.

and spacing of individuals around these hearths.

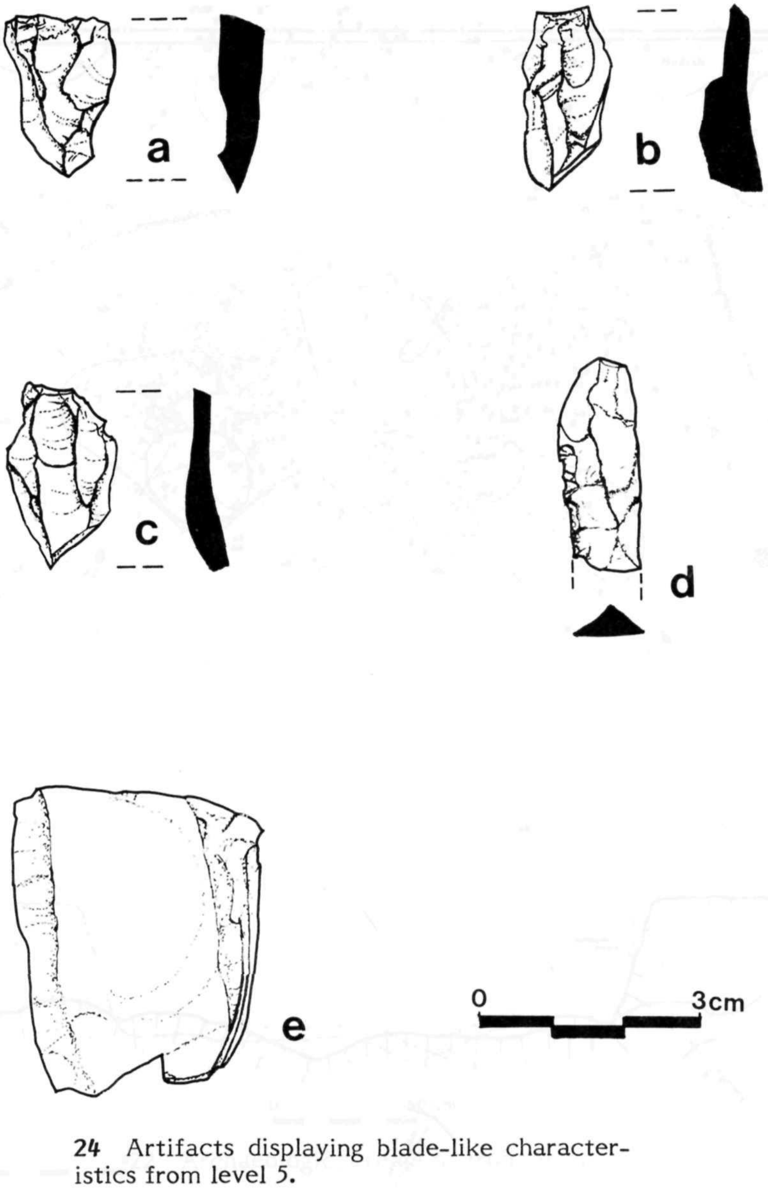
Another spatial pattern of interest concerns the distribution of cores and other large items on the northern periphery of the central artifact concentration and between the hearth-like feature on the east wall of the unit and the central hearth (Figs. 22, 23). Like toss zones and low-density sides of hearths and other centrally organizing features, little-used areas between contemporaneous activity loci may have been favoured for the disposal of large, potentially interfering refuse. While tossing may account for much of the deposition of this type of refuse, there may also be a general tendency in intensively utilized or re-utilized activity areas for large, bothersome items to be moved towards the periphery of such areas as a matter of course. (The distribution of artifacts in level 1 is probably better accounted for with reference to this additional consideration as well.) Alternatively, smaller



23 Various artifact classes in level 5.

items would tend to become embedded more quickly, especially in a sandy matrix (see Villa 1982 for a discussion of these phenomena). Thus we might expect the occurrence of larger materials on the periphery of, and smaller items within, activity areas to be a recurrent phenomenon around heavily utilized hearths in hunter-gatherer sites. If so, it follows that such patterns may eventually prove useful for delineating the overall structural resolution and contemporaneity of artifact assemblages within sites.

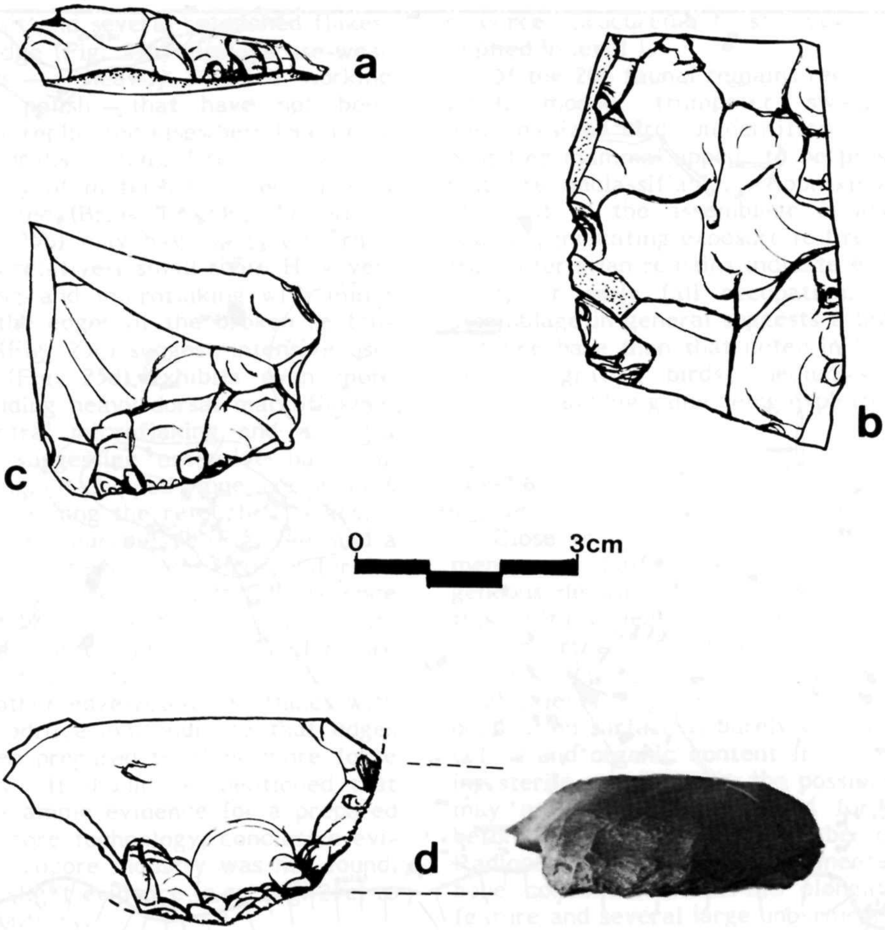
Of the remaining features in level 5, two small circular depressions of blackened soil are particularly problematic. While too shallow to represent post holes, their spatial prox-



24 Artifacts displaying blade-like characteristics from level 5.

imity and similar dimensions suggest a cultural rather than natural origin. Depressions of portable, above-ground wooden structures or fly smudges are offered as possible interpretations. Similarly, an adjacent elongated burnt area may also be the remains of a fly smudge rather than a hearth.

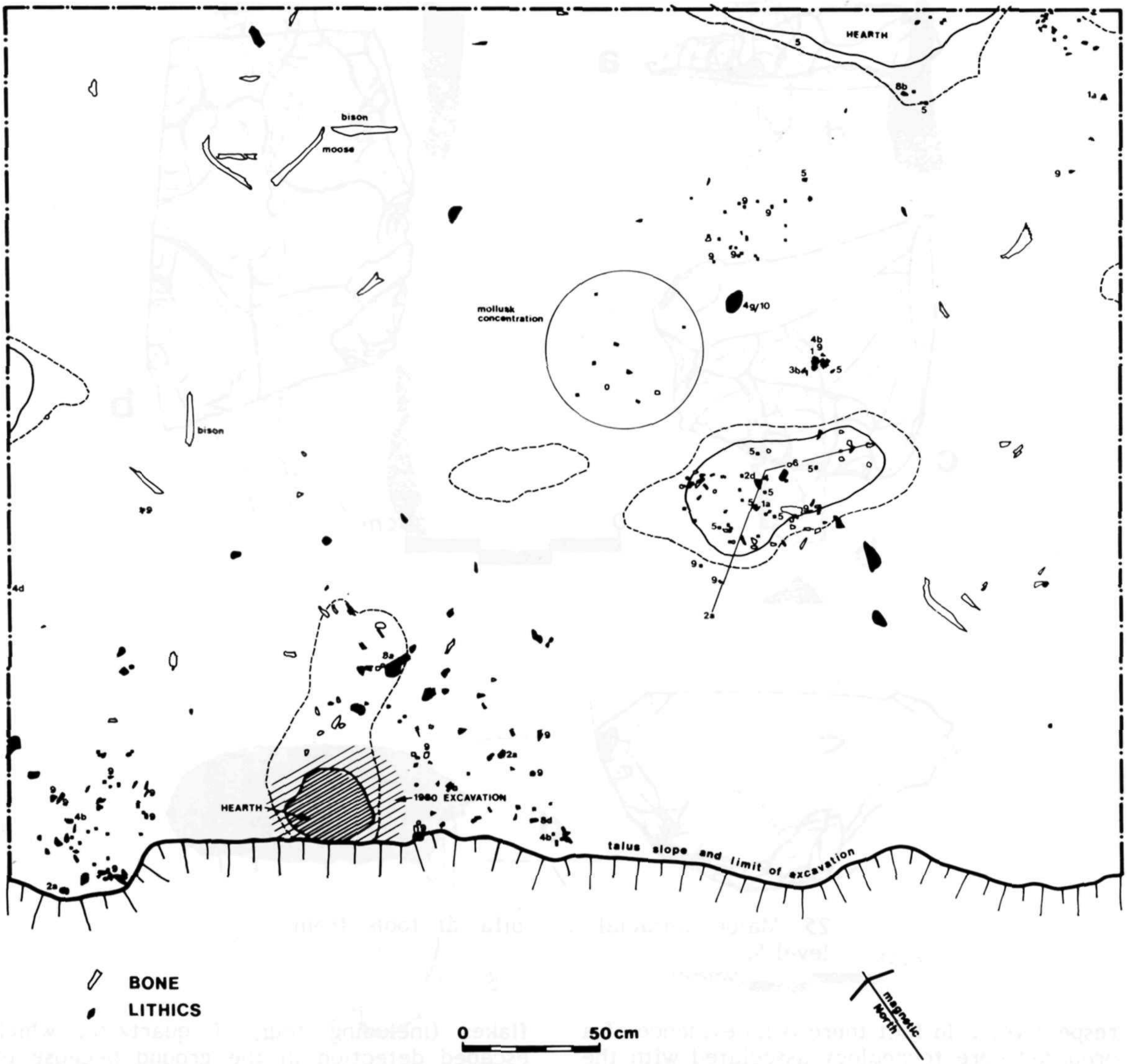
While debitage associated with features on the east wall and in the centre of the unit suggests a heavy emphasis on lithic reduction, other activities also occurred, some of which indicate differences between each area. For example, while both produced small amounts of tertiary debitage, the types of artifacts that underwent maintenance/repair in each area differed. Small unidirectional and/or blade-like core rejuvenation flakes (Fig. 24a-c) and biface/projectile point resharpening flakes appear almost exclusively associated with the east wall and central hearth concentrations



25 Major unifacial and bifacial tools from level 5.

respectively. In fact there is no evidence of a prepared core technology associated with the central lithic accumulation. Each concentration also appears to demonstrate at least one particularly dense cluster of tools. While a variety of expediently employed and retouched flakes attests to a considerable range of activities in both areas, edge-utilized flakes and edge-retouched flakes (some with dorsal end modification) account for 75 per cent of the tools in both clusters.

A final spatial pattern of note concerns the association of a small cluster of tertiary debitage with the smaller circular burnt depression in the central hearth feature. Adjacent to the north side of this depression, a burinated scraper edge and six biface/projectile resharpening flakes (including four of quartzite, which escaped detection in the ground because of their size) were found together in an area less than 0.5 m^2. The occurrence of debitage relating to the maintenance/repair of tools to the virtual exclusion of other types of debitage would appear to indicate the refurbishing of a tool kit. That this "gearing up" debitage is associated with an intensively burned area that may relate to a later period of occupation than the larger circular depression is instructive and logically follows from discussions presented above. Not so easily explainable, however, is the lack of tool production debitage that would be expected if this association relates to a "gearing up" phase during a final



26 Archaeological remains and artifact classes in level 6.

period of occupation (this point is taken up in a following chapter).

Of the 44 tools recorded in level 5, 10 (22.7%) represent prepared or retouched tools, while 34 (77.3%) represent expediently employed tools. Within the latter group, 12 (35.3%) are flakes with 1 cm or more of continuous, steep dorsal modification on a straight to slightly convex edge. A scraping function, perhaps on medium to hard surfaces, is suggested. Continuing, however, from the lowest level are large thick flakes with dorsal modification on one side of an angulated tip (n=4) and small blade-like flakes with steep dorsal end modification (n=2).

The more significant prepared tools within the level include the burinated scraper edge referred to above, a biface preform found on the periphery of the east wall lithic concentration, a broken biface recovered near the western limit of the central hearth feature, a heavily worked uniface found near the north wall of the unit and several retouched flakes. The scraper edge (Fig. 25a) displays use-wear characteristics — a heavily rounded working edge without polish — that have not been experimentally replicated elsewhere (see Brink 1978: 127-28 for discussion). Use on a combination or variety of materials and/or surfaces may be indicated (Brink 1978). The biface preform (Fig. 25b) may have been discarded because of its relatively small size. However, heavy rounding and microflaking with minor polish along the edges of the broken rectangular biface (Fig. 25c) suggest intensive use. The uniface (Fig. 25d) exhibits even more damage, including heavy dorsal macroflaking, moderate ventral microflaking and a slight matte polish suggesting extensive battering and/or chopping. A chipped stone axe or adze is intimated. Among the retouched flakes, a laterally prepared macroblade (Fig. 24d) and a bipolar flake are perhaps the most informative. While the former supports the presence of a prepared blade-core technology, the latter provides the first evidence of bipolar core technology in this unit. The latter flake, as well as two other edge-retouched flakes with dorsal end modification, indicate that edges may have been prepared to allow more force to be applied. It should be mentioned that while there is ample evidence for a prepared undirectional core technology, conclusive evidence of a microcore industry was not found. There is only slight evidence (e.g., Fig. 24e) to support the contrary.

In general appearance the tools from this level indicate a variety of tasks requiring the use of a) steep flake edges for expedient scraping of medium/hard materials, b) prepared tools for heavy scraping and chopping, and c) steep dorsal flake tips for scoring and/or engraving.

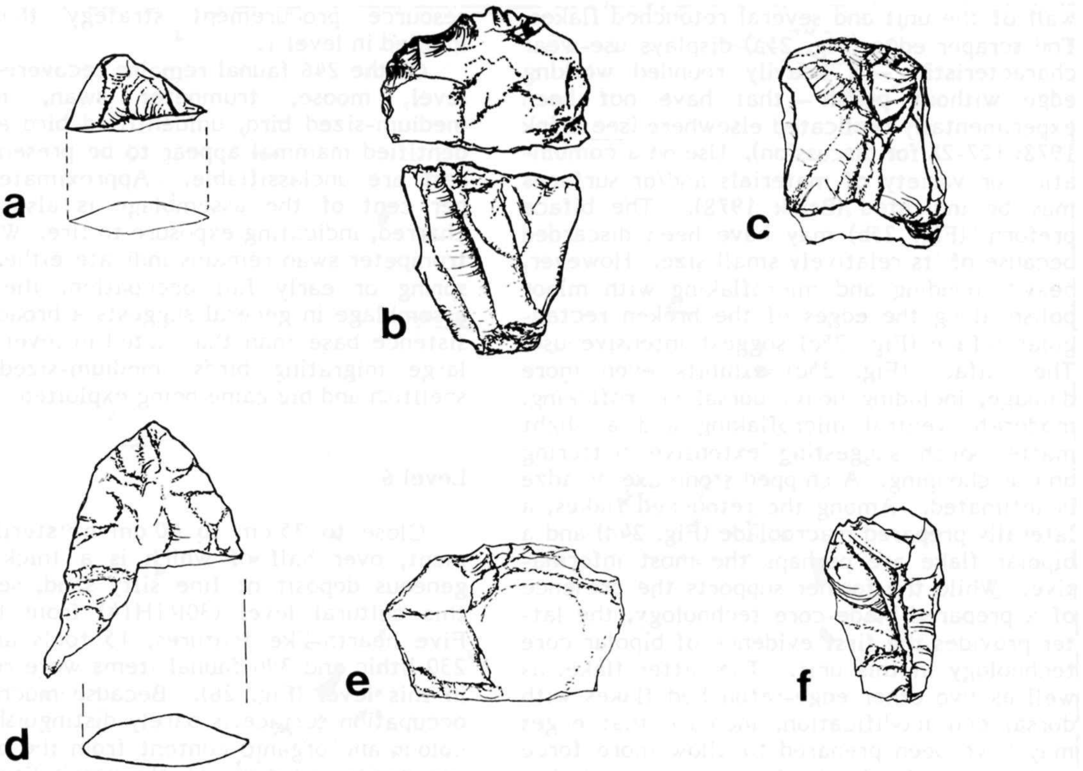
Like the lowest cultural level, level 5 is heavily dominated by primary (74.9%) and secondary (21.5%) debitage, while debitage relating to the maintenance/repair of tools is comparatively rare (3.6%). Again, the lack of debitage relating to tool maintenance may indicate a relatively brief but intense occupation. However, unlike level 1, no exotic lithic materials were found here. With the exception of five flakes of local quartzite, all lithics fall easily within the range of variation of Peace Point chert. All other things being equal, the lack of exotic materials may suggest a different and perhaps more restricted resource procurement strategy than that implied in level 1.

Of the 246 faunal remains recovered in the level, moose, trumpeter swan, mollusc, medium-sized bird, unidentified bird and unidentified mammal appear to be present. The rest are unclassifiable. Approximately 71.1 per cent of the assemblage is also heavily charred, indicating exposure to fire. While the trumpeter swan remains indicate either a late spring or early fall occupation, the faunal assemblage in general suggests a broader subsistence base than that noted in level 1, with large migrating birds, medium-sized birds, shellfish and big game being exploited.

Level 6

Close to 35 cm to 40 cm of sterile sediment, over half of which is a thick homogeneous deposit of fine silty sand, separates this cultural level (30R1H14) from level 5. Five hearth-like features, 15 tools and over 230 lithic and 390 faunal items were recorded in this level (Fig. 26). Because much of the occupation surface is barely distinguishable in colour and organic content from the bracketing sterile soil deposits, the possibility that it may not have been exposed for very long before being buried should be considered. Radiocarbon dates from a fragmented, charred bone concentration in the elongated hearth feature and several large unburnt mammal ribs provided ages of 1320 ± 300 B.P. (S-2066) and 1470 ± 130 B.P. (SFU-168) respectively. The large standard deviation on the first date may be due to the pre-treatment (carbon enrichment) of the sample prior to counting (James Moore, pers. com., 1981).

The two most prominent features in the level include the above-mentioned hearth and an elongated hearth in the east central area of the unit. Large amounts of fragmented mammal bone (some of which is charred) associated with each feature suggest that food preparation may have been an important activity. A particularly dense circular concentration of 315 g of finely crushed burnt bone from the westernmost hearth may, however, indicate slightly different functions. For reasons discussed above, the nature of the bone in the former hearth may imply the production of bone grease/soup. While two other hearth-like features on the sides of the unit may also relate to the preparation of food, a small



27 Major tools and cores from level 6.

burnt feature in the centre of the unit may be the remains of a fly smudge or an extension of the easternmost hearth.

Although tools and debitage associated with both major hearths were generally sparse, supporting the hypothesized differences in their functions are the types of activities that appeared to have been carried out around each. The occurrence of biface/projectile point resharpening flakes and a projectile point tip (Fig. 27a) within the easternmost hearth suggests a very different set of activities from that occurring around the adjacent hearth. Again, the lack of spatial congruity between concentrated accumulations of finely crushed bone and biface/projectile resharpening flakes is intriguing. Lithics within these features also differ in that virtually all items within the easternmost hearth show evidence of pot-lid fracturing or textural alteration. While activities associated with this feature would appear to relate predominantly to the maintenance/repair of biface/projectiles, the scraping of bone is also suggested by the presence of heavy dorsal and slight to moderate ventral microflaking on the distal end of an end scraper (Fig. 27b). Continuous bifacial or alternate microflaking with slight rounding and polish on the lateral edges of this scraper indicates not so much intentional use as wear caused by the bi-directional movement of the tool in a wood or bone haft. In light of the evidence for other maintenance tasks performed in this area, this scraper may have also been undergoing repair when broken.

A number of other discrete artifact clusters also appear to be present within the level. Although a few secondary chert flakes and a small chert end scraper with bright polish and slight rounding on a finely retouched distal end

(Fig. 27c) were recorded just west of the westernmost hearth, this area is almost exclusively dominated by primary and secondary quartzite debitage. The production of quartzite tools is clearly indicated. A similar concentration of primary and secondary quartzite debitage was noted approximately 1 m north of the easternmost hearth. This, together with the occurrence of chert biface/projectile point resharpening flakes and a split quartzite pebble/hammerstone implies the production of quartzite tools and the maintenance of a chert biface. Although limited in number, a very tight cluster of artifacts adjacent to the north wall of the easternmost hearth produced evidence of tool production, biface/projectile maintenance as well as expedient use. Several tools indicative of the expedient tasks also appear to be byproducts of tool production. A final cluster of artifacts was recorded in the northeastern corner of the unit and relates to the maintenance of a single sandstone projectile point (Fig. 27d). Also noted were accumulations of large artiodactyl ribs and mollusc shell fragments in the northwestern and central areas of the unit respectively.

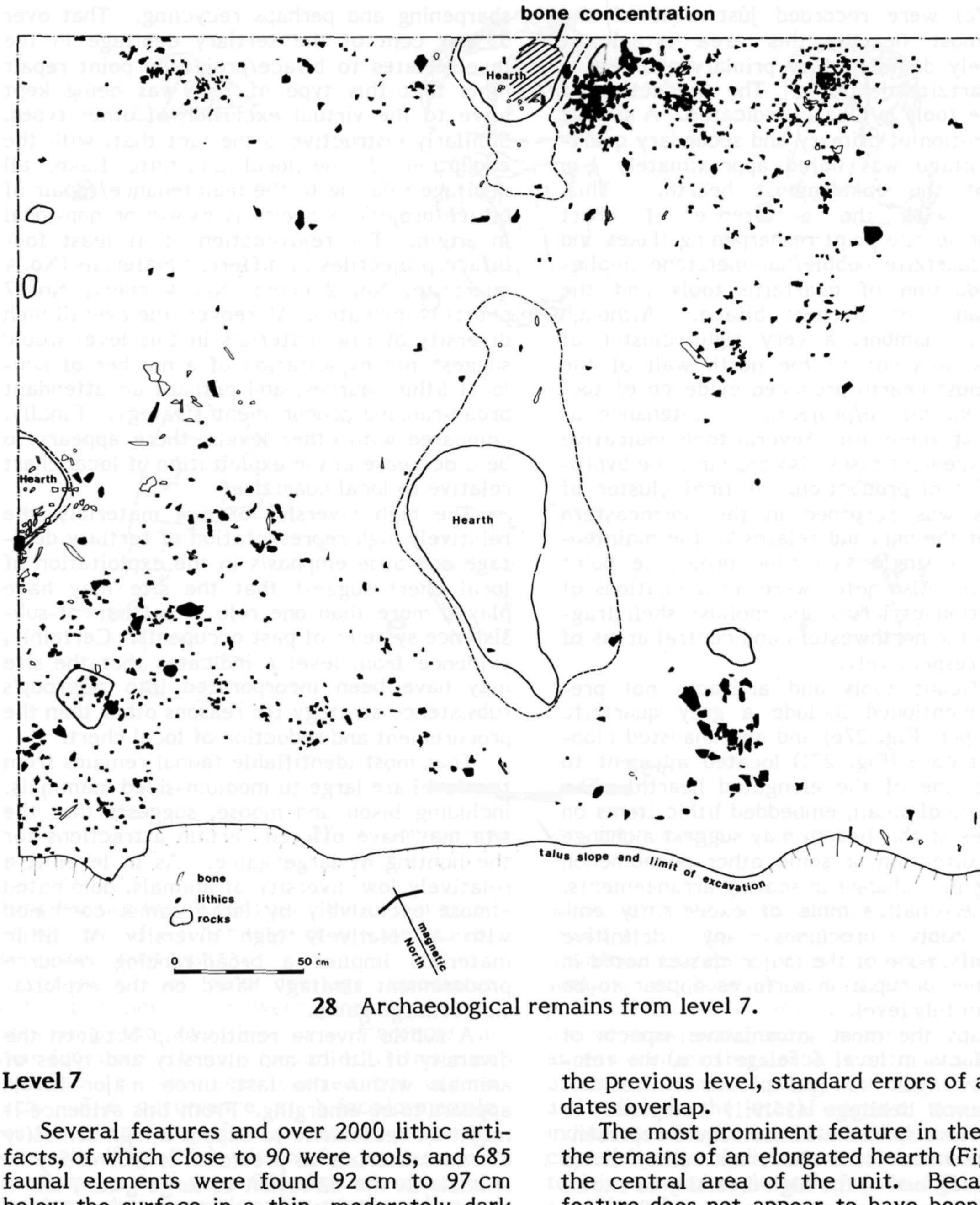
Significant tools and artifacts not previously mentioned include a grey quartzite side scraper (Fig. 27e) and an exhausted bipolar chert core (Fig. 27f) located adjacent to the east side of the elongated hearth. The occurrence of small, embedded lithic items on both sides of this hearth may suggest a change in wind direction or some other phenomenon resulting in a change in seating arrangements. While the small sample of expediently employed tools precludes any definitive statements, none of the major classes noted in the former occupation surfaces appear to be present in this level.

Perhaps the most informative aspects of the artifacts in level 6 relate to a) the relatively low ratio of tool production to tool maintenance debitage (15.9:1) compared to previous levels, b) the almost equal representation between local chert and other lithic types (1.1:1), and c) the high diversity of exotic raw materials in general. Goodyear (1981) has noted that cultural levels or sites high in debris that is secondary (tertiary here) compared to other types of debitage suggests a maintenance rather than a tool replacement phase in which tools were kept alive by resharpening and perhaps recycling. That over 93 per cent of the tertiary debitage in the level relates to biface/projectile point repair hints that this type of tool was being kept alive to the virtual exclusion of other types. Similarly instructive is the fact that, with the exception of one local quartzite flake, all debitage relating to the maintenance/repair of biface/projectile points is exotic or non-local in origin. The rejuvenation of at least four biface/projectiles of different materials (No. 4 quartzite, No. 2 chert, No. 4 chert, No. 7 chert) is indicated. Moreover, the overall high diversity of raw materials in this level would suggest the exploitation of a number of nonlocal lithic sources, and perhaps an attendant broad-ranging procurement strategy. Finally, compared with other levels, there appears to be a decrease in the exploitation of local chert relative to local quartzite.

The high diversity of raw materials, the relatively high representation of tertiary debitage and a de-emphasis in the exploitation of local chert suggest that the site may have played more than one role in settlement-subsistence systems of past occupants. Certainly, evidence from level 6 indicates that the site may have been incorporated into a group's subsistence strategy for reasons other than the procurement and reduction of local chert.

That most identifiable faunal remains from this level are large to medium-sized mammals, including bison and moose, suggests that the site may have offered certain attractions for the hunting of large game. As in level 1, a relatively low diversity of animals, dominated almost exclusively by large game, combined with a relatively high diversity of lithic materials implies a broad-ranging resource procurement strategy based on the exploitation of large game.

A subtle inverse relationship between the diversity of lithics and diversity and types of animals within the last three major levels appears to be emerging. From this evidence it might be reasonable to expect a high diversity of raw materials to predict a low diversity of animals in the direction of large game, and a low diversity of lithic types to predict a higher diversity of animals in a broader size range (the latter suggesting a more restricted procurement strategy based on a more intensive utilization of local resources).

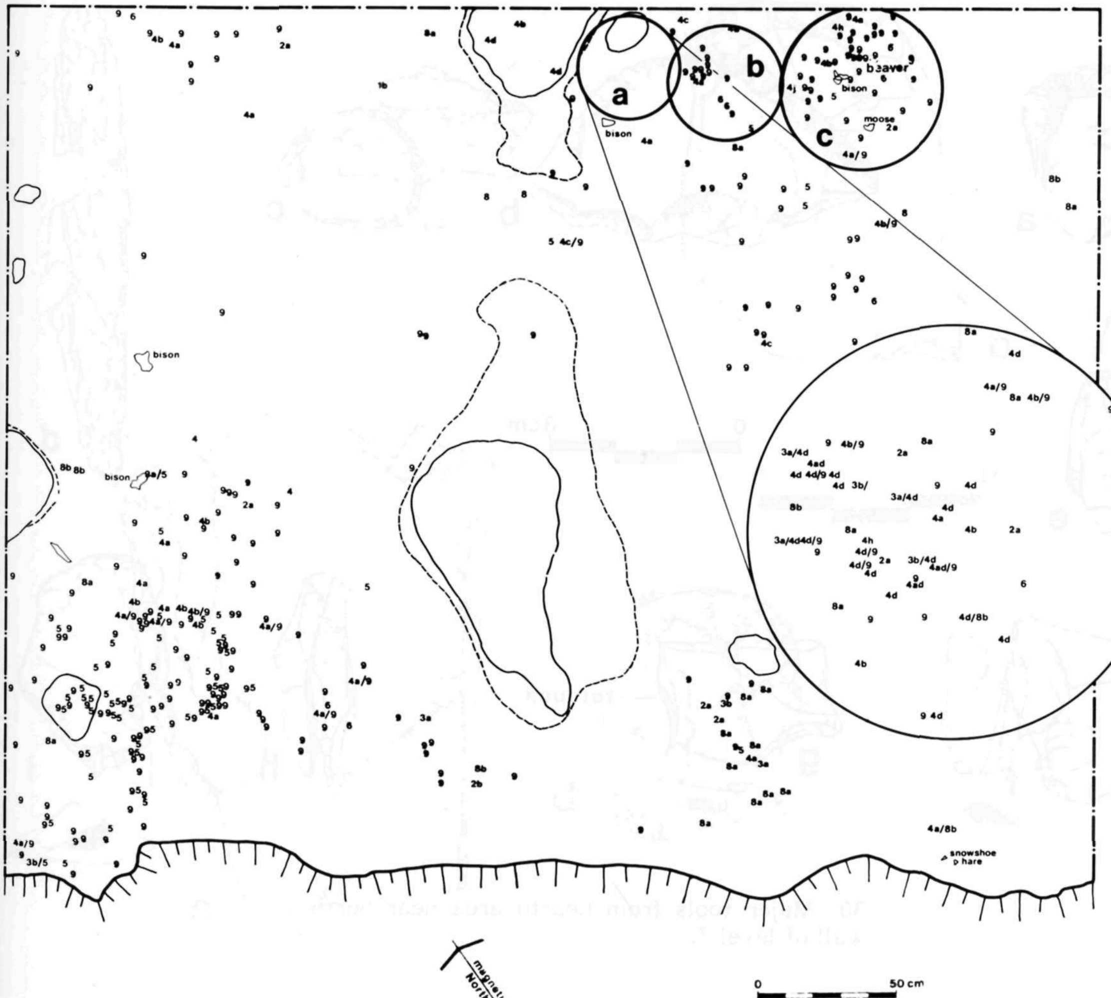


28 Archaeological remains from level 7.

Level 7

Several features and over 2000 lithic artifacts, of which close to 90 were tools, and 685 faunal elements were found 92 cm to 97 cm below the surface in a thin, moderately dark palaeosol. This level (30R1H15), separated from the previous occupation surface by 1 cm to 3 cm of sterile tan silty sand, is one of the most densely occupied surfaces recorded in the unit. While an age determination of 1670 ± 105 B.P. (S-2228) is not in exact stratigraphic agreement with those obtained from the previous level, standard errors of all three dates overlap.

