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ARCHAEOLOGICAL RESOURCE MANAGEMENT IN WESTERN CANADA:
A POLICY SCIENCE APPROACH

by

Brian Eyton Spurling
B.A., Honours, Simon Fraser University 1975

A THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY in the Department of Archaeology

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SIMON FRASER UNIVERSITY
March 1986

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ISBN 0-315-30754-4
Name: Brian Eyton Spurling

Degree: Ph.D. Archaeology

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Title of Thesis/Dissertation:

Archaeological Resource Management in Western Canada:
A Policy Science Approach

Author:

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(date)
The development and practice of archaeological resource management (a.r.m.) in B.C., Alberta, Saskatchewan and Manitoba is analysed from a policy science perspective. The impact of Euro-Canadian settlement on the region's Indian peoples and on the archaeological evidence of their tenure is documented. A.r.m.'s rise as a public policy field is charted and comparisons are drawn with the concurrent development of culture resource management in the United States. Provincial policies and the bureaucracies established to administer them are, contrasted. Problems in regulatory activity, inventory development and site conservation are then explored. Nine target groups with stakes in regional archaeology are discussed insofar as they affect and are affected by resource management issues. Included are environmental regulatory agencies, developers, consultants, academics, museum curators, avocationalists, professional associations, Indians and the public. Societal decision-making processes such as environmental assessment, public forums, and policy analytic techniques, especially benefit-cost analysis, are examined. It is argued that increased participatory effort in these processes is required if a.r.m. is to become more effective. Such involvement in public policy-making may revivify archaeology, which exhibits uncertainty about its practice and future. Renewal seems feasible given several "megatrends" appearing as post-industrialism and postmodernism supersede the normative values of modern, industrial society. Congruent with these trends is an emerging recognition of archaeology's ideological role and its potential to construct a more self-reflective past conducive to achieving greater social equity.
ACKNOWLEDGEMENTS

Many people and several institutions and agencies supported, assisted and guided the research presented herein. Unfortunately, to identify them all is not feasible. However, I will try.

I first would like to thank my SFU committee members, Jack Nance, Knut Fladmark and Brian Hayden, for their support and patience. I also much appreciate the involvement of William Lipe (Washington State University) and Michael Roberts (Department of Geography) who served as my external and internal/external examiners, respectively. Especial gratitude is due Knut Fladmark for inviting my participation in the Peace River project back in 1974 and suggesting archaeological resource management was a vineyard worth labouring in. Other SFU faculty who influenced and assisted me include Roy Carlson and Richard Casteel. Fellow graduate students and colleagues Diana Alexander, Bryce Ball, Peter Bobrowsky and David Burley were, and continue to be sources of inspiration and informed opinion.

I also wish to acknowledge the help extended by Art Charlton, Jack Brink, Gary Dickson, Paul Donahue, Ian Dyck, Henry Epp, Marty Magne, David Meyer, Jo Kamminga, Leo Pettipas, David Pokotylo, Barney Reeves, Bjorn Simonsen and my co-workers at Saskatchewan Culture and Recreation who tolerated me while I wrote this.

To my parents, Francis A.E. Spurling (deceased) and Betty M. Spurling, who instilled a deference for knowledge, who smoothed over the financial vicissitudes confronting anyone pursuing a career in archaeology, and gave me every conceivable encouragement, I cannot express my gratitude. And to Pamela Bjornson, thanks for putting up with all of this, and much more.
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"The trash heaps of ancient civilizations, the bones of ancestral primates, or the social climbing feasts of isolated tribes may conceivably yield some cosmic truths, but they contribute little to explaining the price of beans."

Kimball 1978:278
1.1 INTRODUCTION

This essay is concerned with the current state of archaeological resource management (a.r.m.) in Western Canada. It addresses the historical development of conservation archaeology and the social, economic and political problems it now confronts in the 1980s. The essay also discusses how these difficulties may be lessened, perhaps even overcome, through the strategic use of public policy instruments. Disserted upon, finally, are the roles of archaeology and a.r.m. in a postindustrial, postmodern world. Undiscussed, except in passing, are issues relating to archaeological technique, methodology, theory and substantive contributions in the region. How these topics are engaged by a.r.m. will be left to other researchers.

My choice of this subject area was motivated by several factors. The paramount one is personal: almost a decade of my professional life has been involved, in some way, with managing archaeological sites, objects and information. As a student, university based consultant and provincial archaeologist I have been associated with much of a.r.m.'s history since it became a self-conscious practice in the region. During its early years one contemplating a.r.m. as a career met several obstacles. The neophyte consultant or bureaucrat entered the real world almost unprepared, lacking much formal training or experience and having recourse to a very small, almost exclusively American literature. This situation is improving as courses are now being offered on applied archaeology at several schools. Yet apprenticeship opportunities are rare as are articles and books on the topic.

Consequently, this dissertation may prove helpful to students and
established archaeologists considering a career in government or private industry. The challenges and rewards of these professional paths are considerable and compare favourably with, and in ways surpass, those available in university. I also anticipate that environmental specialists in regulatory agencies, consulting companies and those government departments, Crown corporations and industries which undertake land development projects will find the essay useful. Finally and partially, I hope members of the public, advocacy organizations and other societal groups can employ this information to better conserve Western Canada's disappearing archaeological heritage. There's not much time left.
1.2 THE STUDY AREA

Western Canada comprises a significant part of North America. The surface areas of British Columbia (948 596 km²), Alberta (661 185 km²), Saskatchewan (651 900 km²) and Manitoba (652 600 km²) total almost 3 million km², about half the size of the continental U.S. west of the Mississippi. Latitudinally the study area extends from the International Boundary at 49° N to 60° N except for the Alaska panhandle's 5° dip down the Pacific coast and where Manitoba's border ends on Hudson Bay, about 52° N. Longitudinally, it stretches from the Queen Charlotte Islands at ca. 133° W to about 89° W on the shores of Hudson Bay (Figure 1.1).

The study area has considerable biophysical and culture historical diversity (e.g., Clibbon and Hamelin 1968; Jones and Annas 1978; Ritchie 1980; Fladmark 1982, 1983; Dyck 1983; Meyer 1983; Pettipas [editor] 1983; Figures 1.2 and 1.3). With the exception of southwestern B.C., its climate is as harsh as Siberia's (Hare and Hay 1974). Currently, the earliest evidence of human occupation comes from the eastern Cordilleran flank, at sites near Banff (Fedje 1984) and Ft. St. John (Fladmark et al. 1984). Incidental recoveries of PaleoIndian projectile points in the southern Prairie Provinces record concurrent settlement. The longest Pacific Coast sequence remains that from the Namu site (Carlson 1979a), beginning about 10 000 years B.P., a millennium later than in the eastern slopes area. Mounting paleoenvironmental data suggest earlier human penetration can be anticipated along the continental shelf and ice-free corridor (Fladmark 1983).

At contact, European explorers and fur traders encountered a variety of specialized cultural adaptations to regional conditions, ranging from the
Figure 1.1 Western Canadian Political Boundaries and Place Names

Western Canadian Cities and Towns

1. Victoria  
2. Vancouver  
3. Kamloops  
4. Prince George  
5. Namu  
6. Prince Rupert  
7. Ft. St. John  
8. Banff  
9. Calgary  
10. Edmonton  
11. Lethbridge  
12. Medicine Hat  
13. Battlefords  
14. Saskatoon  
15. Moose Jaw  
16. Regina  
17. Prince Albert  
18. Yorkton  
19. Uranium City  
20. Flin Flon  
21. Brandon  
22. Portage La Prairie  
23. Winnipeg  
24. The Pas  
25. Thompson  
26. York Factory  
27. Churchill
Figure 1.2 Physiographic Regions of Western Canada

Canadian Western Mountains (Cordillera)
- Pacific Mountain System
- Intermontane Belt
- Cordilleran Continental Facade

Circum-Shield Plains and Plateaus
- Western Interior Basin
- Hudson Sea Lowlands (Paleozoic)

Canadian Shield

(after Clibbon and Hamelin 1968:59)
Figure 1.3 Vegetational Zones and Districts of Western Canada

1. Coastal Western Hemlock/Mountain Hemlock/Alpine Tundra (AT)/Glacier Zones
2. Coastal Douglas Fir Zone
3. Englemann Spruce-Subalpine Fir (ESSF)/Interior Douglas Fir (IDF)/Ponderosa Pine-Bunchgrass (PPBG) Zones
5. Sub-Boreal Spruce/ESSF Zones
6. Spruce-Willow-Birch/AT/Boreal White and Black Spruce Zones
7. Interior Western Hemlock/ESSF/PPBG/IDF/Glacier Zones
8. Southern Alberta Foothills District
9. Peace River Lowlands District
10. Swan Hills District
11. Cameron Hills District
12. Caribou Mountains District
13. Southern Boreal Plains District
14. Aspen Parklands District
15. Grassland Plains District
16. Missouri Couteau Uplands District
17. Cypress Hills District
18. Athabasca Plains District
19. Churchill Uplands District
20. Tertiary Uplands District
21. Kazan Uplands District
22. Tundra
23. Hudson Bay Lowlands
24. Tall Grass Prairie
25. Southeastern Mixed Forest
semisedentary fishing societies of the Northwest Coast, to transhumant bison hunting bands on the southern Canadian Plains, to small, mobile groups focused on caribou procurement in the Subarctic. As Kehoe (1981) contends, these populations, of which about 28 can be ethnolinguistically distinguished (Figure 1.4), exhibited established, or proclivities towards socioeconomic organizations with class stratification, occupational differentiation and food production.

Throughout Western Canada the Indian adjustment to the demands and supplies of the fur trade was so successful that Fisher (1977) and Ray (1974) have suggested the staple foundation of Canada's economy was in their control (cf., Pomfret 1981). This hegemony was shortlived, however. Epidemic diseases, agricultural settlement and increasing EuroCanadian competition for land and subsistence resources resulted in dramatic population declines and social disorganization.

Today, approximately 7 million people live in Western Canada, supported by an economic infrastructure based on forestry, agriculture, mining, transportation, service and information industries, and tourism. But the 180 000 native people remain the region's most disadvantaged minority. They only marginally participate in its culture and economy (Fudge 1983) and their status and legal and constitutional rights as Canadians remain unsettled (Stanley 1983; Asch 1984).

The > 11 000 year physical record of Indian cultural development and adaptation comprise the resources with which most of the study area's archaeologists work. As of 1984, over 40 000 archaeological sites had been recorded in Western Canada although a far smaller number had sustained any
Figure 1.4 Distribution of Western Canadian Indian and Inuit Ethno-Linguistic Groups

Algonkian
1. Blackfoot
2. Blood
3. Cree
4. Gros Ventres
5. Ojibway
6. Piegan

Siouan
7. Sioux

Athanaskan
8. Beaver
9. Carrier
10. Chilcotin
11. Chipewyan
12. Kaska

Wakashan
13. Slavey
14. Nicola
15. Sarsi
16. Sekani
17. Tahltan
18. Tsetsaut

Na-Dene
19. Kutenai

Salishan
20. Bella Coola
21. Coast
22. Interior

Eskamoid
23. Kwakiutlan
24. Nootkan
25. Tsimshian
26. Haida
27. Tlingit
28. Caribou
excavation or analysis. Since 1970 the inventory, research and management of these sites has probably cost around 60 million 1984 dollars, the total amount government and industry have spent on archaeological conservation. Arguably, the area's first peoples should benefit from these endeavours but this so far has not been the case. This conduces to argument for a better balance between the goals of archaeological science and the discipline's responsibility to the people whose heritage it studies, as well those societal groups who pay for and use these studies. As a public policy field, archaeological resource management has an opportunity to take a leadership role in achieving this.
1.3 ARCHAEOLICAL RESOURCE MANAGEMENT

Archaeological resource management, heritage resource management, CRM, conservation archaeology, applied or public archaeology --- the legislated conservation and preservation activities of the archaeological profession goes by many names. Despite its technocratic implications I refer to this sector of the discipline as archaeological resource management or a.r.m. (a glossary of acronyms and abbreviations is provided in an appendix).

At present, a.r.m. dominates an increasingly diversifying profession. Resource management programs employ more people, sponsor more field and laboratory projects, generate more information, and allocate and expend more funds than any other sector of the discipline. And its impact on modern archaeology is all the more profound when a.r.m.'s less tractable infrastructural, structural and ethical effects are considered.

It seems unlikely a.r.m.'s grip on the profession will ease. If anything its takeover rate of an ever greater share of the discipline will, and arguably must, continue. Because without proper management the primary data base (sites, objects, and their contexts) may become qualitatively extinct within 20 to 50 years. Granted, this could take place even with adequate and effective a.r.m. programs in all the various provincial, state, national and international jurisdictions. But without such programs the extinction horizon will move closer to the present; in their absence archaeology's legacy could consist of haphazardly recovered, analysed, reported and managed data.

True, brilliant researches will be carried out --- they always have been. However, if the experience of the first 50 years of Western Canadian
archaeology provides insight into what might result from the profession's failure to properly manage its resources, our future endowment will comprise a vanishingly smaller number of irreplicable, inductive and poorly documented experiments, with largely undissemintated findings. To avert this, to ensure a secure future for archaeology, is a primary goal of archaeological resource management.

Although most academic archaeologists have given these notions a nod, fewer have recognized that it is also the responsibility of those not directly engaged in a.r.m. to endorse, accommodate, promote, and participate in the attainment of its objectives. Too often are heard accusations of poor scholarship, shoddy science, atheoretical research designs, and worse directed at consultants and government managers by those cloistered in the academy. Consultants and bureaucrats have abetted this imbroglio with alacrity, charging university archaeologists with elitism, eclecticism, apathy, putting research before conservation, careerism and more heinous crimes.

Relations between consultants and bureaucrats have not always been cordial either. The former often find a lack of understanding for the constraints they must operate under. On the other hand, those staffing regulatory agencies are frequently frustrated by the insouciance typifying many consultant's heritage resource impact assessment and mitigation (h.r.i.a./m.) statements, particularly as regards the lack of attention to research goals or current methodologies (e.g., Burley 1985) and the apotheosis of profit over conservation and management.

Consequently, the infighting once contained within academic
archaeology, with perhaps better cause, has spilled-over to the public arena where university, consulting, and bureaucratic archaeologists increasingly interface (e.g., Stange 1984). This is taking place at a very bad time. As I see it, three major crises confront the discipline. First, the resource base is being degraded and wasted at an unmeasured and, in important ways, uncontrollable rate. Second, prevailing economic conditions and political realities may soon create a very hostile climate for both research and conservation archaeology. Finally, as the "new archaeology" is increasingly unable to deliver its early promises and the need for a post-modern revision becomes clearer, no single intellectual school is heir apparent. Instead, a wiser, exploratory and more mature "post-processual" archaeology is emerging (Hodder 1985), the course of which seems undecided. Facing these problems and instabilities sectorial divisiveness is inappropriate, maybe even internecine. A rapprochement is urgently required and common responses to at least the first two of these crises must be developed soon.

In this dissertation I explore these problems as they affect and shape Western Canadian archaeology. This is accomplished in the following sequence. First, a synoptic view of the historical development of Western Canada is presented, focused on the effects sustained by the area's indigenous people and on the accompanying land use changes which have impacted the archeological resource base (chapter 2). In chapter 3, the emergence of archaeological resource management as an identifiable enterprise within American and Canadian archaeology is charted. Following this is an investigation of a.r.m.'s policies, participants, performances and problems in British Columbia, Alberta, Saskatchewan, and Manitoba over
the 1970s and early 1980s (chapter 4). In conclusion (chapter 5), a brief comparison is made between the state of a.r.m. in Western Canada and some other jurisdictions, the nation's included. Subsequently, the uncertainty evident in archaeological theory is reviewed. This review, rather than leading to the pessimism prevailing in some quarters as to the discipline's relevance and future, conduces to the recognition that archaeology is exhibiting many symptoms of postmodernism, a critical, reflective revivification of theory and method prevalent in contemporary art, architecture, philosophy, literary criticism, and sociology. Accepting archaeology's convergence to postmodernism infuses the discipline with possibilities for renewal and greater societal relevance. A.r.m.'s role, and that of the educational sector, in bringing these potentialities to realities through improving performances in research management, policy-making and public awareness are discussed. There is reason for optimism if the discipline takes action. But without stepped increases in our effectiveness in these areas, there is little hope for archaeology's furtherence (and much concern for its contraction) in this decade of fiscal austerity.
1.4 SOME QUALIFICATIONS

To avert some possible criticisms a choice, an assumption and some omissions require elaboration. The decision to select Western Canada as the study area was based on several factors. Granted, the area does not conform well to the distribution of specific culture areas. Rather, it cuts across the top of Driver and Massey's (Driver 1969:Map 2) Northwest Coast, Plateau and Plains, encompasses only the base of the Yukon Subarctic and Mackenzie Subarctic, barely nicks the Central and Eastern Arctic, and takes in only the western quarter of the Eastern Sub-Arctic culture areas. Even had Driver and Massey's scheme been available to the Dominion Land Survey in the mid-1800s it would have made little difference in the placement of the international or provincial borders. British Columbia, Alberta, Saskatchewan and Manitoba are historical, political and economic creations which came about heedless of the distribution of native cultures.

Western Canada is not a formal jurisdiction, however. Still, the provinces comprising it 1) have a similar body of laws; 2) participate in a regional economy and together exhibit the characteristics of a true ecumene; 3) share a history centered around the fur trade, railway development, settlement and post World War II prosperity; and 4) harbour a sense of alienation from and exploitation by Eastern Canada (Lower 1983:306-310; Conway 1983). The four western premiers and their senior cabinet ministers meet annually on economic and cultural matters. Less formal ties are maintained through sporting and cultural events. In terms of a.r.m. its justification as a study area was first established in 1960 when the Western Canadian Archaeological Council (1960) met in Calgary; was ratified as late
as 1982 when, at the request of the western premiers, the provincial archaeologists of B.C., Alberta, Saskatchewan and Manitoba drafted impact management guidelines for interprovincial developments; and is continually confirmed by the interaction of bureaucrats, consultants and others coping with the common problems of managing the area's archaeological resources. For these reasons, plus the pragmatic one I was able to acquire considerable unpublished data on Western Canadian a.r.m. and my chances to do so decline at the Ontario and international borders, the study area was selected.

The assumption to be made explicit is that the conservation of archaeological resources is worthwhile. For the limited readership of this dissertation a rationalization of the whys (as opposed to the hows) of a.r.m. would seem to be a case of preaching to the choir. Yet the overwhelming majority of those who own, control and ultimately decide the fate of archaeological resources may not even be active members of the congregation. Evidently, as will be seen, some are even some infidels.

In these parlous economic times questions as to the economic utility of archaeology are becoming more common. Responses to them have to be considered and carefully developed. This is not to say that the traditional axioms no longer hold. Few cognoscente would dispute these self-evident values of archaeology:

1. People are interested in it (Carlson 1979c). Simple and true, this is a major reason for museums; films, books, television series, heritage parks, university departments, and archaeologists.

2. It provides a culture history and could contribute to a greater understanding of ethnic identity and pride in indigenous peoples...
3. Land claim issues are potentially resolvable through archaeological research (although Western Canadian archaeology has not been active in this area until very recently).

4. Archaeological research can yield data useful to the theoretical and applied sciences such as climatology, Quaternary geology, botany, sociobiology, medicine, forensic research, etc. (Lipe 1977; Dixon 1977; Gunn 1981; Gelburg 1982; Sigler-Eisenberg 1985).

5. Archaeology gives a temporal dimension to anthropology, a field of continuing scientific importance and public popularity, and which is experiencing an increasingly mutual interest in and with the managerial and policy sciences (Hinshaw 1980; Barrett 1984; Dror 1984; Torgerson 1985a; Weaver 1985a).

6. Archaeology enhances appreciation of one's humanity; it reinforces humanism and provides a perspective of our place in the diversity of cultural and natural evolution (Lipe 1977; Clark 1979).

7. Notwithstanding 6., archaeology, at its best, may emancipate people from the belief that current social inequalities and distortions are historical inevitabilities (see papers in Gero et al. [editors] 1983; Spriggs [editor] 1984; Miller and Tiffen [editors] 1984; Hodder 1985).

8. Archaeology preserves information on arcane and archaic technoeconomies worth retaining against the possibility of a survivable nuclear war or less likely global catastrophe (e.g., Schell 1982; Ehrlich et al. 1983; Smith 1985; Niven and Purnelle 1977).
And archaeology can also provide economic benefits. Because people are interested in the past they visit heritage sites, browse through museums, take historical tours, purchase books, pay to go on digs, etc. Tourism is a major industry for most provinces (Economic Council of Canada 1984:117-19) and visitor surveys consistently show interpreted heritage sites are major attractions. Efforts to measure archaeology's economic value from this angle have just begun. Where benefit-cost analyses have been conducted into the preservation and presentation of heritage resources, net positive benefits on the side of retention have been forthcoming (e.g., Kidder & Associates 1981; Germann 1982). Economic valuations should not be shied away from out of fear of the results or a lack of developed methods. There is no reason to expect intuitively displeasing valuations or that systems of measurements are unattainable. More and immediate attention to this problem area is required. So is a less ex cathedra approach in our sermons to those outside the congregation.

Finally, the omissions. The legislations and policies governing a.r.m. in the U.S. (CRM) and other Canadian provinces and territories are not exhaustively treated. CRM's development is well documented so only the salient historical events and current issues are discussed and then only in the context of their effects on and relationship to the evolution of Western Canadian a.r.m. Alternatively, information from Eastern Canada is scarce. Although the provincial statutes are accessible, the policies, procedures and performances of these jurisdictions remain essentially undiscussed in the literature. For these reasons I concentrate on a.r.m.'s development in the west.
1.5 CAVEAT

A.r.m. is most properly seen as a policy area, one subject to shifting political, economic, and legal influences which often carry or produce little empirical documentation. Indeed, an investigation of a.r.m. such as this may be best regarded as policy science research, hence the dissertation's subtitle. Although opinions differ as to what policy science encompasses, its objective is generally "to augment, by scientific decision methods and the behavioral sciences, the process that humans use in making judgements and taking decisions" (Quade 1970:1). Much policy research is devoted to providing criteria for governments to use in choosing actions to enhance or adjust the social, psychological and physical environments of communities to which they are responsible (Heighton and Heighton 1978:392). The research and resultant data is generally assumed to be value free, at least from the researcher's perspective. Leaving aside the question whether an investigator's hidden goals and values can ever be so purged (Nagel 1979), one of this dissertation's failings as a pure scientific policy study is its advocacy, i.e., for improvement in Western Canadian a.r.m. policies. This bias, however, does not necessarily disqualify it as a policy science study (Bardes and Dubnik 1979).

As Weaver (1985a,b) has shown, anthropology as a whole has been slow to adjust to its role in public policy formulation (also see Hammel 1976; Heighton and Heighton 1978; Kimball 1978). For that matter, archaeology's acceptance of its role in the policy sciences is still inchoate (McGimsey 1976; Knudson 1984; Epp and Spurling 1984). This may be largely due to the discipline's dedication over the 1970s to neo-positivism and achieving
scientific respectability, together with its slow and not altogether happy emergence from the halls of academe. As well, Kimball's (1978:278) point is well taken: "whereas major segments of political science and economics are directly linked with contemporary problems, the subject-matter interests of most anthropologists, in contrast, are with remote peoples or in the past". However, societal pressures are forcing changes. The promulgation of public laws protecting archaeological properties and the emerging interest of the indigenous peoples have placed many archaeologists squarely in public policy fields. "Contending with actions of others, with rules and regulations, and with personal choices" (Bardes and Dubnik 1979:16) requires the adoption of different analytical methods. Scientific inquiries in policy development and change require the use of multiple methodologies -- nomothetic theory and quantitative approaches where possible but, more usually, intentional-interpretive ones (cf., Schneider et al. 1982; Brunner 1982; Tornatzky et al. 1982). In the policy sciences, as is the case in European archaeology, disappointment with nomothetic epistemology prevails. In the former, the search for general laws is superseded by a preference for "partial inquiries that can illuminate situationally localized problems in empirical ways" (Lasswell and Kaplan 1950:xxiii). Goal orientation, contextual mapping and the impact of subjective and unconscious processes in conditioning social actions are increasingly being substituted for quantitative-empirical methods of explanation. While these more normative analytical modes bring their own problems (e.g., Eckart and Durand 1985) they also provide the refreshing assurance of relevance to the subject under investigation. Avoided is deLeon's (1981:2) concern: "the more rigorous and
methodologically elegant one's approach, the further removed it appears to be from policy problems and solutions".

To properly examine the ontogeny and current state of Western Canadian archaeology requires a similar mix of approaches. Consequently, where an field of investigative significance lends itself to quantitative analyses, quantitative methods are used; where these cannot be employed, contextual-interpretive procedures are relied upon. The latter approach, while retaining problem-orientation, explicitly recognizes that knowledge is presumptive and precarious, that explanations change and are tied to their historical context.

Such an acknowledgement is appropriate to the present analysis. Much of the information presented has a built-in obsolescence. The shifting political and economic arena, moreso than intra-disciplinary advances, will continue to shape the development of Western Canadian a.r.m. It can only be hoped that a decade from now a.r.m. will be considerably advanced over its present state and that better legislations, operating principles and management methods, and a greatly improved data base will be at hand.

Generally speaking, all archaeological researches are prey to supersession or revision. This thesis' merit is its documentation of the problems confronting Western Canadian a.r.m. and the reasons for these, and its suggestion of some mitigative measures to ensure continuance and growth. Hopefully, by exposing the problems confronting a.r.m., actions will be taken by the discipline. For there exists the risk that if the same problems dogging us now persist or increase, the future for the past will be unnecessarily foreshortened; and this dissertation could become epitaphic.
Hey Pal! How do I get to town from here?
And he said: Well just take a right where they're going to build that new shopping mall, go straight past where they're going to put in the freeway, take a left at what's going to be the new sports center, and keep going until you hit the place where they're thinking of building that drive-in bank. You can't miss it. And I said: This must be the place.

from Big Science by Laurie Anderson (1982)
2.1 INTRODUCTION

In this chapter a brief overview of Western Canada's social and economic historical development will be presented. Two aspects of the study area's evolution will be emphasized. First, the impacts to Indian cultures caused by initial EuroCanadian contact and subsequent settlement are discussed. Second, the accelerating land use changes of settlement and industrial growth are addressed, particularly as regards the effects these have on Western Canada's physical archaeological record.

The relationship between these two topics should be evident: the profligate loss of much of the archaeological resource base can in part be viewed as a continuation of Euro-Canadian domination of the indigenous peoples insofar as it is the tangible evidence of their cultural achievements and original tenure to Western Canada that is being destroyed.

In the first part standard historical sources are used. These include Fisher (1977) and Ormsby (1971) for B.C., McGregor (1972) for Alberta, Archer (1980) for Saskatchewan, and Morton (1967) for Manitoba. Broader thematic studies on the fur trade and history of the study area as a whole such as Ray (1974), Innis (1970) and Lower (1983) are also employed.

Unfortunately, standard references have not yet been written on land surface alterations in Western Canada. A variety of limited circulation studies, manuscripts, government documents, and informal sources are relied upon to develop a conceptual model of land surface modifications and their effects on the archaeological record. This clearly is an area needing of further research.
2.2 BRITISH COLUMBIA

2.2.1 Exploration and the Fur trade

Starting in the 1770s Spain, England and Russia began voyages of
discovery to the B.C. coast, making contact with the Haida and Nootka in
1774. The maritime fur trade ensued from the 1780s and continued until
1825. European settlement was impermanent, and although a wide inventory of
trade goods entered aboriginal socio-technic systems at this time, the
maritime fur trade's general impact was marginal. Contact increased the
power of trading chiefs, polygamy, inter-group hostility, and carved art
production while populations declined due to diseases such as smallpox
(Gibson 1982). Yet the overall effect was an elaboration of pre-existing
cultural trends, not dramatic social change (Fisher 1977; Ormsby 1971).

Following Mackenzie's overland expedition to the Pacific in 1793 and
continuing to ca. 1812, a series of Northwest Company (NWCo) posts was
constructed on the upper Peace River, in the northern interior, and on the
Fraser and Thompson Rivers. The fur trade became landbased after 1821 with
the Hudson Bay Company (HBC) building coastal posts such as Ft. Langley
(1827) and Ft. Victoria (1843). Small-scale farming began around these
establishments in the 1840s to supply inland posts. As well, coal mining
got underway on the east coast of Vancouver Island (Barker 1977).

Smallpox and other diseases, alcohol and tobacco consumption, and inter-
tribal warfare may have reduced the coastal populations by a third during
this episode (Duff 1964; Gibson 1982). Acculturative processes accelerated
as native groups came into more frequent contact. Art production floresced,
particularly on the north coast, and wealth and ceremonialism (especially
potlaching) accelerated among most NWC groups. Internal political and territorial adjustments also took place as some coastal natives became middlemen and wrested control of fur trade in many areas. Inland, the Kootenay lost territories east of the Rockies to the Blackfoot and, to the north, the Sekani and Beaver were pushed westwards into the Rockies and foothills. Generally, however, most native groups kept their village sites, and hunting and fishing territories. Fisher (1977) maintains that traditional cultures were modified but not disrupted and that the overall impact of the fur trade was probably creative rather than destructive.

2.2.2 Settlement

When Vancouver Island became a HBC administered colony in 1849 competition over land and legal difficulties began between the aboriginal populations and the settlers. Agriculture expanded around Victoria and small scale lumbering operations started up and coal mining began at Nanaimo. Over the next five years, treaties were struck with groups in the Victoria, Nanaimo and Fort Rupert areas but the lands reserved were very limited and did not always accommodate native land use practices (Duff 1964).

The discovery of gold on the Queen Charlottes, in the Kootenays and along the Fraser and Thompson Rivers ended the fur trade's economic dominance of the colony. In 1858, the year the Fraser River goldrush began, the HBC relinquished Vancouver Island to Britain and direct rule of the mainland was established. With the miners came farmers, entrepreneurs and capitalists who began many businesses. A civil service and justice system were established, roads were built to the interior and towns were laid out.

Concurrently, Indians and Euro-Canadians started to compete for
resources and accumulative attempts by missionaries and administrators commenced. Some coastal (e.g., the Nootka, Kwakiutl, and Haida) and a few interior groups were initially isolated from these events but many interior Indians became involved in gold mining and traditional economic pursuits were eroded as a result. As the gold rush continued northwards, entering the Cariboo in the early 1860s, the interior road system followed to service the new mining communities. Over the 1870s strikes occurred in the Stikine, Omineca and Peace River drainages. As a consequence, the northeastern boundary of British Columbia was placed at the 120th meridian and the modern provincial borders were established, taking in a small, but significant part of the western interior basin.

Permanent settlers continued to arrive and conflicts over land increased along with the demand for agricultural products. Competition for arable land was particularly acute on the coast. Frequently, property was removed from Indian control by the threat or application of force. In the interior large numbers of natives migrated to the newly formed towns and the resultant contiguity brought conflict and inter-group hostility, alcoholism and prostitution. These social impacts were greatly exacerbated by the smallpox epidemic of 1862 which reduced the province's native population as much as one-third (Duff 1964). Overall, the pace, magnitude, and direction of native cultural change altered with EuroCanadian settlement. While some coastal groups (e.g., the Haida and Kwakiutl) were sequestered from the direct impacts of settlement and elaborated their ritual life and art production, the majority of B.C. natives experienced disruptions which they could not resist nor recover from (Fisher 1977).
Until 1858 Indians surrendering land were compensated and reserves were more or less established on traditionally used areas. Reserves were laid out on southern Vancouver Island and the Okanagon with title resting with the Crown. But a shift in colonial administration and the union of the Vancouver Island colony with the mainland in the mid-1860s brought a change in policy and the size of reserves was reduced, particularly in the southern Fraser drainage (Fisher 1977).

The hegemony of the EuroCanadian socioeconomic system continued, particularly in the Gulf of Georgia basin. By the late 1860s the lumber industry had become important, especially in the Burrard Inlet area (Ward 1976). As well, some 300 farms were operating in the Fraser Valley and ranching was underway in the interior (Barker 1977).

British Columbia became a Canadian province in 1871 upon a guarantee of a transcontinental railroad being built and the assumption of the provincial debt by the federal government. Unlike its treatment of native populations on the prairies (see section 2.3), the land rights of most B.C. Indians were never formally recognized by the Canadian government. While the former groups had their title extinguished by treaty, only a small number of B.C. groups enjoyed this legality. And, in a word, the first years of Canadian administration of B.C. Indian affairs proved chaotic.

Railroad construction stimulated more immigration (e.g., 2000 Chinese were brought in as labourers) and became heavier after the completion of the Canadian Pacific Railway in 1885. Chinatowns, founded largely by labourers let go after construction, developed in Vancouver (established in 1886) and Victoria.
2.2.3 Industrial Development to c. 1970

International markets for B.C.'s natural resources expanded following railway completion, especially that for lumber. Other resources also gained importance. Wheat was being grown in the Fraser and Okanagon valleys and fruit farming started 1891. Iron ore extraction began on Texada Island and later on the Queen Charlottes and Vancouver Island. In the late 1880s and early 1890s, the Kootenays experienced a silver-ore, gold and copper-ore mining boom and several towns sprang up in the area. Following the construction of a second CPR line through the Crowsnest Pass in 1890, massive coal mining began in the area. A hydroelectric facility was constructed on the Kootenay River in 1897 to service newly constructed towns in the Rocky Mountain Trench. Shortly after both Vancouver and Victoria built hydroelectric facilities to back up thermal plants. Vancouver had now begun to emerge as an important shipping centre. The province's population at this time stood at 49,500 people (Ward 1976).

Alternatively, over the 1880s the number of native Canadians dwindled by 25,000 until, by 1890, they formed about one-third of the province's population. During this period the effects of the settlement frontier were finally felt in the far north and in the Kootenays where reserves were established. On the coast commercial canning and fishing activities expanded and competition between Euro-Canadians and Indians ensued over traditional fishing areas. A major social impact occurred with the outlawing of the potlach in 1884, although this law was incapable of total enforcement. Native cultural and economic traditions steadily gave way to settlement and industry. A few found wage labour in canneries and shipping.
but most retracted to rural reserves. Treaty No. 8 was struck in 1899 encompassing Athapaskan and Cree groups in northern Alberta and northeastern B.C. The general native population decline was checked by 1890 but continued in some areas until 1930. And it was not until 1949 that natives were allowed the provincial vote and the total Federal franchise was finally granted in 1960.

B.C.'s economy continued to grow after the turn of the century. Lumbering expanded up the coast and in the Kootenays. A pulp and paper industry began in 1910. Railway development increased after 1909 followed by the establishment of huge timbering and salmon canning operations on the southern coast. The first provincial university (U.B.C.) was built in 1913. Between 1901 and 1911 B.C.'s population rose from 180,000 to 395,000, with most people concentrated in Vancouver and the Fraser lowlands (Ward 1976).

During World War I a southern CPR railine was built to transport Kootenay ore west and wood products to eastern markets. Following the war, an extensive road building began and a large irrigation project was undertaken in the southern Okanagan. The lifting of a land reserve in the Peace River Block attracted significant settlement and agriculture to the area. A lead-zinc mine and smelter opened in the Kootenays, fisheries continued to expand and additional hydro-electric facilities were developed.

This period of economic prosperity was temporarily halted in 1929 by the Depression which, in B.C., was severe. Although the provincial government launched a massive public relief program, over 230 camps had to be constructed to house up to one third of those Canadians on relief who came to B.C. Forestry was not as hard hit as many other industries and, by
the late 1930s, most of the old-wood coastal forest was being logged or was
reserved for harvest (Ward 1976).

With the coming of WW II, lumbering continued to increase and a
chemical industry began in the Kootenays. The construction of the Alaska
Highway further opened the Peace River district permitting later oil, gas
and hydroelectric development.

Following the war a surge in immigration from elsewhere in Canada took
place. New industrial plants were built; the lumbering industry continued
to escalate in the interior to match the size of coastal operations;
additional pulp and paper mills were constructed; urban centres and port
facilities expanded; a major highway development program was initiated; the
British Columbia Railway was completed, linking Vancouver with Ft. St. John;
further mines were opened especially in the intermontane belt and
continental facade to recover copper, molybdenum, gypsum, barite, antimony,
silver, gold, copper, lead/zinc ores and coal; marginal lands came under
cultivation while former farmlands declined near urban centres; and the need
for increased industrial and residential electrical power was met by the
W.A.C. Bennet dam, one of the largest hydroelectric developments in the
world. By 1971 the provincial population was almost 2.2 million people.
2.3. THE PRAIRIE PROVINCES

2.3.1 Exploration and the fur trade

European contact first occurred in 1612 at the Nelson River estuary on Hudson Bay. Fifty years later the fur resources of Hudson's Bay began to be exploited and, in c. 1682, York Factory was built by the HBC at the mouth of the Hayes River. Trade with the Cree and Assiniboine began immediately (Morton 1967). Conventional demographic interpretations suggest that at this time both groups were pushing northwestwards from Manitoba and eastern Saskatchewan, paralleling the swing of the fur trade around Hudson Bay. However, accumulating archaeological and ethnohistoric information suggest both groups had penetrated fairly deeply into the region in the late prehistoric period (Russell 1982a,b; Syms 1982). Undoubtedly, they underwent some subsequent expansion at the expense of the Sioux, Gros Ventres and Chipewyan (Ray 1974).

To encourage commerce with the Chipewyan, Henry Kelsey was despatched up the Churchill River to the tundra in 1682. In 1690 and 1691 Kelsey again went inland from York Factory onto the Saskatchewan plains where he met the Assiniboine and Cree.

In 1690 war broke out between France and England and York Factory essentially came under French control until 1713. Three years later a second post, Ft. Churchill, was constructed at the mouth of the Churchill River. Chipewyan and perhaps other groups traded at York Factory but after 1720 few groups other than Cree and Assiniboine visited the post. By this time the Cree expansion had reached Lake Athabaska, preventing Athapaskan groups from visiting York Factory (Ray 1974; Ray and Freeman 1978).
The French began to penetrate inland from Lake Superior and probably reached Lake Winnipeg by 1716. In 1733, La Verendrye built Ft. St. Charles on Lake of the Woods. The Winnipeg River was then explored and between 1734 and 1751 a chain of posts was constructed from the lower Red River, along the lakes of the Winnipeg basin to the Saskatchewan River forks (Morton 1967; Innis 1970; Russell 1982a; Lower 1983).