The most prominent feature in the level is the remains of an elongated hearth (Fig. 28) in the central area of the unit. Because this feature does not appear to have been a focal point around which food preparation or stone working were carried out, some other function may be indicated. While the shape of the hearth and the fact that it was positioned for maximum exposure to the wind suggests that it may have been used for smoking, it is not

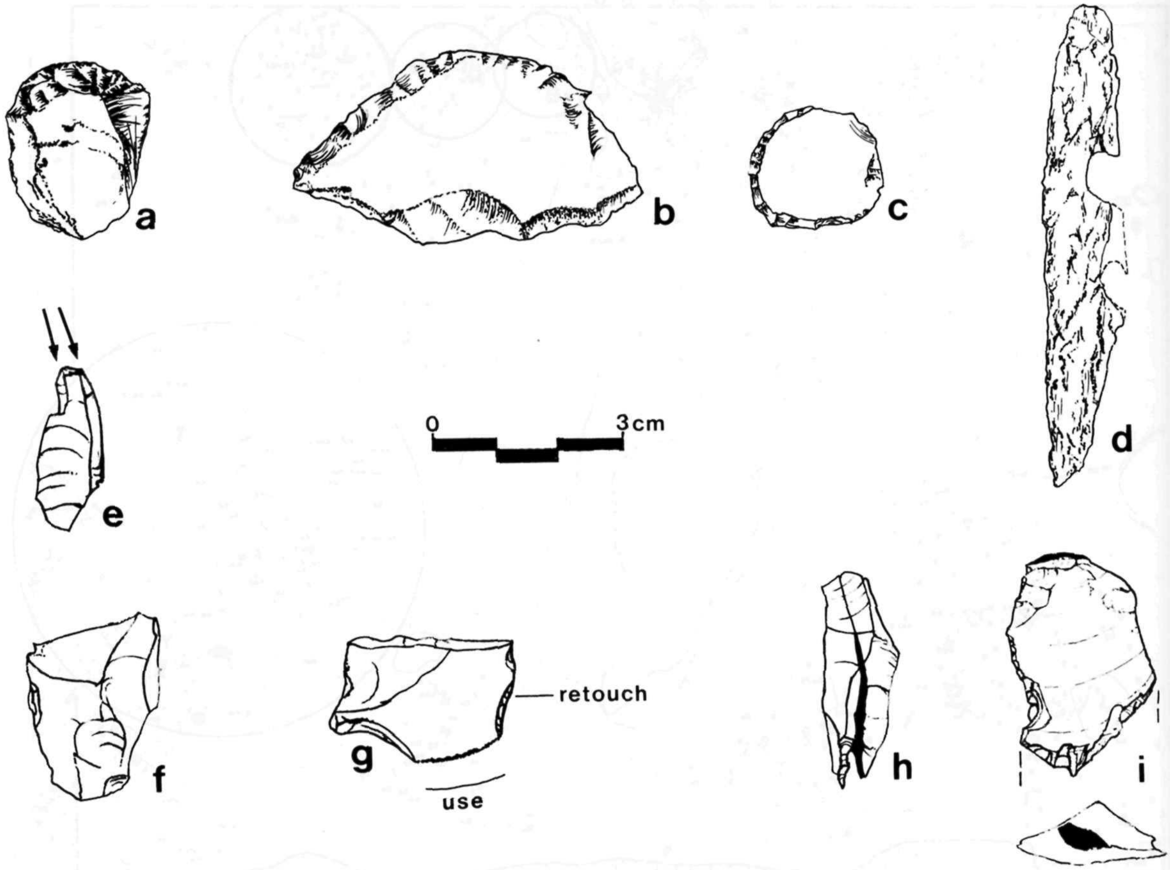


29 Various artifact classes in level 7.

inconceivable that it may have served to heat an enclosed living area.

The hypothesized function of this feature would seem to stand in direct contrast to the suggested food preparation functions of the remaining two hearths in the level. These latter features also differ, however, in that faunal remains associated with the west wall hearth are larger, less numerous (<100), less fragmentary and less burnt (approximately 50 per cent showed signs of charring). Conversely, faunal remains associated with the north wall hearth consisted of over 300 small, finely crushed bone fragments, of which over 80 per cent were charred. Roasting as opposed to bone grease/soup production are offered as possible explanations for the observed differences between these faunal assemblages. An irregularly shaped alignment of lithic debitage near the cliff face provides evidence for another feature. Although uncertain, the outline may represent a hide-working area or the boundary of a hut or tent. The latter would support the alternative explanation for the central hearth feature.

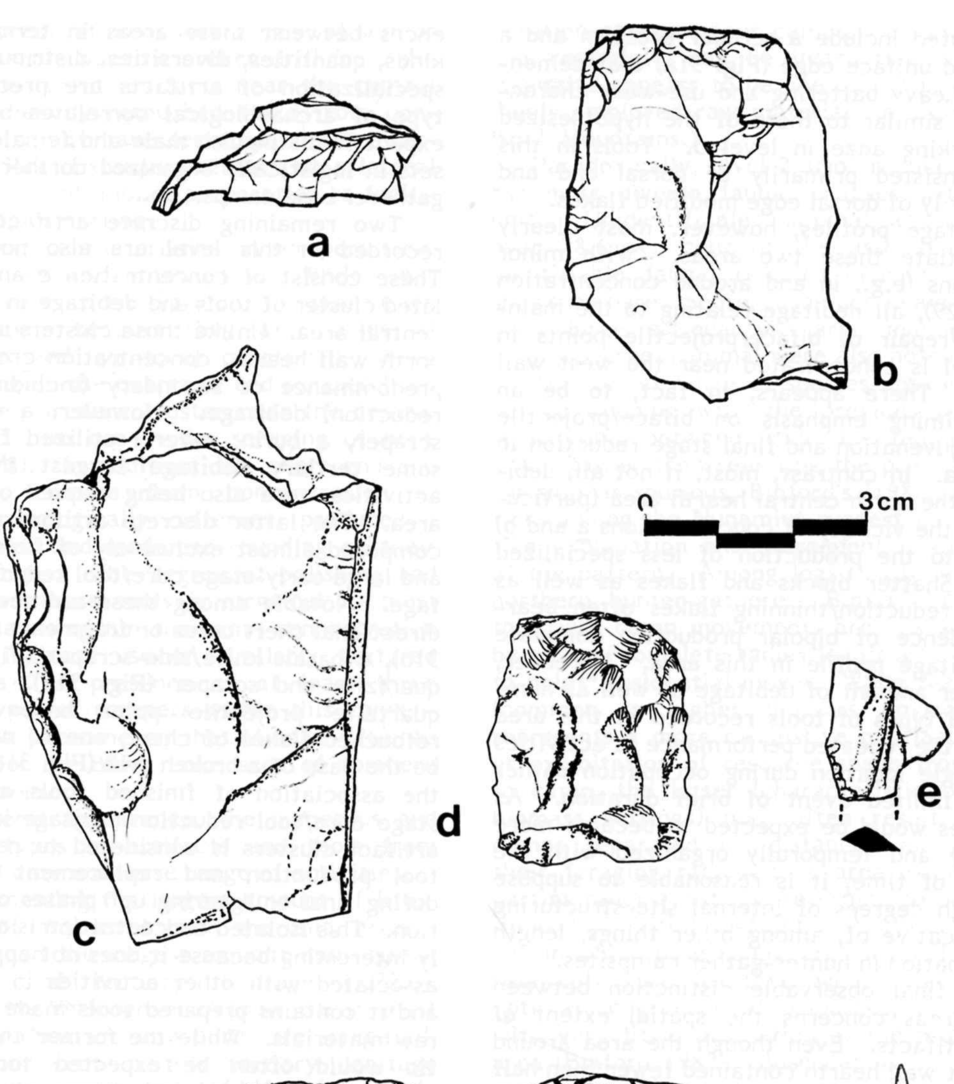
Perhaps the most intriguing data from this level concern differences between the south-west and north central areas of the unit, not just in terms of faunal remains, but also in tool classes, debitage profiles and their distri-



30 Major tools from hearth area near north wall of level 7.

butions (Fig. 29). Not only does the north wall hearth area contain over twice as many tools, but these tools appear much different and more diversified. Several types of scrapers (Fig. 30a-c), a number of retouched and expediently employed flakes, a unilaterally barbed bone point (Fig. 30d), a burin (Fig. 30e) and a biface preform (Fig. 30f) attest to a considerable range of activities within a seemingly restricted area. The dense concentration of tools and debitage immediately adjacent to the east side of the hearth (concentration a, Fig. 24) is particularly interesting as it contained end, side and thumbnail scrapers as well as 22 utilized flakes of a type unrecorded up to this time in the excavation unit. Continuous alternating to bifacial microflaking on one or more lateral edges of the latter tools may indicate employment in a slicing, cutting and/or sawing rather than a scraping motion (see Montgomery 1978: 261-75). Slight rounding and polish on the projecting ridges of these flakes further suggests possible use on soft to medium materials (e.g., hide, wood or plant fibre). While the distal ends of three of these flakes have been retouched, presumably for ease of handling (e.g., Fig. 30g), most appear to have been struck from prepared unidirectional or bipolar cores (two refitted bipolar core flakes are shown in Fig. 30h). Steep unidirectional utilization on the distal ends and dorsal/ventral edges of 18 other expediently employed tools in the general area imply use in scraping functions.

In contrast, the area adjacent to the west wall hearth produced no utilized scrapers, no continuous alternating edge-modified flakes and few formal tools. In regards to the latter,



31 Other major tools and artifacts from level 7.

those noted include a scraper preform and a burinated uniface edge (Fig. 31a) that demonstrates heavy battering and use-wear characteristics similar to those of the hypothesized woodworking adze in level 5. Tools in this area consisted primarily of dorsal end and secondarily of dorsal edge modified flakes.

Debitage profiles, however, most clearly differentiate these two areas. With minor exceptions (e.g., in and around concentration c, Fig. 29), all debitage relating to the maintenance/repair of biface/projectile points in the level is concentrated near the west wall hearth. There appears, in fact, to be an overwhelming emphasis on biface/projectile point rejuvenation and final stage reduction in this area. In contrast, most, if not all, debitage in the north central hearth area (particularly in the vicinity of concentrations a and b) relates to the production of less specialized tools. Shatter blocks and flakes as well as angular reduction/thinning flakes often bearing evidence of bipolar production dominate the debitage profile in this area. Moreover, the sheer amount of debitage as well as numbers and types of tools recorded in this area suggest the repeated performance of activities in a single location during occupation rather than a limited event of brief duration. As activities would be expected to become more spatially and temporally organized with the passage of time, it is reasonable to suppose that high degrees of internal site structuring are indicative of, among other things, length of occupation in hunter-gather campsites.

The final observable distinction between these areas concerns the spatial extent of their artifacts. Even though the area around the west wall hearth contained fewer than half the number of artifacts as the north wall hearth, they were scattered over a much larger area. This seems to indicate that activities in the former area may have been less structured and less intense than those in the north central area. In this regard it is interesting that larger items (e.g., cores) tended to occur on the periphery of artifact clusters in the north central area, whereas no such pattern was observed in the southwest area: the spatial separation of small and large artifacts is expected to be a function of intensity and/or duration of occupation.

Differences between these areas beg the interpretation that they delineate male and female activity areas. For reasons that will be discussed in a following chapter, differences between these areas in terms of the kinds, quantities, diversities, distributions and specialization of artifacts are precisely the type of archaeological correlates one might expect to distinguish male and female activity sets in logistically organized northern hunter-gatherer base camps.

Two remaining discrete artifact clusters recorded in this level are also noteworthy. These consist of concentration c and an isolated cluster of tools and debitage in the south central area. Unlike those clusters nearer the north wall hearth, concentration c contains a predominance of secondary (including biface reduction) debitage. However, a thumbnail scraper, a burin, several utilized flakes and some tertiary debitage suggest that other activities were also being carried out in this area. The latter discrete artifact cluster is composed almost exclusively of finished tools and large early-stage core/tool reduction debitage. Notable among these are seven multidirectional chert cores or fragments (e.g., Fig. 31b), a basalt knife/side scraper (Fig. 31c), a quartzite end scraper (Fig. 31d), a possible quartzite projectile point base and two retouched flakes of chert, one of which may be the base of a broken drill (Fig. 31e). Again, the association of finished tools and early-stage core/tool reduction debitage in discrete artifact clusters is considered to result from tool production and replacement activities during final or "gearing up" phases of occupation. This isolated concentration is additionally interesting because it does not appear to be associated with other activities in the level, and it contains prepared tools made of exotic raw materials. While the former characteristic would often be expected for artifact accumulations produced during abandonment on workshop/habitation sites, the latter suggests that these tools were brought to the site from elsewhere (perhaps when the site was first occupied), used in activities during occupation and then discarded in favour of newly produced tools or preforms during a final episode of occupation.

Several tools and items not discussed above should also be mentioned. These include a wedge-shaped core, an awl and a possible drill. The core, located on the periphery of the north wall hearth concentration, is uniquely interesting as it is a unidirectional flake core rather than a blade core formed into a wedge shape (Fig. 31f). The bone awl (Fig. 31g) was found adjacent to the central hearth and suggests the preparation of items made of skin or hides. Like the possible broken drill from the isolated cluster of artifacts near the central hearth, a heavily retouched flake from concentration a may have served a similar function (Fig. 30i). Extensive retouch on a lateral edge of this tool implies preparation to facilitate holding or hafting.

Use-wear characteristics on scrapers from this level are also noteworthy. While wear patterns were often difficult to observe on most scrapers because they were made of medium-grained non-local quartzites, heavy step-flaking on the quartzite end scraper from the isolated artifact cluster near the central hearth indicates use in the scraping of bone (Brink 1978). In addition, the chert end and thumbnail scrapers from concentration a, while morphologically different, produced a similar polish and moderate rounding on their working edges. The degree of polishing and rounding on these tools is identical to most utilized flakes within the same concentration and may indicate use on similarly textured surfaces. The presence of at least three distinct types of scrapers within this concentration is a phenomenon that Minni (1976) has observed for the Black Lake area of northern Saskatchewan.

In general appearance, the numerous and different types of artifacts and tools from level 7 indicate a diverse range of activities.

While yielding the largest amount of lithic debitage of any level from the unit, level 7 also produced the largest amount and highest percentage of tertiary debitage (5.22%). Although the maintenance/repair of at least one scraper/uniface and burin are indicated, over 98 per cent of this tertiary debitage relates to the rejuvenation of biface/projectile points. Such a high representation of tertiary debitage suggests that this occupation surface may have been occupied for a relatively longer period of time compared to other levels.

Level 7 also demonstrated one of the more diverse lithic material assemblages in the unit. While local chert naturally dominates, a local quartzite and a non-local grey-brown medium-grained quartzite (often frosted on one side) occurs with some frequency. That close to half of the artifacts of the latter material exist in the form of biface/projectile point resharpening flakes (n=6), utilized flakes (n=3) and finished scrapers (n=5) suggests that (more than any other exotic material) this quartzite was the primary focus of procurement and curation at a previous campsite location. (In this regard it may be instructive that this quartzite appears to be one of the most commonly employed raw materials in sites in the Birch Mountains.)

Paradoxically, level 7 also produced one of the most diverse faunal profiles within the unit. Unidentifiable mammal accounts for over 78.6 per cent of the assemblage, but identifiable faunal remains include those of snowshoe hare, moose, bison and beaver. Mollusc, large artiodactyl, large mammal and medium/large mammal were also noted.

This broad range of species appears to be out of keeping with the previous predicted relationship between lithic and faunal diversity. Rather than rejecting the previous relationship as spurious, Binford's (1982) observations among the Nunamiut suggest an alternative explanation and subsequent modification of the pattern. Among logistically organized northern hunter-gatherers Binford has noted that base camp movements are characterized by either "complete radius leapfrog" or "point-to-point" residential moves. While the former (common in higher biomass environments) represents a more exhaustive overlapping use or exploitation of resource space from camp to camp, the latter (characteristic of lower biomass settings) may often result in base camps separated by distances many times their foraging radii — that area exploited by parties ranging out and returning to camp the same day. Point-to-point mobility is a strategy in which base camps are moved from one relatively rare location, where there is an optimal congruence of resources, to another, with very little utilization of the intervening area (Binford 1982). Base camps, in general, are expected to demonstrate evidence of intensive local resource exploitation (i.e., a broad range of resources consumed and activities performed). However, archaeological correlates of point-to-point residential movement may be expected to produce a raw material profile heavily dominated by curated items of one or a few — as opposed to a number of different — types of lithics from a previously exploited base camp area. Despite the fact that both this level and the previous level demonstrated diverse lithic assemblages, no one particular non-local raw material dominated curated items (scrapers and biface/projectile points) in level 6. Clearly, differential mobility strategies are indicated.

In summary, when the degree of internal site structuring, activity patterning and diversity of tasks in level 7 are considered in combination with the broad range of animals consumed and the relatively high representation of tertiary debitage, an intensively occupied base camp is indicated. In fact, much of the above evidence is expected to characterize, and to correlate with, length of occupation in logistically organized hunter-gatherer base camps.

Level 8

Level 8 (30R1H16) is located 2 cm to 3 cm above the previous occupation surface in an equally dark, organically enriched soil deposit. Unlike level 7, it was found to contain few artifacts and faunal remains. Only four lithic and five faunal items were noted. The former consisted of one primary, two secondary and one tertiary flake; the latter was represented by one large mammal and four unidentifiable mammal bone fragments. The edge of one of the secondary flakes appears to be minimally utilized.

Level 9

The ninth occupation surface (30R1H17) in the unit is located approximately 5 cm above level 8 in a similarly dark, organically enriched soil deposit. Here, 18 lithic items and 26 bone fragments were found. The former was composed mostly of primary chert debitage, while the latter was comprised predominantly of unidentifiable mammal bone. Notable exceptions include one utilized secondary flake, and one small flake of No. 1 quartzite as well as a bone identified as Canada goose.

Level 10

Level 10 (30R1H18) is located 3 cm to 5 cm above the previous occupation surface in a dark soil deposit that appears to have a very thin deposit of sand separating it in some areas. While the top of the deposit is darker and more organically enriched (i.e., has greater amounts of wood charcoal) than the lower part of the deposit, the latter contained all of the cultural material. This consisted of 13 lithic artifacts, most of which were primary debitage, and 12 faunal remains including those of medium/large mammal, large bird and Canada goose. The occurrence of the latter species in both this and the previous level suggests a late spring to early fall occupation.

Level 11

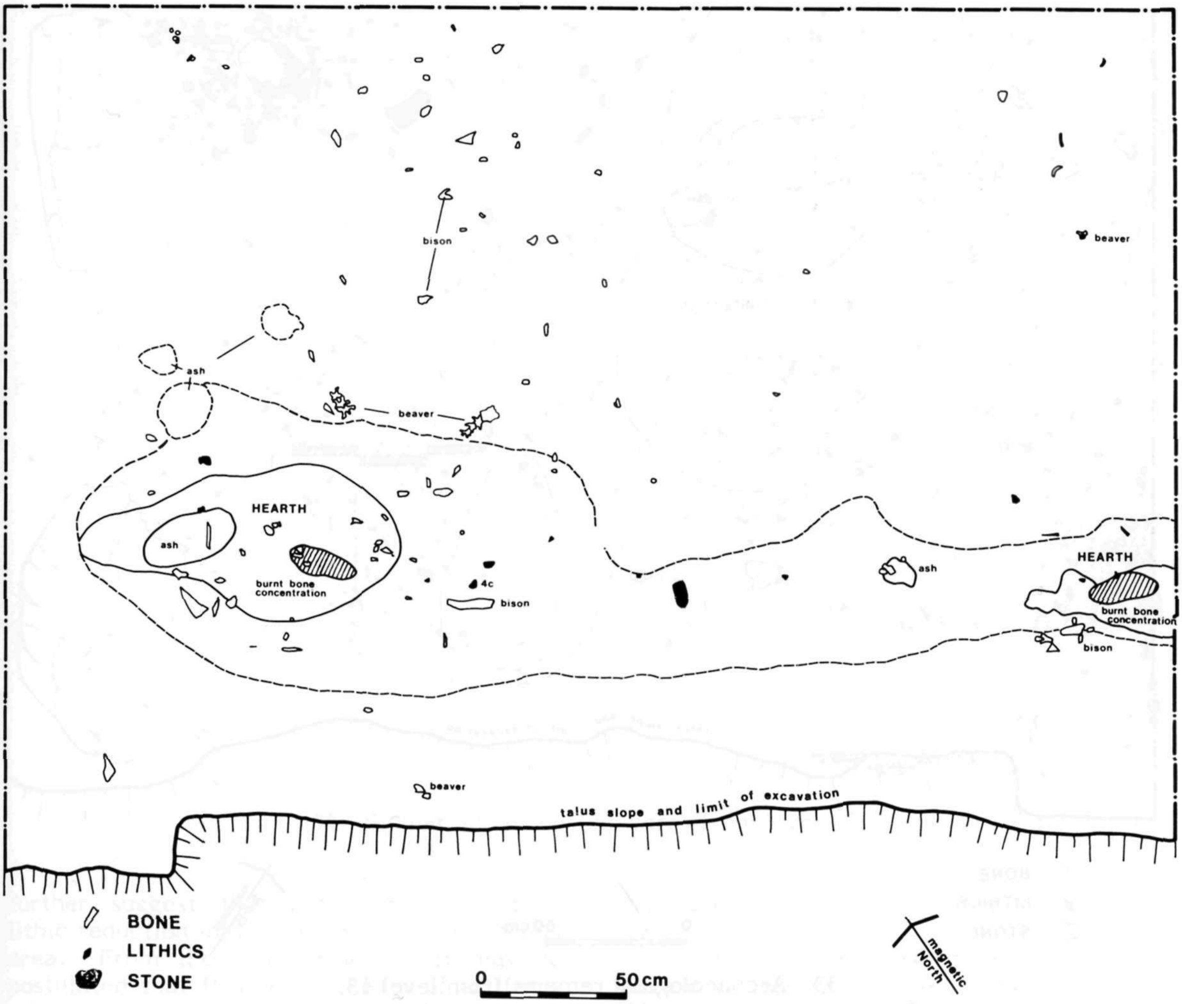
This dark organically enriched band (30R1H19) is separated from the previous occupation surface by approximately 4 cm to 6 cm of sterile tan silty sand. While lithic remains (n=16) were similarly sparse, made mostly of local chert and primary in nature, an elongated hearth-like feature and over 600 individual faunal remains were found (Fig. 32).

The feature actually appears to be the remains of two hearths, each yielding a very dense concentration of finely crushed burnt bone. Associated with the westernmost hearth was a chert burin and a utilized flake as well as the remains of beaver, bison and unidentified bird. Other faunal remains in the level include large artiodactyl as well as large, medium/large, medium and small mammal. Most unidentifiable mammal remains came from the fragmented bone concentrations.

Also recorded from this level in the 1980 test pit were the upper jaw of a grizzly bear (Ursus arctos) and several otter (Lontra canadensis) bones. These remains produced an age estimate of 1370 ± 90 B.P. (S-2065). The grizzly bear is intriguing as it may indicate a more open parkland environment than today.

Level 12

Level 12 (30R1H20) is located immediately above the previous occupation surface, 65 cm to 75 cm below the present ground surface. A radiocarbon date of 1365 ± 90 B.P. (S-2069), derived from bison bone and the position of this level in the profile suggest that this level relates to a final episode of a fairly rapid and frequent period of flooding that begin around 1500 years ago, or shortly thereafter. Recorded within this level were 10 lithic and 399 faunal items. Notable among the lithics were two basalt thinning flakes; noteworthy among the faunal remains were caribou, beaver, bison and grouse/ptarmigan. The last is represented by immature bones and may suggest an early



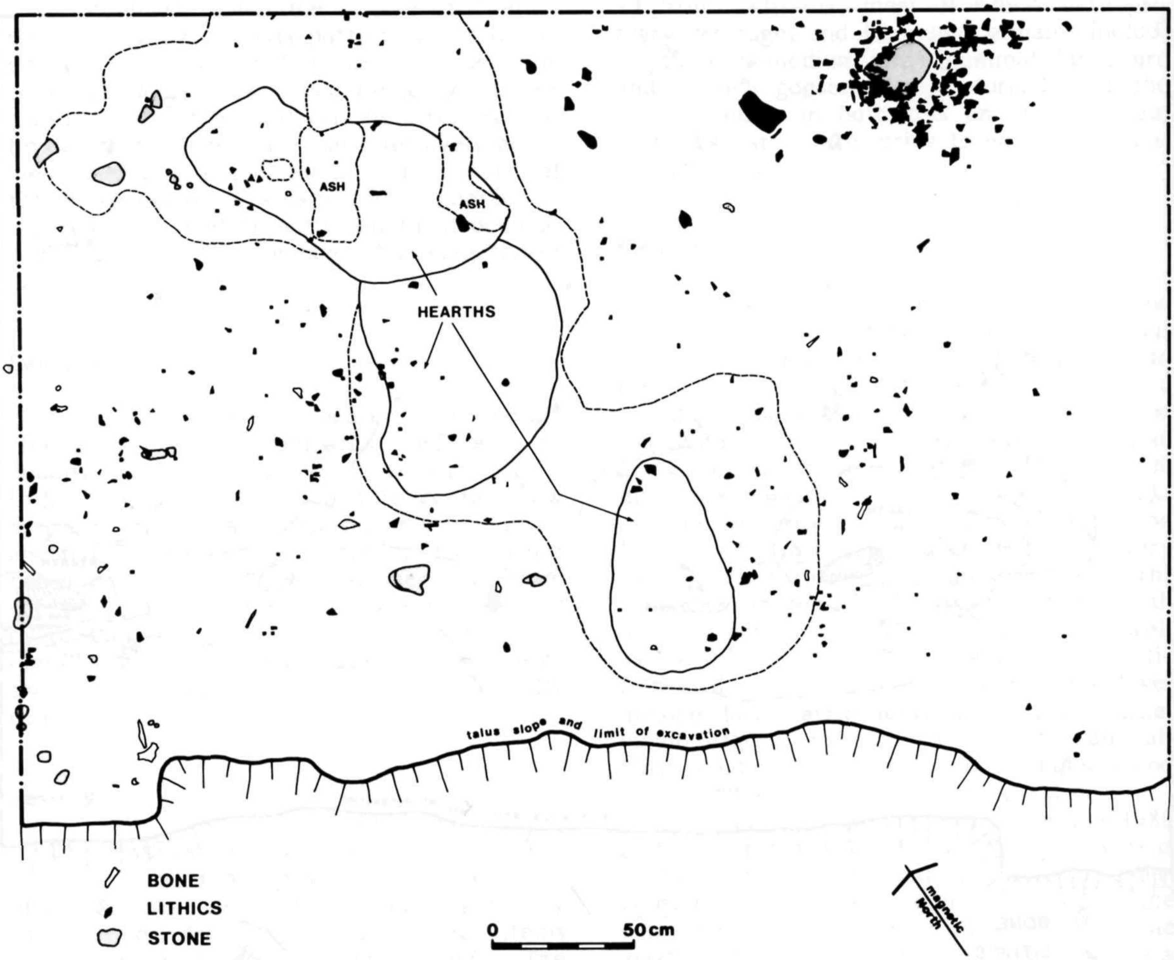
32 Archaeological remains and artifact classes in level 11.

summer occupation. Large, medium/large, medium and small mammal bones as well as medium-sized bird remains were also present.

Unlike the previous occupation surface, no features were found in this level. Faunal remains also differed from the previous level in being less fragmented and charred. A garbage disposal or sheet refuse area as opposed to a food processing/consumption area may be indicated.

Level 13

The thirteenth occupation surface (30R1H21) in the unit is located approximately 12 cm to 15 cm above level 12, 45 cm to 55 cm below the surface, in a fairly thick (5 cm), organically enriched palaeosol. Here over 780 lithic artifacts, 31 tools, 16 faunal items and several hearth-like features were found (Fig. 33). A radiocarbon date of 1040 ±

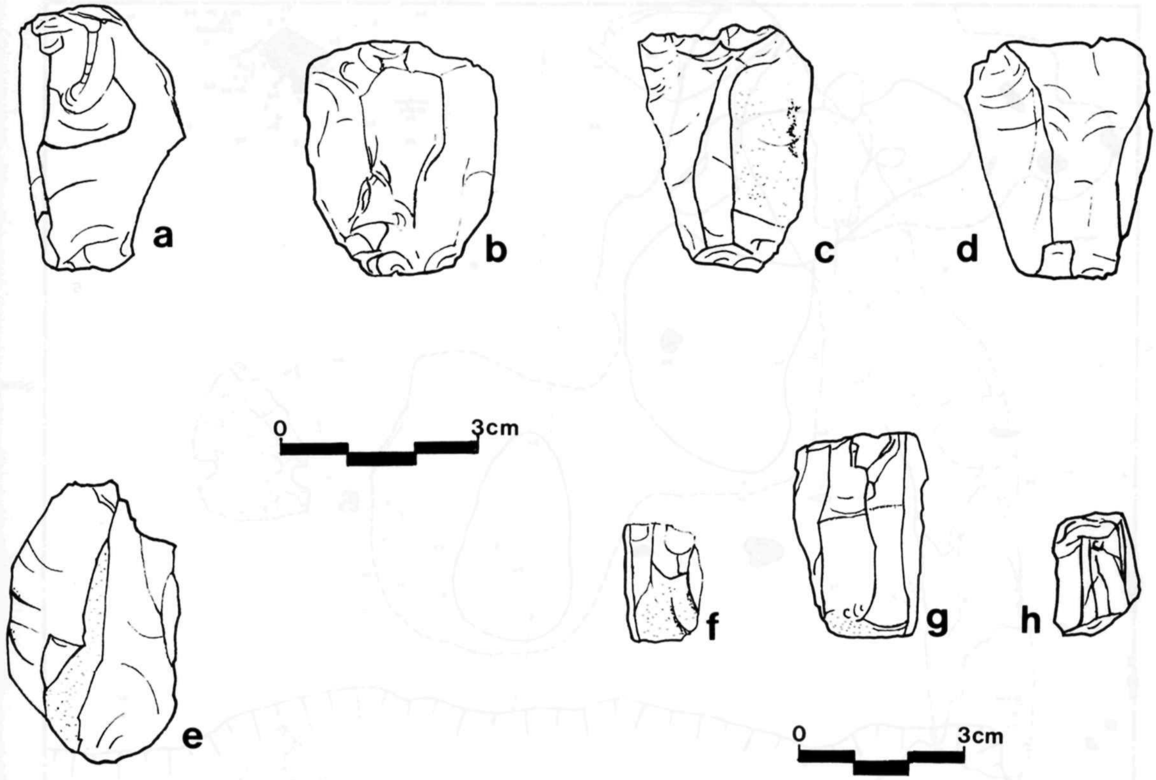


33 Archaeological remains from level 13.

75 B.P. (S-2175), obtained from a combined bone sample, appears to be in general stratigraphic agreement with those obtained from the rest of the profile.

Three shallow basin-shaped depressions argue for the presence of three hearths in this level. The close spatial proximity of two of these features further suggests two different firing episodes. In fact, the westernmost hearth appears to overlay the central feature, indicating that it may be associated with a later occupational event. The lack of bone in and around these hearths also suggests that they may have been used less for food preparation than for some other function. In this regard, the presence of heat-treated chert within these hearths may be instructive.

The densest concentration of artifacts in this level is located in the northeast corner of the unit. Here an assemblage of over 430 lithic artifacts, composed predominately of primary debitage, was found in association with a heavily battered granite rock. The latter, as well as the occurrence of eight bipolar cores (e.g., Fig. 34a-e) and numerous longitudinal/columnar flakes and angular fragments indicate the remains of a bipolar flaking station. Also associated with this cluster were several expediently employed flakes and three blade-like cores (Fig. 34f-h). While the latter cores do not appear to have been rotated, flakes were undoubtedly struck off these cores by placing them on the anvil stone. The occurrence of minimally utilized flakes



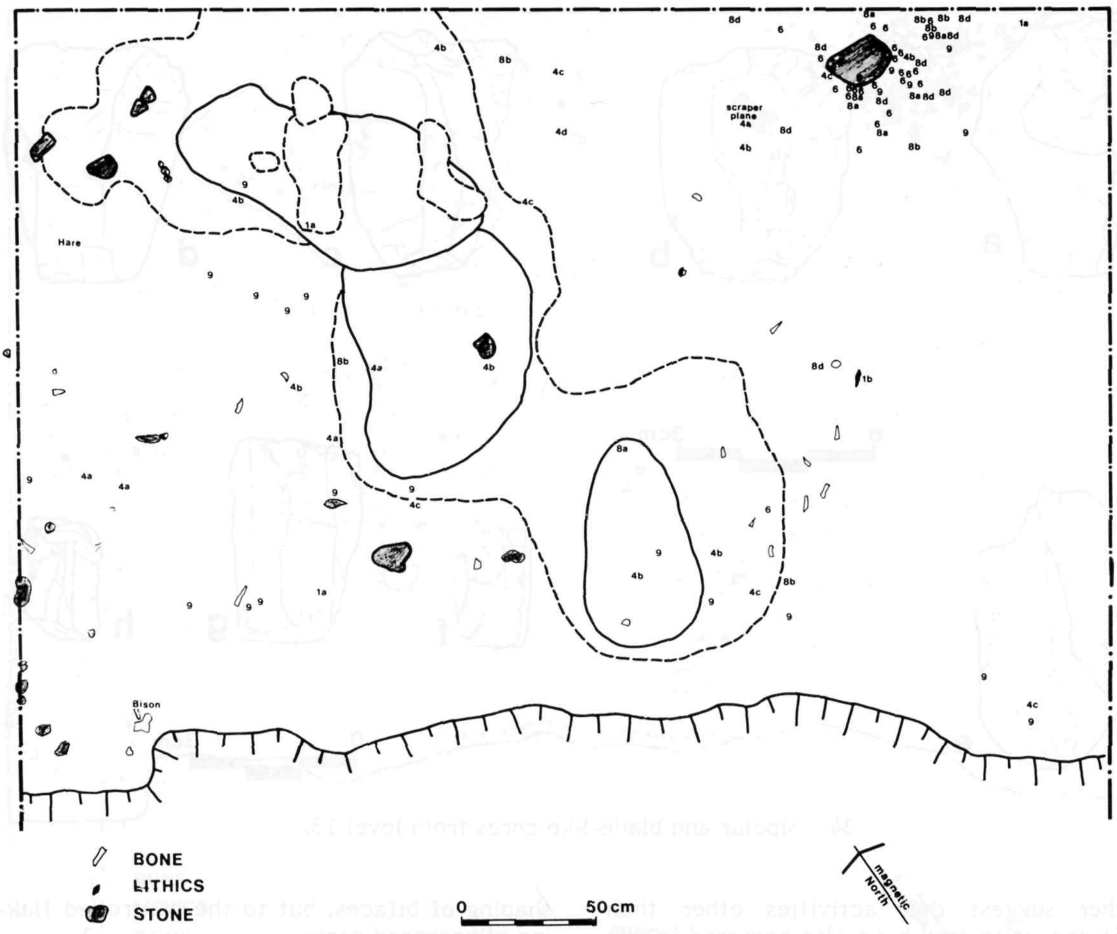
34 Bipolar and blade-like cores from level 13.

further suggest that activities other than lithic reduction may have also occurred in this area. From the above evidence it may be postulated that this dense cluster of artifacts relates to the production of columnar and blade-like flakes employing bipolar or hammer/anvil flaking techniques. Despite being located in the vicinity of several hearths, the tight clustering of this feature is suggestive of a lithic reduction sequence that occurred during a later or final episode of occupation.