Cree and Assiniboine seasonal economic cycles had adjusted early to the fur trade economy. But by 1720 the woodland Cree and Assiniboine did little trapping and instead became middlemen in a highly structured, zonal trading network. Control over canoe routes to the Bay and their military strength led to their monopoly over the interior fur trade at this time.

The HBC responded by sending Anthony Henday inland in 1754 to resecure the interior lines of trade. Henday ascended the Saskatchewan River and, travelling over the plains, reached the Red Deer River region of present day Alberta where he encountered the Blackfoot. Horses had spread into the region at this time and the Blackfoot and Blood were changing over to an equestrian economy (MacGregor 1972; Ray 1974).

After the Seven Years War French claims to the North American territories were extinguished. British and New England traders and capital moved to Montreal and by 1765 the fur trade became even more aggressive. In 1774 the HBC ended its "sleep by the frozen sea" and began building posts up the Saskatchewan River system past Edmonton, in the Swan River region, and at the mouth of the Souris River. Trade was initiated on the Churchill River and moved to the upper reaches by 1776. From here, Peter Pond crossed Methy Portage between Lac La Loche and the Clearwater River and erected a

The various independent enterprises formed the North West Company (NWCo) in 1783. Competing trading establishments and satellite wintering camps proliferated up the North Saskatchewan. Further north, Alexander Mackenzie and others explored and constructed posts along the Peace River. After 1793 the HBC entered eastern Manitoba, founding posts on the Red River and upper Assiniboine. These increasingly became pemmican supply points and the Assiniboine, Plains Cree, and Metis began to hunt bison for trade (Ray 1984). To offset the rising costs of the fur trade, the major companies promoted agriculture at various posts. Pursuant to this policy the HBC granted the upper Winnipeg basin (a.k.a. Assiniboia) to the Earl of Selkirk who, in 1812, began systematic agrarian settlement of the Red River valley.

Native territorial relocations and cultural changes continued (Russell 1982c). The Assiniboine shifted southwards to the grasslands. A smallpox epidemic in 1780-81 claimed up to one third of northern plains populations, affecting Athapaskan (Krech 1983) and Ojibway groups as well. The Cree contracted southwards into the grasslands and parklands and abandoned southern Manitoba where they were replaced by the Ojibway. As the number of interior trading stations increased, the Cree and Assiniboine middleman roles diminished and many turned to provisioning the posts. Measle and whooping cough epidemics further reduced the Assiniboine, Cree, Blackfoot and Gros Ventres. Intertribal warfare developed in southern Alberta between the Blackfoot, and the Cree and Assiniboine over the resources of the
plains. As the Cree and Assiniboine shifted to bison hunting they became less reliant on European goods. Alternatively, parkland and forest groups became more dependant.

Following the NWCo's union with the HBC in 1821 the fur trade recentred on Hudson Bay. Strategic posts became provisioning, distribution and fur gathering points while redundant and poorly sited ones closed. The HBC encouraged unemployed Metis to settle along the Red and Assiniboine drainages. Numbers of French Canadian and European immigrants also entered the Red River Colony at this time (Pannekoek 1976).

During the 1820s unsuccessful attempts were made to establish permanent posts in the southwestern plains. With the advent of steamboats on the upper Missouri River, American traders achieved a monoply by default and managed to secure the greater share of horses, bison hides and robes from the Blackfoot. The Assiniboine moved further south in response to the American trading posts, the contraction of bison herds and the increasing importance of hides and robes. Disease continued to depress native populations. Diphtheria hit in 1836 and, in 1837-8, smallpox wiped out as many as two thirds of the Blackfoot and Assiniboine. The Blood, Sarsi and Piegan also suffered heavy losses while the Beaver and Chipewyan experienced a devastating influenza epidemic. Inter-tribal warfare continued to grow.

Assiniboia returned to HBC administration in 1834. Here, grains, native corn, and vegetables were being grown, livestock was kept, and mills were operating. Still, the fur trade dominated the colony and serious demographic and economic difficulties were experienced by the 1840s (Pannekoek 1976). The completion of a trail from St. Pauls led to agitation
for free trade and representative government. Open trade soon commenced with St. Paul and the HBC monopoly steadily weakened (Lower 1983).

The Metis now constituted a major political and military power in Assiniboia. Their economy was largely based on large, organized bison hunts onto the plains (P. Walker 1982). The Metis were also employed transporting supplies to York Factory and other posts on Lake Winnipeg, in the Saskatchewan River and Athabaska District. After 1858 the HBC began shipping goods overland from St. Paul and the Carlton trail opened, linking Red River, Portage La Prairie, Ft. Carlton and Edmonton. The Metis became involved as tripmen on these routes.

The Indian and Metis were the targets of considerable evangelism between 1840 and 1850. Missions started in the Fort Edmonton area, in the Peace River country, the upper and middle Churchill River, Ft. Chipewayn on Lake Athabaska, along the Saskatchewan and in the Qu'Appelle valley. An Indian agricultural settlement was established at The Pas and a school and industrial farm was later located at Prince Albert. All the missions attracted native settlement.

Between the early 1830s and 1850s Assiniboine populations shifted to the Missouri Couteau uplands and the Cree populated the region between Assiniboine territory and the boreal forest. The Ojibway were now in Manitoba and along the Saskatchewan River valley.

Before the HBC's license to trade expired two scientific expeditions were organized, a Canadian one directed by Dawson and Hind and a British one under Palliser, to explore and assess the Northwest interior. Both reported the feasibility of constructing a railroad across the plains to the Rocky
Mountains and the fertility of the parklands but discounted the southern plains as suitable for agriculture. As well, the decline and socio-economic problems of native populations were noted.

2.3.2 Settlement

In 1859 the HBC's monopoly lapsed outside Rupert's Land. Steamboat traffic had begun on the Red River and American products entered the Red River settlement in quantity. Heightened demand for furs and bison hides brought free traders into the region and Winnipeg developed as their base. Fort Benton on the upper Missouri was serviced by steamboat strengthening American economic presence on the southwestern Canadian plains. American and Canadian immigration grew, the former to trade, the latter to settle.

The Metis viewed increasing settlement with alarm. Their seasonal hunts were now carried to the Cypress Hills due to diminishing bison populations. Semipermanent Metis communities developed along the Saskatchewan River, in the Qu'Appelle Valley, and in forested uplands connected by a system of trails which crisscrossed the interior basin.

Metis and Indian peoples in the Cypress Hills were in the economic sphere of Ft. Benton. The use of alcohol as an exchange commodity led to further social disorganization while competition over the declining bison resource brought about more intertribal warfare, particularly between the Cree and Blackfoot. In 1869 another smallpox epidemic reduced plains populations by one quarter. Scarlet fever and measles also claimed many native people at this time.

After the confederation of British North America in 1867, prolonged governmental discussions were held over the disposition of the region and
land disputes began within the Red River colony. Confusion over the terms of transfer and the arrival of surveyors in 1869 provoked armed resistance by the Red River Metis (Stanley 1961).

In 1870 an enlarged Assiniboia became the province of Manitoba with the remainder of the North-West Territory governed by Ottawa. The Dominion retained control of public lands for the purposes of settlement and railroad construction. Part of the transfer allotted land titles and 5700 km² of reserves to the Metis. An educational and judicial system was established, fishing began on Lake Winnipeg and an influx of settlers commenced. Treaty No. 1 was signed with the Ojibway and Cree which ceded all Manitoba lands to Canada. Land surveys resumed and the province was soon divided into townships and sections. In the parklands Prince Albert emerged as an agricultural settlement and farming began in the Qu'Appelle valley, the Touchwood Hills, and along the Saskatchewan River. Legislation was passed partitioning the North-West Territory and encouraging Euro-Canadian settlement. During the 1870s and 1880s the prairies were surveyed and townships laid out.

Numerous Canadian and English immigrants arrived in Manitoba and settled the southwestern parklands below the Manitoba escarpment. In 1874 the first Mennonites arrived, bringing dry-farming methods to the open plains. Winnipeg became the seat of government and commerce attracting ca. 5000 people by 1875. Logging, flour milling, smithing and brick making became its principle industries. In 1877 the University of Manitoba was built. The Winnipeg River evolved into a major transportation route. Commercial fishing began on the Dauphin River. Steamers on Lake Winnipeg transported
lumber from various mills and fish from the Icelandic colony of Gimli.

Over the early 1870s several American whiskey posts were operating in the southwestern plains, attracting itinerant traders, groups of the Blackfoot Confederacy and wolf hunters. In 1873 the "Cypress Hills" massacre occurred in which American wolfers attacked and killed a group of Assiniboine. The North West Mounted Police (NWMP), created by the Canadian parliament a month prior to the massacre, were immediately organized and began marching west in 1874. Over the next few years the NWMP built posts in southern Alberta and southwestern Saskatchewan and crushed the whiskey trade (Allen 1983).

At the same time railway construction started in Manitoba to the American border and work began on the transcontinental Canadian Pacific Railway. In 1875 HBC steamboats were plying the Saskatchewan River as far upstream as Ft. Edmonton. The North-West Territories were then given a separate government from Manitoba and Battleford became the capital.

The extermination of bison and diminishing moose and deer populations forced many Ojibway to settle in the Red River district. In the western plains and parklands traditional economic patterns persisted but episodes of became frequent among the Cree. Trading posts increasingly supplied food to some groups through the winter. By 1870 posts in the parklands and forests regularly rationed native groups. The plains Cree and Assiniboine economies had become overspecialized on resources which were no longer available.

Upon assuming ownership of the North-West the Canadian government initiated a series of treaties which were to endure "as long as the sun goes round and the water flows" (Stanley 1983:11). Treaty No. 4 was struck with
the Cree and Saulteau, Treaty No. 6 was concluded with the Plains and Woods Cree for ca. 315 000 km² of the N. Saskatchewan and upper S. Saskatchewan drainage and Treaty No. 7, covering 130 000 km², was signed with the Blackfoot, Blood, Piegan, Sarcee and Stoney of southern Alberta. The Indians received an annual cash settlement, reserves, livestock, agricultural instruction, and retained the right to hunt and fish in nonsettled areas. Thus, most populations were settled on reserves prior to experiencing the full brunt of EuroCanadian settlement. The objectives of Federal Indian policy over the immediate post-Treaty period were accomplished by coercion, often involving military force and selective starvation (Tobias 1983).

Rapid agrarian development continued in Manitoba over the 1870s. Towns were formed, most of the southern uplands were occupied and settlement continued westwards. By 1881 all of highland Manitoba south of Riding Mountain and much of the parklands were populated and Manitoba's boundaries were extended to include the settled areas (Gilles et al. 1977). In Saskatchewan most settlement occurred in the parkland belt and, here, Battleford developed a ranching hinterland. Settlers also began to enter the Edmonton area and claim land. Ft. Calgary had a mission, NWMP post, and a ranching hinterland. Also, mining was underway at Lethbridge. Yet most of Alberta's 1500 White population was clustered along the North Saskatchewan River valley at Edmonton and other, smaller settlements.

In 1882 the southern North West Territories was divided into the four districts of Assiniboia, Saskatchewan, Athabaska, and Alberta with Regina as the capital. The CPR was constructed across the southern prairies,
Winnipeg and Calgary in 1883. Numerous towns developed along the railine. Yorkton and Saskatoon were founded and large-scale farming and coal mining started in southeast Saskatchewan. Settlement and land cultivation accelerated again in Manitoba. Forestry developed on the shores of Lake Winnipeg to supply lumber, railway ties, fencing, etc. (Richards 1972).

Settlement pressures were of mounting concern to the Metis. The diminishment of bison populations had already severely depressed their economy (Ray 1984). Their desire to retain their lands and traditional river lot system met opposition from the Dominion government. The Metis were provoked to rebellion in 1885, the events and results of which are well known (e.g., Stanley 1961). The defeated Metis subsequently suffered property and sociological losses and many dispersed to Montana and the Peace River area. Indian populations also were affected, declining by 3000 people between 1884 and 1885. Thereafter, the number of agents and farm instructors was increased and boarding and industrial schools were built, but these assimilative attempts were mostly unsuccessful.

Euro-Canadian immigration to the North-West resumed after the rebellion. Saskatchewan was settled along the railine east of the Missouri Couteau and Mennonite, Scandinavian, Hungarian, Romanian, French, German, Jewish and Icelandic groups began occupying land north of the CPR right-of-way. Ranching also became established in southwest Saskatchewan at this time.

Increasing numbers of Mormons, Germans, Ukranians and Scandinavians also entered Alberta. Mormon groups settled in the St. Mary River drainage and began extensive irrigation and land developments while the majority of European and Canadian settlement took place around Edmonton and elsewhere.
along the North Saskatchewan valley. From 1885 to 1905 a large network of branch and main rail lines (e.g., the CNR) was constructed, interconnecting major population and resource centres in the region. The branch lines tended to form the axes of settlement.

A further influx of American and eastern European immigrants arrived in Manitoba. From 1890 to 1930 settlement fanned out into marginal agricultural areas. Brandon and Portage La Prairie became small cities and a hydroelectric facility was built on the Minnedosa River to serve the former community. Lumbering intensified in western Manitoba. A gypsum industry began in the Interlake district and clay deposits were mined for brickworks. As well, exploratory oil wells were drilled in the Dauphin area (Gilles et al. 1977).

Further west, the first commercial gas well came into production near Medicine Hat and oil exploration was carried on north of Edmonton. Large scale coal mining was underway in the Crowsnest Pass while smaller underground operations began in the Souris River drainage (Kupsch 1984). Lumbering started in the Kananaskis country in the 1880s and a sawmill began at Calgary powered by a hydroelectric facility on the Bow River. Other lumber mills were located at Edmonton and the Crowsnest Pass.

Another major wave of Eastern Europeans and Scandinavians arrived, settling the northern parkland margins of Manitoba. Significant English and American immigration also occurred in Saskatchewan. New strains of wheat and improved farming technology became available which facilitated dry-land farming on the shortgrass plains.

At the turn of the century Federal Indian policies changed and
administrative and educational support was reduced. Tuberculosis and a foreign subsistence base further reduced their populations. Settlement pressures continued to shrink reserves and attempts were made to curtail traditional dances and ceremonies.

2.3.3 Industrial Development to c. 1970

Alberta and Saskatchewan finally attained provincial status in 1905 but like Manitoba they did not gain jurisdiction over public lands or other natural resources. Immigration again increased from Great Britain, continental Europe and the U.S. Both the CPR and CNR expanded and promoted settlement (Lower 1983). Between 1903 and 1913, homesteading pushed the agricultural margin outwards in Saskatchewan and ranching developed in the southwest. Railway construction created a demand for lumber and stimulated a forest industry in the northwest parklands. A major program of highway and ferry building was also initiated. In 1909 the University of Saskatchewan was established in Saskatoon. Four years later Saskatchewan’s population stood at 675,000 people. At this time 39,000 km² acres were under cultivation.

Edmonton, Calgary, Lethbridge and Medicine Hat had 12,000 citizens by 1900 with an additional 7,000 people living in smaller towns and villages. The total provincial population was about 73,000. Railways were built throughout Alberta bringing settlers converging on the Edmonton district. Here, coal was being extracted, gold dredges were operating, and flour mills, lumber mills, and brick yards were in production. The University of Alberta was abuilding at Edmonton by 1908. Homesteaders also were flocking into the Lethbridge area and Peace River District and settlement was pushing.
north and west from Edmonton and Calgary. Some 4600 km of canals and
ditches were excavated between Calgary and Medicine Hat by 1911 requiring
another large dam built on the Bow River. Oil was discovered in the Turner
Valley in 1914 and more than 200 wells were drilled over the next 20 years
(Nelson 1972). Gas wells were sunk in the Bow and Oldman River valleys and
a 270 km pipeline to Calgary was laid in 1911. The same year, a major
hydroelectric facility was built on the Bow River. By 1914, Alberta's
population was 470,000; much of the land south of the Athabaska River was
settled; 10,000 km² were under cultivation; 5800 km of railway had been
constructed; and 264 coal mines were operating.

Between 1901 and 1911 Manitoba's population rose from 250,000 to 450,000
and major capital developments occurred. Hydroelectric projects were
undertaken on the Winnipeg River at Piniwa and Point du Bois. A large road
building program got underway after 1914. The railroad reached The Pas and
a large commercial lumber operation started. Forestry then expanded into
the lower Saskatchewan and Nelson River drainages. Prospecting activity
north and east of The Pas resulted in a gold mine at Herb Lake and sulphide
ore and copper mines in the Flin Flon area.

During World War I additional collieries were opened in Alberta.
Following the war a significant natural gas field was located at Chin
Coulee. As well, more irrigation works were built between Calgary and
Medicine Hat involving yet another dam on the Bow River.

Over the 1920s Manitoba's mining industry grew substantially. In
southern Saskatchewan ranching declined and the Palliser Triangle was opened
up to mixed farming. By 1921, some 72,000 km² were in use as farmland (Ward
1978). Large highway and bridge projects were also undertaken. A pulp and paper industry opened at Pine Falls on the Winnipeg River in 1926 following construction of the Great Falls hydroelectric dam. Flin Flon and Churchill were connected by rail by the end of the decade.

The 1920s were a period of development for Alberta as well. Two hundred and fifty coal mines were functioning in 1928, the forestry industry had expanded, and new gas and oil reserves were being exploited. Both Edmonton and Calgary were serviced by natural gas pipelines. Calgary experienced another major boom from additional oil discoveries in the Turner Valley and smaller fields started to produce near Wainwright, Lethbridge and Lloydminster. A large hydroelectric plant was constructed at Ghost River in 1929. Railway mileage also increased: the CNR and CPR laid track along the North Saskatchewan River and a rail line almost reached the Peace River District of B.C. The provincial highway system grew too and by 1925 95 000 km of roads were graded. In the agricultural sector 142 000 km² of farmland existed, 65 000 of which were under cultivation by 1929.

In 1930, the year following the onset of the Great Depression, Alberta, Saskatchewan and Manitoba finally gained control over their natural resources. During the depression significant public works programs were begun in Manitoba such as highway building and municipal sewer and subway projects. Northern mining and forestry communities in Manitoba and Saskatchewan were not as adversely affected as southern centres. The rest of the Saskatchewan economy, though, was very hard hit due to extremely low grain prices, nine years of drought, extensive wind erosion and crop failure. The provincial government attempted to resettle southern farmers
to the parkland areas with some success. During the drought the Prairie Farm Rehabilitation Administration was established and it built dams on various southern rivers, assisted excavation of numerous dugouts and inaugurated irrigation projects throughout the prairie provinces.

Concurrently, strip mining began in southeast Saskatchewan in 1930, exacerbating unemployment. Relief camps were set up in several centres.

Alberta was also severely affected. Following 1934 the southern farmlands experienced severe drought causing many farmers to vacate the area. However, further oil drilling in southern Alberta and the Turner Valley proved out and another major field was discovered in the latter area.

World War II increased demand for agricultural products, base metals and wood pulp in Saskatchewan and Manitoba. The 1942 construction of the Alaska Highway further opened northwest Alberta. In Alberta, farm, lumber, oil and coal production grew and the provincial highway system was expanded.