Because most artifacts and tools appear to be fairly evenly distributed throughout the rest of the level (Fig. 35), it is difficult to identify any further specific loci of activity. One possible exception may be near the south side of the westernmost hearth. Here several later-stage biface reduction flakes and a complete side-notched projectile point (Fig. 36a) were found, indicating perhaps a retooling area. Most secondary debitage in this level relates not to the intermediate and final shaping of bifaces, but to the controlled flaking of prepared cores.

Other formal or finished tools in level 13 include a heavily reworked biface/projectile (Fig. 36b) and a large bifacially flaked scraper plane with pronounced rounding on its sinuous working edge (Fig. 36c). Expediently employed tools are dominated by edge and end/tip utilization. The latter tool type appears to include some graver-like implements.

Noticeably absent from the level is debitage relating to the maintenance/repair of tools. Even though the westernmost hearth area produced some debitage indicative of biface/projectile point production, the occupation surface yielded the largest and smallest percentages of primary (86.4%) and tertiary (.01%) debitage respectively. This may be due to a brief period of occupation or to the possibility that, in the presence of an abundant source of lithic raw material, curated tools from a previous campsite location may have been conserved. (A similar suggestion has



35 Various artifact classes in level 13.

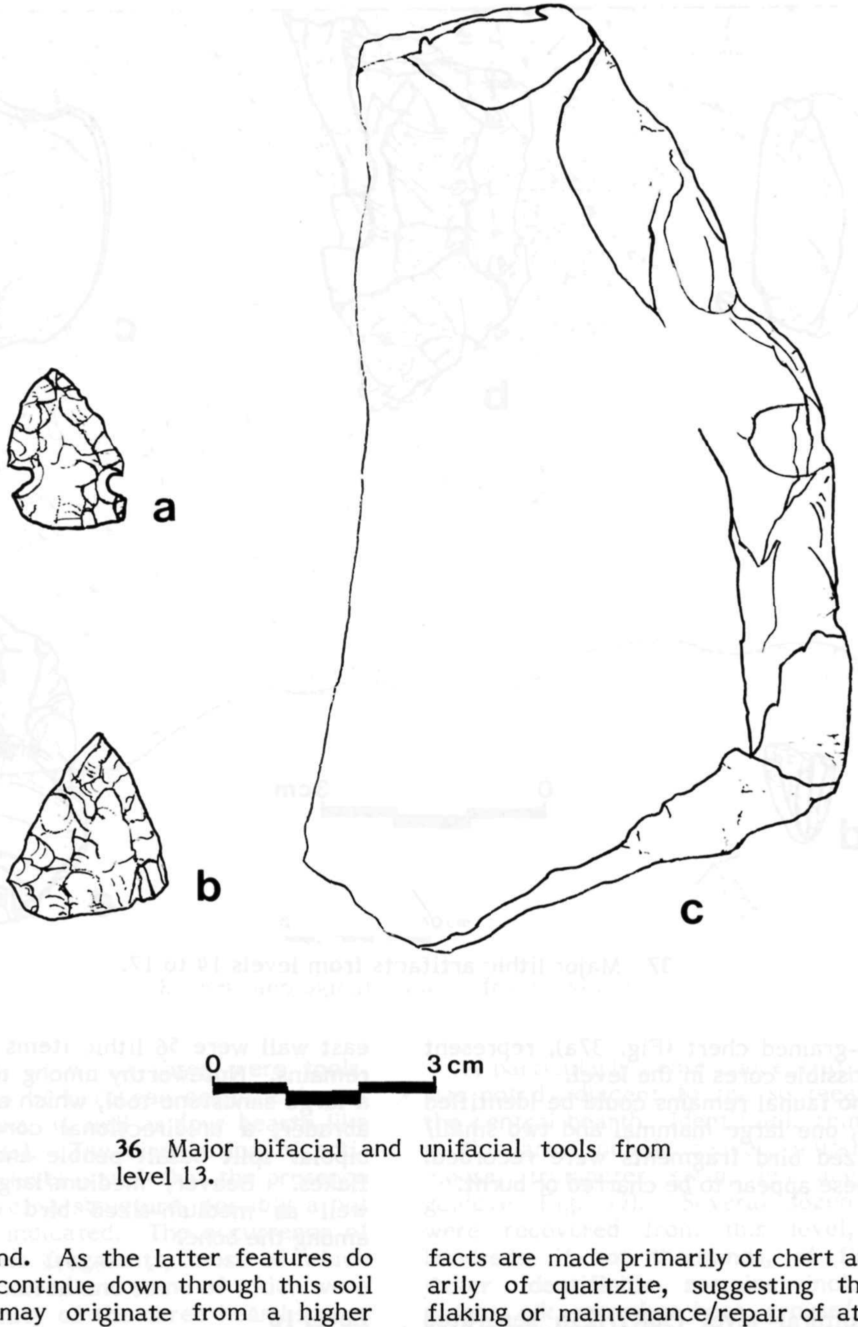
been forwarded to account for patterning at the Koster site in Illinois [Lurie 1982].)

Suggesting that the occupation may not, in fact, have been brief is the relatively high diversity of animals in this level, which would appear to indicate a relatively intense and/or prolonged exploitation of the local environment. Even though only 16 bone fragments were found, the remains of snowshoe hare, otter, bison and small bird as well as large, medium/large and medium mammal were noted.

The occurrence of several exotic lithic materials in this level also indicates the exploitation of a variety of non-local lithic sources. Moreover, that these lithics are heavily dominated by one type of material -- a petrified wood -- is not unlike the situation observed in level 7, where only one or two types of materials accounted for most exotic lithic materials. In this regard, as well as the occurrence of a fairly wide range of animal species, levels 7 and 13 are similar. Thus, it might be suggested that both levels may be the result of a similar subsistence/settlement strategy.

Level 14

Level 14 (30R1H22) is located approximately 35 cm to 40 cm below the present ground surface, 10 cm to 12 cm above the previous level, in a dark, organically enriched soil deposit. Here 191 lithic items, 13 tools, 64 bone fragments and two possible 3-cm post

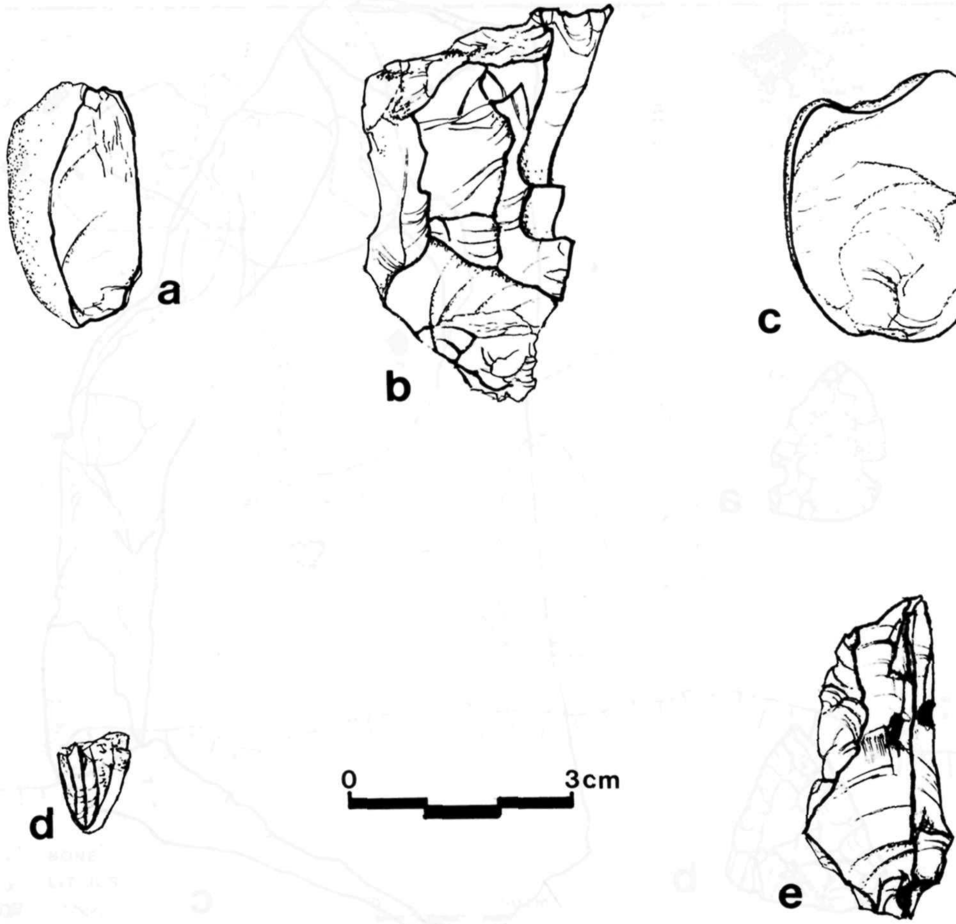


36 Major bifacial and unifacial tools from level 13.

holes were found. As the latter features do not appear to continue down through this soil horizon, they may originate from a higher occupation surface.

The densest concentration of artifacts was observed adjacent to the east wall of the unit in an area less than 0.25 m^2. Here a cluster of over 100 flakes, composed predominantly of later stage biface/projectile reduction and resharpening flakes, was found. These artifacts are made primarily of chert and secondarily of quartzite, suggesting the refined flaking or maintenance/repair of at least two different biface/projectiles. No other activity areas could be inferred.

Although no formally prepared tools were recorded, 13 minimally utilized tools made on secondary and tertiary flakes were found. Two bipolar split pebbles, including one of a



37 Major lithic artifacts from levels 14 to 17.

black fine-grained chert (Fig. 37a), represent the only possible cores in the level.

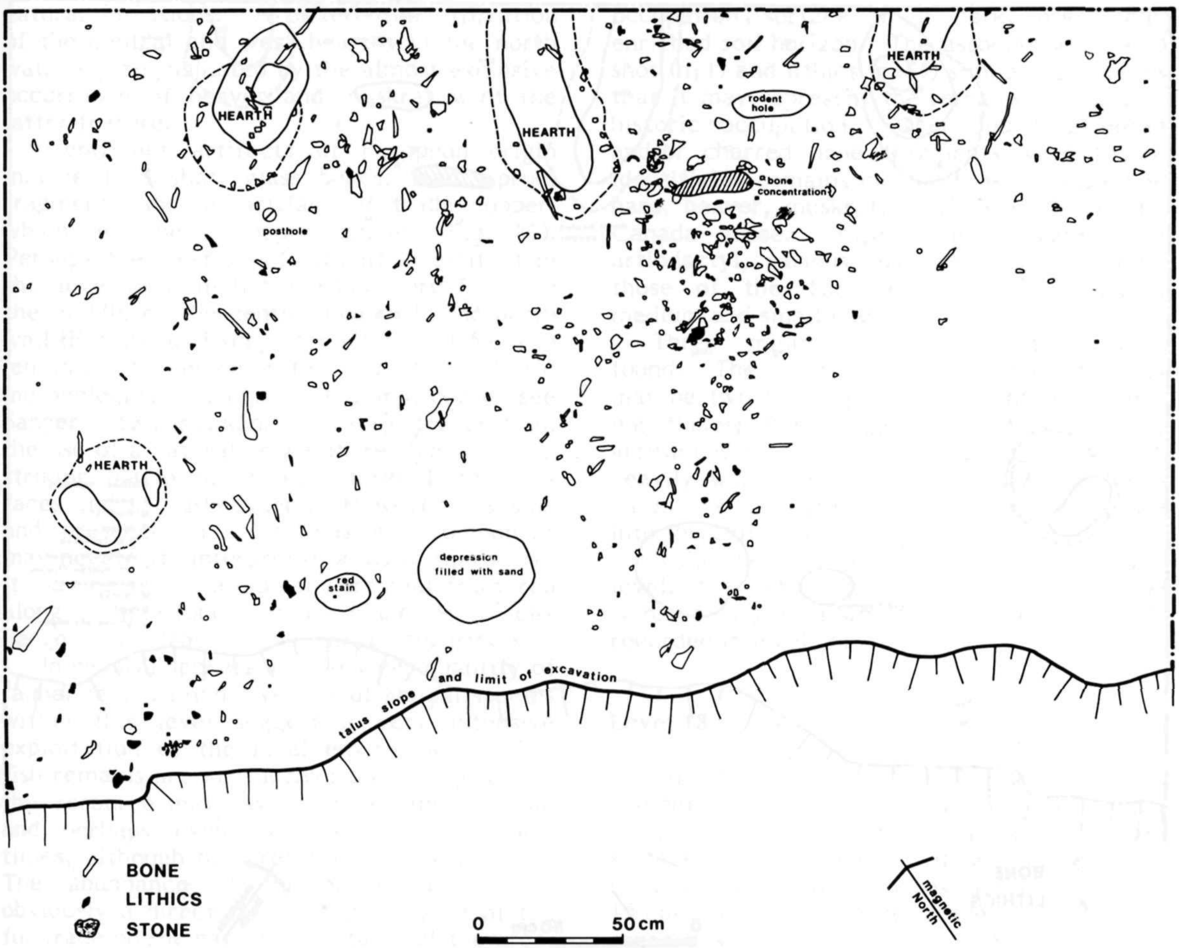
While no faunal remains could be identified to species, one large mammal and two small/ medium-sized bird fragments were recorded. Most of these appear to be charred or burnt.

Level 15

This cultural level (30R1H23), separated from the previous occupation surface by 2 cm to 4 cm of sterile silty sand, represents the uppermost prehistoric occupation surface within the unit. It is located in a fairly thick (3 cm to 4 cm) dark brown palaeosol that appears to have a thin lens of sand dividing it in some areas. Found concentrated near the east wall were 56 lithic items and nine faunal remains. Noteworthy among the former were a large sandstone tool, which appears to be an abrader, a unidirectional core (Fig. 37b), a bipolar split basalt pebble and three utilized flakes. Beaver, medium/large mammal, as well as medium-sized bird were identified among the bone.

Level 16

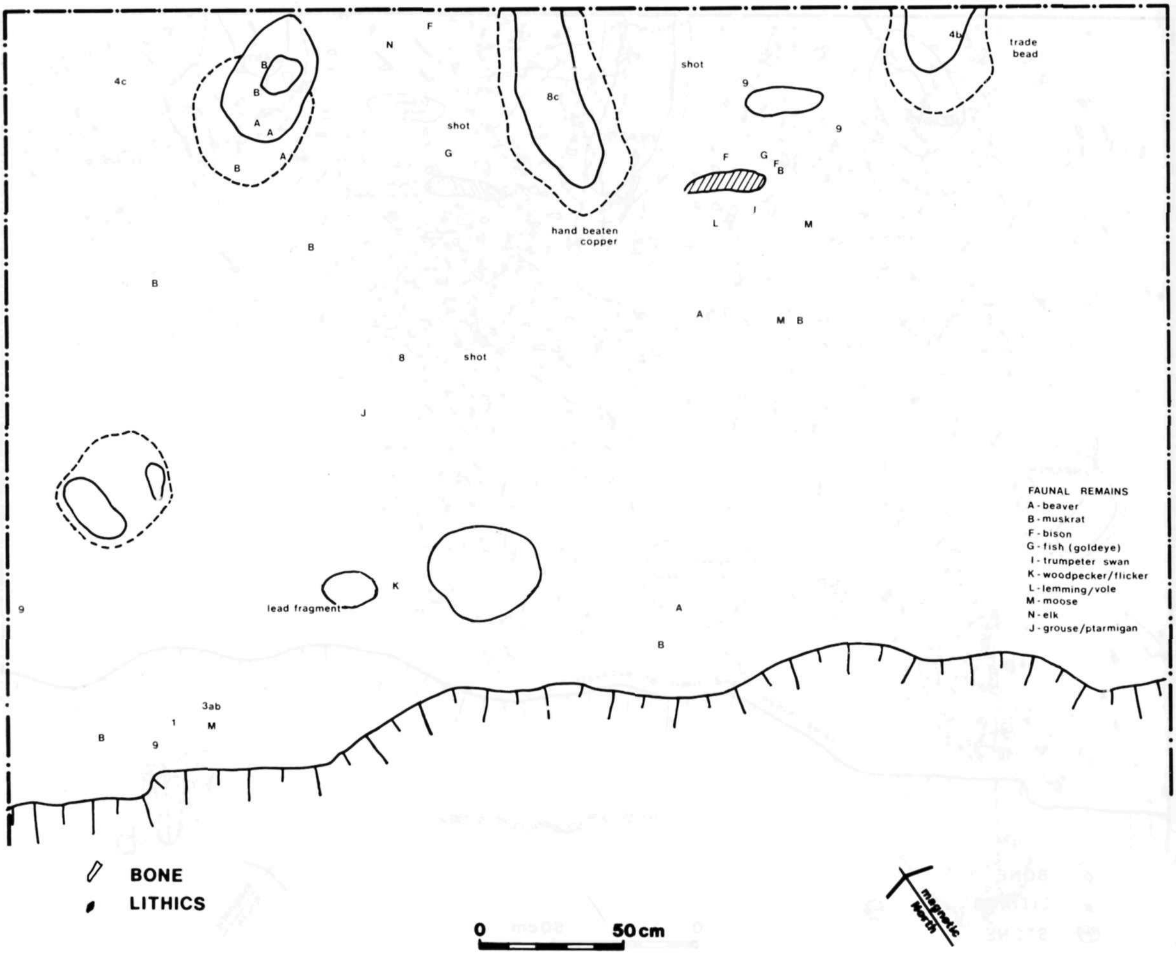
Level 16 (30R1H24) is the lowest of two protohistoric occupation surfaces in the unit. It is located in a fairly thick organically enriched soil horizon, approximately 3 cm to 4 cm above level 15, 23 cm to 27 cm below the surface of the site. Recorded within the level



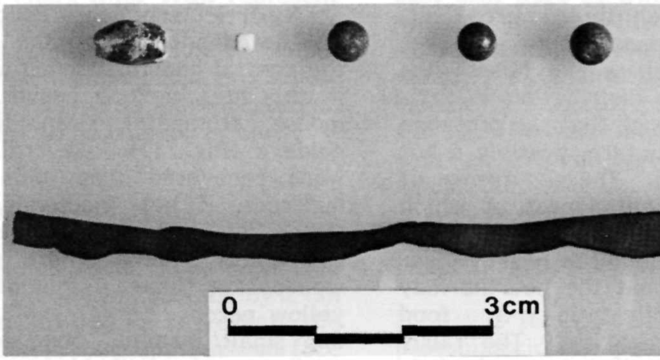
38 Archaeological remains from level 16.

were 74 lithics, of which three were tools, several artifacts of European origin and over 2250 faunal items, as well as four hearth-like features (Fig. 38). The distribution of artifacts within the level is such that the presence (i.e., boundary) of a structure, possibly a hut or skin tent, is indicated. The occurrence of hundreds of bone fragments, most of which were burnt or charred and some of which were cut, in the vicinity of the three hearths near the north wall suggest that the hearths may have served primarily in a food processing/preparation capacity. The fairly even spacing of these hearths and their apparently similar orientation may also indicate that they may be the result of a single or related depositional event.

A particularly dense concentration of bone was noted adjacent to the southeast side of the central hearth. Identifiable remains within this area include beaver, muskrat, bison, moose, trumpeter swan, lemming/vole and goldeye (Fig. 39). Several dozen fishbones were recovered from this level, as were hundreds, if not thousands, of fish scales. Other identifiable remains include small rodent, elk, snowshoe hare, grouse/ptarmigan, woodpecker/flicker, minnow and walleye/yellow perch. Large, medium/large, medium and small mammal bone as well as large, medium and small bird remains were also recorded. Judging from their fresher appearance and more articulated condition, the lemming/vole and small rodent bone may be



39 Various artifact classes in level 16.



40 Major historic artifacts from level 16. Top row, bead and shot; bottom row, hard beaten copper artifact (dangler?).

natural intrusions. A differential utilization of the central and west hearths in the north wall may be indicated by the almost exclusive occurrence of beaver and muskrat with the latter feature.

Significant artifacts of European origin include lead shot, glass beads, lead (sprue) fragments and an artifact of trade copper, which may be a copper dangler (Fig. 40). Perhaps the most significant lithic artifact in this level is a small blade-like core found in the middle of the central hearth in the north wall (Fig. 37c). Except for its size (1.5 cm in length), it demonstrates all the classic morphological attributes of a microcore (see Sanger 1968), including core edge preparation, the use of a natural or weathered surface as a striking platform, at least three fluted surfaces and a crushed keel. However, its size and presence in a protohistoric component may negate its interpretation as a microcore: it may be simply a bipolar core that fractured along a limestone bedding plane or a scavenged curio from a much earlier deposit.

In general appearance the sheer quantity of faunal remains and diversity of animal species within this level suggest a very intensive exploitation of the local environment. The fish remains are instructive; they suggest that this resource may have been readily available and perhaps even exploited in prehistoric times, although not preserved in lower levels. The abundance of fur-bearing animals is obviously a direct result of the impact of the fur trade on the native inhabitants of the area. However, the fact that many remains of fur-bearing animals were cut, fragmented and/or charred indicates that they were also eaten. Together with the hearths and the possible presence of a structure, the faunal remains suggest that this occupation surface represents the remains of an intensively utilized protohistoric base camp. If so, it may be the continuation of a subsistence/settlement pattern that began in prehistoric times. It may be similarly instructive that all faunal remains providing evidence of seasonality (e.g., eggshell fragments, fish scales, immature bird bone and migratory bird), combine to suggest an early spring to early summer occupation.

Level 17

Cultural level 17 (30R1H25) is located immediately (1 cm to 2 cm) above the previous occupation surface in a dark, organically enriched soil horizon. The association of lead shot (n=1) and lithics (n=65) similarly indicates that it may represent the remains of a protohistoric occupation. Over 300 fragmented and/or charred bone fragments were found. Identifiable remains include those of snowshoe hare, beaver, muskrat, black bear, bison and Canada goose. Also recorded were large artiodactyl, various sizes of birds (including those of the Turdidae family) and large, medium and small mammal.

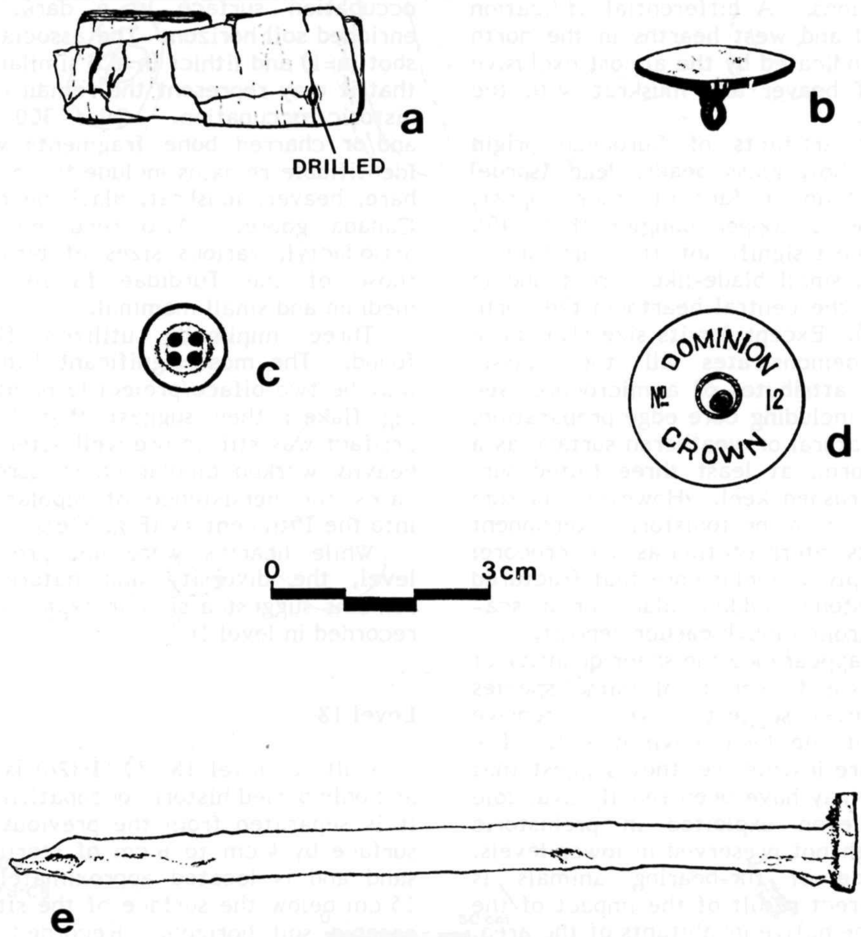
Three minimally utilized flakes were found. The most significant lithic artifacts may be two biface/projectile point resharpening flakes; they suggest that this type of artifact was still in use well after contact. A heavily worked bipolar chert core also indicates the persistence of bipolar technology into the 19th century (Fig. 37e).

While hearths were not present in this level, the diversity and nature of faunal remains suggest a similar exploitation to that recorded in level 16.

Level 18

Cultural level 18 (30R1H26) is the highest and only buried historic occupation in the unit. It is separated from the previous occupation surface by 4 cm to 6 cm of sterile, tan silty sand and is located approximately 12 cm to 15 cm below the surface of the site in a dark organic soil horizon. Recorded within this level were a cut piece of a birch bark, a copper button, a glass button, a 12-gauge shotgun shell casing, several pieces of glass, a small tin cap, several pieces of metal strapping and two wire nails (Fig. 41a-e), as well as 474 faunal items. Snowshoe hare, beaver, muskrat, black bear, Canada goose, northern pike, walleye/yellow perch and large artiodactyl as well as various sizes of mammals and birds were observed among the faunal remains.

The wire nails and the shotgun shell are perhaps the best reflection of the age of this level. While the bulbous and eccentrically aligned nail heads fit well with Nelson's (1968) description of early wire nails produced in the late 1890s and early 1900s, the words "Crown" and "Dominion" on the shell headstamp did not appear until 1900 and 1907 respectively (Provick and Krevosheia 1966). The rest of the artifacts also do not appear out of place in the first quarter of this century.



41 Major historic artifacts from level 18.

CHAPTER VI
A RECORD OF CULTURAL DEVELOPMENT, CHANGE AND CONTINUITY IN NORTHEASTERN ALBERTA

The Peace Point site offers a unique opportunity to investigate the past cultural dynamics of the region. In fact, the deeply stratified nature of the site and its high degree of structural integrity, combined with a rapid rate of sedimentation, present a set of phenomena rarely encountered in archaeology.

The discovery of up to 18 distinct occupation surfaces is unique, not just to the region but to the boreal forest and much of Canada as well. In fact, as more areas of the site are opened up, many more cultural levels will undoubtedly be exposed. The site thus approaches some of the more important Old World Palaeolithic rock shelter sites in its stratification. Unlike the latter, however, which were often formed over tens of thousands of years, Peace Point's occupational sequence (at least in the lower cliff areas) was laid down in less than two and one-half millennia, thus eliminating any possibility of change resulting from major evolutionary developments or processes. The lack of natural post-depositional disturbance combined with patterning thought to result from discrete occupational events further suggest that variation produced by non-cultural formation processes and multiple occupation may be minimized at Peace Point. The site may not only be able to resolve many problems relevant to the prehistory of the region, but it also appears to be an ideal testing ground for many questions germane to much of hunter-gatherer archaeology today.

While the following chapter addresses two issues raised in the previous chapter that may be of broader interest to the discipline as a whole, this chapter reviews that data from Peace Point having direct relevance for documenting prehistoric cultural development, change and continuity through time within the lower Peace River lowlands. It should be pointed out that no definitive, or even provisional cultural-historical chronology is offered here. Rather, broad temporal trends within the data are illuminated and tentative comparisons of the sites' most productive living floors are made with data from other sites in the region and adjacent areas.

In recognition of certain limitations in these traditional methods of regional chronology building, the last section of this chapter is an attempt to formulate a model designed to extract more meaningful cultural-historical sequences from sites such as Peace Point. Specifically, regional cultural development, change and continuity are addressed in terms of variation in site use and mobility patterning at a specific location through time. The implications of the model for modelling local land-use patterns and understanding the past cultural dynamics of the region are discussed.

Broad Temporal Trends

Prepared Core Technologies

In a stratified campsite where lithic reduction/tool production was a major component of site activities it is not surprising that lithic technology would be a sensitive indicator of change through time. In this regard the most notable trend appears to be in the removal of flakes from prepared cores. While prepared cores were noted throughout most major occupation surfaces, the first real evidence of bipolar core technology does not appear until level 6, or about 1500 years ago. The presence of a single bipolar flake in level 5 may be fortuitous. At the very most, the artifact indicates that bipolar flaking was a comparatively insignificant method of removing flakes from prepared cores when the level was occupied. Bipolar flaking continues to be the dominant method of removing flakes from prepared cores from level 6 to the subsequent disruption of traditional lifestyles during the early historic period.

At about the same time as the appearance of bipolar core technology is a disappearance of unidirectional/blade-like core technology. In the lowest major levels, levels 1 and 5, prepared cores were exclusively unidirectional and blade-like. In fact, two cores from level 1 may be microcores. However, this type of core virtually disappears above level 5, or after 2000 years ago. (The blade-like cores from level 13 were produced by bipolar flaking, and are certainly cores of that genera. However, the enigmatic microblade-like core from one of the protohistoric levels remains just that.) With the appearance of bipolar technology and disappearance of unidirectional blade-like cores there is a corresponding decrease in blade-like flakes and tools made on blade-like artifacts. The blade-like flakes in occupation surfaces above level 5, with rare exception, are linear and/or columnar flakes produced by the bipolar flaking technique.

It remains to be determined whether or not these prepared core technologies may be temporally diagnostic within the region. Certainly the limited evidence presented here suggests that this line of inquiry is worthy of investigation. Pollock (1977) has suggested that bipolar split chert pebbles may be a diagnostic artifact in the area. Since this type of artifact was recovered only from upper Late Prehistoric living floors, no exception is taken here with Pollock's observation. However, it is conceivable that the trend noted in prepared core technologies, or any other artifact for that matter, might be rejected or even reversed with further excavation.

Faunal Remains

In a stratified site that demonstrates faunal material throughout so many occupation surfaces, it also is not surprising that species diversity would be a sensitive indicator of change in subsistence strategies through time. In the previous chapter, a relationship was noted between the diversity of animal species and lithic materials throughout a number of levels. However, there also appears to be a trend towards a broader range of species being exploited with time. This pattern culminates in the protohistoric levels where many organics not usually preserved in archaeological sites (e.g., spruce needles and fish scales) are found. While differential preservation of delicate and robust bone certainly accounts for some of this trend, an alternative explanation is offered. Specifically, it is suggested that the increase in faunal diversity through time is the result of the site being utilized increasingly as a major base camp, resulting in a broader range of species being exploited over longer periods of occupation. The possibility that the site may have been used more as a major base camp in later times was hinted at in the previous chapter, and will be explored more fully below.

Features

With the possible exception of two levels, 7 and 16, that demonstrated distributions of artifacts indicative perhaps of the existence of a hut or tent, no evidence of dwellings was found. Rather, the most common features noted throughout most major occupation surfaces were hearths. Of the two types of hearth identified, rock lined and shallow basin, the former was restricted exclusively to the lowest level. All hearths above level 1 were shallow and basin shaped. Whether this difference reflects a cultural difference or change through time remains uncertain, though it might be instructive that Reeves (1973) views the change from rock-filled to basin-shaped hearths as one of the distinctive characteristics of Besant, the first phase of the Napikwan tradition – the tradition considered to define most of the Late Prehistoric period on the northern plains.

Tools

Over 280 tools were recovered from the excavation unit. However, comparatively few were formally prepared or retouched into desired shapes prior to use. In fact, over 81 per cent of the tools were expediently employed flakes. Only seven finished bifaces, of which no more than one could be considered culturally diagnostic in any sense of the word (see below), and 15 finished scrapers were found. Since this small sample of finished tools precludes any form of detailed analysis, it might be fruitful to direct attention towards flake tools – the most common tool at the site and in the region.