Following 1945 many marginal agricultural lands were settled in Manitoba. The first producing Manitoban oil well was sunk near Virden in 1951 and drilling operations increased here until the mid-1950's (Ward 1977). Another mining boom occurred in the Shield at Lynn and Snow Lakes. Two additional hydroelectric facilities were developed at Pine and McArthur Falls taking the last such sites on the Winnipeg River. As well, the nickle-mining town of Thompson was built and the Nelson River was dammed to supply it with power. The Grand Rapids power project was completed in 1965 on the Saskatchewan River. Moreover, flood control works were constructed as part of the Shellmouth Dam-Portage Diversion project built in 1965 to regulate the Assiniboine River. In 1970, an extensive dyke system was put
into operation in the Winnipeg area. A second major road building program was also undertaken.

In Saskatchewan an enlarged power plant was constructed at Island Falls to service the Flin Flon mining industry. Over the 1950s uranium mining began on Lake Athabaska and, in the south, serious attention to oil and natural gas resources began. Medium oil finds were made in the southwest and southeast while heavy oil discoveries centered around Llyodminster and Coleville. Natural gas pipeline systems were installed between major population centres. Road construction programs continued such as the completion of roads into the Shield and the trans-Canada highway. By 1971 over 20 000 km (940 km²) of highways had been built as well as 13 800 km of railroad lines. Hydroelectric generation expanded with the building of the Squaw Rapids dam on the Saskatchewan River and the Gardiner Dam on the South Saskatchewan River in the 1960s. By 1970, nine potash mines were under production and helium was being extracted at Swift Current. A large thermal fired generating plant was built at Coronach using by Souris River lignite; a major uranium mine opened at Uranium City on Lake Athabaska; and a pulp mill was introduced at Prince Albert increasing the volume of timber cut in northern Saskatchewan (Ward 1978).

Of the three Prairie Provinces the post-war years brought the most profound economic growth to Alberta, almost exclusively due to exploitation its fossil fuel reserves. In 1947 the Leduc oil field was discovered south of Edmonton. A number of other significant finds occurred in the area like the Pembina field. New settlements developed to service the oil industry and the major cities experienced dramatic population growth. Prospecting
and drilling activity throughout Alberta brought many more wells into production. Large gas fields were also discovered in the southern two thirds of the province and in the Peace River area, as well. Extensive pipeline systems were laid: over 50 000 km by 1970. Major petrochemical and fertilizer plants were developed at Calgary, Edmonton and Medicine Hat. In 1964 the Athabaska oils sands began to be exploited. Alberta's highway system comprised almost 140 000 km of roads in 1970 and new railway lines were also built. Significant coal developments were undertaken at Grande Cache and the Luscar deposits. By 1971 over 100 000 km² were under cultivation, 9990 km of paved highway had been constructed, and the province's population stood at 1.6 million (Ward 1975).
2.4 CURRENT LAND USES

2.4.1 Introduction

Initiation of the built environment and the landscape alterations brought about almost exclusively by Euro-Canadian techno-culture greatly expanded the range of archaeological sites in Western Canada. Yet, at the same time an unknown number of prehistoric sites, i.e. the tangible evidence of the indigenous peoples' tenure, were displaced and eliminated by rural, urban and resource extraction developments. These processes of destruction continue today and are reducing the physical archaeological record at an unmeasured but accelerating rate.

Due to its physiography, which imposes very real limitations on settlement and other land uses, much of the B.C. ecumene west of the Cordillera is confined to coastal and intermontane lowlands. This has led to a vertical form of ekistics such that modern land uses frequently conflict with the physical remains of aboriginal settlement systems. On the B.C. littoral, wave action, combined in some areas with tectonic activity, is eroding an unknown sample of shell middens, rock art locales and other site types.

The locations of urban and rural settlement are less topographically controlled east of the Rocky Mountains. Nonetheless, environmental characteristics such as climate and soil fertility together with the historical, political, and economic factors effecting the major transportation systems (e.g., the national railways) greatly influenced the evolution of the Prairie Provinces' settlement pattern (Simpson-Lewis et al. 1979). Most small rural centres were founded in the southern prairies to
serve as collection and distributive nodes for agricultural products. With innovations in farming machinery and expanded transportation facilities, farm size has increased, rural towns have declined in number, and population is being concentrated in a few urban areas (e.g., Edmonton, Calgary, Saskatoon, Regina, Winnipeg). Except insofar as the requirements of shelter, potable and reliable water, access to trail and waterway systems, and fuel were met, the region's generally subdued and homogeneous topography did not much favour one location over any other as optimal for historic settlement. Ekistical structure over both the prehistoric and historic periods has tended to a horizontal distribution. Urban growth does not exert a major pressure on prehistoric sites. But agriculture has altered a vast part of the southern prairie landscape and disturbed an unknown amount of the archaeological resource base.

In this section these and other land uses which conflict with archaeological sites will be analysed. Unfortunately, determination of the resource loss rate in Western Canada will not result. For a critical variable is missing: the density of archaeological resources situated in areas affected by these various disturbances. By qualitatively and, where possible; quantitatively assessing the magnitude of land surface disturbances, however, part of the formula for computing past and future resource loss may be established. Evident is the need for more research. As far as the data allow this discussion will be historically oriented, focussing on land surface disturbances occurring since c. 1970. Following this is a survey of major developments forecasted to take place before 1995 together with a synopsis of the possible resource losses.
2.4.2 1970 Onwards: A Synopsis of Land Use and Tenure

Nineteen seventy represents a watershed in archaeological resource management. As charted in the subsequent chapter, about this time archaeological implications became regularly considered in the planning and execution of large scale development projects, particularly those undertaken by government line departments and Crown Corporations. Provincial highways departments and power corporations were generally the first initiates. Later, as environmental assessment gained momentum (section 4.4.1), private corporations in the energy and mines sectors became involved. By about 1980 most mega-projects—government sponsored or backed developments involving significant land-surface modification were preceded by environmental impact assessments. These studies often included a first-generation heritage resource impact assessment (h.r.i.a.). Other important industries such as forestry and agriculture, though, escaped these regulatory instruments.

The 1970s and first years of the 1980s witnessed a considerable rate of economic development in Western Canada. As shown in Table 2.1, all provinces enjoyed steady increases in the Gross Domestic Products (GDP) and some experienced tremendous growth. Alberta's economy, for example, boomed as a result of its oil and gas industry, surpassing B.C.'s GDP in 1977. The following year Saskatchewan, leaving its have-not status behind, exceeded Manitoba in GDP. In terms of population growth (Table 2.2), between 1970 and 1984 Alberta's jumped by 47% while B.C.'s rose by a respectable 35%. Over the same period Saskatchewan and Manitoba registered smaller rates of 7% and 8%, respectively.
Table 2.1. Provincial Gross Domestic Products at Market Prices (Statistics Canada 1985; telephone data 1984, 1985)

<table>
<thead>
<tr>
<th>Year</th>
<th>British Columbia</th>
<th>Alberta</th>
<th>Saskatchewan</th>
<th>Manitoba</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>9 116.3</td>
<td>7 166.1</td>
<td>3 025.0</td>
<td>3 646.8</td>
</tr>
<tr>
<td>1971</td>
<td>10 288.8</td>
<td>7 951.1</td>
<td>3 507.3</td>
<td>3 948.8</td>
</tr>
<tr>
<td>1972</td>
<td>11 796.1</td>
<td>9 016.3</td>
<td>3 653.5</td>
<td>4 368.8</td>
</tr>
<tr>
<td>1973</td>
<td>14 677.4</td>
<td>11 311.2</td>
<td>4 725.8</td>
<td>5 205.4</td>
</tr>
<tr>
<td>1974</td>
<td>17 261.0</td>
<td>15 739.2</td>
<td>6 267.7</td>
<td>6 167.0</td>
</tr>
<tr>
<td>1975</td>
<td>19 053.6</td>
<td>18 796.0</td>
<td>7 085.8</td>
<td>6 967.0</td>
</tr>
<tr>
<td>1976</td>
<td>22 647.0</td>
<td>21 333.0</td>
<td>7 945.0</td>
<td>7 964.0</td>
</tr>
<tr>
<td>1977</td>
<td>25 269.0</td>
<td>24 513.0</td>
<td>8 380.0</td>
<td>8 396.0</td>
</tr>
<tr>
<td>1978</td>
<td>28 250.0</td>
<td>28 643.0</td>
<td>9 575.0</td>
<td>9 262.0</td>
</tr>
<tr>
<td>1979</td>
<td>32 919.0</td>
<td>34 811.0</td>
<td>10 960.0</td>
<td>10 396.0</td>
</tr>
<tr>
<td>1980</td>
<td>37 496.0</td>
<td>42 305.0</td>
<td>13 236.0</td>
<td>11 303.0</td>
</tr>
<tr>
<td>1981</td>
<td>43 195.0</td>
<td>49 036.0</td>
<td>15 206.0</td>
<td>13 158.0</td>
</tr>
<tr>
<td>1982</td>
<td>44 459.0</td>
<td>52 844.0</td>
<td>15 408.0</td>
<td>13 983.0</td>
</tr>
<tr>
<td>1983</td>
<td>47 238.0</td>
<td>56 539.0</td>
<td>16 281.0</td>
<td>15 048.0</td>
</tr>
</tbody>
</table>

(in millions of dollars)

Population and economic growth have led to increased heritage resource loss as the consumption of other land bound resources has accelerated. Despite some major advances in the last two decades with managing archaeological properties in situ, the enterprise confronts significant problems in regulating land use developments which reduce the physical archaeological record.

A primary difficulty is the absence of data on the rate of land surface disturbance in most heritage sensitive areas. Indeed, information on the overall rate of land surface alteration itself is lacking for most of Western Canada. More perseverant scholarship might uncover these data at the provincial level but my research has found only limited source material.
Table 2.2 Provincial Populations (Statistics Canada 1984, telephone data)

<table>
<thead>
<tr>
<th>Year</th>
<th>British Columbia</th>
<th>Alberta</th>
<th>Saskatchewan</th>
<th>Manitoba</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>2128.0</td>
<td>1595.0</td>
<td>941.0</td>
<td>983.0</td>
</tr>
<tr>
<td>1971</td>
<td>2184.6</td>
<td>1627.9</td>
<td>926.2</td>
<td>988.2</td>
</tr>
<tr>
<td>1972</td>
<td>2241.4</td>
<td>1657.3</td>
<td>914.0</td>
<td>991.2</td>
</tr>
<tr>
<td>1973</td>
<td>2302.4</td>
<td>1689.5</td>
<td>904.5</td>
<td>996.2</td>
</tr>
<tr>
<td>1974</td>
<td>2375.7</td>
<td>1722.4</td>
<td>899.7</td>
<td>1007.5</td>
</tr>
<tr>
<td>1975</td>
<td>2433.2</td>
<td>1778.3</td>
<td>907.4</td>
<td>1013.6</td>
</tr>
<tr>
<td>1976</td>
<td>2466.6</td>
<td>1838.0</td>
<td>921.3</td>
<td>1021.5</td>
</tr>
<tr>
<td>1977</td>
<td>2499.4</td>
<td>1912.7</td>
<td>934.9</td>
<td>1027.4</td>
</tr>
<tr>
<td>1978</td>
<td>2542.3</td>
<td>1983.1</td>
<td>943.5</td>
<td>1032.0</td>
</tr>
<tr>
<td>1979</td>
<td>2589.4</td>
<td>2052.8</td>
<td>951.3</td>
<td>1028.0</td>
</tr>
<tr>
<td>1980</td>
<td>2666.0</td>
<td>2140.6</td>
<td>959.4</td>
<td>1024.9</td>
</tr>
<tr>
<td>1981</td>
<td>2744.2</td>
<td>2237.3</td>
<td>968.3</td>
<td>1026.2</td>
</tr>
<tr>
<td>1982</td>
<td>2791.4</td>
<td>2318.7</td>
<td>979.2</td>
<td>1034.6</td>
</tr>
<tr>
<td>1983</td>
<td>2825.0</td>
<td>2352.3</td>
<td>992.0</td>
<td>1046.3</td>
</tr>
<tr>
<td>1984</td>
<td>2865.1</td>
<td>2340.6</td>
<td>1008.8</td>
<td>1058.1</td>
</tr>
</tbody>
</table>

(in thousands of people)

Of these Environment Canada's provincial land use surveys by Ward (1975, 1976, 1977, 1978) and industry-specific ones such as Marshall's (1982) on mining and McCuaig and Manning's (1982) on agriculture, although dated, are helpful (Tables 2.3, 2.4, 2.5, 2.6 and 2.7). Used as well is the quinquennial agricultural census which documents the gross area affected by cultivation in the study area (Table 2.8). Information on land annually consumed by such activities as highways construction and petroleum exploration, production and transportation can be had from the annual reports of provincial government departments and statistical summaries put out by the industries themselves. The utility of these documents is reduced by differences in accounting and reporting practices.
Table 2.3 Land Use and Tenure in British Columbia

<table>
<thead>
<tr>
<th>Use</th>
<th>Area in km²</th>
<th>Percentage of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improved Farmland</td>
<td>7132</td>
<td>0.8</td>
</tr>
<tr>
<td>Unimproved</td>
<td>16526</td>
<td>1.8</td>
</tr>
<tr>
<td>Rangeland</td>
<td>73125</td>
<td>8.2</td>
</tr>
<tr>
<td>Productive Forest Land</td>
<td>515939</td>
<td>57.5</td>
</tr>
<tr>
<td>Parks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provincial</td>
<td>34723</td>
<td>3.9</td>
</tr>
<tr>
<td>National</td>
<td>4735</td>
<td>0.5</td>
</tr>
<tr>
<td>Other Land</td>
<td>281945</td>
<td>27.3</td>
</tr>
<tr>
<td>Privately Owned</td>
<td>181435</td>
<td>19.0</td>
</tr>
<tr>
<td>Publically Owned</td>
<td>770828</td>
<td>81.0</td>
</tr>
</tbody>
</table>

Compounding the problems with this exercise, the impacts of some types of development are poorly or un-documented. Forestry statistics, for instance, are mostly presented volumetrically rather than areally, or as harvesting plans, making determination of surface impacts very difficult.

Because of these impediments a rigorous investigation of impact types cannot be undertaken. However, the effects of four relatively important land use activities --- mining, petroleum extraction and transport, highway construction and agriculture --- can be contrasted quantitatively and a few others can be discussed qualitatively. These development types can also be compared in terms of the abilities of environmental and heritage resource managers to regulate their effects.

Regulatory ability is very much a function of ownership. The provincial
Table 2.4 Land Use and Tenure in Alberta

<table>
<thead>
<tr>
<th>Use</th>
<th>Area in km²</th>
<th>Percentage of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural Land Uses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improved Farmland</td>
<td>110 383</td>
<td>16.7</td>
</tr>
<tr>
<td>Unimproved Farmland</td>
<td>87 845</td>
<td>13.3</td>
</tr>
<tr>
<td>Forested Land Uses (provincial forests)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Productive and Potentially</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Productive Forests</td>
<td>204 120</td>
<td>30.8</td>
</tr>
<tr>
<td>Non-Productive Forests</td>
<td>126 757</td>
<td>19.2</td>
</tr>
<tr>
<td>Urban and Transportation Land Uses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incorporated Cities, Towns, Villages</td>
<td>1 520</td>
<td>0.2</td>
</tr>
<tr>
<td>Developed Highways and Rural Roads</td>
<td>3 152</td>
<td>0.5</td>
</tr>
<tr>
<td>Railways</td>
<td>354</td>
<td>0.1</td>
</tr>
<tr>
<td>Airports</td>
<td>77</td>
<td>0.0</td>
</tr>
<tr>
<td>Parks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>National</td>
<td>54 844</td>
<td>8.2</td>
</tr>
<tr>
<td>Provincial</td>
<td>689</td>
<td>0.1</td>
</tr>
<tr>
<td>Wilderness, Natural Areas</td>
<td>5 745</td>
<td>0.9</td>
</tr>
<tr>
<td>Metis Colonies</td>
<td>5 211</td>
<td>0.8</td>
</tr>
<tr>
<td>Indian Reserves</td>
<td>6 506</td>
<td>1.0</td>
</tr>
<tr>
<td>Department of National Defence</td>
<td>8 601</td>
<td>1.3</td>
</tr>
<tr>
<td>Other Unclassified Land</td>
<td>46 115</td>
<td>6.9</td>
</tr>
<tr>
<td>Privately Owned Lands</td>
<td>223 271</td>
<td>34.6</td>
</tr>
<tr>
<td>Federal Owned Lands</td>
<td>67 669</td>
<td>10.5</td>
</tr>
<tr>
<td>Provincial Owned Lands</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lease</td>
<td>23 755</td>
<td>3.8</td>
</tr>
<tr>
<td>Parks, etc.,</td>
<td>6 105</td>
<td>0.9</td>
</tr>
<tr>
<td>Special Areas</td>
<td>20 513</td>
<td>3.2</td>
</tr>
<tr>
<td>Vacant Land</td>
<td>303 079</td>
<td>47.0</td>
</tr>
</tbody>
</table>

and federal governments own about 70% and 3%, respectively, of Western Canada. The remainder is private property. The provincial governments, which have heritage policy-making powers over 97% of the study area,
Table 2.5 Land Use and Tenure in Saskatchewan

<table>
<thead>
<tr>
<th>Use</th>
<th>Area in km²</th>
<th>Percentage of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural Land Uses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improved Land</td>
<td>189,690</td>
<td>33.1</td>
</tr>
<tr>
<td>Unimproved Farmland</td>
<td>75,660</td>
<td>13.2</td>
</tr>
<tr>
<td>Forested Land Uses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Productive, Potentially</td>
<td>63,930</td>
<td>10.1</td>
</tr>
<tr>
<td>Productive and Non-Productive</td>
<td>289,890</td>
<td>50.7</td>
</tr>
<tr>
<td>Urban and Transportation Land</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incorporated Cities, Towns, Villages</td>
<td>1,149</td>
<td>0.2</td>
</tr>
<tr>
<td>Parks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>National</td>
<td>3,890</td>
<td>0.7</td>
</tr>
<tr>
<td>Provincial</td>
<td>4,735</td>
<td>0.8</td>
</tr>
<tr>
<td>Other Unclassified Land</td>
<td>7,459</td>
<td>1.3</td>
</tr>
<tr>
<td>Privately Owned</td>
<td>249,960</td>
<td>38.2</td>
</tr>
<tr>
<td>Federally Owned Lands</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PFRA</td>
<td>5,569</td>
<td>0.9</td>
</tr>
<tr>
<td>National Defence</td>
<td>226</td>
<td>0.0</td>
</tr>
<tr>
<td>Wildlife</td>
<td>29</td>
<td>0.0</td>
</tr>
<tr>
<td>National Parks</td>
<td>3960</td>
<td>0.6</td>
</tr>
<tr>
<td>Indian Reserves</td>
<td>5642</td>
<td>0.9</td>
</tr>
<tr>
<td>Provincial Owned Lands</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dept. of Agriculture</td>
<td>33,998</td>
<td>5.2</td>
</tr>
<tr>
<td>Recreation</td>
<td>780</td>
<td>0.1</td>
</tr>
<tr>
<td>Parks</td>
<td>4,774</td>
<td>0.7</td>
</tr>
<tr>
<td>Provincial Forests</td>
<td>349,482</td>
<td>53.4</td>
</tr>
</tbody>
</table>

exercise the most control over public land development. Agricultural land use and urban growth, since they primarily occur on private property, create the thorniest a.r.m. problems. This is understandable in a capitalist country where concepts of private property are entrenched. In descending
Table 2.6 Land Use and Tenure in Manitoba

<table>
<thead>
<tr>
<th>Use</th>
<th>Area in km²</th>
<th>Percentage of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural Land Uses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improved Land</td>
<td>52 016</td>
<td>9.5</td>
</tr>
<tr>
<td>Unimproved Farmland</td>
<td>25 204</td>
<td>4.6</td>
</tr>
<tr>
<td>Forested Land Uses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Productive Forests</td>
<td>161 231</td>
<td>29.4</td>
</tr>
<tr>
<td>Non-Productive Forests</td>
<td>186 077</td>
<td>33.9</td>
</tr>
<tr>
<td>Parks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>National Parks</td>
<td>8 801</td>
<td>1.6</td>
</tr>
<tr>
<td>Provincial Parks</td>
<td>2 987</td>
<td>0.5</td>
</tr>
<tr>
<td>Other Unclassified Land</td>
<td>112 318</td>
<td>20.5</td>
</tr>
<tr>
<td>Privately Owned</td>
<td>138 531</td>
<td>21.0</td>
</tr>
<tr>
<td>Publically Owned</td>
<td>513 906</td>
<td>79.0</td>
</tr>
</tbody>
</table>

The province's have no authority at all, however, over 92 818 km² of federal lands. These make up a significant part (10.5%) of Alberta but less so of the others (Saskatchewan [2.3%), B.C. [0.9%] and Manitoba [0.8%]). Indian reserves, national parks and historic sites, defence reserves, community pastures and airports comprise the land uses (Swan 1978).

Confusion over agency mandates and a sudden change in direction at the National Museum of Man about 1975 have prevented any real management of federally owned heritage properties. These policy problems are discussed in subsequent chapters. Suffice to say there is no single agency responsible for managing such important sites as the Moose Mountain Medicine Wheel (Kehoe and Kehoe 1979), the Cactus Flower site (Brumley 1975), the Bakken
Wright bison kill (Adams 1975), etc. The first has just become part of an Indian reserve, the second is in a military reserve and the third occurs in a federal community pasture.

2.4.3 Mining

It is less difficult gauging the extent to which mining activities have caused land-surface alterations than for many other forms of development. A fairly comprehensive study on the topic has been undertaken by Marshall (1982). It shows that, although large parts of the study area contain commercial mineral resources, the actual number of mines in operation and their surface areas are relatively small.

There are 18 mining regions in B.C. containing barite, gypsum, lead, zinc, silver, antimony, gold, cadmium, bismuth, tin, indium, coal, molybdenum, rhenium, uranium, iron, and asbestos. As of 1979, 5 industrial mineral mines, 19 metal mines, and three coal mines were operating in these zones. Alberta has 9 regions with deposits of coal, barite, silica, bentonite, salt and sodium sulphate. Ten coal operations, four industrial mineral mines and two oil sands extraction operations were functioning in these areas in 1979. Nine mining regions also occur in Saskatchewan containing deposits of coal, sodium sulphate, potash, salt, bentonite, copper, nickle, zinc, lead, and uranium. Five coal operations, 16 industrial mineral mines, and three metal mines were working these deposits in 1979. Finally, Manitoba has 8 regions containing silica, bentonite, gypsum, copper, zinc, silver, gold, lead, cadmium, selenium, tellurium, nickle, cobalt, cerium and tantalum. These hosted four industrial mineral mines and 7 metal mines in 1979.
As Table 2.7 shows, the total land area consumed by mining operations amounted to only 1013 km$^2$ by the early 1980s. Since much of this surface is in mountainous or areas with similarly low potentials for archaeological resources, the overall consequences of mining for the resource base is small. But this is not to say its cumulative effects are insignificant. For example, h.r.i.a./m.s associated with the open pit coal mines proposed at Hat Creek, B.C. (e.g., Beirne and Pokotylo 1979) and under operation at Genesse, Alberta (Ronaghan 1983) disclosed numerous archaeological resources at risk. Likewise, most h.r.i.a.s linked with mining projects in the Canadian Shield have identified archaeological resources in conflict with aspects of facility infrastructure. But compared to other forms of development, mining is a relatively minor destroyer of resources. As well, it is a type of development for which which controls are relatively straightforward. Most proposed mining projects must meet fairly stringent guidelines and are usually preceded by an e.i.a. Provincial guidelines and associated e.i.a.s usually carry requirements for h.r.i.a.s which provide for the identification and mitigation of archaeological resource impacts.

2.4.4 Oil and Gas Development

Projects involving oil and gas exploration, extraction and distribution are also closely regulated by provincial environmental and heritage legislation. To be sure, this is justified by the many documented impacts caused by well pad grading and pipeline installation. In Alberta and Saskatchewan, the primary centres of activity, major companies such as NOVA,
Table 2.7 Mining in Western Canada: Statistics (Marshall 1982)

<table>
<thead>
<tr>
<th>Observation</th>
<th>B.C.</th>
<th>Alberta</th>
<th>Sask.</th>
<th>Manitoba</th>
</tr>
</thead>
<tbody>
<tr>
<td>New mines</td>
<td>10</td>
<td>2</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Reopening mines</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potential mines</td>
<td>7</td>
<td>5</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>Mine expansion</td>
<td>7</td>
<td>7</td>
<td>8</td>
<td>4</td>
</tr>
</tbody>
</table>

Area disturbed or alienated by:

<table>
<thead>
<tr>
<th>Industry</th>
<th>B.C.</th>
<th>Alberta</th>
<th>Sask.</th>
<th>Manitoba</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metallic and non-metallic mining</td>
<td>181 km²</td>
<td></td>
<td>4 km²</td>
<td>20 km²</td>
</tr>
<tr>
<td>Uranium</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asbestos</td>
<td>n/a</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potash</td>
<td></td>
<td>41</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coal</td>
<td>62</td>
<td>83</td>
<td>67</td>
<td></td>
</tr>
<tr>
<td>Oil Sands</td>
<td>49</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction Materials (sand, gravels)</td>
<td>167</td>
<td>105</td>
<td>127</td>
<td>104</td>
</tr>
</tbody>
</table>

Total disturbed land area

<table>
<thead>
<tr>
<th></th>
<th>B.C.</th>
<th>Alberta</th>
<th>Sask.</th>
<th>Manitoba</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total disturbed land area</td>
<td>410 km²</td>
<td>237 km²</td>
<td>242 km²</td>
<td>124 km²</td>
</tr>
</tbody>
</table>

Total for Western Canada

<table>
<thead>
<tr>
<th></th>
<th>B.C.</th>
<th>Alberta</th>
<th>Sask.</th>
<th>Manitoba</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1013 km²</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

TransCanada Pipeline, PetroCanada, Esso, PanCanadian and so on have undertaken various studies ranging from the large scale, one-of-a-kind Alaska Gas Pipeline h.r.i.a. to the numerous and very common well-pad surveys. The petroleum industry has become very familiar with h.r.i.a. requirements and, collectively, are one of the most cooperative proponents in the study area. The extent of this is witnessed by the virtual specialization of some heritage consultants in carrying out h.r.i.a.s for the petroleum industry.

How important a source of land surface disturbances are oil and gas
developments? Answering this question is facilitated by the Canadian Petroleum Association (1984) which maintains annual statistics on the number of completed wells in Western Canada (Table 2.8) and the kilometerage of pipeline layed (Table 2.9). By multiplying the figures in the left column of Table 2.8 by 1 ha., the approximate size of a well pad, the total area affected by these projects can be computed. Derived land areas are presented in the right column of Table 2.8. The accuracy of these estimates may be compromised by the fact many gas wells affect smaller areas than oil wells. However, the effect of this may be reduced since the land consumed by access roads and ancillary impacts are not included for either type.

Between 1970 and 1984 about 864 km² was disturbed by drilling activity. This is about 60% of the amount altered by drilling activity since petroleum became an exploited resource in the study area. However, the area affected by oil and gas pipelines (3036 km²; Tables 2.9 and 2.10) is over twice the that affected by drilling. Granted, this latter estimate, calculated on the basis that the average pipeline right-of-way (r.o.w.) has a 2 m wide impact zone, probably overstates the actual extent of disturbance. An unknown length of the pipeline involve limited surface disturbance. For example, many small diameter pipelines are now plowed-in, and this causes little dislocation in surficial deposits. As well, the fact drilling and pipeline construction often occur on already disturbed properties must be taken into account. On the other hand, the amount of surface disturbed by seismic explorations is not included. Unfortunately there is no way to remove such uncertainties; consequently, the tabularized areas of landscape perturbation caused by the petroleum industry must be regarded as rough estimates.
Table 2.8 Oil and Gas Wells Drilled Annually in Western Canada and Estimated Area Affected (Canadian Petroleum Association 1984)

<table>
<thead>
<tr>
<th>Year</th>
<th>Number Completed</th>
<th>Estimated Area Affected</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970/71</td>
<td>2936</td>
<td>29 km²</td>
</tr>
<tr>
<td>1971/72</td>
<td>2934</td>
<td>29</td>
</tr>
<tr>
<td>1972/73</td>
<td>3585</td>
<td>36</td>
</tr>
<tr>
<td>1973/74</td>
<td>4397</td>
<td>44</td>
</tr>
<tr>
<td>1974/75</td>
<td>3967</td>
<td>40</td>
</tr>
<tr>
<td>1975/76</td>
<td>4032</td>
<td>40</td>
</tr>
<tr>
<td>1976/77</td>
<td>5493</td>
<td>55</td>
</tr>
<tr>
<td>1977/78</td>
<td>5976</td>
<td>60</td>
</tr>
<tr>
<td>1978/79</td>
<td>6978</td>
<td>70</td>
</tr>
<tr>
<td>1979/80</td>
<td>7455</td>
<td>75</td>
</tr>
<tr>
<td>1980/81</td>
<td>8932</td>
<td>89</td>
</tr>
<tr>
<td>1981/82</td>
<td>6971</td>
<td>70</td>
</tr>
<tr>
<td>1982/83</td>
<td>6381</td>
<td>64</td>
</tr>
<tr>
<td>1983/84</td>
<td>6850</td>
<td>69</td>
</tr>
<tr>
<td>1984/85</td>
<td>9380</td>
<td>94</td>
</tr>
<tr>
<td>Total</td>
<td>86 267</td>
<td>864 km²</td>
</tr>
<tr>
<td>Mean/year</td>
<td>5751</td>
<td>58 km²</td>
</tr>
<tr>
<td>Grand Total</td>
<td>143 039</td>
<td>1430 km²</td>
</tr>
</tbody>
</table>

Table 2.9 Oil and Gas Pipeline Construction (source: Canadian Petroleum Association 1984)

<table>
<thead>
<tr>
<th>Year</th>
<th>B.C.</th>
<th>Alberta</th>
<th>Sask.</th>
<th>Manitoba</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970/71</td>
<td>16 347 km</td>
<td>43 895 km</td>
<td>19 584 km</td>
<td>6306 km</td>
</tr>
<tr>
<td>1971/72</td>
<td>17 493</td>
<td>46 169</td>
<td>20 684</td>
<td>6695</td>
</tr>
<tr>
<td>1972/73</td>
<td>18 441</td>
<td>48 522</td>
<td>22 591</td>
<td>7120</td>
</tr>
<tr>
<td>1973/74</td>
<td>19 122</td>
<td>51 387</td>
<td>23 825</td>
<td>7221</td>
</tr>
<tr>
<td>1974/75</td>
<td>18 233</td>
<td>54 620</td>
<td>23 988</td>
<td>7395</td>
</tr>
<tr>
<td>1975/76</td>
<td>18 940</td>
<td>59 134</td>
<td>24 741</td>
<td>7436</td>
</tr>
<tr>
<td>1976/77</td>
<td>19 193</td>
<td>66 270</td>
<td>25 680</td>
<td>7519</td>
</tr>
<tr>
<td>1977/78</td>
<td>19 766</td>
<td>72 985</td>
<td>26 306</td>
<td>7617</td>
</tr>
<tr>
<td>1978/79</td>
<td>20 553</td>
<td>61 048</td>
<td>25 982</td>
<td>7680</td>
</tr>
<tr>
<td>1979/80</td>
<td>20 772</td>
<td>78 871</td>
<td>26 367</td>
<td>7808</td>
</tr>
<tr>
<td>1980/81</td>
<td>21 802</td>
<td>83 750</td>
<td>26 571</td>
<td>7751</td>
</tr>
<tr>
<td>1981/82</td>
<td>22 342</td>
<td>88 211</td>
<td>26 958</td>
<td>7881</td>
</tr>
<tr>
<td>1982/83</td>
<td>23 187</td>
<td>91 677</td>
<td>27 571</td>
<td>6182</td>
</tr>
</tbody>
</table>
### Table 2.10 Estimated Area Affected Annually by Pipeline Construction in Western Canada

<table>
<thead>
<tr>
<th>Year</th>
<th>B.C.</th>
<th>Alberta</th>
<th>Sask.</th>
<th>Manitoba</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970/71</td>
<td>33 km²</td>
<td>88 km²</td>
<td>39 km²</td>
<td>13 km²</td>
</tr>
<tr>
<td>1971/72</td>
<td>35</td>
<td>92</td>
<td>41</td>
<td>13</td>
</tr>
<tr>
<td>1972/73</td>
<td>37</td>
<td>97</td>
<td>45</td>
<td>14</td>
</tr>
<tr>
<td>1973/74</td>
<td>38</td>
<td>103</td>
<td>48</td>
<td>14</td>
</tr>
<tr>
<td>1974/75</td>
<td>37</td>
<td>109</td>
<td>48</td>
<td>15</td>
</tr>
<tr>
<td>1975/76</td>
<td>38</td>
<td>118</td>
<td>50</td>
<td>15</td>
</tr>
<tr>
<td>1976/77</td>
<td>38</td>
<td>133</td>
<td>51</td>
<td>15</td>
</tr>
<tr>
<td>1977/78</td>
<td>40</td>
<td>146</td>
<td>53</td>
<td>15</td>
</tr>
<tr>
<td>1978/79</td>
<td>41</td>
<td>122</td>
<td>52</td>
<td>15</td>
</tr>
<tr>
<td>1979/80</td>
<td>42</td>
<td>158</td>
<td>53</td>
<td>16</td>
</tr>
<tr>
<td>1980/81</td>
<td>44</td>
<td>166</td>
<td>53</td>
<td>16</td>
</tr>
<tr>
<td>1981/82</td>
<td>45</td>
<td>176</td>
<td>54</td>
<td>16</td>
</tr>
<tr>
<td>1982/83</td>
<td>46</td>
<td>183</td>
<td>55</td>
<td>12</td>
</tr>
</tbody>
</table>

Mean | 40 | 130 | 50 | 15 |

Total | 514 km² | 1691 km² | 642 km² | 189 km² |

Western Canadian Total: 3036 km²

### 2.4.5 Roads and Highways

Owing to differences in the recording and presentation methods used by the four provincial ministeries of highways and transportation, the amount of highway and road construction taking place annually across Western Canada cannot be accurately estimated. Exacerbating these uncertainties is the probability many rural and private road developments are not counted in departmental reports. Cognizant of such ambiguities, the estimates for kilometers of highway construction (Table 2.11) and total area affected (Table 2.12), calculated on the assumption the average highway r.o.w. is 60 m, are 24 124 km and 1449 km², respectively.

Departments of Highways were among the first line departments to
Table 2.11 Linear Estimates of Highway and Road Construction in Western Canada (from the Annual Reports of Departments of Highways)

<table>
<thead>
<tr>
<th></th>
<th>B.C.</th>
<th>Alberta</th>
<th>Sask.</th>
<th>Manitoba</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970/71</td>
<td>153 km</td>
<td>251 km</td>
<td>793 km</td>
<td>653 km</td>
</tr>
<tr>
<td>1971/72</td>
<td>186</td>
<td>328</td>
<td>663</td>
<td>519</td>
</tr>
<tr>
<td>1972/73</td>
<td>182</td>
<td>245</td>
<td>734</td>
<td>810</td>
</tr>
<tr>
<td>1973/74</td>
<td>104</td>
<td>283</td>
<td>692</td>
<td>551</td>
</tr>
<tr>
<td>1974/75</td>
<td>82</td>
<td>464</td>
<td>570</td>
<td>631</td>
</tr>
<tr>
<td>1975/76</td>
<td>89</td>
<td>411</td>
<td>770</td>
<td>481</td>
</tr>
<tr>
<td>1976/77</td>
<td>153</td>
<td>274</td>
<td>526</td>
<td>578</td>
</tr>
<tr>
<td>1977/78</td>
<td>62</td>
<td>290</td>
<td>382</td>
<td>425</td>
</tr>
<tr>
<td>1978/79</td>
<td>323</td>
<td>244</td>
<td>730</td>
<td>456</td>
</tr>
<tr>
<td>1979/80</td>
<td>120</td>
<td>296</td>
<td>682</td>
<td>554</td>
</tr>
<tr>
<td>1980/81</td>
<td>177</td>
<td>257</td>
<td>490</td>
<td>446</td>
</tr>
<tr>
<td>1981/82</td>
<td>96</td>
<td>1003</td>
<td>495</td>
<td>514</td>
</tr>
<tr>
<td>1982/83</td>
<td>156</td>
<td>1405</td>
<td>239</td>
<td>445</td>
</tr>
<tr>
<td>1983/84</td>
<td>161</td>
<td>733</td>
<td>306</td>
<td>461</td>
</tr>
</tbody>
</table>

Total: 2044
Mean: 146
Total: 1723

Table 2.12 Estimated Area Affected by Highway and Road Construction

<table>
<thead>
<tr>
<th></th>
<th>B.C.</th>
<th>Alberta</th>
<th>Sask.</th>
<th>Manitoba</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970/71</td>
<td>9 km²</td>
<td>15 km²</td>
<td>48 km²</td>
<td>39 km²</td>
</tr>
<tr>
<td>1971/72</td>
<td>11</td>
<td>20</td>
<td>40</td>
<td>31</td>
</tr>
<tr>
<td>1972/73</td>
<td>11</td>
<td>15</td>
<td>44</td>
<td>49</td>
</tr>
<tr>
<td>1973/74</td>
<td>6</td>
<td>17</td>
<td>42</td>
<td>33</td>
</tr>
<tr>
<td>1974/75</td>
<td>5</td>
<td>28</td>
<td>34</td>
<td>38</td>
</tr>
<tr>
<td>1975/76</td>
<td>5</td>
<td>25</td>
<td>46</td>
<td>29</td>
</tr>
<tr>
<td>1976/77</td>
<td>9</td>
<td>16</td>
<td>32</td>
<td>35</td>
</tr>
<tr>
<td>1977/78</td>
<td>4</td>
<td>17</td>
<td>23</td>
<td>26</td>
</tr>
<tr>
<td>1978/79</td>
<td>19</td>
<td>15</td>
<td>44</td>
<td>27</td>
</tr>
<tr>
<td>1979/80</td>
<td>7</td>
<td>18</td>
<td>41</td>
<td>33</td>
</tr>
<tr>
<td>1980/81</td>
<td>11</td>
<td>15</td>
<td>29</td>
<td>27</td>
</tr>
<tr>
<td>1981/82</td>
<td>6</td>
<td>60</td>
<td>30</td>
<td>31</td>
</tr>
<tr>
<td>1982/83</td>
<td>9</td>
<td>84</td>
<td>14</td>
<td>27</td>
</tr>
<tr>
<td>1983/84</td>
<td>10</td>
<td>44</td>
<td>18</td>
<td>28</td>
</tr>
</tbody>
</table>

Total: 122
Mean: 9
Total: 1449
accommodate heritage resource concerns in their planning and construction. Thus, most highway projects with heritage resource implications have been preceded by impact assessments. This has routinely occurred in B.C. since the early 1970s and since the mid-1970s in the three other jurisdictions. In fact, the highway ministries of B.C. and Alberta either transfer or support the injection of sizeable funds into provincial a.r.m. agency budgets. By so doing they insure heritage resource concerns will be covered off with a minimum of administrative overhead and provide much needed organizational slack to the recipient agencies. Highway surveys and mitigation studies have contributed considerable new information on Western Canadian prehistory (e.g., C. Carlson 1979; Eldridge 1981; Gryba 1983; and Meyer et al. 1981).