Of all the flake tools recorded, two groups appear to be more stratigraphically distinct (i.e., separable) than others. These are that group from the lowest levels with steep utilization on one side of an angulated dorsal tip, and that from level 7 with continuous bifacial to alternating modification on one or both lateral edges of an elongate flake. Edges perpendicular to the working end of several flakes within each group appear to have been retouched to facilitate ease of handling.

While functional differences may be indicated (engraving/scoring of moderate to hard surfaces as opposed to slicing/cutting/sawing of softer surfaces), there may also be a cultural component to differences in flake morphology, as hinted at by the change in prepared core technologies.

However, before the diagnostic value of flake tools can be addressed, two criteria need to be met. First, much larger areas of the site will need to be excavated in order to recover a larger sample of tools from each occupation surface. Once this is done, flake tools could be subjected to a numerical taxonomic technique such as factor analysis to determine if flake tools separate out in levels. If there is some correspondence between groups of tools derived from the cluster analysis and groups of tools from different occupation surfaces, this would add some weight to the diagnostic value of such artifacts, especially if differences in seasonality, resources exploited, activities conducted, group composition, occupation span, site formation processes, etc., were accounted for. At the same time, a principal components analysis could be carried out to determine what variables or combinations thereof account for the most variation within the data. These attributes could then be employed and tested as culturally or temporally diagnostic indicators within and between sites in the region.

While it seems premature to attempt this exercise here, continuous, ordinal and discrete attributes of expediently employed flakes that might prove useful in this type of endeavour are presented in Appendix C. It seems obvious that this method could also be used to determine the diagnostic potential of other types of artifacts, such as thinning flakes associated with later-stage core/tool production.

Comparisons of Occupation Surfaces

Level 1

A number of characteristics distinguish this level from all others in the unit. Apart from differences in hearths, the most obvious is the presence of a microcore industry. Specifically, several microblades and two microcores were found in this level. While prepared parallel, elongate flakes with triangular and prismatic cross-sections were undoubtedly struck from these cores, they do not appear to demonstrate the degree of technological sophistication (i.e., preparation or control) exhibited by microcores from the recently discovered microblade site, HhOv-73, in the Alsands area (Ray Le Blanc, pers. com., 1982). In this respect they are more like the microcores recently found at 32R23 on the Slave River (Proch and Stevenson 1982) and 34R57 20 km upstream of Peace Point near the Boyer Rapids (Stevenson and Proch n.d.). Strong parallels are also seen with some microcores from the Fisherman Lake locale in the southwest N.W.T. (J.V. Millar, pers. com., 1982); and it is there that these cores have perhaps their closest parallels.

In a recent update of the Fisherman Lake cultural sequence, Millar (1981, n.d.) recognizes the Julian Core Tool Industry to include much of the Early Northern Archaic period in the area from 4000 to 1000 B.C. The Pointed Mountain, the Transitional and Julian complexes define the early, middle and late complexes of this period. Throughout the early complex, Julian technology is contemporary with a true microblade industry. While the Julian complex is thought to die out before 2200 B.C., Julian technology continues up to the Mackenzie complex. Even though true microcore technology is considered to disappear with Pointed Mountain, a small percentage of cores and linear flakes of Julian chert from the Transitional and Julian complexes fall well into the morphological and metric range of microcore technology (Millar n.d.). Since a) attempts to separate these groups statistically have proven unsuccessful (Millar n.d.), b) true microcore and Julian technologies occur mostly together in the same components although they are known to occur separately (Millar n.d.; pers. com., 1982), and c) microcores and microblades are made predominantly of exotic or non-local materials more homogenous than the local chert (personal observation), any variation in these assemblages simply may be the result of a shift through time from curated to expedient lithic technologies. That is, differences in morphology, material type and time frame could be easily explained with reference to the possibility that a relatively mobile population, exploiting a number of dispersed, high-quality lithic sources, was becoming increasingly more localized or sedentary with time. This would result in a more localized and expedient industry characterized by the use of local raw materials. Certainly, this hypothesis accords well with the data and Millar's (n.d.) observation that the Early Northern Archaic represents the earliest substantiated adaptation to the boreal forest in the area. If correct, this model may have important and testable implications for understanding the disappearance of microcore technology in other regions of northwestern North America. In any event, it seems clear that a microcore technology — albeit not as abundant, well developed or refined as in earlier times — persisted in the Fisherman Lake area well into the first millennium B.C. It is perhaps instructive in this regard that the microcore from 34R57 is made of a non-local chert that, in all respects (e.g., grain, texture, inclusions, etc.), is identical to Julian chert.

Another similarity that level 1 shares with the Julian Core Tool Industry, and especially the Julian complex, is the presence of small blade-like tools. Moreover, many of these tools appear to demonstrate similar types of modification (e.g., steep retouch or utilization on one side of an angulated tip). Blade-like flakes, however, also have been found in the Birch Mountains and at Calling Lake and are similarly common in the earliest two complexes of the early Taltheilei tradition — a time frame well within the one- and two-sigma range of the radiocarbon dates from this level.

Although bifaces and scrapers are common to most prehistoric cultures in North America, the asymmetric sinuous edged quartz biface and humpbacked chert end scraper from this level also have close parallels with those found in the Julian complex. Given the limitations of the data, further comparisons or speculations do not seem warranted.

Level 5

The level 5 occupation surface demonstrates a number of similarities with level 1. Perhaps the most obvious is the presence of a prepared, unidirectional, blade-like core technology. Blade-like flakes, some of which have been utilized or retouched, are also found in this level. As noted above, the change in hearth types is the most striking difference between these levels. Although few hearths have been excavated in northeastern Alberta, those recorded are exclusively of the shallow, basin-shaped variety. Although not clearly diagnostic, a broken rectangular biface is not unlike specimens reported from the Julian complex (Fedirchuk 1975).

Level 6

From a comparative standpoint, the most significant artifacts from level 6 are the bipolar chert core and sandstone projectile point tip. While the point lacks sufficient diagnostic information for definitive comparisons, it is interesting to note its tendency to flare towards the base. This is not unlike some "eared" projectile points from the Narrows complex in the Middle Taltheilei Shale tradition. However, the earlier dates from this level may preclude any comparisons in this direction.

The implications of the core in this level have been addressed previously. Bipolar cores are the most common type of prepared core found in northeastern Alberta; they have been recovered from virtually every major excavated site in the region from Calling Lake to Wentzel Lake. They also appear to occur on the shores of Lake Athabasca, although it is not clear whether Wright's (1975) bipolar wedges are cores. While bipolar technology is present in the southwest (Millar 1968) and central (Noble 1971) District of Mackenzie, it appears to be much less common than in northeastern Alberta. The only other stratified sites within the region to produce bipolar cores, the Wentzel Lake and 31R26, did so only from the uppermost strata. Additionally, late dates have been obtained from two other sites yielding bipolar cores in northern Alberta, the Karpinsky and Wabasca Lake sites.

Level 7

Although the level 7 occupation surface was the most productive prehistoric level in the unit, few artifacts suitable for intra-regional comparisons were found. The unilateral-barbed bone point from the level is a type that has a fairly wide distribution throughout much of the northern boreal forest of western Canada. It has been found, for example, at Lesser Slave Lake and in the later prehistoric complexes of the central and southwest District of Mackenzie. The variety of scrapers noted in this level are also common throughout the region.

The variety of non-local quartzites in the level are perhaps the most informative artifacts from a comparative standpoint. As noted previously, these quartzites are among the most common lithic materials found in sites in the Birch Mountains. Whether this provides evidence for contact between this area and the lower Peace River lowlands is uncertain. Lower Peace River chert, however, is far from being the most common type of non-local lithic material in the Birch Mountains. In fact, this chert appears to be one of the rarer lithic types in the area. Even if, for the sake of argument, the quartzites are assumed to reflect contact between these two areas, the cherts would indicate a subsistence-settlement pattern inherently more complex than simple upland-lowland transhumance. This is not to say such a subsistence-settlement strategy was not employed within the region. On the contrary, the fact that the type of chert found in the vicinity of Peace Point is one of the most common lithic materials recovered from the Wentzel Lake site would seem to indicate transhumance between the lower Peace River lowlands and Caribou Mountains.

Level 13

Of all the major occupational surfaces in the unit, level 13 is perhaps the most suitable for attempting regional comparisons. Of specific interest are the arrow point and the petrified wood, the bipolar cores having been discussed previously. The side-notched square-based projectile is most easily classified as a Prairie side-notched point of the Late Prehistoric Plains period. While points of this type are rare in northeastern Alberta, they have been found in late contexts in the Black Lake area of northern Saskatchewan. The artifacts of petrified wood would similarly suggest relationships to the south, as this type of material has been recovered only from Lesser Slave Lake in northeastern Alberta.

Regional Chronology Building from the Ground Up

Even though a number of important temporal trends within the Peace Point data may have been illuminated, and comparisons of one or two major living floors may have proved instructive, it seems obvious that these traditional methods of regional chronology building are inadequate for elucidating the past cultural dynamics of the region. Such endeavours are concerned primarily with documenting similarities and differences within and between sites using type-based systematics (Binford 1982). They do not address the operation of past cultural systems nor acknowledge the amount of variability that even one group can produce at different places at different times while moving across the landscape in pursuit of seasonally available resources. They are, in effect, incapable of informing us about the processes that brought about patterning within and between sites.

Although such methods have some utility under some circumstances, this section addresses culture development, change and continuity within an area in a manner similar to that recently propounded by Binford (1982); it looks at the Peace Point data in terms of variation or differentiation in mobility patterning and site use at a specific location through time. To understand the past, we must understand places (Binford 1982: 6). That is, we must seek to know the various roles and functions that specific places had at different times during the past. If we can begin to explicate the role of a specific place within a past cultural system at any one time, then we can begin to understand the operation of that society and their land-use patterns within a particular environmental setting.

It should be made clear that this section is intended only to demonstrate the potential of the Peace Point site to formulate a cultural chronology in this manner. It is a model-building exercise first and foremost, and no culture-historical sequence is offered. In spite of this, however, the data and discussion that follow should prove useful and illuminating for future attempts to document culture development, change and continuity within the region using the concepts of mobility patterning and site use.

Mobility Patterning

In the previous chapter, an inverse relationship was noted between the diversity of lithic materials and faunal species in the three lowest major levels (levels 1, 5 and 6). When a relatively high diversity of lithic materials was noted, it was found in association with a low diversity of faunal species in the direction of large game. Conversely, when a low diversity of lithic materials was noted, it was found associated with a higher diversity of animals. While the first pattern was suggested to represent a highly mobile subsistence-settlement strategy based on the exploitation of large game, the second pattern was thought to represent a less broad-ranging strategy based upon a more intensive use of the local environment.

This patterning gave way in the last two major prehistoric living floors (levels 7 and 13) to one where a high diversity of animals was found to be roughly correlated with relatively high diversity of lithic materials. Upon closer examination, however, it was also discovered that non-local lithics were heavily dominated by one or two materials. The explanation offered for this pattern was that it represented a subsistence-settlement strategy in which major base camps were moved from one intensively utilized area, with an optimal congruence of resources, to another, with little intervening exploitation of resources (lithic or otherwise) between base camp locations. This would account for both the broad range of species exploited and the curation of tools made predominantly of one or a few non-local lithic materials from a previous base camp locale. Binford (1982) has noted that point-to-point mobility is common among logistically organized hunter-gatherers, and this would be precisely the archaeological correlate one might expect to monitor this type of positioning tactic.

While point-to-point base camp movement can be invoked to account for patterning in levels 7 and 13, no encompassing theory has yet been advanced to explain patterning observed in the lowest three levels. Drawing again on Binford's (1982) recent research, it is suggested that this pattern may be the result of a classic encounter strategy in which resources were exploited in relative proportion to their encounter frequencies. Highly mobile groups employing this type of strategy would undoubtedly encounter and exploit a variety of lithic sources. However, one would also expect tools from different sources to be discarded at different times and places in relative proportion to when sources were encountered, moderated, of course, by intensity of tool use and functional utility at specific locations. Thus at any one site occupied by a <u>highly mobile</u> group operating under this type of strategy, tools differing in material types as well as remaining use-lives might be expected to be used and even discarded. The large quartz biface (which is almost certainly still functional), and the exhausted green chert microcore from level 1 and the broken sandstone projectile and grey-brown quartzite biface/projectile point resharpening flakes from level 6 are cases in point. Conversely, in a site occupied by a less mobile group exploiting resources on the basis of their encounter frequency, one would expect lithic and faunal remains to be predominantly, if not exclusively, local in origin. With an intense utilization of the local environment over longer periods of time, curated items of utilitarian value from previous locales would be used and discarded quickly.

Binford (1982: 11) observes that strategies in which resources are exploited in proportion to their encounter frequencies are common among foragers. Such strategies are aimed at learning about the distribution of resources within a region. Point-to-point mobility, on the other hand, is an organizational tactic that is an accommodation to a prior understanding of resource distributions (which are generally incongruent) within a region. From Binford's perspective, then, we may view levels 1, 5 and 6 as being occupied by foraging groups employing coverage tactics to maximize resource encounters, and levels 7 and 13 as being occupied by collecting groups employing positioning tactics designed to take advantage of a prior knowledge of resource distributions. It logically follows that the former strategy would precede the latter in time.

While the change in prepared core technologies suggests that the shift in mobility patterning may be perhaps accompanied by a cultural change, Binford (1982) goes on to note that groups, even within a single annual cycle, may employ both coverage and positioning tactics depending on the seasonal availability and density of resources.

Site Use

It is important to point out that mobility patterning at a single site cannot be addressed without considering variation in site use. While evidence from levels 7 and 13 (and even 16 and 17) indicated that the site may have been used as a major base camp by groups of collectors in later times, levels 1, 5 and 6 suggested that the site may have been utilized as a campsite by groups of foragers with differing degrees of mobility in earlier times. Nevertheless, since hunting parties and perhaps other task-specific groups ranging out of collector base camps may be expected to employ coverage tactics to maximize encounters with resources, it is conceivable that levels 1 and 6 may be simply the remains of field camps occupied by groups of logistically organized hunters. In fact, this explanation may better account for the almost exclusive occurrence of large game in both these levels; highly mobile groups operating under a classic encounter strategy would not be expected to concentrate solely on one type of animal to the exclusion of all others. In this light, levels 1 and 6 could represent special task sites of collecting groups just as well as campsites of foraging groups. Perhaps one way of resolving the issue would be to determine how much evidence each demonstrates of the exploitation and processing of large game for transport. The fact that both produced biface/projectile point resharpening flakes and butchered bone would seem to favour the hunting camp hypotheses. However, both levels yielded tantalizing evidence of the presence of women — a finding not generally expected for such sites occupied by logistically organized groups. Thus the foraging camp scenario cannot be discounted.

The evidence is ambiguous to say the least. The discussion, however, does draw attention to the inadequacies of current theory for explaining patterning within a single site, let alone between sites. Moreover, it suggests that one cannot gain knowledge about the operation of past societies using the concept of mobility patterning without addressing site use. Indeed, attempts to illuminate change in mobility patterning through time from sites such as Peace Point must be considered incomplete if they do not endeavour to explicate the various roles and functions served by that site even within one cultural system. As Binford (1982: 11) notes, "mobility patterning may be both geographically variable and regionally complicated."

Discussion

In summary, three types of occupations have been inferred from data collected during the 1981 excavation of Peace Point. These are 1) either campsites of mobile groups of foragers employing coverage tactics, or hunting camps of mobile collectors employing foraging tactics while operating under a logistical strategy, 2) a campsite of a less mobile foraging group exploiting resources based upon their encounter frequencies, and 3) base camps of collectors operating under a point-to-point mobility pattern. Of the three interpretations, the last is perhaps the most conclusive and instructive. Peace Point's role as a major base camp in later times finds support in the pronounced increase in faunal diversity in occupation surfaces above level 6. Radiocarbon dates of 1405 ± 95 (S-2067), 1395 ± 110 (S-2068) and 1385 ± 125 B.P. (S-2070) from a 50-m section of cliff near the westernmost limit of 30R1 also indicate an intensive use of the site beginning about 1400 years ago. Finally, the most extensive and continuous distributions of artifacts along the cliff at Peace Point were noted in the upper half of most profiles.

Because of data limitations, the interpretations of these levels should be regarded as provisional. They do, however, provide a model for site occupation and a direction for future research employing the concepts of mobility patterning and site use. If, for example, the site functioned in later times primarily as a major base camp for logistically organized groups operating under a point-to-point mobility strategy, subsequent research should yield further evidence of a high diversity of faunal species and a non-local lithic material profile dominated by one or a few types. At the same time, one would expect the site's increasing use as a base camp to be met with a corresponding increase in resource scheduling and a decrease in seasonal variability of site occupation. This, in turn, would result in less varied associations between the kinds and proportions of resources being exploited from one occupation to the next. Thus, if the site served predominantly as a base camp for logistically organized groups in later times, increasing regularity in site use, season of occupation, kinds and proportions of resources exploited, as well as group size, composition, etc., would be expected.

Conversely, if the site served other, more variable functions in earlier times, for instance, campsites of foraging groups or field camps of specialized task parties, much more variability would be expected. To a certain extent, the data seem to bear this out. However, before any further statements can be made regarding the roles and functions that the site may have served in the past, new theories differentiating various types of occupations will need to be constructed and more data will need to be collected. While the former will be left to others and the future, the latter raises the issues of sampling units and size.

Rarely do archaeologists have the opportunity to excavate whole sites or entire occupations. Moreover, if or when they do, very little confidence can be placed in such claims because of the lack of explicit frames of reference for what constitutes a single occupation. Perhaps archaeologists could attempt to recover a sufficient (i.e., statistically adequate) number of sampling units from each level. But what would be the most appropriate unit of analysis? Brooks (1982) has recently suggested that the hearth and its associated artifacts, or what he prefers to call the "episode," might be a worthy unit of analysis in hunter-gatherer research. In many hunter-gatherer societies (see e.g., Yellen 1977), and certainly among subarctic cultures, the hearth and its ability to provide heat and light made it the centre of social activity. Evidence of many, although not necessarily most, tasks might thus be expected to be carried out around hearths. Even though restricting analysis to the use of "episodes" would arbitrarily limit the amount of information potentially recoverable from each level, greater confidence could be placed on the results because of the problem of multiple occupation. Multiple occupation can produce markedly different archaeological records, even by the same group, depending on the number of roles any one particular site plays within a subsistence-settlement system (a point recently stressed by Binford [1982, 1983]), and the archaeologist faces a formidable challenge when it comes to separating different occupations. The archaeologist is aided in this challenge by the fact that knowledge of the formation processes of artifact assemblages around hearths may help to differentiate single from multiple depositional events (see next chapter).

Employing measures aimed at extracting information about mobility patterning and site use, a standard number of "episodes" from each level could then be compared. Obviously, because of the problems of deep-site archaeology, very large areas would need to be excavated to obtain a statistically adequate sample. An alternative approach may be to recover only that number of "episodes" that would exhaust the variability from any one particular level. This in itself would be a useful measure of variability in site use as the greater the number of uses of a site, the greater the diversity of "episodes" in each level. One of the largest sources of variability between episodes within a single occupation, it should be noted, may simply be the result of the division of labour by sex common to most hunter-gatherer societies and northern groups in particular (see next chapter).

It has been suggested that the diversities and types of animal species and lithic materials have adequately monitored the mobility of those groups responsible for levels 1, 5, 6, 7 and 13. However, it is obvious that there are other ways to measure the mobility of past hunter-gatherers. Vierra (1982) and Lurie (1982), for example, have formulated a number of expectations that would differentiate logistical and residential systems on the basis of raw material acquisition, tool-manufacture and tool-use strategies. Residential systems employ coverage tactics to maximize encounters with resources, whereas logistical systems place greater dependence on local or aggregated resources (Vierra 1982; Binford 1980), resulting in a strategy in which producers exploit non-local resources for transport back to consumers at relatively permanent campsites (Binford 1980, 1982; Vierra 1982). In logistical systems with decreased mobility and greater economizing behaviour in non-local lithic materials, Lurie hypothesized that there will be fewer tools of exotic raw materials, more specialized single-purpose tools and more heavily utilized and reworked tools, particularly of exotic, expensive-to-procure lithics. (Vierra's expectations are similar, but not identical, to Lurie's.) Conversely, in residential (foraging) systems with increased mobility Lurie hypothesized that there will be a more varied assortment of minimally and heavily modified tools of a greater variety of good quality raw materials, more multipurpose tools, less specialized tools and more expediently utilized tools. The Peace Point data would appear to conform to some of these expectations, and they should be considered in any future attempts to document changes in mobility patterning and site use at the site. It is also apparent that variability in life histories of curated tools may prove useful in this regard as well, with greater variability suggesting coverage tactics and lesser variability suggesting positioning tactics.

Once the problem of sample size has been dealt with, measures of mobility patterning have been determined and the data analysed, statements regarding the various roles and functions of the site, and the types of groups that occupied it at different times in the past, could then be put forward. It is at this point that the real potential of the site to address cultural development, change and continuity comes to light.

The discovery that the site may have served one or more functions in one system while playing a different role(s) in another may have important implications for understanding local land-use patterns through time. For example, if the site was incorporated into a logistically organized subsistence-settlement system as a major base camp at one period of time, other sites in the immediate vicinity (Binford's [1980, 1982] foraging radius) would be expected to be characterized predominantly by special-purpose collecting locations, such as snaring, fishing and plant-gathering stations, rather than camping loci. Beyond that area normally exploited by daily work parties ranging out of base camp, task-specific sites such as hunting camps, trapping sites, game lookouts and caching stations may be expected. While these sites may take on the appearance of base camps, in that maintenance accommodations (e.g., hearths and huts) would be provided (Binford 1982), their task-specific nature would result in smaller, less variable, more specialized archaeological assemblages produced over shorter periods of time. In general, increasing regularity and repetitiveness in local land-use patterns would be expected concomitant with a site's use as a major base camp, thus resulting in fewer, more specialized sites. Put another way, the economic potential and subsequent use of different places within an environment may become increasingly more stabilized and repetitive as a function of increasing regularity in the use of a site as a base camp (Binford 1982: 21).

Conversely, if the site served other more variable functions for groups, whether foragers or collectors, employing coverage tactics at another time, one would expect less regularity and repetitiveness in the use of places within the local environment. This should result in a local land-use picture characterized by a greater number of less specialized sites distributed across the landscape in a more dispersed manner, with most sites taking on the appearance of campsites. While this would have the effect of producing more variability at any one particular reoccupied place within a local setting, fewer well-defined types of sites would be expected, thus yielding an archaeological record of greater similarity between artifact assemblages from different sites (Binford 1982; 1983).

Two scenarios of site use and their resultant implications for modelling local land-use patterns have been discussed. The base camp scenario may be somewhat oversimplified in that the attributes that made the site desirable as a base camp in the first place may have also attracted specific task groups (e.g., lithic procurement, hunting and/or fishing parties) when the base camp was moved elsewhere – a distinct possibility suggested by the Nunamiut data (Binford 1980, 1982). While greater intrasite heterogeneity would result from multiple use, other sites in the area would also be expected to take on somewhat different functions and an added complexity. On the other hand, if further evidence is found to support the site's exclusive use as a base camp, this would continue to support a point-to-point mobility pattern characterized by considerable spacing between base camps, rather than a base camp movement pattern in which there was a greater use of intervening space and resources between base camp locales. In the event that both forager campsites and collector base camps were to occur regularly in the same level, at least two cultural systems, each employing different strategies, might be envisioned – a scenario hinted at by the projectile points from the Lake One dune site.

It has been demonstrated that the Peace Point site, and others like it, have virtually an unlimited potential for building cultural-historical chronologies using the concepts of site use and mobility patterning. It seems apparent that as well as providing information about local land-use patterns, such endeavours may also shed light on broader patterns of land use within other areas of northeastern Alberta. For example, if a population's land-use pattern was becoming increasingly more regular and repetitive in one area, this would be expected to have an influence on local land-use patterns in other areas. Specifically, increased regularity in resource scheduling, season of occupation, site use, etc., in one particular environmental setting would be anticipated to be met with the same in another.

While the view may still apply that one cannot elucidate regional cultural development, change and continuity within a region from a single site, in light of data, theory and discussion presented here, it is apparent that it is as good a place as any to start.

CHAPTER VII
THEORY BUILDING FROM THE PEACE POINT SITE

A number of ideas and hypotheses of theoretical interest were put forward in Chapter V. The most substantive of these dealt with site formation processes and division of labour by sex in sites such as Peace Point. Specifically, artifact patterning was recognized across several occupation surfaces that could be explained with reference to a) the cultural formation of lithic artifact assemblages at workshop/habitation sites and b) male/female activity differentiation in northern hunter-gatherer base camps. This chapter presents several models in an attempt to address this patterning in a broader theoretical light.

The Formation of Artifact Assemblages at Workshop/Habitation Sites

Artifact patterning across several densely inhabited occupation surfaces at the Peace Point site was previously inferred to relate to the cultural formation of artifact assemblages at workshop/habitation sites. Such sites are defined here as campsites in which stone tool production was a major component of site activities. Usually sites of this type would have been incorporated into hunter-gatherer subsistence-settlement systems because of access to workable stone material, regardless of whether opportunities to procure lithics played a primary, secondary or lesser role in site placement decisions.

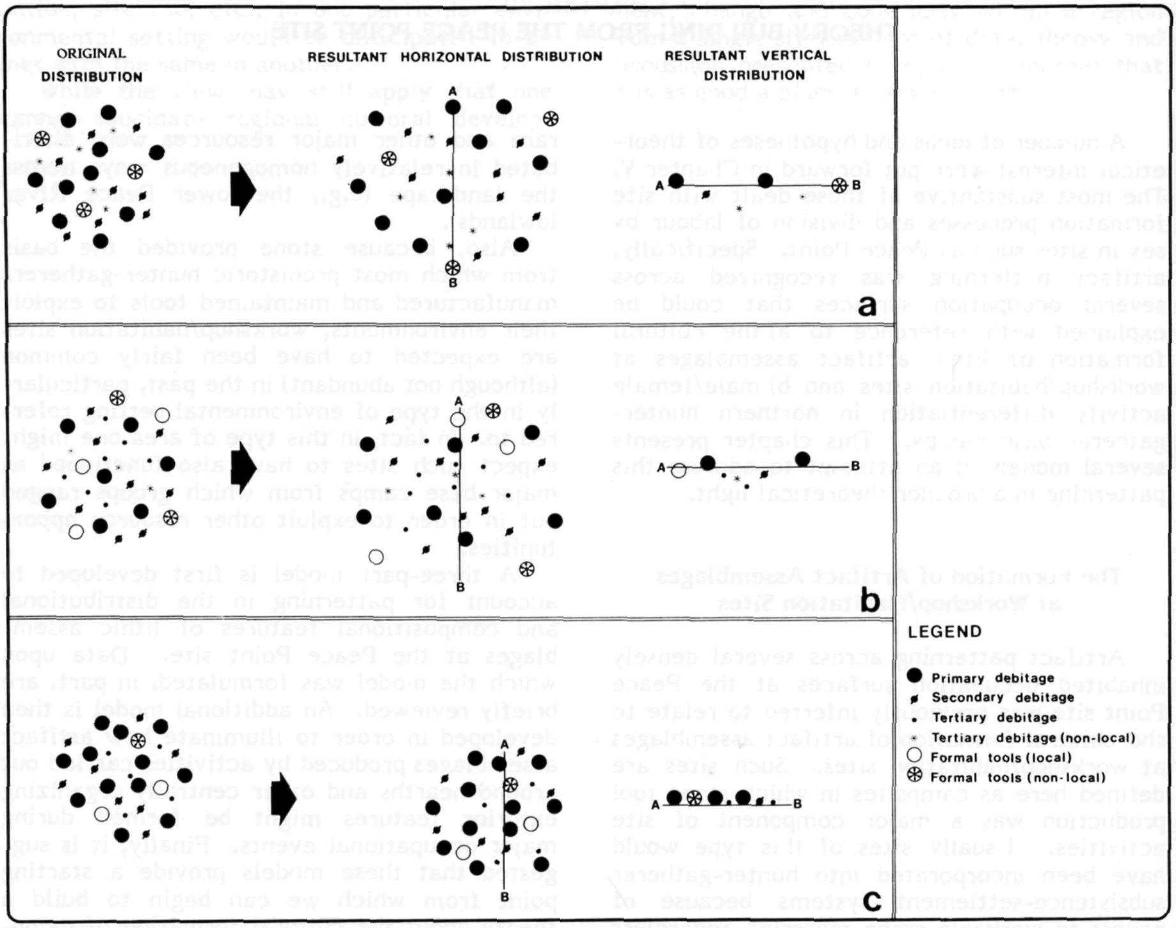
While Binford's (1979) recent ethnographic study of Nunamiut lithic procurement patterns is acknowledged to be an important contribution (inasmuch as it recognizes that hunters will rarely, if ever, range out of base camp for the exclusive purpose of obtaining stone to make tools), lithic procurement may not always be embedded within other subsistence strategies as he implies. Because hunter-gatherer movement and settlement is often based on maximizing a number of resource options, especially among logistically organized groups where optimal congruences of resources often determine base camp locations (Binford 1982), access to lithic material may play a major role in settlement decisions in some areas. Such areas would include environmental settings in which lithic sources are rare and other major resources were distributed in relatively homogeneous ways across the landscape (e.g., the lower Peace River lowlands).

Also, because stone provided the basis from which most prehistoric hunter-gatherers manufactured and maintained tools to exploit their environments, workshop/habitation sites are expected to have been fairly common (although not abundant) in the past, particularly in the type of environmental setting referred to. In fact, in this type of area one might expect such sites to have also functioned as major base camps from which groups ranged out in order to exploit other resource opportunities.

A three-part model is first developed to account for patterning in the distributional and compositional features of lithic assemblages at the Peace Point site. Data upon which the model was formulated, in part, are briefly reviewed. An additional model is then developed in order to illuminate how artifact assemblages produced by activities carried out around hearths and other centrally organizing exterior features might be formed during major occupational events. Finally, it is suggested that these models provide a starting point from which we can begin to build a theory about the cultural formation of campsites in which lithic procurement was a determinant in site placement and stone tool manufacture was a major component of site activities.

General Model

Initial Activity Sequence. Among the first activities expected to produce tangible archaeological remains at workshop/habitation sites are lithic reduction sequences for the production of site-specific tools and the replacement of more universally employed stone tools. Hearths, huts and other features would undoubtedly be built. However, at campsites incorporated into hunter-gatherer settlement systems, because of access to workable stone material some of the first activities might relate to the "gearing-up" of tool kits needed for exploitation of the local



42 Three-phase model for the formation of lithic artifact assemblages at workshop/habitation sites.

environment during occupation. This postulate should hold regardless of whether campsites were located at lithic sources or some distance away in order to exploit other resource opportunities. However, such sites are generally expected to be positioned so that lithic sources could be exploited on a regular basis (i.e., within the foraging radius).

These preliminary activities are expected to produce concentrations of lithic artifacts consisting predominantly of primary debitage, secondary debitage and discarded tools of exotic materials, in that order (Fig. 42a). Unless the use-life of a formal tool was unusually long, or had some value beyond its functional one, tools of local raw materials may not be discarded during this sequence. Nor may very many expediently employed processing tools of the desired local lithic material be generated at this time because of the early stage of occupation. For similar reasons, very little debitage relating to the maintenance or repair of tools would be expected. If tertiary debitage is produced at all, it would probably relate to the rejuvenation of tools made of non-local raw materials that were repaired, rather than replaced, during this initial period of activity. It should still be easier to repair a tool with some use-life remaining than to manufacture a new one.

While originally concentrated, lithic accumulations produced during this sequence would tend to become more dispersed through time as a result of subsequent displacement by human occupation (Fig. 42a). For example, primary debitage and other large items may be expected to become more dispersed around intensively utilized features and activity areas, while smaller items of debitage would tend to become embedded more quickly in occupation surfaces, especially in permeable substrates. (See Stockton [1973], Villa [1982], for a more detailed discussion of the size-sorting effects of post-depositional disturbance.) As a consequence of trampling and other post-depositional displacement processes during occupation, the edges of larger artifacts might be expected to develop damage. As well, some expedient use of debitage produced during this phase might occur in processing activities before abandonment took place.

Occupation Phase. During the main period of occupation on such sites, lithic reduction/tool production activities would continue as tools are discarded and as new needs arise requiring the use of stone. However, rather than generating predominantly early-stage and secondarily later-stage core/tool reduction debitage, with little tertiary debitage, a much more even distribution of these categories might be expected (Fig. 42b). In fact, given that it would be easier to repair or recycle rather than replace stone tools dulled through use, debitage relating to the refined flaking and maintenance/repair of stone tools may dominate lithic assemblages produced during the main period of occupation. Tools falling out of the systemic context as they wear out during this phase may be either local or non-local in origin, although with the passage of time fewer and fewer tools of exotic raw materials would be contributed. A major addition to the archaeological record at this time, of course, would be food remains and refuse resulting from other processing activities.

As in the first sequence, there would be a general tendency for larger items to become more dispersed in the vicinity of intensively utilized features and activity areas, and smaller items to become embedded near their discard locations (Fig. 42b). Similarly, edge modification on larger items of debitage caused by expedient tool use and unintentional post-depositional alteration may be expected. Significantly more, and more variable, refuse would doubtless be contributed during the occupation phase. However, the major difference between lithic assemblages produced by stone tool working activities during this phase and the initial sequence would be reflected more in their composition rather than their distribution. Both would have been subjected to post-depositional displacement by subsequent occupation.