2.4.6 Agriculture

Acknowledging the weaknesses in the above computations, we can roughly estimate that the cumulative landscape disturbances contributed overall by mining and, since 1970, by petroleum and highway and road projects total almost 7000 km². Yet this amount, though sizeable, is exceeded by the land area agriculturally improved in Saskatchewan alone over the same period (Table 2.13).

Western Canadian agricultural land use has increased dramatically, even since 1971. Yet, exposing regional historical trends is difficult because this land use is monitored by census units, and the boundaries between these change (McCuag and Manning 1982:11). However, at the macro- and provincial levels it is possible to show the gains made in the study area's
agricultural lands every 5 years (the agricultural census periods) since 1961. These data are displayed in Table 2.13 as area of improved farmland, rather than area of total farmland. The former refers to "land under improved agricultural practices" (McCuag and Manning 1982:14) while the latter includes the total area of censused farms, a less useful measure for discriminating land surface disturbances.

Due to the ease and low cost of clearing, it is unsurprising the Prairie Provinces have the largest share (82% in 1976) of Canada's improved farmland (Simpson-Lewis et al. 1982). Saskatchewan alone contains over 1/3 of all Canadian farmlands. The significant increases in improved lands were in the Peace River District of Alberta and B.C., about half of which (ca. 81 000 km²) is potentially arable (Beattie et al. 1981:30). From 1961 to 1976, 7270 km² of improved farmland were added here. Large gains also occurred elsewhere in the prairie provinces, although there were small losses in southern B.C., the Winnipeg urban area and the Rocky Mountain Foothills (McCuag and Manning 1982:19). If future market conditions lower development costs, the agricultural margin will expand further into the vast crescentric area between the prairie farming belt and the Shield's southern edge (Beattie et al. 1981:29).

The process of agricultural improvement in the southern Canadian plains has been described thus:

"Within one human lifetime, the prairies have passed from wilderness to become the most altered habitat in this country and one of the most disturbed, ecologically simplified and overexploited regions in the world" (Forsyth 1983:66).
Table 2.13  Increases in Improved Farmland in Western Canada, 1971 to 1981.
(McCuag and Manning 1982: Appendix A; Statistics Canada, telephone data, 1985).

<table>
<thead>
<tr>
<th>Province</th>
<th>1971</th>
<th>1976</th>
<th>1981</th>
<th>Absolute Change</th>
<th>Annual Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manitoba</td>
<td>51 817</td>
<td>52 169</td>
<td>55 040</td>
<td>3223 (6%)</td>
<td>322</td>
</tr>
<tr>
<td>Saskatchewan</td>
<td>187 888</td>
<td>189 296</td>
<td>196 839</td>
<td>8951 (4%)</td>
<td>895</td>
</tr>
<tr>
<td>Alberta</td>
<td>115 179</td>
<td>118 106</td>
<td>125 255</td>
<td>10 076 (9%)</td>
<td>1077</td>
</tr>
<tr>
<td>B.C.</td>
<td>7 103</td>
<td>7 735</td>
<td>9 463</td>
<td>2 360 (33%)</td>
<td>263</td>
</tr>
<tr>
<td>Totals</td>
<td>361 987</td>
<td>367 786</td>
<td>386 597</td>
<td>24 610</td>
<td>639</td>
</tr>
</tbody>
</table>

(in km²)

When the impact on archaeological resources coterminous with cultivated farmland is considered, the consequences of agricultural land use become even more severe. The effects of tillage on archaeological resources has a respectable history of investigation (e.g., Binford et al. 1970; Redman and Watson 1970; Roper 1976; Talmage et al. 1977; Ammerman and Feldman 1978; Baker 1978). However, the scope of these studies have concerned the isomorphism between surface assemblages and excavated deposits, artifact transportation distances, how items are sorted according to size and, most recently, the retention of use-wear data on collected lithics (Odell 1985).

Neglected topics of study include the selective removal of artifacts by land operators, surface feature destruction, distortions of vertical and horizontal spatial relationships, inter-annual exposure and burial of assemblages, artifact breakage, and the creation of artificial sites through mechanical redeposition of cultural materials.

Recent contributions to plowzone archaeology such as those by Lewarch...
(1979), Lewarch and O'Brien (1981a, b) and O'Brien and Lewarch (1981 [editors]) have done little to alter the view that agricultural effects on the archaeological record are severe. It should also be borne in mind that routine cultivation (discing and harrowing) affects no more than a 20 cm deep zone and thus may bias against the preservation of uppermost deposits; primarily, one suspects, those containing late prehistoric assemblages.

It is ironic that, of all the readily quantifiable sources of landscape disturbance, agriculture, with both the greatest annual impact and amount of research into its effects, remains the least regulated. The importance of agricultural disturbances is appreciated by the provincial a.r.m. agencies. Table 2.15 presents their ranking, in terms of severity, of primarily anthropogenic disturbances to the resource base. Agriculture tops each list.

Trying to establish the regulatory procedures and the necessary bureaucratic instruments to monitor and mitigate agricultural impacts will not be easy. Some difficult political and economic hurdles exist. Much agricultural improvement is undertaken by small, independant businesses on privately owned property. Current social attitudes favour assisting small entrepreneurs like farmers and protecting their property rights. These considerations combined with economic problems in the agricultural sector, means that governments are unlikely to institute strict a.r.m. requirements on farmers in the near future.

2.4.7 Other Sources of Landscape Disturbance

Some overarching problems attend evaluating the magnitudes of other sources of landscape modification. Mega-projects involving water impoundments for storage, irrigation and electrical generation systems occur
relatively infrequently and, in the aggregate, do not affect large land areas. These developments have intensive rather than extensive impacts. Dam projects tend to disturb or render inaccessible contiguous segments of highly significant segments of the resource base.

Owing to their economic and environmental implications, impoundment projects are closely regulated. Since 1970 virtually all major developments have been preceded by e.i.a.s which generally encompassed archaeological investigations. Examples of either proposed or already constructed impoundments in B.C. which sponsored h.r.i.a.s were the Peace Canyon*, Revelstoke*, Site C, Liard River, Stikine River, Homathcko, and Kootenay Canal* projects. In Alberta, h.r.i.a.s were associated with the Dunvegan, Slave River, Three Rivers, Crawling Valley and Forty Mile Coulee* proposals. Similarly the Churchill River, Choiceland, Forks, Nipawin*, Weyburn* and Rafferty projects in Saskatchewan were all archaeologically assessed. And likewise, the South Indian Lake project* in Manitoba hosted a h.r.i.a. Of these, only 7 (those with asterisks) have proceeded to construction.

Since there seems to be no single source on inundation projects for Canada, getting data on land surface areas flooded in the last 15 years requires contacting the individual utilities or agencies responsible. B.C. Hydro, B.C. Ministry of Environment, Saskatchewan Power, Manitoba Hydro and Manitoba Environment and Workplace Safety and Health had replied by the time of writing. Since 1970 B.C. Hydro's their four projects have inundated a total of 117.7 km², 92% of which was the apparently sterile upper reach of the Columbia River (Murton and Ferguson 1973). In Saskatchewan the two major impoundments concluded since 1980 have inundated about 18 km². For Manitoba
Hecky et al. (1984:723) indicate the area of South Indian Lake was increased by 415 km² while the entire Churchill River Diversion project flooded 768 km². In total, since 1970 Manitoba Hydro's projects and those of the Prairie Farm Rehabilitation Administration have inundated 1035 km².

Reservoir developments have been studied from environmental standpoints (e.g., Baxter 1977; Baxter and Glaude 1980; Hecky et al. 1984) as well as from archaeological ones (e.g., Foster and Bingham 1978; Garrison 1975, 1977; Lenihan et al. 1977, 1981; Padgett 1978; and Schaafsma 1978). Like the petroleum industry, provincial power utilities and water management authorities responsible for such projects have a history of cooperation and support for heritage programs. Because of this, until recently a.r.m. agencies enjoyed latent regulatory abilities over land surface disturbances caused by dams and reservoirs.

An appurtenant form of land surface modification, that due to the installation of electrical transmission lines, has been substantially downgraded as an impact to archaeological resources for much of the study area. Where r.o.w. clearing and maintenance is required for transmission lines traversing forested area or where pads must be constructed to support towers for high voltage (>238 kV) lines, adverse effects may occur. But the majority of transmission lines built annually, especially those in the southern continental interior, have few implications for heritage resources. Kenny (1984) has described precautions which can be taken during construcion and maintenance to minimize heritage resource impacts.

As alluded to above, forestry is a major alterer of terrain, but one which seems understudied and not closely regulated in any jurisdiction (but
see Environment Council of Alberta 1979). Western Canada contains 997,022 km² of lands classified as productive or potentially productive forest (Tables 2.3, 2.4, 2.5, 2.6; Saskatchewan Environment 1980: Table 2-7). Yet determining how much of this area is affected by logging activities is extremely difficult since industry statistics are usually presented in units of volume (e.g., "board feet", "mm fbm", etc.) rather than area.

As to why and how the forestry industry has evaded complying with a.r.m. and some other environmental controls, the reasons are obscure. This state of regulatory laxity may be due to forestry’s position as a very early, almost founding economic activity in Western Canada. Unlike petroleum and energy industries in which government regularly intervenes or participates through Crown corporations, the forest industry is firmly embedded in the private sector. The industry also contributes significant portions of some provinces’ GDP. Furthermore, it maintains strong lobbies and wields considerable political influence. These factors, plus perhaps extension of the industry’s concept of its own resources as "vast", "inexhaustible" and "limitless" (Swift 1983) to other environmental components may explain the resistance to regulation, heritage and otherwise.

While a.r.m. agencies in the study area are aware of these problems and rate the negative impact of forestry as comparatively severe (Table 2.15), little progress has been made in encouraging companies to carry out surveys of timber supply units or conserve archaeological resources threatened by logging actions. This is despite the fact provincial governments own and manage the forests and the land they grow on. By contrast, the Forest Service of the U.S. Department of Agriculture has aggressively assumed
Table 2.14 Land Consumed by Urban Growth (from Simpson-Lewis 1979:198-200)

<table>
<thead>
<tr>
<th>City</th>
<th>Estimated Land Consumption 1971-1976</th>
<th>Area Left to Develop</th>
<th>Estimated Date of Full Supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vancouver</td>
<td>43 km²</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Victoria</td>
<td>8</td>
<td>189 km²</td>
<td>17 years</td>
</tr>
<tr>
<td>Edmonton</td>
<td>27</td>
<td>181</td>
<td>16</td>
</tr>
<tr>
<td>Calgary</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Regina</td>
<td>8</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Winnipeg</td>
<td>17</td>
<td>54</td>
<td>8</td>
</tr>
</tbody>
</table>

* data unavailable

Cultural resource management responsibilities (Flamm and Friedman 1981; Friedman 1981). In 1979 the USFS employed 84 resource management specialists (Rogge 1980). Other indications of its commitment are the planning programs developed for specific National Forests (e.g., Barber 1981). Breaching Western Canadian forestry’s resistance to additional regulations may be difficult (e.g., Economic Council of Canada 1984: Recommendation 7). However, a beginning must be made.

A final form of land surface disturbance bears brief discussion: urban expansion. Table 2.14 shows the land consumed by residential growth for select cities. Also given for three urban areas is the surface left to develop within 8 to 24 km of each and the years this would take at the 1971 to 1976 consumption rate. Heritage resource conflicts with residential and industrial developments at the urban fringes are difficult to regulate. High land values and the facts of (often multiple) private property holders and municipal jurisdictions complicate, politicize and render controversial much management decision-making. While the amount of land under urban use
Table 2.15 Ranking of Resource Loss Causes by Provincial A.R.M. Agencies

<table>
<thead>
<tr>
<th>Land Use/Erosional Agency</th>
<th>British Columbia</th>
<th>Alberta</th>
<th>Saskatchewan</th>
<th>Manitoba</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Natural Erosion</td>
<td>3</td>
<td>7</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Forestry</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Road/Highway Construction</td>
<td>6</td>
<td>6</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Hydroelectric Projects</td>
<td>4</td>
<td>9</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>Petroleum/Gas Extraction and Transmission</td>
<td>9</td>
<td>8</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Mining/Aggregate Borrowing</td>
<td>5</td>
<td>4</td>
<td>7</td>
<td>9</td>
</tr>
<tr>
<td>Electrical Transmission</td>
<td>9</td>
<td>8</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>Line Construction</td>
<td>8</td>
<td>10</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>Collecting/Vandalism</td>
<td>10</td>
<td>5</td>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>

is small, the correspondence of prehistoric to modern settlement must be considered. Vancouver, Victoria, Edmonton, Calgary, Saskatoon and Winnipeg have replaced many, and in cases, very significant heritage resources dating to both sides of contact.

2.4.8 The Provincial Archaeologists' Impact Ratings

Through their experiences as the senior archaeological managers in Western Canada, the provincial archaeologists should have fairly accurate and comprehensive ideas of total land uses and impacts under their jurisdictions. On this assumption Table 2.15 was constructed through written questionnaires answered in 1982. Agriculture is ranked first in all provinces followed, less unanimously, by natural erosion, forestry and highway construction. It would be desirable to develop the means to test the accuracy of these impressionistic assessments.

2.4.9 Future Developments in Western Canada

Forecasting the future rate of land surface alteration for Western
Canada turns largely on anticipating the rate of regional economic development. Clearly, any such exercise contains uncertainties. New energy accords, international demand for agricultural, forest and mineral products, variations in interest and inflation rates, changes to domestic transportation policies, tariffs, countertrade, enhanced trade agreements --- a host of factors are involved.

Fortunately, two recent studies have been released which project economic futures for Western Canada. The first, by the Canada West Foundation (Beck and Dungan 1983; Beck 1983a, 1983b; Cameron and Dean 1983; Maki and Meredith 1983; St. Louis 1983) began in 1982. This study identified major project investments (i.e., > 100 million 1982 dollars and referred to as "megas and mini-megas") which could be undertaken up to 1995. Three investment scenarios were developed. The first assumes all planned projects would proceed as scheduled, the second anticipates some delays and cancellations due to a weaker economic recovery, while the third assumes protracted postponements and a high cancellation rate. From these scenarios, the impact stream of these investments measured in GDP, employment rates, disposable income and so on, were simulated. The Economic Council of Canada (ECC [1984]) undertook the second study. More general in scope, their report looks at the long term economic future of Western Canada, focusing on the region's transition from its traditional reliance on the natural resource sector to the service sector.

Under Canada West Foundation's most optimistic scenario, the following major projects can be expected to take place or are already taking place. Since some corporations did not volunteer information on their investment
intentions, the list of projects probably understates those which may actually be undertaken. Further imprecision to the list is caused because some corporations revealed their plans on the assurance their projects would not be named or otherwise identified.

In B.C., 61 projects meeting the investment criterion are or are predicted to soon be underway. Twenty three of these were already abuilding as of 1983. In total, these included 10 coal mines, 9 metal mines, 8 B.C. Hydro projects (the Revelstoke Dam and two transmission lines then under construction, another large transmission line in the planning stage, and hydroelectric projects at Murphy Creek, Site C, Kemano, and the Stikine River), 5 forest product projects, and 5 pipeline projects (one of which is the B.C. portion of the Alaska Highway gas pipeline). Of the 19 remaining miscellaneous projects, the only ones likely to have significant and direct heritage resource impacts are plant, smelter and terminal constructions and two highways projects (Maki and Meredith 1983).

Ninety projects are estimated for Alberta, 35 of which were underway in 1983. The majority of these are in the energy sector: 20 coal mines, 6 tar/oil sands extraction projects, two heavy oil upgraders, two enhanced oil recovery projects and 5 fractionating or refining facilities, the Alaska Gas pipeline and Arctic pilot project as well as various gas plants and transmissions lines. In addition, 7 hydroelectric projects (e.g., Slave River), thermal plants and large transmission lines are projected. As well, 5 forestry projects and three transportation projects, including national railway improvements, are envisioned (Beck 1983a).

Saskatchewan is expected to host 12 projects in addition to the 7
already started. These comprise three electrical generating facilities, one hydro development --- the Nipawin project, which concluded in 1985 --- and two thermal generating stations, 5 heavy oil projects, 6 uranium projects, three potash mines or expansions together with one ammonia plant and an unspecified railroad project (St. Louis 1983).

Meanwhile Manitoba is projected to have the lowest rate of major development. Only 11 projects are forecast, three of which had started as of 1983. These include two potash mines, an aluminum smelter, a nickel mine and another mine expansion, another hydro dam, a uranium mine, the Nelson River transmission line along with two others and a major irrigation project (Cameron and Dean 1983).

Not all these developments will cause large-scale adverse impacts in a direct fashion. Some, like subsurface mines, smelters, chemical plants, refineries, and heavy oil upgraders in and of themselves will cause few resource losses, due to their size or location. But they will stimulate many indirect impacts. Spin-offs such as residential growth, additional roads and rail lines, electrical and petroleum transmission lines, and other intensified land uses have to be considered.

If the trends identified by the ECC (1984) develop and its recommendations are followed, mature forests in B.C. will be harvested at an even greater rate, perhaps under relaxed environmental regulations. For the agricultural sector a small deceleration in growth is projected which may be reflected in reduced rates of agricultural land improvement. However, the EEC (1984:88) suggests expanding grain production by "bringing into production an estimated 1.7 million hectares of potential cropland". While
stepped up cultivation of unimproved land is not one of the means proposed to accomplish this, it will likely occur. The eventuation of these predictions for the forestry and agricultural sectors will undoubtedly contribute to increased heritage resource losses.

The largest impending source of impact to the archaeological resource base at the turn of the century has not yet been fully considered. Domestic and U.S. requirements for cheap and secure energy as well as large quantities of fresh water may place dramatic demands on Western Canadian hydrological systems. Already five drainage basins are environmentally stressed (i.e., the Okanagan, Milk, North Saskatchewan, South Saskatchewan and Red-Assiniboine [ECC 1984]). To meet increasing demands for energy and water, huge hydroelectric projects, interbasin water transfers and large-scale river diversions will be required (cf., Pillsbury 1981; D. Thompson 1983; Pearse et al. 1985). River basin planning, of necessity, is advanced for the majority of Western Canadian drainages. Megaprojects already in the design stage may well destroy much of the resource base located in the major valley systems of the study area. The scope of programs required to adequately mitigate resultant heritage resource impacts would dwarf the River Basin Survey efforts of the 1940s, 1950s and 1960s (Jennings 1985).