Final Activity Sequence. At habitation sites positioned to exploit lithic sources, it is not unreasonable to expect final episodes of activity to be characterized by stone tool replacement and manufacturing activities in anticipation of projected needs and concerns at future locations. In this regard, Goodyear (1981) and Keeley (1982) have made similar observations. While this would depend upon the availability and quality of lithic materials at future locations, length of anticipated absence from site, expected duration and/or intensity of tool use, etc., tool replacement sequences are expected to be a major component of activities on such sites during abandonment.

Similar to the first sequence of activity, this would probably produce lithic assemblages composed predominantly of primary and secondary debitage. Discarded tools would also be expected (Fig. 42c). Unlike the initial sequence, however, there may be a consideration at this time not only for the immediate but for the eventual replacement of tools as well. This additional concern may have the effect of producing slightly more early-stage core/tool reduction debitage than would be produced by replacement episodes during the initial activity sequence. Again, some tertiary debitage might be generated depending on the relative merits of repairing rather than replacing tools. The amount of tertiary debitage produced during this stage as well as the ratio of primary to secondary debitage would be influenced by the same considerations as those above. Although discarded tools, if found, would probably be made mostly of the local material, it is not inconceivable that tools of exotic materials brought initially to the site would be left behind during this sequence. (The latter type of artifact may have important implications for monitoring the length of occupation and/or intensity of certain activities on such sites.)

Unlike the previous two phases, lithic assemblages produced during abandonment are expected to remain clustered, as they would not have been exposed to the same degree of occupational disturbance after deposition (Fig. 42c). This would also have the effect of generating comparatively little trampling damage on the edges of larger artifacts. Similarly, expedient use of debitage during this time would not be expected unless it occurred in association with other "gearing-up" activities. In addition, as a result of little or no post-depositional occupational disturbance, smaller items would tend to remain on their depositional surfaces. Finally, unlike the main period of occupation, lithic assemblages produced during abandonment may not be related, either spatially or functionally, to previous site activities. While lithic assemblages produced during abandonment are expected to differ from those generated during the initial activity sequence in distribution, they should also differ from those produced during major occupational episodes in both distribution and composition (Fig. 42).

Discussion. It is apparent that each major phase of activity from abandonment back through to the initial activity sequence may not be equally recognizable because of the general blurring effects of post-depositional occupational disturbance. However, that lithic assemblages produced during final episodes of activity on workshop/habitation sites would be the most archaeologically visible should not be surprising, given their suspected discreteness and unique composition.

Evidence for such assemblages were found, for example, in levels 1, 7 and 13. Level 1 yielded a Y-shaped accumulation of flakes (interpreted to be a seating arrangement) composed, in descending order of occurrence, of primary debitage, secondary debitage and tools (Figs. 17, 19). Similarly, level 7 produced a cluster of large primary debitage, secondary debitage and finished tools, in that order (Figs. 28, 29). Finally, a dense cluster, composed almost exclusively of primary and secondary debitage, was found in level 13 (Figs. 33, 35). A number of expediently employed items of debitage in both the first and last clusters suggest that activities other than lithic reduction for the replacement of discarded tools were also carried out. That these tools may be related to the "gearing-up" of other items and/or implements seems likely.

An activity episode that may have occurred during a final period of occupation but which did not yield any evidence of tool production or replacement was found in level 5 (Fig. 22). Here, adjacent to a hearth considered to relate to a later occupational event, only tertiary debitage was found. The lack of tool production activities may possibly be due to the foraging as opposed to collecting nature of the economy responsible for this level. That is, the apparent absence of debitage relating to tool manufacture in this area of level 5 may be a feature more characteristic of foragers, who exploit resources on the basis of their encounter frequencies, than of collectors, who tend to employ positioning tactics (see previous chapter for discussion). While it is beyond the scope of this chapter to differentiate foragers from collectors in terms of tool production strategies at workshop/habitation sites during abandonment, this interpretation could serve as a basis for exploring such differences.

Interestingly, Ives (1977b) has also recovered a very dense cluster of finished tools and large primary debitage from the Eaglenest Lake Portage site (HkPa-4). Although he interpreted this assemblage to be an unrecovered cache or a group of accidently lost artifacts, it is possible that it could just as well represent a "gearing-up" or tool replacement sequence during a final period of occupation.

Because archaeological remains produced during both pre-abandonment phases of activity may be extremely difficult to separate with any degree of confidence, it is fortunate that fairly clear-cut evidence for an assemblage of artifacts relating to the main period of occupation has been recovered from level 7. In the southwest corner of this level an artifact assemblage consisting predominantly of secondary and tertiary debitage was recorded (Fig. 28). While some primary debitage was found, it appeared to be associated mainly with the rock in the centre of this activity area. Whether this primary debitage relates to a final or abandonment episode remains uncertain, although the clustered nature of this debitage would seem to argue in favour of this notion. However, there can be little doubt that the almost exclusive occurrence of biface/projectile point resharpening and thinning flakes found underneath the rock relate to episodes of activity earlier than that responsible for the placement of the rock, and perhaps the production of its associated primary debitage.

The Formation of Artifact Assemblages During Major Occupational Events

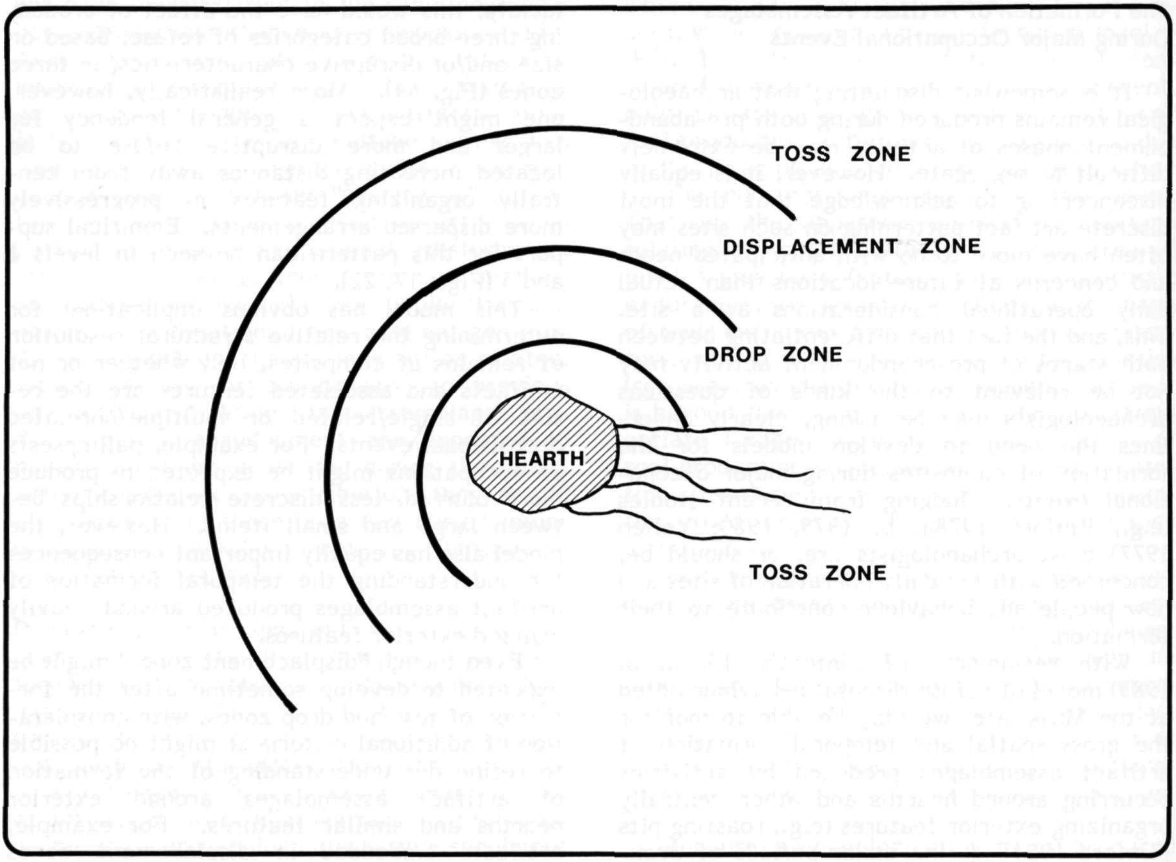
It is somewhat disquieting that archaeological remains produced during both pre-abandonment phases of activity may be extremely difficult to segregate. However, it is equally disconcerting to acknowledge that the most discrete artifact patterning on such sites may often have more to do with anticipated needs and concerns at future locations than actual daily operational considerations at a site. This, and the fact that differentiating between both stages of pre-abandonment activity may not be relevant to the kinds of questions archaeologists may be asking, clearly underlines the need to develop models for the formation of campsites during major occupational events. Judging from recent studies (e.g., Binford 1978a, b, 1979, 1980; Yellen 1977) most archaeologists are, or should be, concerned with the daily operation of sites and how people and behaviour contribute to their formation.

With refinement of Binford's (1978a, b, 1983) model of refuse disposal behaviour noted at the Mask site, we may be able to monitor the gross spatial and temporal formation of artifact assemblages produced by activities occurring around hearths and other centrally organizing exterior features (e.g., roasting pits [Binford 1983]) during major periods of occupation. Binford distinguished two areas where refuse was disposed of around hearths. These were a "toss zone" where large and polluting refuse interfering with the performance of activities carried out around such features were tossed and a "drop zone" in which smaller, less disruptive items were discarded in their areas of use. Had Binford witnessed an intensive utilization producing large amounts of debris around hearths, or even re-use of hearths during subsequent site visits, an additional zone of refuse disposal might have been recognized. This would be a zone where items initially discarded in their areas of use would have been displaced, both intentionally and unintentionally, outward towards the periphery of activity areas because of the potentially disruptive nature of refuse build-up in the drop zone (Fig. 43).

Similar to expectations generated in the previous model, larger items in the drop zone would tend to be displaced more readily than smaller items, which would become embedded more quickly into the occupation surface. Ideally, this would have the effect of producing three broad categories of refuse, based on size and/or disruptive characteristics, in three zones (Fig. 44). More realistically, however, one might expect a general tendency for larger and more disruptive refuse to be located increasing distances away from centrally organizing features in progressively more dispersed arrangements. Empirical support for this pattern can be seen in levels 1 and 5 (Figs. 17, 22).

This model has obvious implications for determining the relative structural resolution of remains at campsites, i.e., whether or not artifacts and associated features are the result of single/related or multiple/unrelated depositional events. For example, palimpsests of occupations might be expected to produce more blurred, less discrete relationships between large and small items. However, the model also has equally important consequences for understanding the temporal formation of artifact assemblages produced around heavily utilized exterior features.

Even though "displacement zones" might be expected to develop sometime after the formation of toss and drop zones, with consideration of additional criteria it might be possible to refine our understanding of the formation of artifact assemblages around exterior hearths and similar features. For example, artifacts embedded in displacement zones should clearly relate to earlier episodes of activity than those producing comparatively sized or disruptive refuse lying on the surface of drop zones. Similarly, large or disruptive items concentrated on the surface of drop zones would be expected to relate to activities later than those associated with comparable refuse dispersed within toss-zone areas. In general, embedded artifacts, regardless of zone, are expected to be the result of activities earlier than those producing artifacts found on depositional surfaces. In a similar vein, the more artifact assemblages are dispersed, and the more damage they possess from occupational disturbance, the greater the likelihood that they relate to activities earlier than those which produced assemblages that are less damaged and less dispersed. It even seems likely that the degree of embedding, trampling damage and dispersion of artifacts within zones around centrally organizing features may enable us to monitor more than just early- and late-occurring activities on hunter-gatherer campsites. In fact, it is conceivable



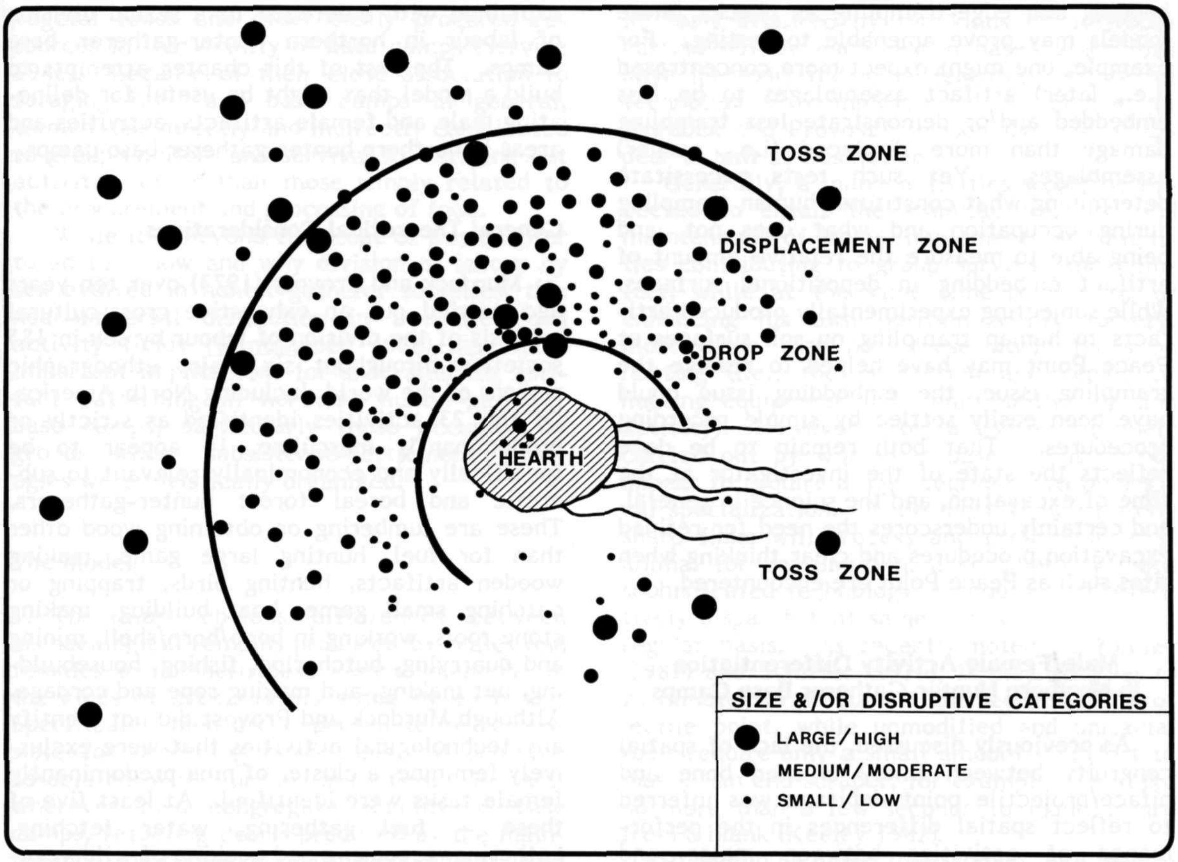
43 Three-zone model for the formation of artifact assemblages produced by activities carried out around hearths and other central exterior features.

that with further testing and refinement of this model, it may be possible to trace the sequential formation of artifact assemblages. Such endeavours may be extremely useful and timely in light of Binford's (1982) recent suggestion that the structure of many prehistoric hunter-gatherer campsites, particularly those occupied by logistically organized groups, may be the result of repeated and often functionally unrelated occupational events.

General Discussion

While both the general and more specific models may prove useful for understanding the formation of campsites in which lithic procurement was a determinant in site placement and stone tool manufacture was a major activity, they may also have relevance beyond just this type of site. In fact, they may be useful in our attempt to understand the formation of most artifact assemblages (whether composed predominantly of lithics or not) on most types of short-term hunter-gatherer campsites where activities occurring around exterior features produced large amounts of refuse.

Far from trivial, the ability to explicate the spacio-temporal formation of artifact assemblages around such features may have important consequences for identifying shifts through time in resource exploitation strategies. As a working hypothesis, it is suggested that the kinds and quantities of resources



44 Three-zone model in Figure 43 superimposed over hypothetical artifact distribution.

exploited during earlier occupational events should differ from those of later episodes. Specifically, the larger, more abundant, more easily procured (i.e., more desirable resources) would be expected to be harvested before others (the concept of K and r-selected species or the marginal value theorem of optimal foraging theory [Charnov 1976] may have some relevance here), and artifact assemblages produced by activities occurring around such features should record this shift. Herein lies just one of the many promising and illuminating aspects of explicating the culture formation processes of hunter-gatherer campsites.

It is obvious that many processes, both natural and cultural, may modify and displace archaeological remains after abandonment and prior to burial in sites such as Peace Point. However, because of the high degree of structural integrity and fairly rapid rate of sedimentation noted at the site, the assumption was made that the processes most responsible for altering artifact assemblages after their deposition were cultural activities occurring before abandonment. That artifact patterning could be delineated throughout a number of levels would seem to indirectly support this assumption. If the models are to have any applicability in other contexts, it is essential that the full range of natural and cultural formation processes operating at each site be investigated.

While these models find support in the data presented, adequate tests of them remain to be conducted. However, using dispersion as a relative indicator of age and employing embedding and edge-trampling as checks, these models may prove amenable to testing. For example, one might expect more concentrated (i.e., later) artifact assemblages to be less embedded and/or demonstrate less trampling damage than more displaced (i.e., earlier) assemblages. Yet such tests necessitate determining what constitutes human trampling during occupation and what does not, and being able to measure the relative amount of artifact embedding in depositional surfaces. While subjecting experimentally produced artifacts to human trampling on soil surfaces at Peace Point may have helped to resolve the trampling issue, the embedding issue could have been easily settled by simple recording procedures. That both remain to be done reflects the state of the investigator at the time of excavation, and the science in general, and certainly underscores the need for refined excavation procedures and clear thinking when sites such as Peace Point are encountered.

Male/Female Activity Differentiation in Northern Hunter-Gatherer Base Camps

As previously discussed, the lack of spatial congruity between finely crushed bone and biface/projectile point debitage was inferred to reflect spatial differences in the performance of activities between males and females in northern hunter-gatherer base camps. The theoretical foundation for this inference was based on a) the general tendency in all hunter-gatherer societies for males to be associated with hunting activities, and b) Vehik's (1977) observations that bone grease/soup production was predominantly a female task, and that this activity accounts for the occurrence of most finely crushed bone in sites. Although males under some circumstances, such as the absence of females, might be expected to prepare food in this manner, they are anticipated to have some validity in most hunter-gatherer base camps — the probable historic context of most early ethnographic accounts (e.g., Catlin 1857).

While observed in several levels, the disassociation between biface/projectile point debitage and finely crushed bone was particularly well demonstrated in level 7 (Figs. 28, 29). In fact, the disassociation of these materials was so clear between two major hearth areas in this level that it led to the recognition of additional artifact patterning that could be explained with reference to a sexual division of labour in northern hunter-gatherer base camps. The rest of this chapter attempts to build a model that might be useful for delineating male and female artifacts, activities and areas in northern hunter-gatherer base camps.

General Theoretical Considerations

Murdock and Provost (1973) over ten years ago carried out an exhaustive cross-cultural analysis of the division of labour by sex in 185 societies throughout six major ethnographic regions of the world, including North America. Of the 23 activities identified as strictly or predominantly masculine, 14 appear to be specifically and economically relevant to subarctic and boreal forest hunter-gatherers. These are lumbering or obtaining wood other than for fuel, hunting large game, making wooden artifacts, hunting birds, trapping or catching small game, boat building, making stone tools, working in bone/horn/shell, mining and quarrying, butchering, fishing, housebuilding, net making, and making rope and cordage. Although Murdock and Provost did not identify any technological activities that were exclusively feminine, a cluster of nine predominantly female tasks were identified. At least five of these — fuel gathering, water fetching, gathering, preparing and cooking of wild vegetal foods — appear to be relevant to subarctic and boreal forest hunter-gatherers. While there is nothing in the earlier ethnographies of such peoples to contradict these general observations, other studies (e.g., Driver and Massey 1957) suggest that hide preparation and the processing of meat and fish may have also been predominantly female tasks. This certainly appears to be the case among the Chipewyan (Irimoto 1979; Sharp 1981), the closest ethnographically studied group to Peace Point.

The important point is that in virtually all North American and in most worldwide hunter-gatherer societies, the hunting of large- to medium-sized game was carried out by men ranging over large areas away from camp. On the other hand, while women may have occasionally fished, hunted birds, caught small game and assisted in communal drives and hunts, as well as butchered and transported game home (Driver and Massey 1957), their main contribution to the daily nutritional requirements of a group was foraging for vegetal foods and other easily procured resources in the vicinity of base camps (Service 1966). Because of their close association to foraging radii and base camps in general, women also directly and indirectly contributed to group comfort and survival by carrying out activities other than those simply related to the procurement and processing of food.

While it is beyond the scope of this chapter to address how and why division of labour by sex evolved in hunter-gatherer societies, this near-universal distinction in activities and activity fields (Wantanabee 1968) may have important implications for understanding artifact patterning in northern hunter-gatherer base camps, particularly those occupied by groups whose subsistence-settlement strategies were logistically organized.

The Model

The most obvious differences between archaeological remains produced by males and females in northern base camps should be in the kinds of artifacts discarded by each sex. Specifically, men are expected to be responsible for producing most tools and debitage associated with hunting activities. In fact, wherever men congregate socially in base camps, retooling debris produced by the maintenance and repair of hunting equipment, may be expected (see Keeley [1982] for a similar discussion). Conversely, women should be mostly responsible for generating debitage and tools associated with activities routinely carried out in base camps and foraging radii. For example, the most archaeologically visible remains produced by women in base camps are expected to relate to the processing of hides and foods (meat, fish, vegetal matter, etc.) and the maintenance and repair of features, huts, clothing, etc., as well as the manufacture and maintenance of tools that would facilitate the performance of these and other activities in the vicinity of base camps.

As important as the distinction between artifacts relating to hunting and non-hunting pursuits in base camps is the degree of technological specialization or complexity expected to be exhibited in tools associated with each sex. While it is not unreasonable to expect men and women in subarctic and boreal forest hunter-gatherer societies to have made, maintained and replaced their own regularly employed tools when the need arose, the types of tools required by the kinds of activities carried out by each sex in base camps may have necessitated a differential degree of technological complexity. A glance at Murdock and Provost's revised lists would appear to hint at this notion.

Generally, a man's activities would be expected to entail the manufacture, use and maintenance of items, implements and facilities contributing to group survival and comfort, while at the same time reinforcing or enhancing his own position within society. More often than not, these would focus on hunting (i.e., the production and repair of hunting equipment and items facilitating this activity). However, most activities routinely carried out by women in base camps do not appear to require a high degree of technological specialization. While most know that one sharp flake will process and prepare a large animal for consumption, a considerably more sophisticated technology is required to effectively dispatch that same type of animal on a regular basis. As recently noted by Keeley (1982) and Schiffer (1976), it may take up to 20 minutes to produce a finished bifacial projectile point, while unmodified and unifacial tools require only a small amount of effort to make. An end scraper, for example, may take no more than a few seconds to manufacture from a blank (Keeley 1982).

(It should be noted that women, like men in such societies, are expected to work in stone, especially when there was ready access to this material [e.g., Peace Point]. The general ethnographic observation that stone tool manufacture was a man's activity may reflect a male bias [although it cannot be demonstrated at present time] of both observer and informant. Moreover, for reasons discussed, this observation may apply to the manufacture of highly specialized tools only.)

A functional explanation for this differential degree of specialization in tools is indirectly suggested by Torrence's (1982) cross-cultural comparison of hunter-gatherer tool specialization and resource diversity. Torrence noted that, in low-biomass environments with few resource options, a high degree of specialization in tools would be predicted. The need for an efficient, highly dependable technology should be obvious when resources are few, dispersed and unpredictable. Conversely, in high-biomass environments with greater resource diversity, many different types of specialized tools to procure and process a broad range of plant and animal species would be neither necessary nor efficient. While it is apparent that both men and women in northern hunting systems exploit the same environment — although base camps may be expected to occur in areas with somewhat greater resource diversity (e.g., ecotones) and men may often encounter different environmental settings when out hunting — their range of activities differ. Even though women have a more spatially restricted activity field, they have a broader spectrum of tasks and duties necessitating technological input in base camps than do men. Possessing a technology requiring many different types of specialized tools to perform these activities would be neither advantageous nor cost-efficient. On the other hand, it is advantageous for men in such societies, with their narrower subsistence focus on the hunting of large game, and other activities associated with this pursuit, to possess a more specialized technology. The Eskimo "women's knife" or ulu, which contains only a few technological components, and the man's sealing harpoon, which requires dozens of technological considerations, is an extreme (although instructive) example of the differential degree of tool specialization between the sexes in northern hunting cultures.

The suggestion that women may have a broader range of tasks to perform in base camp situations may also be important for understanding the diversity of tools associated with each sex. Although women may be expected to produce less specialized (i.e., more generalized) tool assemblages, having a greater variety of tasks to perform, they are also expected to generate greater tool diversity. Where stone tools could be easily replaced (e.g., at Peace Point), this would be manifested in numerous different types of minimally prepared and expediently employed tools. Where tools were not so easily replaced for reasons of material availability, social prohibitions, etc., this diversification of activities would be reflected in the frequent occurrence of generalized multi-purpose tools. Extensively utilized and heavily reworked tools might be expected as a result. Again, the Eskimo "women's knife" is a good example of a general multi-purpose tool; it was used for all manner of processing tasks. Perhaps the most appropriate method of measuring functional diversity in multi-purpose tools would be to determine the number of uses to which a tool was put. The concept of "employable unit," first introduced by Knudson (1973), may have some utility in measuring the diversity of tasks in the use of a single tool.

Another expectation resulting from the sexual division of labour in base camps is the differential contribution of each sex to the archaeological record. Simply, with women much more bound to base camp areas than men, who spend considerable lengths of time (although not necessarily most of their time) away from camp, they have a far greater opportunity to contribute to the archaeological visibility of base camps. Whether they in fact do or not would depend upon the intensity of, and amount of debris produced by, activities carried out by each sex. However, assuming that refuse production and accumulation are in some way time-dependent, women are expected to be the major contributors of refuse to the archaeological records of base camps.

The final difference characterizing archaeological remains produced by males and females in base camps should be reflected in the spatial distribution of their artifacts. First, because there is a functional difference in the kinds of activities carried out by each sex, it is not unreasonable to expect their activities to occur in different areas. This would also be predicted by the general tendency for male and female tasks to require different technological inputs, amounts of materials, lengths of time, amounts of space and number of participants to perform and complete.

While this logistical incompatibility of activities suggests that male and female tasks would be carried out in different areas, there may be a strong social component reflected in the spatial distribution of artifacts associated with each sex within and between activity areas. Traditionally in most hunter-gatherer societies, particularly northern cultures, the status of women is regarded to be lower than that of men. Anthropologists are mixed as to whether or not this is based directly on their economic contribution, including how this contribution is structured and who controls the conditions of work as well as the dispensation and the amount of goods produced (Dahlberg 1981). While Sanday (1973) found that where women contribute very much or very little to subsistence they lose status, Whyte (1978) found no grounds for assuming that the relative contribution to subsistence has any status implications at all.

Many also base the frequently lower status of women squarely on childbearing and child-rearing (Dahlberg 1981), and the fact that these duties must be compatible with other subsistence activities (Brown 1970). Brown, for example, has noted that such activities would be performed close to home and involve mundane and monotonous tasks requiring little concentration that could be easily interrupted and resumed. It is possible that such activities may carry with them lower prestige than that of hunting simply because they may be less dangerous and interesting, even though women might be the major providers in some societies. As a working hypothesis it might also be suggested that women generally possess a lower status than men because they perform duties that, after a while, can offer comparatively little new, interesting or relevant social or economic information that would contribute directly to group comfort and survival. Conversely, men ranging over larger areas generally have a much better opportunity to accumulate and contribute new information that would benefit present and future living conditions. The correlation between status and differential access to resources and information provided by differential mobility may be especially important for understanding social differences between the sexes in northern hunter-gatherer societies.

While there may be as many hypotheses about the status of women in hunting and gathering societies as there are anthropologists interested in the subject, a general pattern appears to be emerging. In foraging societies where male and female activities are less distinct and their roles are more blurred, women may approach men in equality and the ability to govern their own affairs (see Dahlberg 1981). On the other hand, in logistically organized or collecting systems where male and female roles and activities are more clearly defined (with men usually providing a greater part of the subsistence), a woman's status, at least in the public sphere, is generally lower. This is not to say that the lower status of women made their societal contributions any less important or that women were constantly oppressed in such societies. Sharp (1981) notes, for example, in the case of the Chipewyan — the tribe reputed to have treated its women worse than any other tribe in North America — that women are predominantly responsible for the processing, control and distribution of game once it enters camp. Sharp also notes that the role of females in non-communal or isolated situations is a great deal more flexible to meet the erratic necessities of subarctic life. Moreover, Sharp (1981) concludes that Chipewyan sexual inequality generates a subtle tension or conflict within their system (i.e., pressure upon the man to hunt) that is adaptive in responding to social and physical environmental change.

The general tendency for women in hunting societies to have generally lower status than men may have direct consequences for understanding intra- and inter-activity area patterning in base camps. One might expect, for example, that men would be less tied to specific behavioural patterns and areas in base camp situations than women. That is, possessing a higher status, men would have more flexibility or choice in where, when and how they could conduct their activities and affairs. Conversely, having lower status and more tasks to peform in base camps than men, women should be more closely tied to specific behavioural patterns and areas of activity. Thus, we might expect men's activity areas to be more randomly distributed, while activities carried out by women would tend to be more localized to specific areas, depending on functional requirements. Arguing along similar lines, we might also anticipate artifacts within activity areas produced by males and females to be more and less dispersed respectively.

Although some variation might be expected between the public and private spheres, this pattern would be expected to hold wherever men and women were in direct face-to-face contact and interaction with each other (e.g., huts, tents and other confined areas). Where social interaction was less direct and intense, however, this pattern would be expected to hold less well. In fact, as the intensity and/or frequency of interaction decreases, as a result of an increase in spatial or temporal (and hence social) distance, a corresponding decrease in the structuring of women's activity areas would be expected, although there may be a tendency for their activities to remain localized in the same areas simply because a greater degree of internal site structuring would be expected the longer a location is occupied. There may even be a tendency for male activity loci in less public contexts to become more structured and functionally compatible with activities carried out in their areas, as the need to signal (affirm, demonstrate or assert) superordinate status would be reduced.

Support for the Model

It should be obvious that in building a model that differentiates male/female activities and areas in northern hunter-gatherer base camps, much of that artifact patterning recognized between the two major hearth areas in level 7 — the occupation surface most likely to be the remains of a major base camp — has been addressed. While this was the intention of the model, it was also constructed with other archaeological sites in mind. Although few sites are expected to demonstrate exactly all the above expectations — Peace Point's uncommon degree of structural integrity and location near a source of workable stone, as well as other specific environmental and cultural factors, make it unique — some of these premises are anticipated to hold in sites where other archaeologists have interpreted artifact patterning with reference to male/female activity differentiation in hunter-gatherer base camps.