2.4.10 Summary Discussion

The problems of estimating and managing resource loss are numerous. Some sources of disturbance, such as agriculture and forestry, are essentially uncontrolled despite the fact regulatory means exist in most provinces. Presently, though, the political will is lacking.

There is also a major source of resource loss which is outside the scope
of legislative actions. To this point there has been little discussion of natural erosion. The lack of discussion can be attributed to the lack of information on the topic. Little effort has been dedicated to this problem area since ASAB's efforts in the mid 1970s. At this time projects were conducted in the Gulf of Georgia, Greater Vancouver Regional District and the Arrow Lakes impoundment (Mohs 1977). B.C.'s concern with this problem is clearly warranted by high energy shoreline environments containing the majority of NWC prehistory. At most sites, beneficial C transforms (Schiffer 1976) have ceased: foreshore deposition of midden deposits no longer defend samples of earlier components from erosion. B.C. also shares with its eastern neighbours the problem of slope failure on many river systems and reservoirs. Contrary to the U.S., where several impact analyses studies (e.g., Lenihan et al. 1981) have been carried out, similar research has yet to be launched in Western Canada. Resource managers can only guess as to the severity of natural impacts and can do little to control them. As a managerial discipline with a finite resource, a.r.m. has not performed well in developing planning and evaluation methods. Clearly, the sources and rate of resource loss are basic management parameters. Yet the research effort required has not really even begun.

This raises some vital questions for the discipline as a whole. By failing to understand the rate at which the region's prehistory is being eliminated is not the extinction of the rich and independant history of Western Canada's first peoples condoned? And, does not this contribute to their subjugation as the poorest and most politically disorganized minority in Western Canada?
THREE

"RESOURCES ARE NOT, THEY BECOME": THE RISE OF WESTERN CANADIAN ARCHAEOLOGICAL RESOURCE MANAGEMENT

"And what rough beast, its hour come round at last, Slouches towards Bethlehem to be born?"

from The Second Coming by William-Butler Yeats
3.1 INTRODUCTION

Since the full effects of a.r.m. have been experienced only in the last decade, much of its history is so recent that many signal events go unrecorded, data on its performance continue undocumented, and most of the major actors are still alive and practicing. This is also true of the heritage conservation movement in general in Western Canada. It should not be surprising that to this point no Hosmers (1965, 1981) or Kings et al. (1977) have emerged from the legislative libraries and provincial archives to tell the story of archaeological conservation's evolution in Western Canada.

Still, the salient steps in its rise can be isolated and described. They can also be compared with the evolutionary phases of American cultural resource management (CRM). Over the 1970s CRM studies and concerns exerted considerable influence on the manner in which conservation archaeology was practiced in Western Canada. By comparing the trajectories of resource management in both areas, the development of U.S. archaeological conservation can be held up as a yardstick against which Western Canada's progress can be measured. This chapter, then, examines Western Canadian a.r.m. in both historical and comparative terms. An enhanced analysis of participants, practices, performances and problems specific to Western Canada after 1970 is provided in chapter 4.
3.2 UP TO 1930: CONCERN ON THE COAST; IMPOTENCE ON THE PRAIRIES

Western Canadians have long had an interest in their past. As Denhez (1978:16) observes, "Manitobans had a historical society when their provincial history was barely nine year old, almost before they had any history to study". Some of the interests these early societies had were not that exemplary, illustrated in an extreme by the looting of burial mounds in southwestern Manitoba (Syms 1978). Not until considerably later was this interest converted into a concern for preservation.

The first steps towards conserving landscape amenities were taken by the federal government. Between 1885 and 1930 it set aside lands for the purpose of creating national parks (Nelson 1977). Responding to the precedent American interests in preserving scenic and wilderness lands in the west over the late 1800s (e.g., McAllister 1982) and recognizing the tourist potential of the hot springs, mountains and forests of the Cordillera, the Canadian government and CPR entered into an ad hoc partnership in 1885 to develop Banff as Canada's first national park (Nelson 1973; Leighton 1985). The alienation of Jasper, Waterton, Glacier and other areas as National Parks followed, their selection based primarily on recreational values.

The U.S. federal government had been withdrawing lands containing significant archaeological sites since the 1890s. In 1906, Congress passed The Antiquities Act which empowered the President to set aside national monuments and protect sites on federally owned or controlled lands (King et al. 1977; Kermer 1981; Nurkin 1982). The pedigree of this act goes back to 1882, a time when romantic and patriotic motives were helping to coalesce...
the heritage interests of various upper class eastern Americans into the historic preservation movement (Birch and Roby 1984). Twenty-four years of campaigning were required to achieve Congressional approval due to countervailing lobbying by a faction opposing the reservation of large public lands as parks (Knudson 1984). Limited awareness of the legislation and a disinclination on the part of the FBI to enforce the statute led to litigations, despite the apparent growth of site destruction during the Depression years (McAllister et al. 1984).

The Canadian government did not take similar legislative action for the alienation of public lands until the 1930 National Parks Act. An Historic Sites and Monuments Board had been set up in 1919 to commemorate historic sites of national importance. Initially, the Board operated under Order-in-Councils rather than statutory authority. Consequently, there was no provision for parliamentary review of its decisions, a disablement which continued until promulgation of the The Historic Sites and Monuments Act in 1953 (National and Historic Parks Branch 1958; O'Keefe and Prott 1984:66).

Prior to 1930 the natural resources of the Prairie Provinces were controlled by the Canadian government. It is dismaying that so little was done during this tenure to conserve archaeological sites in the continental interior. Whether such oversight 1) was because heritage conservation was an idea whose time had not yet come, 2) represented eastern Canadian chauvinism, 3) belies a depreciation of the prehistoric achievements of the regional indigenous peoples, 4) was the result of fiscal considerations, 5) was due to federal-provincial wrangling or 6) was caused by a simple lack of information is unknown. The last reason seems improbable for the
institutional forerunner of the National Museum, the GSC, and various eastern scientists had been archaeologically investigating parts of the prairies since the late 1800s (Noble 1972; Wright 1985). An early example of the national government's failure in a.r.m. is the Parks Branch's poor record of stewarding the known pithouse villages in Banff (Reeves 1974).

Up to 1930 only British Columbia was constitutionally capable of drafting legislation to protect its heritage properties. In 1925 the province exercised this power in An Act to Provide for the Preservation of Historic Objects. The motives for this are obscure. Given that the prevailing interest in B.C. archaeology had narrowed to rock and ethnographic art (Carlson 1970), it is probable that this focus led to a demand for legal protection for these sites. A further fillip may have been provided by the rapacious collection of ethnographic artifacts by eastern U.S. collectors and institutions, which had been ongoing intensively since 1875 (Cole 1985). These objects (viz., "any primitive figure or legend cut in or painted upon rock, or any group of such figures or legends"), along with structures or natural objects declared by the provincial cabinet to be historic objects were, when posted, protected from vandalism. A permit was required from the Provincial Secretary for altering such objects and a fine ≤ $500 was to be assessed upon summary conviction. Noteworthy is that the administration of the legislation was placed under the Provincial Secretary, a ministry which has basically retained the responsibility to this day. Significant also was the size of the maximum fine, considering this early penalty was five times that for contraventions of Manitoba's heritage conservation legislation, legislation which was not replaced until 1985.
3.3 1930 TO 1960: THE EMERGENCE OF A RESOURCE

3.3.1 Archaeology and the U.S. Response to the Depression

Even after control over natural resources was transferred to Alberta, Saskatchewan and Manitoba in 1930 there was no rush to enact laws to protect archaeological and historic sites. Facing a deepening depression the federal and provincial governments commenced public work projects such as the construction of the TransCanada Highway and various provincial and municipal initiatives (Lower 1983). However, nothing the scale of the Tennessee Valley Authority (TVA), Civil Works Administration (CWA) and Works Progress Administration (WPA) programs of Roosevelt's New Deal were undertaken. Archaeology was not to become the job-generator in Western Canada that it did in areas of the U.S.

Archaeology's advantage as a labour-intensive source of employment which "did not compete with anything that private enterprise might remotely be expected to undertake" (King et al. 1977:23) was recognized early in the U.S. The CWA and later the WPA provided funding to the Smithsonian Institution which, as a consequence, oversaw some massive field programs (> $1 500 000/yr in the southeast alone). As King et al. (1977) and others (e.g., Johnson 1966; Jones 1976; Quimby and Cleland 1976; Haag 1985) have observed, these projects were mostly concentrated in the southeast where the TVA was busy damming various river systems. No broad Congressional policy regarding archaeological conservation motivated these conservation programs, however, despite the fact significant public monies were being used (Knudson 1984). Many of those involved in these projects became senior figures in the discipline and their experiences no doubt influenced their own and their
students' subsequent methods, performances and later commitment to CRM.

Another signal event of the Depression in the U.S. occurred when the New Dealers, on the urging of preservationists concerned with retaining aspects of the built environment, sponsored The Historic Sites Act in 1935. This law authorized the National Parks Service (NPS) to inventory, acquire and preserve nationally significant archaeological and historic sites for "the inspiration and benefit of the people of the United States" (Johnson 1966:1594). According to Knudson (1984:255), this bill was developed without much consideration-of, or support from, archaeological interests.

The same year this milestone in historic preservation came into law, the newly formed Society for American Archaeology (SAA) published its constitution and bylaws. Among these were the threat of membership suspension for those who used archaeological materials for commercial gain or individual satisfaction, an inchoate statement of archaeological ethics (Davis 1984).

3.3.2 The Western Canadian Experience

Meanwhile, north of 49° the Prairie Farm Rehabilitation Administration was constructing smaller dams and irrigation systems, roads and bridges were being built, and various municipal projects proceeded. Even with these programs thousands of the unemployed restively cooled their heels in relief camps. Yet no attempts were made to utilize the labour-intensive characteristics of archaeology. Instead of becoming a period of data gathering by scientific institutions, the Depression was a time when thousands of private collections were haphazardly amassed over the southern interior basin (e.g., Dyck 1980).
Stasis essentially characterises the federal a.r.m. effort over this period. Dating back to 1927, The Indian Act (1960-61) provided limited protection to some sites and objects (e.g., grave houses and poles, totem poles, petroglyphs and petroglyphs) located on reserve lands. Other modest legislative advances serving to conserve the national prehistoric patrimony included a 1935 ordinance which apparently extended protection to some types of Inuit sites (Turnbull 1977:122), the 1956 Yukon Archaeological Sites Regulations which governed licensing field work in the Territory, and the 1960 Regulations for the Protection and Care of Archaeological Sites in the Northwest Territories (SOR/60-31; Jones 1978). For Western Canada, the impact of these rulemakings was negligible.

At the provincial level no action took place in archaeological conservation until after WW II. The economies of the western provinces grew rapidly in the postwar years and little thought was initially given to preserving the sites and objects of precedent cultures. Sufficient concern did exist in Manitoba for the provincial legislature to draft An Act Respecting Historic Sites and Ethnological and Anthropological Objects in 1946. The act's genesis is nebulous but Chris Vickers, who was active in research and professional and popular publication, along with the Manitoba Historical and Scientific Society were probably influential in its development. (Vickers' abilities in the print media are attested to by his editorship with the Winnipeg Free Press in 1951 [Syms 1980]). An evaluation of this act noted its ineffectiveness in that it protected only designated properties and it lacked provisions for site development (Gonsalves et al. 1965).
At about the same time as the Manitoba act became law, Carl Borden began salvaging sites around Vancouver, B.C. With the inside-knowledge and assistance of Wilson Duff, then with the provincial museum, Borden became apprised of the Aluminum Company of Canada's plans to dam the Nechako River. He prepared a brief to the provincial government requesting survey and salvage funding. In 1951 the province allocated $2000 for the survey and $8000 the next year for salvage. Five thousand dollars was also forthcoming from the company (Borden 1977). With these funds was born the first formal mitigation project in Western Canada.

Lessons learned from this experience hardened Duff's and Borden's resolve that adequate lead-time was required for proper survey and data recovery and that both government and private developers were morally obligated to fund these activities. Throughout the 1950s both vigorously lectured various organizations and used available media opportunities to promote the creation of reasonable legislation. Their campaign was eventually assisted by national and international pressure as sympathetic stories began appearing in the Christian Science Monitor and the New York Times. Duff was requested to draft legislation in 1959 and the Archaeological and Historic Sites Protection Act (AHSPA) became law in 1960 (Borden 1977).

Considering its strength and the powers invested in the responsible minister, this act was a milestone in the evolution of Western Canadian a.r.m. (its ultimate 1972 version may have even surpassed B.C.'s present legislation insofar as it was less ambiguous in a few important ways than the current Heritage Conservation Act [Germann 1979]). The AHSPA prohibited
the disturbance of archaeological sites situated on Crown Land except where a permit had been obtained and provided that the minister-in-charge could request a developer to carry out adequate salvage investigations. Its chief drawback was that only impacts to known sites were controlled; the act did not compel proponents to undertake surveys prior to land alteration activities in unknown areas. In most other ways it proved exemplary. One vital provision was for the establishment of the Archaeological Sites Advisory Board (ASAB) to be comprised of senior representatives of the Provincial Museum, the Provincial Archives, the responsible government ministry, and the University of B.C. Membership from the general public and the other provincial universities was later sought (Borden 1977). Throughout the ensuing decade a number of conservation studies were conducted, some of which were associated with proposed hydroelectric projects, e.g., the High Arrow Dam and the Bennett Dam. Noble (1972) and Carlson (1970) discuss numerous other projects carried out in the 1960s.

British Columbia was not the only Western Canadian province to host rescue archaeology and the emergence of heritage legislation. Saskatchewan's Universities Act had early contained provisions for setting aside historically significant properties. Between 1951 and 1953 management responsibilities for provincial protected areas were formally taken up by a line ministry (the Department of Natural Resources). Following this a few resources began to be designated as protected properties.

Despite the absence of a legislated requirement to do so, the Saskatchewan Power Corporation (SPC) funded Wettlaufer's and Mayer-Oakes's (1960) salvage excavations of the Long Creek site in 1957. In his Foreword
to the Long Creek report, SPC's General Manager, David Cass-Beggs acknowledged the proponent's responsibility, particularly that of power utilities, to undertake archaeological research in areas to be affected by their projects. He also eloquently expressed the value of the studies funded by his corporation to the people of, and beyond, Saskatchewan.

The second significant mitigation project was carried out within the 450 km² reach of the South Saskatchewan River destined to become Lake Diefenbaker, behind the Gardiner Dam. Information on this project is very hard to come by as so little was published. Funding, though, was provided for archaeological studies by both the federal and provincial governments (Pohorecky 1973). The initial allocations were also made before there was a legal need to do so.

In 1960 Saskatchewan joined B.C. and Manitoba in having heritage legislation passed (Jones 1978; Dyck 1980). Entitled The Provincial Parks, Protected Areas, Recreation Sites and Antiquities Act (PPPARSAA) it was markedly less forceful than B.C.'s AHSPA. The 1960 PPPARSAA (and its amended 1962 and 1965 versions) was more of an omnibus bill in that it covered the establishment and protection of a number of kinds of amenity resources. Consequently, several fur trade posts, trails and an archaeological site were protected. But the act had few teeth as regards the general conservation of archaeological sites or objects. The responsible minister was empowered to create protected areas which could include burials, pictographs, petroglyphs, and other types of archaeological sites. Moreover, a permit was required to alter any ethnological, archaeological or historical object situated in a provincial park or
protected area or to alter any rock art or burial site found anywhere in the province. Furthermore, any heritage object found within a provincial park or protected area was deemed property of the Crown and could not be disposed of until the minister was given an opportunity to purchase it. Contraventions carried a penalty of ≤ $500 or up to six months of imprisonment. Aside from the restrictive areal applications, another of the act's flaws was that the onus was placed on a proponent to both inform the minister if a construction project threatened an archaeological site and delay activities to allow the minister to undertake salvage measures. That any expenses or losses incurred by the proponent were to be compensated for by the government remained its most egregious deficiency. This, plus the absence of a regulatory agency to ensure compliance meant that few h.r.i.a./m.s were ever undertaken as a consequence of this legislation.

It is little wonder that one of the main resolutions of the first and last meeting of the Western Canadian Archaeological Council (WCAC), held at the Glenbow Foundation in Calgary in 1960, was to recommend to the federal and all provincial governments that legislation similar to the AHSPA be passed as soon as possible. Other resolutions included recommendations to the federal government that it formally adopt the international principles applying to archaeological excavations formulated by UNESCO in 1956; to amend The Indian Act to protect archaeological sites on reserve lands; and that Western Canadian universities be encouraged to start archaeological programs (WCAC 1960).

Another significant outcome of this meeting was the explicit acknowledgement of archaeological sites and objects as resources. This is a
classic example of what Zimmerman (in Krueger and Mitchell 1977:10) noted in 1933, "resources are not, they become". Insofar as members of the Council argued that archaeological properties were equivalent to timber, fisheries and other provincial resources, a conceptual breakthrough was achieved. Archaeological sites and objects no longer were strictly viewed as objects of purely scientific or antiquarian interest. Rather they began to be considered as common property resources owned by, and to be used for the benefit of, Western Canadians (although several years were to go by before this was fully recognized in provincial statutes). Obviously this view was owed to the B.C. legislation which treated archaeological sites more or less the same as other natural provincial assets.

3.3.3 Meanwhile Back in the U.S.A.

On the provincial level significant forward movement had occurred in Western Canada between 1930 and 1960. And in the U.S. over the same period? While the WPA and TVA projects had produced a lot of data, in a few instances sites had been maltreated or destroyed by improperly supervised gangs of relief workers. To impose order and direction on these programs the National Research Council appointed a committee to study the needs of American archaeology. In 1939 the committee tabled a report which outlined essential guidelines for archaeological projects, many of which remain cogent today (Guthe 1939). The committee also helped to close down projects in many states (Johnson 1966).

Understandably, World War II significantly reduced archaeological activity. But it rapidly picked up when, in 1944, the federal government began planning multipurpose dams and related projects in numerous river
systems, the most ambitious of which were slated for the Missouri Valley. The blue-ribbon Committee for the Recovery of Archaeological Remains (CRAR) was struck to draft standards of performance and coordinate the associated rescue program. An alliance between archaeologists and federal construction agency personnel was successful in gaining the Administration's recognition that salvage work was an appropriate concern of the federal government and that funding for this work should be appropriated. In 1947 the Interagency Archaeological Salvage Program (IAS) began operation with funding authority provided by The Historic Sites Act. The IAS came to encompass some 18 federal agencies supporting or carrying out salvage work through to the mid-1960s.

Initially, the majority of these projects were conducted through the Smithsonian Institute and administered by the NPS. Over the late 1940s and into the 1950s the former's role in the reservoir salvage programs declined as university, museum and historical society involvement increased. In 1960 the Reservoir Salvage Act was passed, establishing the NPS as the lead agency in coordinating the salvage projects. Thereafter, enjoying an annual budget of ca. $1 500 000, the NPS administered the reservoir salvage program from a number of regional offices (King et al. 1977). Johnson (1966), in his summary of these programs, observed that beyond the information recovered, analysed and disseminated through these projects, the IAS fostered growth in the numbers of professional archaeologists and anthropology departments.