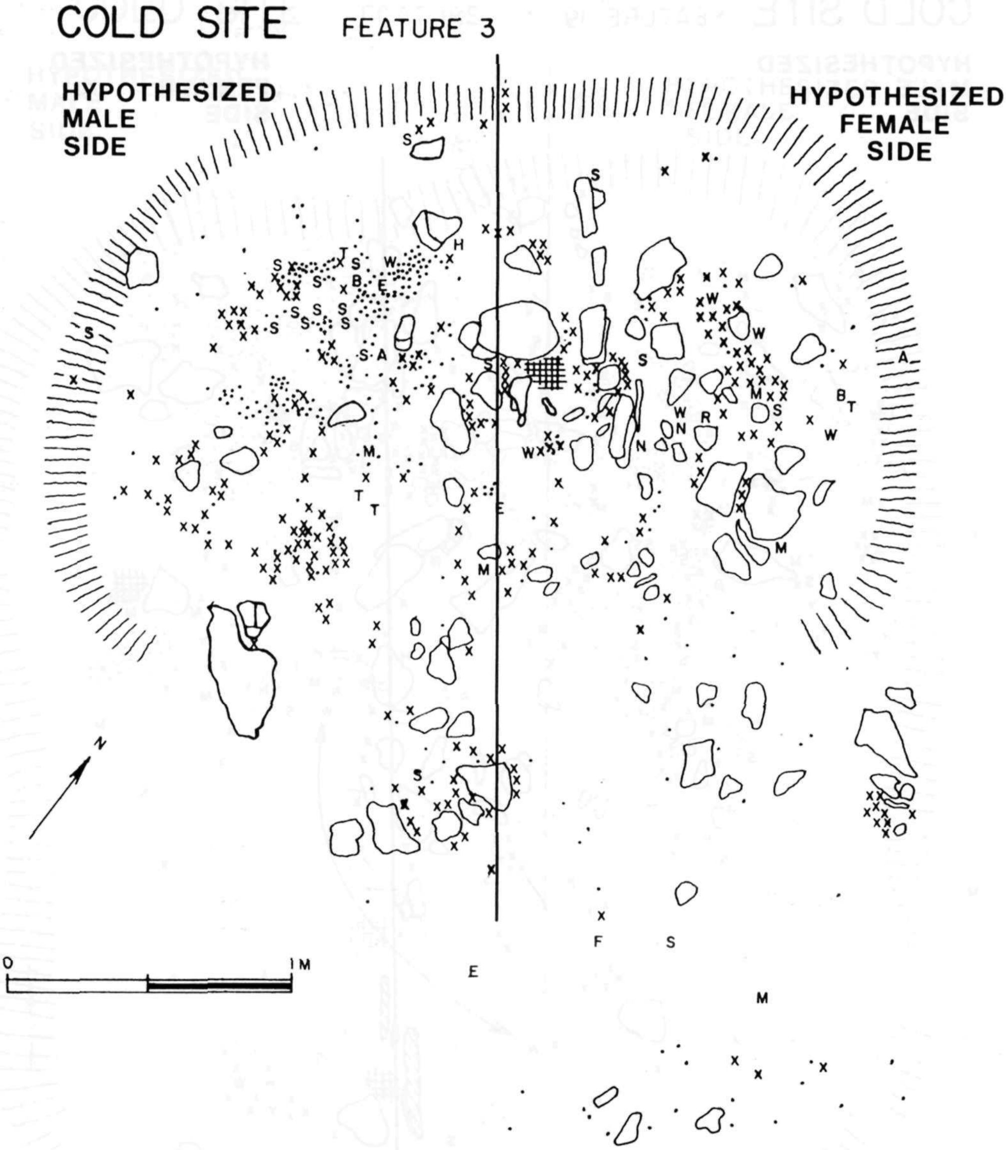
Perhaps the most relevant study recognizing differences in activity areas related to the sexes is that of McGhee (1979) at Port Refuge in the high Arctic. There McGhee excavated a dozen or so features considered to be dwellings of the Independence I culture. By dividing dwelling plans down the middle, from the entranceway to the rear, a distributional analysis of artifacts revealed significant differences between the left- and right-hand sides of dwellings. These he interpreted to be male and female activity areas. Specifically, burins, burin spalls and weapons (stone, bone and antler points, as well as side and end blades) were found to be significantly over-represented on the right-hand sides of dwellings. On the other hand, microblades and needles appeared to be over-represented on the left-hand sides. While the bone-working artifacts and projectile points were considered to provide evidence for the manufacture and maintenance of stone and bone tools relating to hunting activities by men, the microblades and needles were interpreted as a tool kit for use by women in sewing and hide-cutting activities. Although there is little evidence to suggest that the latter two artifact types are anything but randomly distributed within features, it should be noted that biface fragments and retouched flakes also tend to occur more frequently on the right-hand sides of dwellings. Additionally, modified and unworked bone fragments appear to concentrate on the left-hand sides of features, with bone fragments tending to occur near central hearth areas.

No exception is taken here with McGhee's interpretations. On the contrary, some evidence provided, such as the association of hunting and non-hunting activities with men's and women's sides respectively and the tendency for tools in the former area to be more specialized than those in the latter, conforms well with expectations. In light of the proposed model, additional patterning can be recognized in support of McGhee's thesis.

With respect to lithic debitage, waste flakes within the more substantial dwellings were largely biface/projectile point retouching and resharpening flakes (McGhee 1979), which from plans and other evidence provided tended mainly to be located on the right-hand sides of features. In fact, in all intensively utilized dwellings (i.e., those producing over 200 artifacts) comparatively little lithic debris was found on the left-hand sides of features when right-hand sides produced large amounts of retooling debitage (e.g., Figs. 45 and 46). Conversely, where a much more equal representation of waste flakes was observed, the average weight of flakes from each feature was significantly larger (Table 7). This pattern is explained as the result of the more primary, <u>less specialized</u> nature of women's stone-working activities influencing the overall appearance of lithic assemblages within dwellings.

In addition, in the most heavily utilized features (i.e., those dwellings yielding over 800 flakes) there appears to be a general tendency for artifacts associated with hypothesized female sides to be more concentrated than artifacts on the hypothesized male sides (<u>see</u> Figs. 45-47). This may be taken as evidence in support of the posited differential dispersion and size of male and female activity areas.

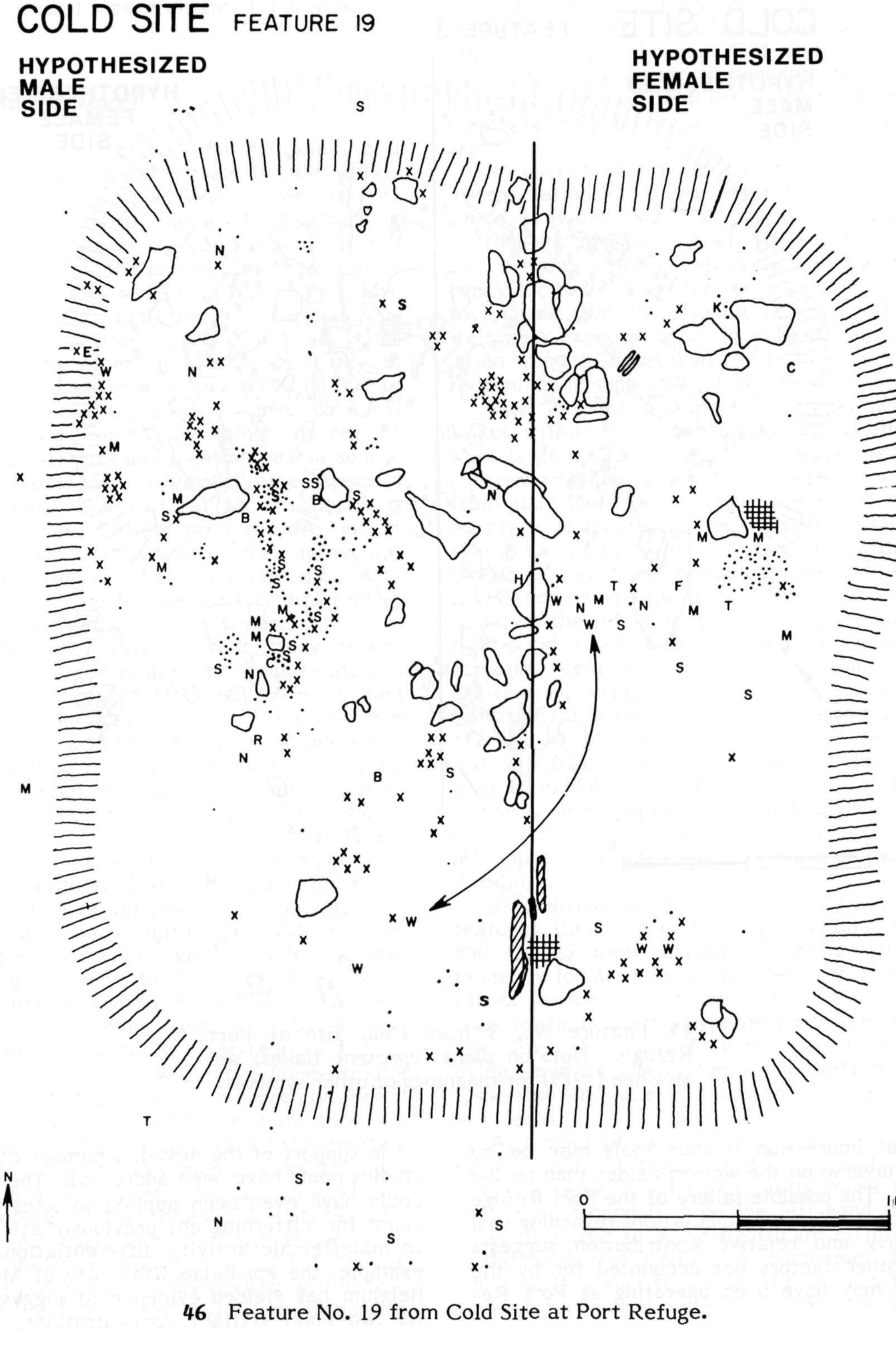
A number of expectations from the model either could not be assessed or did not hold. While McGhee found significantly more tools on the right-hand than on the left-hand sides, there appeared to be no significant difference in the number of artifacts on each side. Also, while tool diversity could not be assessed, because tools were not directly examined, the



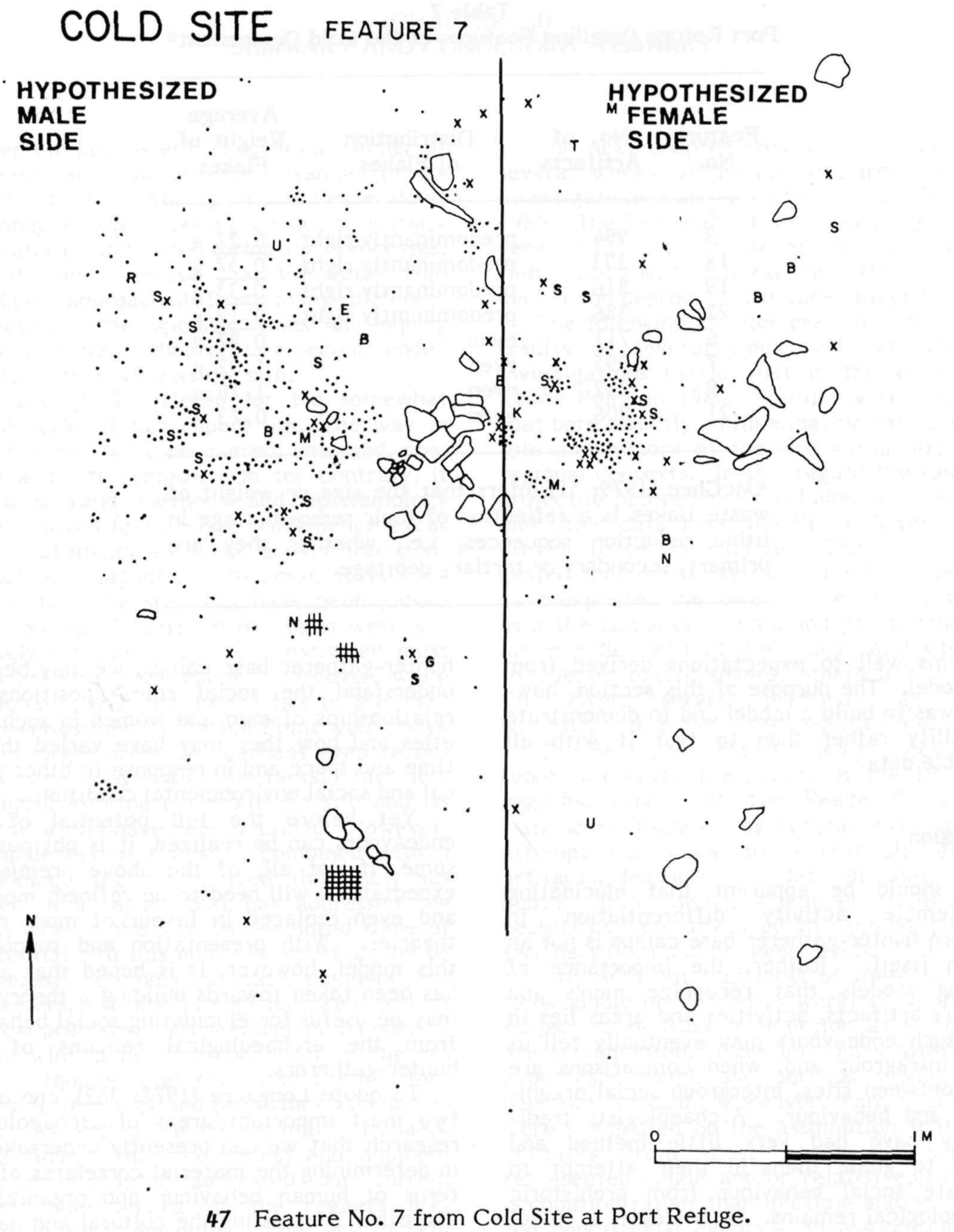
45 Feature No. 3 from Cold Site at Port Refuge. Dots on plans represent flakes; see McGhee (1979) for meanings of other symbols.

general impression is that tools may be no more diverse on the women's sides than on the men's. The possible failure of the Port Refuge data to conform to expectations regarding tool diversity and relative contribution suggests that other factors not accounted for by the model may have been operating at Port Refuge.

In support of the model, a number of other studies could have been addressed. The model could have even been applied to sites to account for patterning not previously attributed to male/female activity differentiation. For example, the epi-Palaeolithic site of Meer in Belgium has yielded evidence to suggest that its two main artifact concentrations, separ-



46 Feature No. 19 from Cold Site at Port Refuge.



47 Feature No. 7 from Cold Site at Port Refuge.

ated by approximately 20 m, may represent male and female activity areas. While one concentration was interpreted predominantly as a hide working area, it was suggested that the other was a bone and antler tool manufacturing area (Cahen, Keeley and Van Noten 1979). The fact that the former area also yielded a more diversified, less specialized, more abundant array of tools in an area as large or larger than that of the latter area

Table 7
Port Refuge Dwelling Features of the Cold Component*

Feature No.	No. of Artifacts	Distribution of Flakes	Average Weight of Flakes
3	994	predominantly right	0.27 g
18	203	predominantly right	0.57 g
19	816	predominantly right	0.33 g
28	386	predominantly right	0.12 g
6	711	even	0.87 g
7	1095	even	1.02 g
9	342	even	1.70 g
21	206	even	0.73 g

*McGhee (1979: 51) infers that the size or weight of waste flakes is a reflection of their removal stage in lithic reduction sequences, i.e., whether they are primary, secondary or tertiary debitage.

conforms well to expectations derived from the model. The purpose of this section, however, was to build a model and to demonstrate its utility rather than to test it with all available data.

Discussion

It should be apparent that elucidating male/female activity differentiation in northern hunter-gatherer base camps is not an end in itself. Rather, the importance of building models that recognize men's and women's artifacts, activities and areas lies in what such endeavours may eventually tell us about intragroup and, when comparisons are made between sites, intergroup social organization and behaviour. Archaeologists traditionally have had very little method and theory to guide them in their attempt to explicate social behaviour from prehistoric archaeological remains. If, however, a model can be built that adequately differentiates male and female activity areas in northern hunter-gatherer base camps, we may begin to understand the social roles, positions and relationships of men and women in such societies and how they may have varied through time and space and in response to other physical and social environmental conditions.

Yet before the full potential of such endeavours can be realized, it is obvious that some, if not all, of the above premises or expectations will need to be refined, modified and even replaced in favour of more robust theories. With presentation and support of this model, however, it is hoped that a step has been taken towards building a theory that may be useful for elucidating social behaviour from the archaeological remains of past hunter-gatherers.

To quote Longacre (1978: 362), one of the two most important areas of archaeological research that we can presently undertake lies in determining the material correlates of patterns of human behaviour and organization. The other is assessing the cultural and natural site formation processes forming the archaeological record (Longacre 1978).

CHAPTER VIII
SUMMARY AND CONCLUDING REMARKS

Over the last several chapters a number of hypotheses and models were advanced to account for that variability in the Peace Point data thought to have been produced by historical, cultural and site formation processes. While it seems obvious that the data could have been approached from many different perspectives, the specific lines of inquiry addressed in these chapters are recommended to guide further work at the site.

No apology is offered for the somewhat unusual style of this report (i.e., the way in which the data were recovered, analysed, presented and interpreted). On the contrary, if traditional field methods and epistemology were employed (e.g., block provenience excavation in arbitrary levels to recover traditionally defined diagnostic artifacts), it is conceivable that the site may have been judged much less significant; formal tools were exceedingly rare and debitage constituted most of the artifact assemblage. Moreover, while traditional type-based approaches to the 1981 salvage-assessment of Peace Point would have exposed larger areas and perhaps even recovered more diagnostic artifacts, far less meaningful information about the site and its potential would have been obtained. However, the uniqueness of the site, combined with a methodology that recognized this fact, has resulted in a report that has addressed the significance of the site and explored some of its potential. To this end this report should be of interest not only to park planners and interpreters, but also to regional prehistorians and most prehistoric archaeologists in general.

Following a brief introduction to the report, an equally brief review of northeastern Alberta archaeology and prehistory was undertaken. As well as reviewing major archaeological finds within the region and adjacent areas, this chapter addressed our current limited understanding of the region's prehistoric cultural dynamics. The lack of productive stratified sites, which would provide us with opportunity to begin to address regional cultural development, change and continuity, was seen to be one of the major reasons why advances in northeastern Alberta have been slow in coming.

The next chapter presented the results of several weeks of preliminary archaeological investigations carried out at Peace Point in 1980. The Peace Point site was judged to be very significant because of its deeply stratified, productive cultural deposits and their uncommon degree of structural integrity.

The following chapter presented the major results of several weeks of archaeological investigations carried out in the vicinity of Peace Point in 1980. Results were discussed that bore directly on illuminating the function, role and history of the site within local and regional contexts. In this regard the range of projectile points from the Lake One dune site and lithic data from the Peace River survey proved to be instructive. The former suggested that a variety of cultural groups may have exploited the lower Peace River lowlands over the last several thousand years, while the latter indicated that the Peace Point site, and to a lesser extent several others like it along the river, served primarily as major workshop/habitation sites through time.

The next and most detailed chapter in the report presented the results of the 1981 salvage-assessment of the Peace Point site. Data were discussed by natural levels and an attempt was made to address all relevant artifacts, features and data in considerable depth. In so doing, a number of ideas and postulates were advanced to account for patterning within and between levels. It is important to point out that most of these formulations should be viewed as working hypotheses, subject to revision or rejection as more data are accumulated. Certainly many alternative hypotheses could, and perhaps should, have been put forward. Moreover, many hypotheses were predicated on the assumption that most artifacts from most occupation surfaces represented single and/or related episodes of occupation rather than multiple and/or unrelated depositional events — an assumption that found support in the data but which has to be demonstrated by alternative means such as refitting. Nonetheless, it was in this chapter that the real potential of the site came to light. More than anything else, the deeply stratified nature of the Peace Point site and its high degrees of structural resolution and integrity account for its significance.

The following chapter presented the first real synthesis of the Peace Point data. Initially, attempts were made to illuminate several broad temporal trends within the data and to compare several of the unit's most productive prehistoric living floors with other sites in the region and adjacent areas. While the shift in prepared core technologies was perhaps the most instructive trend noted, levels 1 and 13 proved to be the most informative levels from a comparative standpoint. In recognition of certain inherent limitations within these traditional methods of regional chronology building, an attempt was then made to elucidate cultural development, change and continuity within the data by looking at variation and/or differentiation in site use and mobility patterning through time. Although this exercise was intended to demonstrate only the utility and potential of constructing cultural-historical chronologies in this manner, an important trend that may serve as a model for site use and occupation and a direction for future research was noted. Specifically, much of that variability in the Peace Point data could be explained with reference to a shift in the use of the site from foraging groups employing coverage tactics to maximize resource encounters to collecting groups employing positioning tactics to utilize a prior knowledge of resource distributions. The implications of these findings for modelling local land-use patterns through time were discussed.

The next and last substantive chapter in the report explored in detail a number of substantive theoretical issues presented earlier. The first part of the chapter formulated two complementary models designed to account for artifact patterning thought to have been produced by site formation processes during occupation. The implications of these models for understanding the formation of workshop/habitation sites in general were discussed. The second section of this chapter, with reference to data from level 7, attempted to formulate a model differentiating male and female activities and behaviour in northern hunter-gatherer base camps. A number of expectations were generated and then tested independently with data from the Cold Site at Port Refuge in the high Arctic. The implications of this model for explicating social behaviour and organization from the remains of prehistoric hunter-gatherers — a traditional but elusive pursuit of most prehistoric archaeologists — were discussed.

In conclusion, it seems obvious that the Peace Point site is an extremely uncommon and productive archaeological resource that can offer so much to so many. To Parks staff it affords an excellent opportunity to educate and inform the park visitor about man's use of, and relationship with, the park environment through time. To the local native inhabitants of the northern boreal forest of western Canada it offers a rare chance to grasp, understand and appreciate their own unique cultural heritage. To the regional archaeologist interested in the past cultural dynamics of northeastern Alberta it affords the best opportunity yet to formulate a regional chronology. Finally, to the prehistoric archaeologist and theorist it offers an unparalleled opportunity to formulate, test and refine many ideas and hypotheses relevant to understanding man's most universal and successful adaptation to date — the hunting and gathering way of life.

APPENDIX A
SOIL PROFILE DEVELOPMENT, PEACE POINT
by Douglas Proch

During the initial examination of 30R1, soil samples were collected from several test pits and various cliff face profiles. It was anticipated that these samples would be able to provide information about the environmental history of the Peace Point area. This appendix presents the results of one study designed to achieve this end.

Underlying the terrace sediments at 30R1 is a sporadic glacial till on top of fractured Slave Point Formation limestone. Devonian gypsum of the Fort Vermillion Formation occurs below the limestone (Airphoto Analysis Associates 1979). Small pockets of grassland surrounded by a 7-m- to 10-m-high aspen forest occur on these sediments. Jeffrey (1961) states that the grasslands were once much larger but they have been displaced over the last 50 or so years by the advancing aspen forest. Although it may be problematic, he suggests that the prairie may be anthropogenic and possibly pyrogenic in origin. A climatic change or a decrease in bison grazing could also have contributed to the aspen invasion.

Samples used in this analysis were obtained by removing 300 g to 500 g of soil from the various levels observed in the walls of test pits and cliff face profiles at the site. Levels were initially discriminated from one another by the subjective observation of colour changes within the various soil sequences. Of the 41 samples collected in 1980, 18 were subjected to floral analyses, while 24 were incorporated into a particle-size analysis. While the former were derived from the original cliff face profile and test pit in the vicinity of the excavation unit, the latter were derived from a test pit approximately 450 m upstream near the western terminus of 30R1 (Fig. 48). Despite this distance, a strong similarity in stratigraphy exists between these areas.

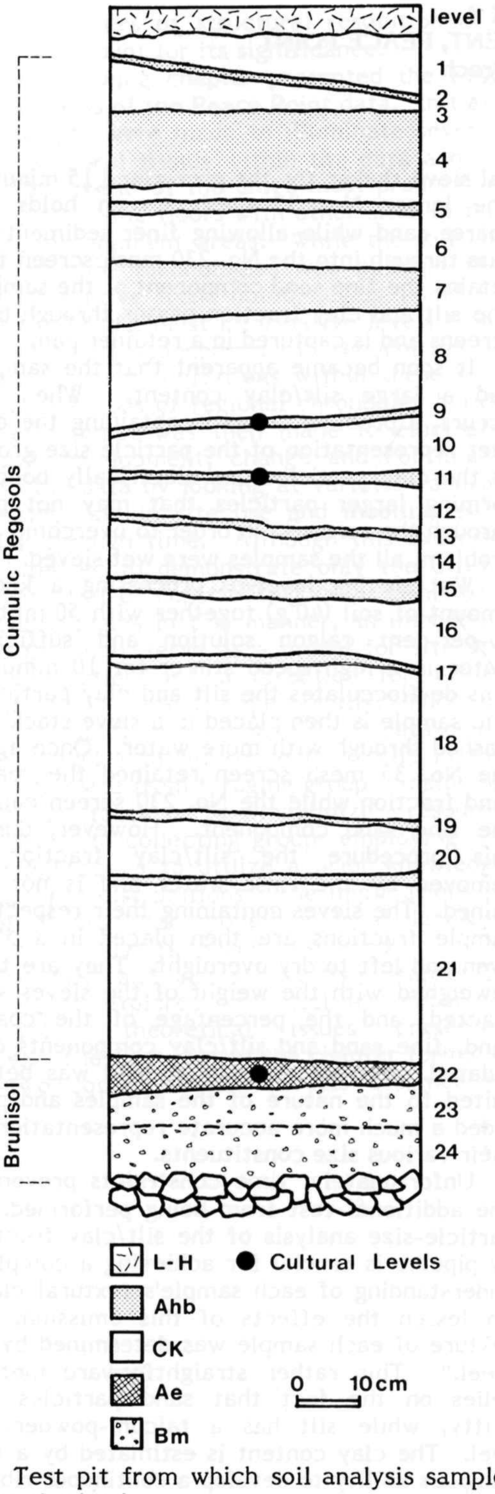
Test Performed

A dry sieving procedure was initially employed in the particle-size analysis of the soil samples. This was accomplished by placing a measured amount of soil (10 g) into a stack of sieves that in turn were placed in a mechanical sieve shaker for the prescribed 15 minutes. The larger No. 35 mesh screen holds the coarse sand while allowing finer sediments to pass through into the No. 230 mesh screen that retains the fine sand component of the sample. The silt and clay fraction passes through both screens and is captured in a retainer pan.

It soon became apparent that the samples had a large silt/clay content. When this occurs, a problem arises in obtaining the correct representation of the particle size groups as the clay particles are electrically bonded, forming larger particles that may not pass through the screens. In order to overcome this problem, all the samples were wet sieved.

Wet sieving involves processing a known amount of soil (40 g) together with 50 ml of a 10-per-cent calgon solution and sufficient water in a high speed stirrer for 10 minutes. This de-flocculates the silt and clay particles. The sample is then placed in a sieve stack and washed through with more water. Once again the No. 35 mesh screen retained the coarse sand fraction while the No. 230 screen caught the fine sand component. However, during this procedure the silt/clay fraction is removed by the rinse water and is not retained. The sieves containing their respective sample fractions are then placed in a 50°C oven and left to dry overnight. They are then reweighed with the weight of the sieves subtracted, and the percentage of the coarse sand, fine sand and silt/clay components calculated. The wet sieving method was better suited to the nature of the samples and provided a much more accurate representation of their various size constituents.

Unfortunately, time constraints prevented one additional test from being performed. A particle-size analysis of the silt/clay fraction by pipette is crucial for achieving a complete understanding of each sample's textural class. To lessen the effects of this omission, the texture of each sample was determined by its "feel." This rather straightforward method relies on the fact that sand particles are gritty, while silt has a talcum-powder-like feel. The clay content is estimated by a wet sample's ability to develop a continuous ribbon when pressed between the thumb and fingers.



48 Test pit from which soil analysis samples were obtained.

Although this method is not nearly as refined as the pipette analysis, it assisted in determining the constituents of and the processes involved in the formation of the soils at the Peace Point site.

It remained necessary to dry sieve the samples as this was the only way to obtain the silt/clay sample that is required to determine the organic matter content of each sample. This was accomplished by placing approximately 5 g of the silt/clay fraction from each sample into a 550°C kiln for 40 minutes. In that environment, all the organic matter was consumed. The percentage of organic matter contained in each sample can then be calculated from the differences observed between the pre- and post-firing weights. A balance capable of weighing to four decimal points was used to conduct this study.

Because the bedrock along the lower Peace River consists of limestone and gypsum, it was suspected that the soil contained a substantial amount of carbonates. To test this assumption, material retained from the dry sieving segment of this study was sent to the Historic Resources and Conservation Division of Parks Canada where Senior Conservation Technician Mark MacKenzie undertook a pH analysis of the samples. The results of his analysis have been incorporated into this report.

Soil colour is a useful characteristic when distinguishing profile horizons and it was important to remove any subjectivity from this segment of the study. This was accomplished by comparing all the dry soil samples with the Munsell colour charts.

Results

The results of these tests are presented in Table 8. Not only does this table document the change in soil alkalinity, from slight to moderate, which occurs 50 cm below the surface, but it also indicates the texture of the various soil horizons. This 190-cm-thick profile is composed of sediments with texture classes ranging from a loam, through silt and clay loams, to clay. This is in agreement with Airphoto Analysis Associates (1979) who state that the terrace soils along the Peace River were derived from river alluvium composed of non-stony silty clays to very fine sand. Perhaps the most salient attribute of the profile is its stratification. It is composed of numerous dark organically enriched bands separated

Table 8
Summary of Soil Analysis

			Wet Sieving						
			Sieve No. 35		Sieve No. 280		Retainer		
Level	pH	Munsell Colour	Coarse Sand	Organics	Fine Sand	Organics	Silt/Clay	Organics	Textural Class
1	7.9	Olive brown	-	0.20	43.53	1.24	53.50	1.52	Loam
2	7.7	Very dark greyish brown	-	-	-	-	-	-	-
3	7.8	Brown	-	0.07	56.51	2.19	36.69	1.54	Silt loam
4	7.8	Dark brown	-	0.07	24.80	1.77	68.45	4.90	Silt loam
5	7.9	Dark brown	-	0.05	16.44	1.71	74.06	7.74	Silt loam
6	7.9	Brown	-	0.15	38.10	1.52	57.90	2.32	Silt loam
7	7.9	Dark brown	-	0.30	31.26	2.96	59.96	5.69	Loam
8	8.2	Light olive brown	-	0.12	20.45	0.79	75.69	2.94	Clay
9	8.1	Dark brown	-	0.20	15.67	1.15	77.29	5.68	Silt loam
10	8.2	Brown	-	0.22	40.82	2.20	53.85	2.90	Clay loam
11	8.0	Dark brown	-	0.07	17.63	1.92	72.46	7.92	Silt loam
12	8.1	Brown	-	0.17	47.87	2.40	47.19	2.36	Clay loam
13	8.0	Very dark greyish brown	-	0.50	32.67	3.90	56.22	6.71	Loam
14	8.2	Brown	-	0.20	42.25	1.82	51.57	4.15	Clay loam
15	8.0	Very dark greyish brown	-	0.07	17.19	2.26	71.11	9.37	Silt loam
16	8.1	Brown	-	0.05	16.62	0.78	78.81	3.74	Clay
17	8.1	Dark brown	-	0.50	23.72	1.50	69.85	4.42	Silt loam
18	8.2	Brown	-	0.05	47.72	1.63	48.93	1.67	Loam
19	8.0	Very dark greyish brown	-	0.55	22.48	2.89	65.62	8.45	Silt loam
20	8.0	Brown	-	0.02	51.74	2.86	43.01	2.37	Loam
21	8.0	Light olive brown	-	0.02	37.34	1.76	58.23	2.65	Silt loam
22	8.1	Very dark greyish brown	-	0.45	22.43	2.84	65.93	8.35	Silt loam
23	8.1	Dark yellowish brown	0.3	-	20.96	1.14	73.58	4.02	Clay loam
24	8.3	Yellowish brown	0.3	-	10.11	0.49	84.41	4.19	Clay

by lighter coloured, generally thicker sediments. Airphoto Analysis Associates (1979) suggest that these alternating layers of mineral and organic material are evidence of various flooding episodes. The former surface position of the dark bands is reflected in their higher pollen counts (see Appendix B). This, along with the fact that three organically enriched horizons in this test pit and almost every dark horizon in the 1981 excavation unit contained cultural material, proves beyond most doubt that they represent buried soil surfaces. These dark organically enriched bands continue down to 175 cm below the surface. A 6-cm-thick dark yellowish brown horizon occurs directly below this lowest dark band. It grades into an 8-cm-thick yellow-brown horizon lying directly on the limestone bedrock.

Soil Classification and Interpretation

To facilitate the classification and interpretation of the Peace Point soils, Steven L. Zoltai (Manitoba Department of Historic Resources) was consulted. Although Mr. Zoltai's exposure to the profile was limited to the examination of photographic slides and the data in Table 8, he was able to corroborate interpretations as well as make many useful comments.

First, the entire profile consists of a number of buried palaeosols whose surfaces are represented by dark bands. Within the upper 170 cm of the profile, numerous buried palaeosols combine to form a series of cumulic regosols which are characterized by a thin humus enriched (Ah) horizon above a generally thicker horizon of undeveloped alluvium (CK). The cumulic regosols lack any other genetic horizons. In this case, the lack of development is due to the addition of alluvium during flooding episodes. These rapidly formed, short-lived and undeveloped soils lie on top of a brunsolic palaeosol, possibly an eluviated eutric brunisol.

Although not especially well developed in the test pit yielding the 24 analyzed soil samples, this brunisol is strongly developed in the 1981 excavation unit where its dark buried surface horizon was dated to just after 2500 years ago. This mature soil is characterized by prominent eluvial (Ae) and illuvial (Bm) horizons created by surface water percolating down through the profile. The relatively less developed brunisol in the upstream test pit may have resulted from the reduced availability of surface water created by local differences in relief and drainage. In any case, the brunisol's mature profile requires a much longer formation period than the overlying cumulic regosols. Hence, at the time of the *brunisols formation, prior to approximately* 2500 years ago, the land surface was more stable than it has been in succeeding times. Since the soil is composed of alluvial sediments, the upper short-lived palaeosols formed between periods of flooding. This increased flooding and the subsequent deposition of alluvium indicates that the Peace River in the vicinity of Peace Point has undergone some change in its hydrologic regime since 2500 years ago.

Possible biotic changes may also be reflected in the Peace Point soil profile. During the stable period, denoted by the brunsolic soil, the dominant vegetation was most likely a forest, although this type of soil can develop under a wide range of vegetation and climatic conditions. Its formation, however, depends on readily available surface water which suggests generally moister conditions. This condition would also favour a forest, rather than grassland habitat.

Flora occurring on the surface of the cumulic regosols, however, is more problematic, since their time frame was too limited to allow for any profile development. Had grasses dominated a substantial humus-enriched (Ah) horizon would have been expected to form. Whereas if forest conditions had prevailed, a sequence of eluvial (Ae) and illuvial (Bm) horizons over a calcareous parent material, similar to the sequence occurring just above the bedrock at 30R1, would be expected.

Initially, wood charcoal in most soil samples suggested that forest must have occurred on the soil surfaces. However, a new scenario develops when we introduce the fact that very few areas are exclusively grassland without trees and shrubs growing on them. The presence of the charred wood may actually strengthen Jeffrey's (1961) observation that there may have been a cultural preference for grasslands and that their existence was encouraged by frequent burning. Regardless of the reasons responsible for its existence, the Peace Point area was grassland when Charles Mair visited it in 1899:

Landing at Peace Point, the traditional

scene of peace between the Beavers and Chipewyans, or between the Beaver and the Crees, as MacKenzie says, or all three, we found it to be a wide and beautiful table-like prairie, begirt with aspen, on which we flushed a pack of prairie chicken (Mair 1908: 99).

Conclusion

The analysis of the soil samples from 30R1 has been able to shed light on soil profile development and past environmental conditions. Essentially, this development can be separated into two periods. The earliest period, prior to approximately 2500 years ago, was characterized by a relatively stable hydrologic regime. This stability is reflected in the well-developed brunsolic soil which most likely developed in a moister environment under forest conditions. This was followed by an unstable hydrologic period characterized by a series of cumulic regosols formed on river alluvium deposited during flood episodes. The flora that developed on their thin surface horizons cannot be determined because the soil profile did not have sufficient time to acquire any significant characteristics in response to the impact of vegetation and climate. While the vegetation may have been forest, it is more conceivable, in light of this and the discussion presented in the body of the report, that it was grassland. Certainly a number of observations going back to Alexander Mackenzie's visit to the area support this interpretation. It seems clear, however, that within the last century the prairie has been invaded by an aspen forest. This would seem to indicate that the grassland was not so much a natural expression of the environment as it was anthropogenic in origin. In this regard it would be interesting to determine if the maintenance of grasslands by native peoples at Peace Point corresponds to the use of the site as a possible base camp approximately 1500 years ago.

Table 9
Weight and Volume of Soil Samples From 1980 Cliff Face Profile and Test Pit

PROFILE

Provenience	Lab No.	Total Volume (mL)	Total Weight (g)	Sub-sample (>1.0 mm) Volume (mL)	%	Sub-sample (<1.0 mm) Weight (g)	%
Level 6 (hearth)	6	410	446	230	56	165	37
Dark band between levels 5 and 6	5-6	150	168	35	23	19	11
Level 5	5	245	228	70	29	46	20
Level 2	2	260	252	120	46	79	31
Level 1	1	235	248	75	32	68	27
Transition zone below level 1	1b	185	212	100	54	85	40
Red zone above bedrock	1c	125	154	50	40	50	32

TEST PIT

Provenience	Lab No.	Total Volume (mL)	Total Weight (g)	Sub-sample >1.0 mm (mL)	%	Volume >0.5 mm (mL)	%	Sub-sample <1.0 mm (g)	%	Weight <0.5 mm (g)	%
Level 5	5	470	451	100	21	50	11	81	18	33	7
Light soil above level 3	3a	760	921	100	13	55	7	76	8	32	3
Level 3	3	510	514	100	20	80	16	91	18	53	10
Light soil above level 2	2a	660	686	250	38			200	30		
Level 1	1	560	536	150	27	80	14	123	23	53	10
Transition zone	1b	660	643	200	30	100	15	166	26	68	11
Red zone	1c	710	816	300	42			247	30		
Level 16	16	710	599	120	17			65	11		
Level 17	17	410	331	70	17	55	13	40	12	22	7
Level 12	12	385	386	75	19	60	16	66	17	36	9
Level 7	7	610	574	50	9			28	5		
	Total	8055	8165	2195				1695			

APPENDIX B
MACRO- AND MICROFLORAL ANALYSES

Eighteen soil samples from the 1980 cliff face profile and original test pit in the vicinity of the excavation unit were initially culled for macrofloral and pollen analyses. Soil samples from the profile were intentionally selected from six lower cultural and non-cultural levels for the purpose of providing information about floral preservation and change in the site's earlier deposits. Soil samples from all seven cultural and several non-cultural levels from the test pit were retained primarily to answer questions concerning differences in floral content between suspected flood-deposited sediments and past occupation surfaces. These samples were submitted by James Moore (Senior Conservation Scientist for Parks Canada in Ottawa) to J.H. McAndrews and R.O. Fecteau of the Dept. of Botany, Royal Ontario Museum, Toronto, for analysis. This appendix briefly summarizes the results of their analyses of these samples (McAndrews and Fecteau 1981). The location, weight and volumes of the samples are listed in Table 9.

Macrofloral Analysis

Cursory inspection of most samples showed a dearth of visible organic remains, particularly from cultural levels. Experience dictated to the investigators that such samples usually contain few macrofossils. To test this assumption, sub-samples were taken using a 1.0-mm sieve, which separates the soil into two fractions —<1.0 mm and >1.0 mm. While seeds and organic material are usually concentrated in the larger fraction, small seeds such as goosefoot and raspberry can be found in both. To check for small seeds, all soil sub-samples less than 1.0 mm were inspected. A further sub-sample using a sieve with a 0.5-mm mesh was then taken. Preliminary inspection of the latter sub-samples, however, failed to yield any seed remains, and fine sieving was subsequently discontinued. All seeds were examined with a stereomicroscope using magnifications from 10X to 25X and compared with reference specimens.

Generally, uncarbonized plant remains from archaeological soils are recognized as recent, and thus contaminants. Therefore, with the possible exception of the protohistoric levels, they should be regarded as such. Charred wood fragments, although quite small (ca. 2.0 mm), were removed from the matrix and prepared for examination by breaking the specimen to obtain a fresh transverse cross-section. Larger fragments of charred wood were then identified using an illustrated wood identification key and by comparison with identified wood samples. Only seeds were quantified because of the abundance of other organics in the darker soil samples.

While the interpretation of macrofossil remains is limited because of the paucity of seeds, a number of things are readily apparent from Table 10. First, with the exception of one charred hawthorn (Crataegus) seed from level 3, macrobotanical remains were restricted to level 17. Here 25 uncharred seeds of Chenopodium (goosefoot), four of Fragaria (strawberry) and one of Rubus (raspberry) were found. While all three species occupy weedy habitats and may be modern, they may also be part of the diet of the protohistoric occupants responsible for this level. The differential number and nature of seed remains from upper and lower levels further suggests that we might expect only carbonized seeds from the lowest levels and then only in small numbers. In this regard, flotation techniques should be considered for any further attempts to recover macrobotanical remains from the site.

While charred and uncharred wood fragments and rootlets were present in most soil samples, the investigators noted that the samples from the lighter, non-cultural levels contained comparatively little or no charred wood (McAndrews and Fecteau 1981). This they interpreted as evidence for soil blackening as a result of forest fires. The latter would also appear to support the interpretation that darker soils represent past soil surfaces while lighter sediments represent brief, catastrophic flooding events. The fact that microdebitage and bone fragments occurred only in the former samples would seem to support this interpretation as well. While charred, diffuse porous wood from levels 1, 2 and 3 appeared to be poplar, charred spruce needles were found in abundance in both protohistoric levels. For reasons discussed in the body of the report,

Table 10
Macrofloral Contents of Soil Samples from 1980 Cliff Face and Test Pit Profiles in the Vicinity of Site 30R1

	Charred			Uncharred				Non-botanical					
Lab. No.	Picea (Spruce) Needle Fragments	Diffuse Porous Wood	Wood Frag-ments	Wood Frag-ments	Twigs	Buds	Root-lets	Chert Flakes	Bone Frag-ments (Burned)	Bone Frag-ments (Unburned)	Snail	Insect	Miscellaneous (Seed)
6	-	-	+	-	-	-	+	-	+	+	-	-	
5-6	-	-	+	-	-	-	+	-	-	-	-	-	
5	-	+	+	-	-	+	+	-	-	-	-	-	
2	-	-	+	-	-	+	+	-	-	-	+	-	
1	-	-	+	-	-	-	+	-	-	-	-	-	
1b	-	-	-	-	-	-	+	-	-	-	-	-	
1c	-	-	+	-	-	-	+	-	-	-	+	-	
17	+	-	+	-	+	-	+	-	-	+	-	-	uncharred goosefoot (Chenopodium) 25, strawberry (Fragaria) 5, raspberry (Rubus) 1
16	+	-	+	-	+	+	+	-	-	+	-	-	
12	-	-	+	-	-	-	+	-	-	-	+	+	
7	-	-	+	-	-	-	+	+	-	+	+	+	
5	-	-	+	+	-	+	+	+	-	-	+	-	
3a	-	-	+	-	-	-	+	-	-	-	+	+	
3	-	+	+	-	-	-	-	-	-	-	-	+	charred hawthorn? (Crataegus) 1
2a	-	-	+	-	-	-	+	-	-	-	+	-	
1	-	-	+	-	-	-	+	-	-	-	+	-	
1b	-	+	-	-	-	-	+	-	-	-	+	-	
1c	-	-	-	-	-	-	+	-	-	-	-	-	

Table 11
Pollen and Spores in Soil Samples from 1980 Cliff Face Profile and Test Pit Profiles

Lab. No.	Identified Pollen g^{-1} ($X\ 10^{-3}$)	Total Pollen Counted	Picea (Spruce)	Pinus (Pine)	Betula (Birch)	Gramineae	Lycopodium	Dryopteris Type (Fern)	Sphagnum (Peat Moss)	Indeterminable	Pre-Quarternary	Miscellaneous
6	0.1											unknown 1, Umbelliferae 1,
5-6	1.5	100	10	85	1	2	1	1	17	-	90	Alnus Artemisia 1,
5	4.4	100	31	69	-	-	1	2	17	4	40	Caryophyllaceae 1,
2	2.0	100	24	66	2	3	-	1	16	3	110	Chenopodiineae 2,
1	0.9											Caryophyllaceae 2,
1b	0.2											Tubuliflorae 1
1c	0.0											
17	3.3	100	23	75	-	1	-	-	6	1	7	Cyperaceae 1
16	5.5	100	17	82	-	-	-	-	1	3	6	Onagraceae 1
12	3.5	100	16	80	2	-	-	2	2	5	41	Ulmus 1, Alnus 1
7	2.1	100	23	72	3	1	1	1	9	3	21	Equisetum 1
5	1.0	100	30	69	-	-	1	1	9	2	89	Tubuliflorae 1
3a	0.0											
3	0.7											
2a	0.8											
1	0.8											
1b	1.3	100	16	84	-	-	2	1	7	2	12	unknown 2
1c	0.0											

the charred nature of the latter remains may have resulted from culturally derived forest or grass fires.

Microfloral Analysis

This analysis was undertaken specifically to determine if there were any significant changes in the pollen spectrum during occupation of the site and to supplement the previous findings that the darker soil horizons represented past soil surfaces.

Fossil pollen and spores were first concentrated from 10 ml of air-dry soil. The soil was also weighed. Before treatment 23,700 modern Lycopodium spores were introduced. The samples were sieved and the 150-um to 15-um fraction treated with HCL, HF and acetolysis solution. The concentrate was then mounted in silicone oil. Microfossils were counted together with the introduced Lycopodium, and the pollen g^{-1} was calculated. Only samples with over 1000 g^{-1} were deemed rich enough to proceed to a 100 pollen grain count. Because pollen concentrates contained much organic debris (mostly insoluble charcoal), analysis was tedious and lengthy.

Pollen was generally sparce, with values up to 5000 Quaternary pollen g^{-1}. Most pollen spectra, however, were dominated by Pinus and Picea with occasional Betula, Alnus and miscellaneous herbs (Table 11). Sphagnum spores are more abundant in the original profile. Pre-Quaternary pollen and spores are abundant, reflecting the sedimentary rocks that are the source of the soil parent material.

With the exception of level 3 and possibly level 1, all darker cultural horizons contained more pollen than the lighter non-cultural soils, suggesting that they represent past soil surfaces. The sample from the hearth in level 6, however, had little pollen, perhaps because of firing. The defined red horizon below level 1 had no pollen and may represent a light soil with iron staining.

The modern pollen rain of the area is Picea 25, Pinus 30, Betula 15, Alnus 15, herbs 10 and miscellaneous 5 (McAndrews and Manville 1981). In comparison, fossil Betula and Alnus are virtually absent, possibly because they are differentially destroyed (Hall 1981). Assuming that Picea and Pinus are preserved proportionately to one another, then their ratio can be compared with the radiocarbon-dated pollen diagram from nearby Porter Lake in the Northwest Territories (Ritchie 1980: 24, Fig. 4). There Pinus exceeds Picea only after 5000 years B.P. Thus all soil pollen spectra are probably considerably younger than this age -- a finding consistent with the radiocarbon dates from the levels. The pollen spectra from the profile and test pit are similar, except that Sphagnum spores are more abundant in the original profile, possibly because of the profile's location in the cliff face.

In conclusion, the pollen analysis revealed that 1) fossil pollen was most abundant in darker horizons, indicating that the latter represent fossil soil surfaces, 2) pollen spectra are dominated by relatively tough Pinus and Picea, 3) soils had accumulated well within the last 5000 years, and 4) there is no significant change in the pollen stratigraphy through time.

APPENDIX C
FLAKE TOOLS

This appendix presents a summary table of ten metric and eight non-metric attributes of over 220 flake tools from the most productive prehistoric living floors in the excavation unit. Included within the table are all minimally retouched and/or utilized lithic artifacts from levels 1, 5, 6, 7, 13 and 14. Not included in the table are minimally modified flakes from minor occupation surfaces or finished tools such as biface/projectile points or scrapers. Some flake tools undoubtedly represent prepared tools that were manufactured with some preconceived shape (i.e., metal template) in mind. They, and not finished bifaces and scrapers, were included simply because their potential to yield stylistic or cultural information remains unknown. This is not to say we understand the stylistic content of more formally prepared tools where artisans had greater intention or opportunity to impart ethnically significant information on stone artifacts. We do not. Nevertheless, most archaeologists interested in the ethnic significance of lithic artifacts have rejected the ubiquitous flake tool in favour of more formally prepared tools.

The approach advocated here is the same as that elaborated by Sackett (1982). Style is considered to reside not so much in the formal variation that artisans purposefully invest in tools, but in the choice of options that one encounters when carrying out a given task. The stylistic potential of edge-modified flakes, in short, remains to be explored. Because of this, and in light of the fact that traditionally defined artifacts were so rarely encountered in the excavation, the following list is presented for the primary purpose of identifying some attributes that might be useful for such an endeavour. The attributes presented are not unlike those considered by Stiles (1979). The list also demonstrates the range of variation that might be expected, even in the smallest of samples.

While the continuous and ratio scale measurements in the tables are self-explanatory, legends for the non-metric observations are presented below.

Material Type	
chert	1
quartzite	2
other	3
Location of Work	
distal	1
lateral	2
angulated	3
proximal	4
Type of Work	
dorsal	1
ventral	2
bifacial	3
alternating	4
Working Edge Shape	
concave	1
straight/concave	2
straight	3
straight/convex	4
convex	5
angulated point	6
narrow nose	7
undulating	8
Working Edge Angle	
<40°	1
40° - 60°	2
>60°	3
Spine Plane Angle	
<40°	1
40° - 60°	2
>60°	3
Type of Flake	
primary	1
secondary	2
tertiary	3
Platform Angle	
<40°	1
40° - 60°	2
60° - 90°	3
>90°	4
absent or could not be determined	0

Table 12
Summary of Metric and Non-metric Attributes of Flake Tools from 1981 Excavation of 30R1

Level	Artifact Number	Maximum Length (ML) (mm)	Maximum Breadth (MB) (mm)	Maximum Thickness (MT) (mm)	Circumference (C) (mm)	Length of Worked Edge (LW) (mm)	LW/ML	LW/C	MB/ML	MT/MB	No. of Modified Edges	Material Type	Location of Work	Type of Work	Working Edge Shape	Working Edge Angle	Spine Plane Angle	Type of Flake	Platform Angle
1	001	14	09	04	041	09	064	022	064	044	1	1	1	1	3	3	1	2	4
1	002	21	15	03	056	20	095	036	071	020	1	1	2	1	3	3	1	1	4
1	003	11	06	02	031	10	091	032	055	033	1	1	1	1	3	3	1	1	4
1	004	42	20	09	103	80	190	078	048	045	1	1	2	1	3	2	2	1	2
1	005	26	10	02	063	09	035	014	038	020	1	1	1	1	3	3	1	2	0
1	006	11	08	01	032	06	055	019	073	013	1	1	1	1	3	3	1	3	0
1	007	22	07	02	046	06	027	013	032	029	1	1	2	1	4	3	1	2	0
1	008	16	08	02	044	09	056	020	050	025	2	1	2	1	3	2	1	2	0
1	-	-	-	-	-	-	-	-	-	-	-	-	1	1	3	3	1	2	0
1	010	29	16	03	070	155	052	021	055	019	1	1	2	1	3	1	1	1	3
1	011	23	17	08	063	11	048	017	074	047	1	1	1	1	4	3	1	1	4
1	012	22	17	02	061	09	041	015	077	012	1	1	2	1	5	2	1	2	0
1	013	17	12	01	047	04	024	009	071	008	1	1	2	1	3	2	1	3	0
1	014	22	11	02	051	08	036	016	050	018	1	1	4	1	3	3	1	2	0
1	016	10	07	02	026	05	050	019	070	029	1	1	2	1	3	2	1	2	4
1	017	20	07	03	048	14	070	029	035	043	2	1	2	1	5	3	1	2	0
1	-	-	-	-	-	-	-	-	-	-	-	-	1	1	5	3	1	2	0
1	018	15	07	03	034	05	033	015	047	043	1	1	1	1	3	3	1	3	0
1	019	10	09	02	029	07	070	024	090	022	1	1	1	1	4	3	3	2	4
1	021	33	16	04	088	12	036	014	048	025	1	1	2	1	3	3	1	2	3
1	022	19	12	04	061	09	047	015	063	033	1	1	1	1	6	3	1	2	4
1	023	25	20	08	077	05	020	006	080	040	1	1	1	1	3	3	1	2	4
1	024	23	21	09	079	18	078	023	091	043	2	1	1	2	3	1	1	2	4
1	-	-	-	-	-	-	-	-	-	-	-	-	2	1	6	3	2	2	4
1	025	10	09	01	031	05	050	016	090	011	1	1	2	1	3	3	1	2	0
1	026	14	12	01	038	04	029	011	086	008	1	1	2	1	3	1	1	2	4
1	027	29	24	07	081	11	038	016	083	029	1	1	1	1	3	2	2	2	4

Table 12 continued

Level	Artifact Number	Maximum Length (ML) (mm)	Maximum Breadth (MB) (mm)	Maximum Thickness (MT) (mm)	Circumference (C) (mm)	Length of Worked Edge (LW) (mm)	LW/ML	LW/C	MB/ML	MT/MB	No. of Modified Edges	Material Type	Location of Work	Type of Work	Working Edge Shape	Working Edge Angle	Spine Plane Angle	Type of Flake	Platform Angle
1	029	21	15	03	063	09	043	014	071	020	1	1	1	1	3	3	1	2	4
1	030	65	35	22	165	14	022	008	054	063	1	1	2	1	1	3	3	2	0
1	031	14	13	01	039	11	076	028	093	008	1	1	2	1	3	3	1	1	0
1	032	14	12	02	041	05	036	012	086	017	1	1	2	2	3	2	1	2	0
1	033	19	12	02	049	09	047	018	086	017	1	1	1	1	5	1	1	2	4
1	034	14	08	01	036	06	043	017	057	013	1	1	2	1	3	3	2	2	4
1	035	28	18	05	068	05	017	007	064	028	1	1	4	1	3	3	3	2	0
1	036	17	13	02	043	05	029	012	076	038	1	1	1	1	3	3	2	2	0
1	037	12	11	01	036	08	067	022	092	009	1	1	2	1	3	3	1	2	0
1	038	25	12	04	059	08	032	014	048	033	1	1	1	1	3	3	1	1	4
1	039	12	10	02	036	07	058	019	083	020	1	1	1	1	3	3	1	2	3
1	040	14	08	03	036	05	036	014	057	038	1	1	1	1	3	3	1	2	0
1	041	18	14	02	052	09	050	017	078	014	1	1	2	1	3	2	2	2	4
1	042	30	16	06	071	09	030	013	053	038	1	1	2	3	3	3	1	1	3
1	043	39	24	10	096	15	038	016	062	042	2	1	2	1	3	2	1	2	3
1	-	-	-	-	-	-	-	-	-	-	-	-	1	3	0	0	0	2	3
1	044	11	09	02	031	04	036	013	082	022	1	1	2	1	3	3	3	2	4
1	045	25	20	07	068	13	052	019	080	035	2	1	2	4	3	2	1	1	0
1	-	-	-	-	-	-	-	-	-	-	-	-	2	2	1	2	1	1	0
1	046	25	08	03	056	13	052	023	032	038	1	1	2	2	3	2	1	2	0
1	047	17	09	02	042	03	018	007	053	022	1	1	2	1	5	2	1	2	4
1	049	17	09	04	041	07	041	017	053	044	1	1	1	1	3	3	2	1	4
1	050	50	30	12	125	26	052	021	060	040	2	1	2	1	1	2	1	1	3
1	-	-	-	-	-	-	-	-	-	-	-	-	2	1	3	3	2	1	3
1	051	36	23	06	103	12	033	012	064	026	1	1	2	1	2	3	2	1	0
1	052	23	13	02	056	03	013	005	057	015	1	1	2	4	3	2	1	2	4
1	053	29	22	05	072	08	028	011	076	023	1	1	1	1	5	3	1	1	4

Table 12 continued

Level	Artifact Number	Maximum Length (ML) (mm)	Maximum Breadth (MB) (mm)	Maximum Thickness (MT) (mm)	Circumference (C) (mm)	Length of Worked Edge (LW) (mm)	$\frac{LW}{ML}$	$\frac{LW}{C}$	$\frac{MB}{ML}$	$\frac{MT}{MB}$	No. of Modified Edges	Material Type	Location of Work	Type of Work	Working Edge Shape	Working Edge Angle	Spine Plane Angle	Type of Flake	Platform Angle
1	054	18	16	02	055	06	033	011	089	013	2	1	2	2	3	2	1	2	0
1	-	-	-	-	-	-	-	-	-	-	-	-	1	1	5	1	1	2	0
1	056	15	17	04	052	12	082	024	110	041	1	1	1	1	3	3	3	2	4
1	057	45	28	15	120	11	024	009	062	054	1	1	2	2	3	3	3	1	0
1	058	15	09	02	036	06	040	017	060	022	1	1	1	1	3	3	1	1	3
1	059	51	15	11	125	26	051	021	029	073	2	1	2	1	3	3	2	2	4
1	-	-	-	-	-	-	-	-	-	-	-	-	2	2	3	2	1	2	4
1	060	62	52	40	145	09	015	006	084	077	1	1	2	1	3	3	1	2	0
1	061	21	15	02	062	20	013	032	011	013	2	1	2	1	3	3	1	2	0
1	-	-	-	-	-	-	-	-	-	-	-	-	2	1	3	2	1	2	0
1	062	33	17	10	092	18	055	020	052	059	1	1	2	1	3	2	1	1	0
1	063	22	19	07	072	10	045	014	086	037	1	1	2	1	3	2	1	2	4
1	064	40	33	12	111	22	055	020	083	036	1	1	2	1	3	2	2	1	4
1	065	25	24	05	075	09	036	012	096	021	1	1	2	2	3	2	1	1	4
1	066	38	19	05	086	13	034	015	050	026	2	1	1	1	3	3	2	1	4
1	-	-	-	-	-	-	-	-	-	-	-	-	2	1	3	2	2	1	4
1	067	30	20	05	060	30	100	050	067	025	2	1	1	3	6	0	0	2	4
1	-	-	-	-	-	-	-	-	-	-	-	-	2	4	3	3	1	2	4
1	068	27	19	08	070	04	015	006	070	042	1	1	1	1	3	2	1	1	2
1	069	25	21	08	060	04	016	007	084	038	1	1	2	2	4	2	1	1	4
1	070	25	18	12	063	10	040	016	072	067	1	1	1	1	6	3	3	1	0
1	071	35	23	09	100	04	011	004	066	039	1	1	2	1	3	2	1	1	4
1	072	14	10	03	037	07	050	019	071	030	1	1	2	1	3	2	1	2	0
5	073	23	20	08	058	05	019	009	087	035	1	1	1	1	7	3	1	2	4
5	074	12	10	03	038	06	050	016	083	030	1	1	1	2	3	3	1	1	0
5	075	13	12	06	042	07	054	017	092	050	1	1	1	1	5	2	1	1	3
5	076	18	16	03	052	11	061	021	089	019	1	1	2	1	3	3	1	2	4

Table 12 continued

Level	Artifact Number	Maximum Length (ML) (mm)	Maximum Breadth (MB) (mm)	Maximum Thickness (MT) (mm)	Circumference (C) (mm)	Length of Worked Edge (LW) (mm)	LW/ML	LW/C	MB/ML	MT/MB	No. of Modified Edges	Material Type	Location of Work	Type of Work	Working Edge Shape	Working Edge Angle	Spine Plane Angle	Type of Flake	Platform Angle
5	077	21	12	06	054	12	057	022	057	050	2	1	2	1	3	3	3	1	3
5	-	-	-	-	-	-	-	-	-	-	-	-	1	1	7	2	1	1	3
5	078	10	07	01	028	03	030	011	070	014	1	1	2	2	3	2	1	2	0
5	079	23	18	08	067	10	043	015	078	044	1	1	2	1	3	3	2	1	4
5	080	25	19	06	073	09	036	012	076	032	1	1	2	1	3	2	1	1	3
5	081	24	21	03	074	16	067	022	088	014	1	1	2	1	5	3	1	2	4
5	082	11	08	01	028	04	036	014	073	013	1	1	1	1	4	2	1	2	4
5	083	12	10	01	035	04	033	011	083	010	1	1	1	1	1	2	1	2	0
5	084	15	09	02	040	10	067	025	060	022	1	1	2	1	3	3	1	1	0
5	085	21	19	06	062	09	043	015	090	032	1	1	1	1	3	3	1	1	4
5	086	28	10	06	063	02	007	003	036	060	1	1	1	1	7	3	2	1	4
5	087	21	14	05	059	06	029	010	067	036	1	1	2	1	3	2	1	1	4
5	088	16	06	01	037	07	044	019	038	017	1	1	2	1	3	3	1	1	0
5	089	22	15	05	058	12	055	021	068	033	1	1	2	2	3	1	1	1	0
5	090	22	16	05	060	07	032	012	073	031	1	1	2	1	5	3	2	1	0
5	091	20	09	06	049	16	080	033	045	067	1	1	2	1	5	2	1	1	4
5	092	28	16	08	072	14	050	019	057	050	1	1	2	1	3	3	1	1	0
5	093	31	22	09	089	05	016	006	071	041	1	1	2	4	2	2	1	1	4
5	094	25	13	06	063	24	096	038	052	046	1	1	2	4	3	2	1	1	0
5	095	09	08	01	028	06	067	021	089	013	1	1	2	1	3	2	1	2	0
5	096	13	13	06	042	12	092	029	100	046	1	1	1	4	3	3	1	1	0
5	098	18	13	03	049	10	056	020	072	023	1	1	2	1	3	3	1	1	0
5	099	22	06	03	051	03	014	006	027	050	1	1	1	2	3	2	1	2	0
5	100	22	11	02	053	15	068	028	050	018	1	1	2	2	5	3	1	2	0
5	101	49	22	11	115	22	045	019	045	050	1	1	2	1	4	3	3	1	4
5	102	52	17	11	124	06	012	005	033	065	1	1	1	4	3	3	2	1	4
5	104	31	23	08	082	18	058	022	074	035	2	1	2	1	5	2	1	1	0

Table 12 continued

Level	Artifact Number	Maximum Length (ML) (mm)	Maximum Breadth (MB) (mm)	Maximum Thickness (MT) (mm)	Circumference (C) (mm)	Length of Worked Edge (LW) (mm)	LW/ML	LW/C	MB/ML	MT/MB	No. of Modified Edges	Material Type	Location of Work	Type of Work	Working Edge Shape	Working Edge Angle	Spine Plane Angle	Type of Flake	Platform Angle
5	-	-	-	-	-	-	-	-	-	-	-	-	1	1	3	1	1	1	0
5	106	24	15	06	062	06	025	010	063	040	1	1	1	1	3	3	1	1	4
5	107	25	09	03	060	05	020	008	036	033	1	1	2	1	3	3	1	2	0
5	108	24	11	04	059	03	013	005	046	036	1	1	2	1	3	2	1	2	4
5	109	29	12	06	071	19	066	027	041	050	1	1	2	1	3	3	1	2	4
5	110	19	06	03	046	12	063	026	032	050	2	1	1	1	7	2	1	2	3
5	-	-	-	-	-	-	-	-	-	-	-	-	2	1	3	1	1	2	3
5	111	12	06	02	032	04	033	013	050	033	1	1	1	1	4	3	1	2	0
5	112	25	09	04	055	02	008	004	036	044	1	1	4	1	3	3	1	1	4
5	113	25	11	03	062	03	012	005	044	027	1	1	4	1	3	1	1	1	4
5	114	25	15	04	063	08	032	013	060	027	1	1	2	1	3	3	3	1	4
6	115	24	19	12	059	09	038	015	079	063	2	1	1	1	3	2	2	1	4
6	-	-	-	-	-	-	-	-	-	-	-	-	2	2	3	3	2	1	4
6	117	21	11	05	059	06	029	010	052	045	1	1	2	1	3	3	1	1	4
6	119	24	12	04	059	09	038	015	050	033	1	1	2	2	4	2	1	1	0
6	120	16	11	02	048	07	044	015	069	018	1	1	1	1	3	3	1	2	0
6	121	11	06	01	029	05	045	017	055	017	1	1	2	1	3	2	1	3	0
6	122	27	09	05	068	10	037	015	033	056	1	1	2	1	3	2	1	1	4
6	123	29	21	05	073	04	014	005	072	024	1	1	2	2	3	3	1	1	0
6	124	33	17	04	077	10	019	013	052	024	1	2	2	1	3	3	1	1	0
6	125	12	11	03	037	05	042	014	092	027	1	1	1	1	4	3	1	2	2
7	127	36	19	05	086	16	044	019	053	026	1	1	2	1	3	1	1	1	0
7	128	30	22	05	073	31	103	042	073	023	2	1	2	2	3	2	1	1	4
7	-	-	-	-	-	-	-	-	-	-	-	-	2	1	5	2	1	1	4
7	129	27	16	03	069	12	044	017	059	019	1	1	2	1	3	1	1	1	4
7	130	19	11	07	047	12	063	026	058	064	1	1	2	1	5	3	1	1	4
7	131	17	10	03	037	07	041	014	066	030	1	1	2	1	5	3	1	1	4

Table 12 continued

Level	Artifact Number	Maximum Length (ML) (mm)	Maximum Breadth (MB) (mm)	Maximum Thickness (MT) (mm)	Circumference (C) (mm)	Length of Worked Edge (LW) (mm)	LW/ML	LW/C	MB/ML	MT/MB	No. of Modified Edges	Material Type	Location of Work	Type of Work	Working Edge Shape	Working Edge Angle	Spine Plane Angle	Type of Flake	Platform Angle
7	132	13	13	02	044	08	062	018	100	015	1	1	2	1	3	2	1	2	0
7	133	27	16	08	084	20	074	024	059	050	2	1	2	4	3	2	1	1	4
7	-	-	-	-	-	-	-	-	-	-	-	-	2	2	3	2	1	1	4
7	134	29	19	07	080	11	038	014	066	037	1	1	1	1	2	3	1	1	4
7	135	21	20	03	065	06	029	009	095	015	1	1	2	2	2	2	1	2	3
7	136	31	13	05	074	07	023	009	042	038	1	1	2	2	3	1	1	1	4
7	137	23	14	05	061	13	057	021	061	036	1	1	2	2	3	2	1	1	4
7	138	35	17	05	086	12	034	014	049	029	1	1	2	1	3	2	1	1	0
7	139	18	11	05	046	04	022	009	061	045	1	1	1	1	3	3	1	1	4
7	140	15	13	02	046	03	020	007	087	015	1	1	2	1	3	2	1	1	4
7	141	19	13	04	048	05	026	010	068	031	1	1	1	1	3	2	1	1	2
7	142	17	11	03	044	09	053	020	065	027	1	1	2	2	3	3	2	1	0
7	143	30	20	06	077	17	057	022	067	030	1	1	2	2	3	2	1	1	0
7	144	37	24	11	102	08	022	008	065	046	1	1	4	1	5	3	1	1	3
7	145	35	19	09	086	06	017	007	054	047	1	1	1	1	3	3	1	1	0
7	146	32	20	05	082	12	038	015	063	025	1	1	2	1	3	2	1	1	1
7	147	16	10	03	042	06	038	014	063	030	1	1	1	1	3	3	1	1	4
7	148	34	23	04	096	08	024	008	068	017	1	1	2	1	3	1	1	1	0
7	149	26	18	06	074	10	038	014	069	033	1	1	2	2	4	1	1	1	4
7	150	17	16	04	059	10	059	017	094	025	1	1	2	1	3	2	1	2	0
7	151	31	19	05	078	09	029	012	061	026	1	1	2	1	3	3	1	1	4
7	152	31	16	06	075	17	055	023	052	038	1	1	2	1	3	2	1	1	0
7	153	16	11	03	041	04	025	010	069	027	1	1	1	1	4	2	1	1	3
7	154	15	09	02	041	05	033	012	060	022	1	1	1	1	3	2	1	3	4
7	155	15	12	03	041	09	060	022	080	025	1	1	1	1	3	3	1	2	4
7	156	17	12	02	048	12	071	025	071	017	1	1	2	1	3	1	1	2	0
7	157	15	08	02	039	07	047	018	053	025	1	1	1	1	2	2	1	3	4

Table 12 continued

Level	Artifact Number	Maximum Length (ML) (mm)	Maximum Breadth (MB) (mm)	Maximum Thickness (MT) (mm)	Circumference (C) (mm)	Length of Worked Edge (LW) (mm)	LW/ML	LW/C	MB/ML	MT/MB	No. of Modified Edges	Material Type	Location of Work	Type of Work	Working Edge Shape	Working Edge Angle	Spine Plane Angle	Type of Flake	Platform Angle
7	158	20	17	07	059	15	075	025	085	041	1	1	1	1	4	3	1	1	4
7	159	28	23	05	079	08	029	010	082	022	1	1	1	1	5	3	1	1	0
7	160	28	20	06	080	14	050	018	071	030	2	1	1	1	3	3	1	1	4
7	-	-	-	-	-	-	-	-	-	-	-	-	2	2	3	2	1	1	4
7	161	37	19	08	097	10	027	010	051	042	1	1	2	1	3	2	1	1	4
7	162	14	12	04	040	10	071	025	086	033	1	1	1	1	3	3	1	1	4
7	163	13	09	03	035	07	054	020	069	033	1	1	2	1	3	2	1	1	4
7	164	31	20	06	091	16	052	018	065	030	1	1	2	1	3	1	1	1	0
7	165	32	15	03	086	08	025	009	047	020	1	1	2	2	3	1	1	2	4
7	166	38	16	07	088	11	029	013	042	018	1	1	1	4	3	1	1	1	4
7	167	15	07	02	033	09	060	027	047	013	1	1	1	1	3	1	1	3	0
7	168	22	12	04	057	05	023	009	055	018	1	1	2	1	3	1	1	1	0
7	169	14	08	01	035	10	071	029	057	013	1	1	2	1	3	3	1	2	0
7	170	20	11	05	055	04	020	007	055	045	1	1	2	1	3	1	1	1	0
7	171	35	25	14	091	13	037	014	071	056	1	1	1	1	8	3	2	1	3
7	172	47	18	06	108	36	077	033	038	033	1	2	2	4	3	2	1	1	0
7	173	32	30	05	101	10	031	010	094	017	1	1	2	4	3	1	1	1	4
7	174	27	22	05	077	47	174	061	081	023	4	1	2	2	3	1	1	1	4
7	-	-	-	-	-	-	-	-	-	-	-	-	2	1	1	2	1	1	4
7	-	-	-	-	-	-	-	-	-	-	-	-	2	4	6	1	1	1	4
7	-	-	-	-	-	-	-	-	-	-	-	-	2	4	5	1	1	1	4
7	175	33	19	04	085	58	176	068	058	021	3	1	2	4	3	1	1	1	4
7	-	-	-	-	-	-	-	-	-	-	-	-	2	4	5	1	1	1	4
7	-	-	-	-	-	-	-	-	-	-	-	-	1	4	1	1	1	1	4
7	176	20	17	06	059	28	140	047	085	035	4	1	2	2	3	3	1	1	0
7	-	-	-	-	-	-	-	-	-	-	-	-	2	1	3	2	2	1	0
7	-	-	-	-	-	-	-	-	-	-	-	-	2	2	1	1	1	1	0

Table 12 continued

Level	Artifact Number	Maximum Length (ML) (mm)	Maximum Breadth (MB) (mm)	Maximum Thickness (MT) (mm)	Circumference (C) (mm)	Length of Worked Edge (LW) (mm)	LW/ML	LW/C	MB/ML	MT/MB	No. of Modified Edges	Material Type	Location of Work	Type of Work	Working Edge Shape	Working Edge Angle	Spine Plane Angle	Type of Flake	Platform Angle
7	-	-	-	-	-	-	-	-	-	-	-	-	1	2	3	3	3	1	0
7	177	24	20	03	071	06	025	008	083	015	1	2	2	1	2	3	1	2	0
7	179	30	19	03	077	13	043	017	063	016	1	2	2	1	3	3	1	2	4
7	180	41	20	11	094	03	007	003	049	055	1	1	1	1	6	3	2	1	0
7	181	48	21	10	115	07	015	006	044	048	1	1	1	1	6	3	2	1	4
7	182	22	05	02	045	01	005	002	023	040	1	1	1	1	6	3	1	2	4
7	183	27	25	11	086	06	022	007	093	044	1	1	2	4	3	3	2	1	4
7	184	35	15	19	087	18	051	021	043	060	2	1	2	2	3	3	1	1	4
7	-	-	-	-	-	-	-	-	-	-	-	-	2	4	3	1	1	1	4
7	185	28	16	08	082	23	082	028	057	050	2	1	2	1	9	3	1	1	4
7	-	-	-	-	-	-	-	-	-	-	-	-	2	4	3	1	1	1	4
7	186	18	15	03	054	07	039	013	083	020	1	1	1	1	3	3	1	2	4
7	187	17	12	02	044	07	041	016	071	017	1	1	1	1	3	3	2	2	2
7	188	14	10	02	037	09	064	024	071	020	1	1	1	1	4	3	1	2	3
7	189	20	18	03	055	08	040	015	090	017	1	1	1	1	4	2	1	2	4
7	190	21	15	05	059	18	086	031	071	033	1	1	1	1	3	3	2	1	3
7	191	38	16	04	095	55	145	058	042	025	3	1	2	2	3	2	1	1	4
7	-	-	-	-	-	-	-	-	-	-	-	1	1	1	3	3	1	2	4
7	-	-	-	-	-	-	-	-	-	-	-	1	1	1	3	2	1	1	4
7	192	35	13	03	087	25	071	029	037	023	3	1	2	1	2	2	1	1	4
7	-	-	-	-	-	-	-	-	-	-	-	-	2	2	3	1	1	1	4
7	-	-	-	-	-	-	-	-	-	-	-	-	2	2	3	2	1	1	4
7	193	35	15	04	096	12	034	013	043	027	1	1	2	1	3	1	1	2	0
7	194	20	12	02	051	09	045	018	060	017	1	1	1	1	3	1	1	2	4
7	195	34	25	09	092	37	109	040	074	036	2	1	2	2	2	3	1	1	4
7	-	-	-	-	-	-	-	-	-	-	-	-	1	2	3	1	1	1	4
7	196	33	14	06	080	34	103	043	042	042	2	1	1	1	3	1	1	1	0

Table 12 continued

Level	Artifact Number	Maximum Length (ML) (mm)	Maximum Breadth (MB) (mm)	Maximum Thickness (MT) (mm)	Circumference (C) (mm)	Length of Worked Edge (LW) (mm)	LW/ML	LW/C	MB/ML	MT/MB	No. of Modified Edges	Material Type	Location of Work	Type of Work	Working Edge Shape	Working Edge Angle	Spine Plane Angle	Type of Flake	Platform Angle
7	-	-	-	-	-	-	-	-	-	-	-	-	4	2	3	1	1	1	0
13	197	18	11	03	050	03	017	006	061	027	1	1	2	1	1	3	1	1	3
13	198	12	10	03	038	07	058	018	083	030	1	1	1	1	3	2	1	1	4
13	200	19	11	03	043	10	053	023	058	027	1	1	2	2	3	2	1	1	0
13	201	18	15	04	053	09	050	017	083	027	1	1	2	2	5	2	1	2	0
13	202	20	18	02	059	03	015	005	090	011	1	1	1	1	3	2	1	2	4
13	203	24	21	06	069	10	042	014	088	029	1	1	2	1	5	3	1	1	0
13	204	17	12	02	047	09	053	019	071	017	1	1	2	1	5	3	1	1	0
13	205	29	14	08	072	05	017	007	048	057	1	1	1	1	3	1	1	1	4
13	206	11	09	03	032	03	027	009	082	033	1	1	2	1	3	2	1	2	4
13	207	08	07	02	027	03	038	011	088	029	1	1	2	2	3	2	1	2	0
13	208	37	25	14	094	11	030	012	068	056	1	1	2	2	3	3	3	1	4
13	209	13	12	02	037	03	023	008	092	017	1	1	2	1	3	1	1	1	4
13	210	30	17	08	074	11	037	015	057	047	1	1	2	2	3	2	1	1	0
13	211	36	27	14	102	05	014	005	075	052	1	1	2	1	3	3	1	1	0
13	212	17	10	01	044	02	012	005	059	010	1	1	2	1	1	3	1	2	0
13	213	43	30	08	115	06	014	005	070	027	1	1	2	1	3	3	1	1	4
13	215	14	07	01	037	07	050	019	050	014	1	1	2	1	3	2	1	2	0
13	216	28	14	05	072	14	050	019	050	036	1	1	2	2	3	2	1	1	4
13	217	24	12	03	058	06	025	010	050	025	1	1	1	1	7	3	2	2	3
13	218	22	12	05	056	02	009	004	055	042	1	1	2	1	5	3	1	1	3
13	219	52	26	12	134	42	081	031	050	046	1	1	2	4	4	2	1	1	2
13	220	27	08	04	058	12	044	021	030	050	1	1	2	1	3	2	1	2	0
13	221	19	09	03	044	05	026	011	043	033	1	1	2	1	3	1	1	2	4
13	222	22	15	05	048	08	036	017	068	033	1	1	1	2	4	3	1	1	1
13	224	22	19	05	062	10	045	016	086	026	1	1	4	1	5	3	3	1	3
13	226	36	14	09	074	07	019	009	039	064	1	1	4	1	6	3	3	1	0

Table 12 continued

Level	Artifact Number	Maximum Length (ML) (mm)	Maximum Breadth (MB) (mm)	Maximum Thickness (MT) (mm)	Circumference (C) (mm)	Length of Worked Edge (LW) (mm)	LW/ML	LW/C	MB/ML	MT/MB	No. of Modified Edges	Material Type	Location of Work	Type of Work	Working Edge Shape	Working Edge Angle	Spine Plane Angle	Type of Flake	Platform Angle
13	227	48	13	07	107	31	065	029	027	054	1	3	2	1	3	2	3	1	4
14	228	12	08	01	032	04	033	013	067	013	1	1	2	1	3	3	1	2	4
14	229	17	14	02	057	04	024	007	082	014	1	1	1	1	3	2	1	2	0
14	230	12	08	01	033	07	058	021	067	013	1	1	1	1	3	3	1	2	0
14	231	11	08	01	029	07	064	024	073	013	1	1	2	2	2	1	1	3	4
14	232	15	08	02	033	04	027	012	053	025	1	1	2	2	3	3	1	2	0
14	233	13	08	04	038	05	038	013	062	050	1	1	2	2	3	3	1	2	0
14	234	12	07	01	032	04	033	013	058	014	1	1	1	1	3	3	1	3	2
14	235	13	08	02	032	08	062	025	062	025	1	1	1	1	7	2	1	2	0
14	236	10	05	02	024	04	040	017	050	040	1	1	2	1	3	1	1	2	4
14	237	14	08	02	034	07	050	021	057	025	2	1	2	1	1	1	1	2	4
14	-	-	-	-	-	-	-	-	-	-	-	-	1	1	3	1	1	2	4
14	238	09	07	02	029	03	033	010	078	029	1	1	2	2	3	2	1	2	0
14	239	15	11	02	039	05	033	013	073	018	1	1	1	1	3	1	2	2	0

REFERENCES CITED

Airphoto Analysis Associates
1979
"Integrated Resources Survey, Wood Buffalo National Park, Alberta–North West Territories." Report on file, Prairie Regional Office, Parks Canada, Winnipeg.

Bagnold, R.A.
1941
The Physics of Blown Sand and Resort Pines. Methuen, London.

Binford, Lewis R.
1978a
"Dimensional Analysis of Behavior and Site Structure: Learning from an Eskimo Hunting Stand." American Antiquity, Vol. 43, pp. 330-61. Washington, D.C.
1978b
Numamiut Ethnoarchaeology. Academic Press, New York.
1979
"Organization and Formation Processes: Looking at Curated Technologies." Journal of Anthropological Research, Vol. 35, pp. 255-73. Alberquerque.
1980
"Willow Smoke and Dog's Tails: Hunter-Gatherer Settlement Systems and Archaeological Site Formation." American Antiquity, Vol. 45, pp. 1-17. Washington, D.C.
1982
"The Archaeology of Place." Journal of Anthropological Archaeology, Vol. 1, pp. 5-31. New York.
1983
In Pursuit of the Past: Decoding the Archaeological Record. Thames and Hudson, London.

Brink, John W.
1978
An Experimental Study of Microwear Formation on Endscrapers. Archaeological Survey of Canada, National Museum of Man, Ottawa. Mercury Series, Paper No. 83.

Brooks, Robert L.
1982
"Events in the Archaeological Context and Archaeological Explanation." Current Anthropology, Vol. 23, pp. 67-105. Chicago.

Brown, Judith K.
1970
"A Note on the Division of Labour by Sex." American Anthropologist, Vol. 72, pp. 1073-78. Washington, D.C.

Brumley, John H.
1975
The Cactus Flower Site in Southeastern Alberta: 1972-1974 Excavations. Archaeological Survey of Canada, National Museum of Man, Ottawa. Mercury Series, Paper No. 46.

Bryan, Alan L., and Gerald T. Conaty
1975
"A Prehistoric Athapaskan Campsite in Northwestern Alberta." Western Canadian Journal of Anthropology, Vol. 5, pp. 64-91. Edmonton.

Cahen, D., L.H. Keeley and F.L. Van Noten
1979
"Stone Tools, Toolkits, and Human Behavior in Prehistory." Current Anthropology, Vol. 20, pp. 661-84. Chicago.

Catlin, George
1857
Illustrations of the Manners, Customs and Conditions of the North American Indians. H.G. Bohn, London.

Charnov, E.L.
1976
"Optimal Foraging and the Marginal Value Theorem." Theoretical Population Biology, Vol. 9, pp. 129-36. New York.

Churcher, C.S., and Michael Wilson
1979
"Quaternary Mammals from the Eastern Peace River District, Alberta." Journal of Paleontology, Vol. 53, pp. 71-76. Chicago.

Conaty, Gerald T.
1977
"Excavations at Wentzel Lake." Archaeological Survey of Alberta Occasional Paper, No. 4, pp. 31-36. Edmonton.
1978
"The Wentzel Lake Site: A Stratified Prehistoric Archaeological Site in the Caribou

Mountains, Northern Alberta." MA thesis, Memorial University of Newfoundland, St. John's.
1980
"Alsands Lease Archaeological Survey." Manuscript on file, Archaeological Survey of Alberta, Edmonton.

Craig, B.G.
1965
"Lake McConnell and the Surficial Geology of Parts of Slave River and Redstone River Map-Areas, District of Mackenzie." Geological Survey of Canada Bulletin, No. 122. Ottawa.

Dahlberg, Frances
1981
"Introduction." In Woman the Gatherer, ed. Frances Dahlberg, Yale University Press, New Haven.

Donahue, Paul F.
1976a
"Research in Northern Alberta, 1975." Archaeological Survey of Alberta Occasional Paper, No. 2. Edmonton.
1976b
"Alberta North." Archaeological Survey of Alberta Occasional Paper, No. 1, pp. 42-50. Edmonton.

Driver, H.E., and William C. Massey
1957
"Comparative Studies of North American Indians." Transactions of the American Philosophical Society, New Series, Vol. 47, pp. 165-456. Philadelphia.

Fedirchuk, Gloria J.
1973
"Peace-Athabasca-Slave Archaeological Project — The Penner Site: Salvage Excavation." Manuscript on file, Prairie Regional Office, Parks Canada, Winnipeg.
1975
"Functional Analysis of the Julian Technology, Fisherman Lake, Northwest Territories." PhD dissertation, Dept. of Anthropology, University of New Mexico, Alberquerque.
1981
"Historical Resources Inventory, Borden, Whitney, Laurier and Ross Lakes Park, Permit 80-119-C." Archaeological Survey of Alberta Occasional Paper, No. 17, pp. 38-44. Edmonton.

Fenton, Mark, and J.W. Ives
1982
"Preliminary Observations on the Geological Origins of Beaver River Sandstone." Archaeological Survey of Alberta Occasional Paper, No. 19, pp. 161-89. Edmonton.

French, Diana E.
1980
"Historical Resources Impact Assessment of Canal and Weir, Lesser Slave Lake, Alberta." Archaeological Survey of Alberta Occasional Paper, No. 15, pp. 75-80. Edmonton.

Gardner, W.
1974
"The Flint Run Paleo-Indian Complex: A Preliminary Report, 1971-73 Seasons." Catholic University of America, Dept. of Anthropology, Archaeological Laboratory, Occasional Paper, No. 1. Washington, D.C.

Goodyear, Albert C.
1981
"Reply to Straus ... et al." Current Anthropology, Vol. 22, p. 678. Chicago.

Gruhn, Ruth
1981
Archaeological Research at Calling Lake, Northern Alberta. Archaeological Survey of Canada, National Museum of Man, Ottawa. Mercury Series, Paper No. 99.

Hall, S.A.
1981
"Deteriorated Pollen Grains and the Interpretation of Quaternary Pollen Diagrams." Review of Palaeobotany and Palynology, Vol. 32, pp. 193-206. Amsterdam.

Hammond, Gawain, and Norman Hammond
1981
"Child's Play: A Distorting Factor in Archaeological Distribution." American Antiquity, Vol. 46, pp. 634-36. Washington, D.C.

Heitzmann, R.J., J. Priegert and S. Smith
1980
"Slave River Hydro Feasibility Study, Task Area 5, Archaeological Studies." Manuscript on file, Alberta Environment. Edmonton.

Irimoto, Takashi
1979
"Ecological Anthropology of the Caribou-eater

Chipewyan of the Wallaston Lake Region of Northern Saskatchewan." PhD dissertation, Simon Fraser University, Burnaby, B.C.

Ives, John W.
1977a
"A Spatial Analysis of Artifact Distribution of a Boreal Forest Archaeological Site." MA thesis, University of Alberta, Edmonton.
1977b
"The Excavation of HkPa-4, Birch Mountains, Alberta." Archaeological Survey of Alberta Occasional Paper, No. 4, pp. 37-44. Edmonton.
1980
"An Archaeological Reconnaissance of the Middle and Lower Peace River." Manuscript on file, Archaeological Survey of Alberta, Edmonton.
1981a
"Birch Mountain Archaeological Study, 1980." Archaeological Survey of Alberta Occasional Paper, No. 17, pp. 127-38. Edmonton.
1981b
"The Prehistory of the Boreal Forest of Northern Alberta." Alberta Archaeology: Prospect and Retrospect, pp. 39-58. Lethbridge.
1982
"Birch Mountains Archaeological Study, 1981." Archaeological Survey of Alberta Occasional Paper, No. 19, pp. 61-70. Edmonton.

Jeffrey, W.W.
1961
"A Prairie to Forest Succession in Wood Buffalo National Park, Alberta." Ecology, Vol. 42, pp. 442-44. Brooklyn.

Jenness, Diamond
1963
The Indians of Canada. 6th ed. Information Canada, Ottawa. National Museum of Canada, Bulletin 65, Anthropological Series, No. 15.

Joslin-Jeske, R.
1982
"Economics in Raw Material Use by Prehistoric Hunter-Gatherers." Paper presented at the 47th Annual Meeting of the Society for American Archaeology, Minneapolis.

Keeley, Lawrence H.
1982
"Hafting and Retooling: Effects on the Archaeological Record." American Antiquity, Vol. 47, pp. 798-809. Washington, D.C.

Kintigh, Keith W., and Albert J. Ammerman
1982
"Heuristic Approaches to Spatial Analysis in Archaeology." American Antiquity, Vol. 47, pp. 31-63. Washington, D.C.

Knudson, Ruthan
1973
"Organizational Variability in Late Paleo-Indian Assemblages." PhD dissertation, Washington State University. University Microfilms, Ann Arbor.

Le Blanc, Raymond J.
1981
"Archaeological Investigations in the Lesser Slave Lake Area, 1980." Archaeological Survey of Alberta Occasional Paper, No. 17, pp. 52-59. Edmonton.

Lewis, Henry
1977
"Muskuta: The Ecology of Indian Fires in Northern Alberta." Western Canadian Journal of Anthropology, Vol. 7, pp. 15-32. Edmonton.

Lichti-Federovich, Sigrid
1970
"The Pollen Stratigraphy of a Dated Section of Late Pleistocene Sediment from Central Alberta." Canadian Journal of Earth Science, Vol. 7, pp. 938-45. Ottawa.

Longacre, W.A.
1978
"Ethnoarchaeology." Reviews in Anthropology, Vol. 5, pp. 357-63. Westport, Ct.

Lurie, Rochelle
1982
"Measuring Efficiency in the Use of Lithic Materials." Paper presented at the 47th Annual Meeting of the Society for American Archaeology, Minneapolis.

Lutz, H.J.
1959
"Aboriginal Man and White Man as Historical Causes of Fire in the Boreal Forest With Particular Reference to Alaska." Yale University, School of Forestry, Bulletin, 65. New Haven.

McAndrews, J.H., and R.D. Fecteau
1981
"Floral Analyses of Soil Samples from Wood Buffalo National Park." Manuscript on file, Prairie Regional Office, Parks Canada, Winnipeg.

McAndrews, J.H., and C. Manville
1981
"Modern Pollen Rain of Canada." Manuscript on file, Dept. of Botany, Royal Ontario Museum, Toronto.

McCullough, E.J.
1976
"Lac La Biche Archaeology Survey." Archaeological Survey of Alberta Occasional Paper, No. 1, pp. 35-41. Edmonton.
1977
"Prehistoric Cultural Dynamics of the Lac La Biche Region." MA thesis, University of Calgary, Calgary.

McCullough, E.J., and M.C. Wilson
1982
"A Prehistoric Settlement-Subsistence Model for Northeastern Alberta, Canstar Oil Sands Ltd. Bituminous Sands Leases 33, 92 and 95: A Preliminary Statement." Canstar Oil Sands Ltd. Monograph 1982-1. Edmonton.

McGhee, Robert
1979
The Paleoeskimo Occupations at Port Refuge, High Arctic Canada. Archaeological Survey of Canada, National Museum of Man, Ottawa. Mercury Series, Paper No. 72.

Mackenzie, Alexander
1967
Alexander Mackenzie's Voyage to the Pacific Ocean in 1793. Intro. and notes by Milo M. Quaife. Citadel Press, New York.

Magne, Martin
1981
"Controlled Lithic Reduction Experiments for Application to Late Prehistoric Settlement Systems of Interior B.C." Revised paper presented at the 46th Annual Meeting of the Society for American Archaeology, San Diego.

Mair, Charles
1908
Through the MacKenzie Basin -- A Narrative of the Athabasca and Peace River Treaty Expedition of 1899. William Briggs, Toronto.

Mallory, Oscar L.
1980
"Preliminary Report, 1979 Archaeological Investigation on Highway Project No. 963." Archaeological Survey of Alberta Occasional Paper, No. 15, pp. 120-33. Edmonton.

Millar, James V.
1968
"Archaeology of Fisherman Lake, Western District of MacKenzie, N.W.T." PhD dissertation, University of Calgary, Calgary.
1981
"Interaction between the MacKenzie and Yukon Basins during the Early Holocene." In Networks of the Past: Regional Interaction in Archaeology, ed. P.D. Francis, F.J. Kense and P.G. Duke, University of Calgary, Calgary, pp. 259-94.
n.d.
"The Julian Core Industry: A Lithic Manufacturing Technology and Tool Complex at Fisherman Lake." Paper on file, Dept. of Anthropology and Archaeology, University of Saskatchewan, Saskatoon.

Minni, Sheila Joan
1976
The Prehistoric Occupations of Black Lake, Northern Saskatchewan. Archaeological Survey of Canada, National Museum of Man, Ottawa. Mercury Series, Paper No. 53.

Montgomery, Pamela
1978
"Stone Artifacts from the [Panchaw] Lake site (Area C): A Late Prehistoric Occupation in Central British Columbia." MA thesis, Simon Fraser University, Burnaby, B.C.

Munsell Color Co.
1960
Munsell Book of Color. Pocket ed. Baltimore.

Murdock, George P., and Caterine Provost
1973
"Factors in the Division of Labor by Sex: A Cross Cultural Analysis." Ethnology, Vol. 12, pp. 203-35. Pittsburgh.

Nelson, Lee H.
1968
"Nail Chronology as an Aid to Dating Old

Buildings." American Association for State and Local History Leaflet, 48. Nashville.

Nichols, H.
1975
"Palynological and Paleoclimatic Study of the Late Quarternary Displacement of the Boreal Forest-Tundra Ecotone in Keewatin and Mackenzie, N.W.T. Canada." Institute of Arctic and Alpine Research, University of Colorado, Occasional Paper, No. 15. Boulder.

Noble, William C.
1971
"Archaeological Surveys and Sequences in Central District of MacKenzie, N.W.T." Arctic Anthropology, Vol. 8, pp. 102-35. Madison.
1977
"The Taltheilei Shale Tradition: An Update." In Problems in the Prehistory of the North American Subarctic: The Athapaskan Question, Archaeological Association, Dept. of Archaeology, University of Calgary, Calgary.

Pollock, John W.
1977
"Archaeological Survey of Northern Alberta." Archaeological Survey of Alberta Occasional Paper, No. 4, pp. 9-16. Edmonton.
1978
"Early Cultures of the Clearwater River Area." Archaeological Survey of Alberta Occasional Paper, No. 6. Edmonton.
n.d.
"Prehistoric Settlement, Material Culture and Resource Utilization of the Slave River Area, Northeastern Alberta." Manuscript on file, Archaeological Survey of Alberta, Edmonton.

Potyondi, Barry
1979
Wood Buffalo National Park: An Historical Overview and Source Study. Manuscript Report Series No. 345. Parks Canada, Ottawa.

Proch, Douglas, and Marc Stevenson
1982
"Archaeological Research in Wood Buffalo National Park, Alberta/N.W.T." Alberta Archaeological Review, No. 5, pp. 3-14. Lethbridge.

Provick, A.M., and N. Krevosheia
1966
DCC-CIL, Shotshells, 1886-1954; An Illustrated Handbook. [N.p., Edmonton.]

Raup, H.M.
1935
"Botanical Investigations in Wood Buffalo National Park." National Museum of Canada, Bulletin, No. 74; Biological Series, No. 20. Ottawa.

Reeves, B.O.K.
1970
"Culture Change in the Northern Plains, 1000 B.C.–A.D. 1000." PhD dissertation, University of Calgary, Calgary.
1973
"The Concept of an Altithermal Cultural Hiatus in Northern Plains Prehistory." American Anthropologist, Vol. 75, pp. 1221-53. Washington, D.C.

Ritchie, J.C.
1976
"The Late-quaternary Vegetational History of the Western Interior of Canada." Canadian Journal of Botany, Vol. 54, pp. 1793-1818. Ottawa.
1980
"Towards a Late-quaternary Palaeoecology of an Ice-free Corridor." Canadian Journal of Anthroplogy, Vol. 1, No. 1, pp. 15-28.

Ronaghan, B.
1981
"Final Report — Historical Resource Impact Assessment of Selected Portions of the Alsands Lease 13 (Archaeological Survey of Alberta, Permit 80-91)." Report on file, Archaeological Survey of Alberta, Edmonton.

Sackett, James R.
1982
"Approaches to Style in Lithic Archaeology." Journal of Anthropological Archaeology, Vol. 1, pp. 59-112. New York.

Sanday, Peggy
1973
"Toward a Theory of the Status of Women." American Anthropologist, Vol. 75, pp. 1682-1700. Washington, D.C.

Sanger, David
1968
"Prepared Core and Blade Traditions in the

Pacific Northwest." Arctic Anthropology, Vol. 5, pp. 92-120. Madison.

Schiffer, Michael B.
1976
Behavioral Archaeology. Academic Press, New York.

Service, Elman R.
1966
The Hunters. Prentice-Hall, New York.

Sharp, Henry S.
1981
"The Null Case: The Chipewyan." In Woman the Gatherer, ed. Frances Dahlberg, Yale University Press, New Haven, pp. 221-44.

Soper, J. Dewey
1964
The Mammals of Alberta. Hambley Press, Edmonton.

Sorenson, C.J., and J.C. Knox
1974
"Paleosols and Paleoclimates Related to Late Holocene Forest/Tundra Border Migrations: MacKenzie and Keewatin, N.W.T., Canada." In International Conference on the Prehistory and Paleoecology of Western North American Arctic and Subarctic, University of Calgary, Calgary, pp. 187-203.

Spurling, Brian E.
1980
"Site Discovery and Assessment Techniques for Mixed Cover Survey Regimes." Saskatchewan Archaeology, Vol. 1, pp. 25-56. Saskatoon.

Spurling, Brian E., and Bruce F. Ball
1981
"On Some Distributions of the Oxbow 'Complex.' " Canadian Journal of Archaeology, Vol. 5, pp. 89-102. Hamilton.

Stevenson, Marc G.
1981a
"The Peace Point Site — A Stratified Prehistoric Campsite Complex in Wood Buffalo National Park, Alberta." Research Bulletin, No. 158. Parks Canada, Ottawa.
1981b
"Preliminary Archaeological Reconnaissance in Wood Buffalo National Park." Research Bulletin, No. 159. Parks Canada, Ottawa.
1982
"Toward an Understanding of Site Abandonment Behavior: Evidence from Historic Mining Camps in the Southwest Yukon." Journal of Anthropological Archaeology, Vol. 1, pp. 237-65. New York.

Stevenson, Marc G., and Douglas Proch
n.d.
"Preliminary Inventory of Archaeological Sites in Wood Buffalo National Park." Manuscript in preparation.

Stiles, Daniel
1979
"Paleolithic Culture and Culture Change: Experiment in Theory and Method." Current Anthropology, Vol. 20, pp. 1-21. Chicago.

Stockton, E.D.
1973
"Shaw's Creek Shelter: Human Displacement of Artifacts and its Significance." Mankind, Vol. 9, pp. 112-17. Los Angeles.

Straus, L.G., et al.
1981
"Paleoecology at La Riera, Asturias, Spain." Current Anthropology, Vol. 22, pp. 655-82. Chicago.

Syncrude Canada
1973
"Syncrude Lease No. 17: An Archaeological Survey." Environmental Research Monograph, No. 1973-4. Edmonton.
1974
"The Beaver Creek Site: A Prehistoric Stone Quarry on Syncrude Lease No. 22." Environmental Research Monograph, No. 1974-2. Edmonton.

Taylor, R.S.
1960
"Some Pleistocene Lakes of Northern Alberta and Adjacent Areas." Journal of the Alberta Society of Petroleum Geologists, Vol. 8, pp. 167-78. Edmonton.

Thompson, H.
1973
"An Introduction to the Prehistory of the Peace River Country." MA thesis, University of Alberta, Edmonton.

Torrence, Robin
1982
"Time, Efficiency and Hunter-Gatherer Technology." Paper presented at the 47th Annual Meeting of the Society for American Archaeology, Minneapolis.

Vehik, Susan C.
1977
"Bone Fragments and Bone Grease Manufacturing: A Review of their Archaeological Use and Potential." Plains Anthropologist, Vol. 22, pp. 169-82. Lincoln.

Vierra, Robert K.
1982
"Typology, Classification and Theory Building." In Essays on Archaeological Typology, ed. Robert Whallon and James A. Brown, Center for American Archaeology Press, Evaston.

Villa, Paola
1982
"Conjoinable Pieces and Site Formation Processes." American Antiquity, Vol. 47, pp. 276-90. Washington, D.C.

Wantanabee, Hitoshi
1968
"Subsistence and Ecology of Northern Food Gatherers with Special Reference to the Ainu." In Man the Hunter, ed. R.B. Lee and I. Devore, Aldine, Chicago, pp. 69-77.

Whallon, Robert
1979
"Unconstrained Clustering in the Analysis of Spatial Distribution on Occupation Floors." Paper presented at the 44th Annual Meeting of the Society for American Archaeology, Vancouver.

Whyte, Martin K.
1978
The Status of Women in Pre-Industrial Societies. Princeton University Press, Princeton.

Wright, J.V.
1975
The Prehistory of Lake Athabasca: An Initial Statement. Archaeological Survey of Canada, National Museum of Man, Ottawa. Mercury Series, Paper No. 29.

Yellen, John
1977
Archaeological Approaches to the Present. Academic Press, New York.

Recent archaeological assessment of the Peace Point site, in Wood Buffalo National Park, which lies across the border between Alberta and the Northwest Territories, has uncovered an uncommon and productive archaeological resource that offers an unparalleled opportunity to illuminate not only the past cultural dynamics of the region, but also the northern hunter-gatherer way of life in general. This report presents the results of investigations carried out at Peace Point and in the vicinity during 1980 and 1981. The significance of the Peace Point site is seen to derive primarily from the site's deeply stratified cultural deposits and their high degree of structural integrity and resolution. In recognition of this unique set of circumstances, this report explores the potential of the site to enable the researcher to formulate a cultural chronology, to clarify how similar sites are formed and to explicate social behaviour from the material remains of past northern hunter-gatherers. In so doing, the archaeological significance of the site is believed to have been accurately identified.

Canada