Wedel (1967) also makes the first point in his discussion of the Smithsonian's Missouri Basin Project, the first of the several River Basin
Surveys arising out of the IAS. From 1946 to 1967 $2,500,000 was expended in the Missouri Basin alone. Evidently, Wedel harboured some reservations about the project's publication record and lack of interdisciplinary research. Jennings' (1985) account of the organizational contexts of the early River Basin Surveys provides reasons enough for some of these problems. To be sure, concern for the quality of the salvage work and the resultant reports was not restricted to the Missouri Basin (cf. Roberts 1948; King et al. 1977:26-7). Nonetheless, the majority of current information on middle Missouri prehistory was produced over the course of this project. As well, considerable data was produced from reservoir salvage projects in the Pacific Northwest, Virginia, Georgia, Texas, California and other states.

But perhaps the two most significant contributions of the River Basin Surveys to American archaeology were as follows. First, most participating archaeologists became committed to resource conservation. Second, government responsibility for heritage resource conservation was implicitly established. Indeed, Jennings (1985) finds the genesis of today's cultural resource management programs in the River Basin Surveys of the 1940s to 1960s.

Despite the successful efforts of the archaeological community to secure appropriations for salvage programs over the decade 1945-1955, there was no major thrust to develop a national policy on archaeological conservation. Rather, over this period, federal responsibilities for the management of archaeological resources were met on a project-by-project basis. Critical decisions on single salvage projects and, later, in the
development of broader policy usually hinged on the interpersonal and negotiating skills of individuals. An informal policy-making process evolved, whereby a few prominent archaeologists with Congressional contacts, together with small professional committees, lobbied for legislative gains. This *ad hoc* policy making procedure persisted up to passage of the Moss-Bennet Bill in 1974 (Knudson 1984). Compared to the Western Canadian archaeological conservation effort, American progress to this time was staggering. Even so, the accomplishments of the historic preservation movement in the U.S. (see Birch and Raby 1984) continued to dwarf those of the small archaeological constituency.
3.4 POST-1960: LEGISLATIVE GAINS, PROFESSIONALIZATION AND THE ACADEMIC REACTION

3.4.1 Western Canada: Legislative Passages

At least one of the Western Canadian Archaeological Council's resolutions was to bear fruit. Over the 1960s archaeologists were posted to anthropology departments in all the western provinces and the University of Calgary went so far as to create a stand-alone department. The others, though, did not fare so well.

Canada's participation in UNESCO, notwithstanding, neither the Recommendations on international principles applicable to archaeological excavations enunciated by this body in 1956 nor its 1968 Recommendations concerning the preservation of cultural property endangered by public or private works were promulgated in any national heritage legislation. These and later UNESCO Recommendations and Conventions represent a serious body of treaty law which place obligations on member states, and the duty to report what progress had been made towards meeting the recommendations (O'Keefe and Prott 1984). Yet there are no records of the federal government's attempts to comport with the 1956 and 1968 Recommendations. Although compliance with later Conventions and Recommendations is considerably better, the neglect to concretely ratify the 1956 Recommendations is (and remains) particularly egregious. Several decades in the making, and designed to guide sovereign states in drafting national laws and minimal goals for a.r.m., the Recommendations set out standards of conduct, publication and reporting; site discovery and excavation licensing procedures; the desirability of reserving "witness areas"; the requirement to establish a central agency to administer legislation, manage and inventory archaeological sites; and
several other elemental a.r.m. principles. These and the supplementary 1968 Recommendations concerning the need for forward planning, surveys, salvage excavations, penalties and who should pay for mitigation (Jones 1978:28-38) proved too far-reaching and prevenient for the senior level of Canadian government.

Standing in the shadow of the U.S. achievements must have been somewhat galling for the WCAC, appreciating that most of its archaeological members were American. Nothing like the IAS or NPS programs, no scholarly oversight committees, no policies, and no national laws respecting archaeological resource conservation were forthcoming. This situation basically continued --- later in the decade Taylor's recommendations to the Dominion-Provincial Conference on the Development of Historical Resources for effective legislation and salvage programs (Turnbull 1977:122) were to have no great effect.

On the provincial fronts, though, some gains were being made. Now under Cass-Beggs' management, Manitoba Hydro allocated money to carry out mitigatory excavations in association with the Grand Rapids hydro-electric project. In 1963, monies were made available for salvaging the Lockport site, an action necessitated by the Winnipeg Floodway Development. And in 1967 An Act Respecting the Protection and Preservation of Historic Sites and Objects was assented to.

In 1965 concern had been formally expressed by the Manitoba Archaeological Society (established in 1961) that the province protect and develop Manitoba's archaeological resources (Gonsalves et al. 1965). Its brief recommended that management responsibilities be vested in a government
department, that a provincial archaeologist be engaged, and that an act be passed to provide 1) that all archaeological sites and objects were protected, 2) for a permit system, 3) that a field program be initiated 4) for control over the disposition of archaeological materials, and 5) for penalties for non-compliance. The act the society got fell considerably short of these desiderata. Three years after its passage it had already been judged inadequate and efforts began to replace it (Mayer-Oakes 1970).

The 1967 act had numerous weaknesses, paramount being that the responsible minister could only recommend and not require salvage or survey studies be undertaken by proponents where sites were threatened by their actions. Only in the case of designated historic sites did the province have this control. Whereas the act did incorporate a permit system, contraventions at worst entailed a $100 fine. An agency to administer the act did not come about for another 7 years. So the immediate dissatisfaction with the act is not surprising.

Nonetheless, these several legislative deficiencies did not prevent the provincial government from allocating funds for survey and rescue operations in the Churchill River Diversion project (CDAP) area in 1969. With significant financial inputs by Manitoba Hydro in the early 1970s (i.e., > $800 000) CDAP actually went on to become one of the largest and possibly most under-reported mitigation projects in the history of Western Canadian a.r.m. Beginning in the 1970s a.r.m. began to gather momentum in Manitoba. In 1970, the provincial government designated 7 archaeological resources as Historic Sites, a move that measurably improved their survivorship in the face of culturally induced threats. With the creation of a Provincial
Archaeologist's office within the newly founded Historic Resources Branch in 1974 it became possible for the government to monitor developments and negotiate impact management measures with less publically accountable (spirited?) proponents. Preparation of h.r.i.a. guidelines in 1978 together with the passage of permit regulations and the hiring of an assistant staff archaeologist in 1980 were further steps in the direction of more effective a.r.m.

From what can be gathered from the available literature a.r.m. efforts actually diminished as academic archaeology began to thrive in Saskatchewan over the 1960s. After T. Kehoe, who had functioned as the provincial archaeologist since 1959, departed in 1965, his position was de facto abolished and direct government involvement became moribund. Kehoe's major legacy in the realm of resource management was to have many of the sites he investigated declared protected areas. The PPPARSAA was amended in 1962 and 1965 but the sections which related to archaeological resource conservation were essentially untouched. Evidently, archaeological resource conservation was not a priority over the later 1960s. In fact, the province seems to have ignored foreknown archaeological resource impacts when construction was approved for the multimillion dollar Saskatoon-Southeast Water Supply Project in 1965. Similarly, no provisions for h.r.i.a. were made in advance of a large scale highway construction in Saskatoon in 1968 (Pohorecky 1973:57). Positive political actions in support of heritage conservation were few over the 1960s in Saskatchewan.

Not until 1975 was the legislative base for archaeological resource conservation altered. Impetus for new legislation came in part from
lobbying efforts of the Saskatchewan Archaeological Society, a prominent member of which had served as an MLA and Deputy Speaker of the House in a previous NDP government. The Heritage Act was an improvement over, but did not replace, the PPPARAA. Defining heritage property broadly, The Heritage Act mandated the Minister-in-charge to 1) coordinate the orderly development and preservation of, study and interpret, and promote the appreciation of, the province's heritage properties; 2) designate heritage property as protected property; 3) issue permits for research on protected property; 4) provide compensation for persons suffering loss as a result of the act's application; 5) appoint the Saskatchewan Heritage Advisory Board (SHAB); and 6) order h.r.i.a.s. Penalties for contravention were a fine ≤ $5000 and/or ≤ six months imprisonment. Over its five year existence, this legislation was not widely used. Problems impeded full implementation, primary being its vague, enabling nature (Jones 1978:86-7) and its compensation provision. Moreover, no regulatory agency was established to administer the act.

Instead, the Curator of Archaeology at the Saskatchewan Museum of Natural History (SMNH) added regulatory activities to a host of other responsibilities.

This act did not appreciably influence the course of Saskatchewan a.r.m. In fact, throughout the last half of the 1970s, the basis for requiring h.r.i.a.s derived from draft policy guidelines administered by Saskatchewan Environment. Beginning two years before its passage, with the 1973 Churchill River Project (Meyer and Smailes 1974), and carrying through the decade some Crown corporations and extra-provincial proponents began to engage consultants to carry out surveys and assessments as a matter of
course. Answering the increased demand for consulting services, the Saskatchewan Research Council established an archaeological unit in 1976. But the general shortcomings of The Heritage Act were apparent. Resource management was being conducted in a haphazard and ad hoc fashion. In 1978 the SMNH released a 400 page overview and policy study which identified the chief gaps and issues in archaeological resource conservation in Saskatchewan (Jones 1978).

The same year the Saskatchewan Government and Heritage Canada sponsored a heritage conference at which new legislation and policy initiatives were discussed (Saskatchewan Culture and Youth 1979a). In 1979 a White Paper was prepared by government staff containing a proposal for a new heritage bill (Saskatchewan Culture and Youth 1979b). The problems with archaeological resource conservation figured prominently in the document along side the need for legislative means to encourage historic resource conservation. A telling argument for action was an interprovincial comparison which exhibited Saskatchewan's high per capita growth in GDP as inversely related to its efforts in general heritage preservation and archaeological resource management. This mounting attention to heritage conservation resulted in a series of public hearings and the introduction, passage and proclamation, in 1980, of the strongest heritage conservation legislation in Canada, The Heritage Property Act. That year, too, a regulatory agency -- the Archaeological Resource Management Section (ARMS) of the Heritage Conservation Division (now called the Heritage Resources Branch) --- was established to administer relevant parts of this legislation.
There is no published information on what explicit steps toward a R.M. were being taken in Alberta over the 1960s. Seemingly, the only indirect advance attributable to government action was the Provincial Museum of Alberta's official establishment in 1967. The Glenbow Foundation, which had begun sponsoring archaeological projects in the mid-1950s (e.g., Wormington and Forbis 1965) continued its patronage into the early 1960s. Archaeological programs were established at the Universities of Alberta and Calgary, the latter becoming an extremely influential school under the direction of R.S. MacNeish. Several of the first generation of graduate students did become involved in survey and salvage projects in the southern intermontane valleys during the late 1960s. This exposure to rescue archaeology may well have provided the impetus for political action towards heritage legislation.

For, in the early 1970s, groups like the Archaeological Society of Alberta, the Research Council of Alberta, university representatives and private citizens started to express consternation to their political representatives that Alberta's heritage resources were being destroyed in ever increasing numbers by cultural and natural forces. The Premier responded by appointing the Environment Conservation Authority to study the problem and advise the government. A Public Advisory Committee on the Conservation of Historical and Archaeological Resources, chaired by R. Forbis, was struck and a series of hearings was held. Seventy seven briefs were entertained from individuals, various professional, ethnic and religious groups, and the municipal and federal levels of government. Combined with this was a survey to ascertain the degree of public interest.
The report on the hearings disclosed that Albertans were interested in the past and desired the preservation of its tangible representations. As well, the statistical survey found, among other things, that 33% of those polled were highly concerned and 63% were somewhat concerned that Alberta's heritage be saved (Alberta Environment Conservation Authority 1972; Byrne 1981).

The Alberta government responded to this information virtually immediately. In 1973 The Alberta Heritage Act was enacted and the next year it was amended and renamed The Alberta Historical Resources Act. For the time this legislation was the most powerful in Canada, perhaps the Americas. It contained far reaching powers and provisions for the conservation and management of archaeological resources and its implementation sponsored several sociological changes in the discipline's practice. The powers vested in the responsible minister, i.e., to require h.r.i.a.s of developers, combined with Alberta's strong economic performance in the natural resources development sector (section 2.4), conduced to the formation of several limited consulting firms like Reeve's Lifeways of Canada, Ltd. and Poole's ARESCO Ltd. A favourable taxation incentive for small professional business creation probably provided an extra fillip to their development (Zimmer 1980:159-164), to say nothing of the considerable monies to be earned. Simultaneously, the Alberta government established the Archaeological Survey of Alberta (ASA) to administer those sections of the legislation dealing with archaeology. Since these organizations were formed they have dominated Alberta archaeology while academic participation has dropped off to truancy levels.
Over the next 7 years h.r.i.a./m. grew like topsy in Alberta. Over 200 projects were carried out prior to 1981 in the eastern slopes alone, almost all of which resulted in descriptive reports of surveys, evaluations or limited mitigatory excavations (Reeves 1981). Few of these studies were ever disseminated for, although the ASA inaugurated an expeditious publication series, submissions were limited to papers either produced by staff or by consultants whose studies were carried out under government contract. Indeed, most of the research activity in Alberta over the 1970s was, in one way or another, associated with the ASA. From the ASA's inception its staff were encouraged to undertake research "to provide information necessary to manage the provincial archaeological resource properly" (Byrne 1981:17). This imprimatur, backed by the creation of a research section with several professional archaeologists, technicians and, in 1980, research facilities superior to those found at most universities, resulted in numerous projects throughout Alberta.

B.C.'s legislative base changed in the 1970s as well. In 1972 the AHSPA was strengthened in a few areas. Then, and subsequently, ASAB was advising the responsible minister to improve provincial heritage legislation, particularly to extend control over resources on private property. Historians, too, exerted pressure to have significant aspects of the built environment better protected. Furthermore, the Archaeological Society of B.C. carried out lobbying efforts, perhaps best illustrated by its brief to the NDP caucus in 1975, the final year of NDP government. Apparently the brief was well received but the incumbent minister was disinclined to take any action (Simonsen, personal communication, 1984).
In 1977 completely new legislation was drafted. The Heritage Conservation Act was largely the brainchild of the Honorable Sam Bawlf, the Minister of Recreation and Conservation, who took a direct role in drafting the bill. Bawlf had been personally involved in several restoration projects and was interested in providing more power over heritage matters to municipalities and in establishing a Heritage Trust to encourage the conservation and use of heritage properties through the provision of private and public funds. The new act contained sections which did both. As well, the act extended provincial control over archaeological resources on privately owned land. As well the act called for the setting up of a Provincial Heritage Advisory Board which supplanted the ASAB (Simonsen 1979). Along with these changes, an administrative body --- the Heritage Conservation Branch (HCB) --- was established. The Resource Management Division (RMD) was created as part of the HCB to nominally replace the Provincial Archaeologist's Office.

Over the 1970s B.C. archaeology had grown explosively. This is measurable in the numbers of academic and government positions created, the size and geographical spread of pure research and h.r.i.a./m. projects, the creation of an Archaeology Department at Simon Fraser University, the building of two museums of anthropology, the proliferation of paleoenvironmental studies, the number of publication series and papers actually published, and so on.

The decade also witnessed considerable intellectual ferment as the new archaeology was hotly debated. Since working in frontier areas was the privilege of established researchers, and the exigencies of conservation
vis-a-vis research preferences dictated many project goals, students and contract archaeologists were largely excluded from making significant culture historical contributions, except by accident. And so some turned to the new archaeology with its methodological advocacy and experimentation. Parts of the new archaeology's armamentarium such as regional sampling became the blunter instruments of large-scale h.r.i.a./m. projects.

After 1975 significant monies were allocated to h.r.i.a./m. by public utilities and line ministries (e.g., B.C. Hydro and Power Authority, West Coast Transmission, the Ministry of Highways, etc.). The four largest were the Hat Creek (ca. $500 000), Peace Site C ($600 000), Duke Point (est. $600 000) and Pitt River (est. $600 000). Projects like these not only provided opportunities for technical experimentation and innovation. They also created a group of seasonally employed paraprofessionals, unprecedented support for graduate students, an image of archaeology as nearing fiscal self-sufficiency in the eyes of some public institutions and an inchoate consulting industry. In B.C., as in the other provinces, the emergence of a.r.m. brought about profound disciplinary changes.

A chronology of Western Canadian heritage legislation is presented in Table 3.1. One could reasonably expect, given the dynamic legislative changes and the enlargement of archaeological activity which occurred during the 1970s, a corresponding increase in the a.r.m. literature, especially regarding its practice, accomplishments, directions, and effects on the discipline. The response to a.r.m. will be examined below but first we return to the evolution of archaeological preservation in the U.S.
Table 3.1  Legislative Landmarks in Western Canadian Archaeological Resource Management

<table>
<thead>
<tr>
<th>Date of Assent</th>
<th>Province</th>
<th>Title of Act</th>
</tr>
</thead>
<tbody>
<tr>
<td>1925</td>
<td>British Columbia</td>
<td>An Act to provide for the Preservation of Historic Objects</td>
</tr>
<tr>
<td>1946</td>
<td>Manitoba</td>
<td>Historic Sites and Ethnological and Anthropological Objects Act</td>
</tr>
<tr>
<td>1960</td>
<td>British Columbia</td>
<td>Archaeological and Historic Sites Protection Act (amended 1972)</td>
</tr>
<tr>
<td>1967</td>
<td>Manitoba</td>
<td>An Act Respecting the Protection and Preservation of Historic Sites and Objects</td>
</tr>
<tr>
<td>1973</td>
<td>Alberta</td>
<td>The Alberta Heritage Act</td>
</tr>
<tr>
<td>1974</td>
<td>Alberta</td>
<td>The Alberta Historical Resources Act</td>
</tr>
<tr>
<td>1975</td>
<td>Saskatchewan</td>
<td>The Saskatchewan Heritage Act</td>
</tr>
<tr>
<td>1977</td>
<td>British Columbia</td>
<td>Heritage Conservation Act (amended 1979)</td>
</tr>
<tr>
<td>1985**</td>
<td>Manitoba</td>
<td>The Heritage Resources Act</td>
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</tbody>
</table>

* known amendments only; ** passed but not yet assented to

3.4.2 The United States: CRM Comes of Age

South of the border a.r.m., or cultural resource management as it is better known, began in earnest in the early 1960s as well. Subsequently, a voluminous literature has grown up around CRM which is beyond more than gross distillation for the purposes of this essay. Suffice to remark upon
the more outstanding legislative events and disciplinary responses in CRM's development.

As has been seen the Reservoir Salvage Act of 1960 gave support to numerous mitigation projects connected with dam-building projects. The act authorized the NPS to acquire appropriations for this work and mandated dam-building agencies to cooperate. Other statutes and legislation such as the 1956 Federal Highway Act likewise made funding available to support salvage of resources threatened by highways and other public works (King and Lyneis 1978). These laws led to numerous mitigation projects throughout the U.S.

Perhaps because of the engulfing nature of these projects and the prevalent culture historical emphasis on acquiring large quantities of data vis-à-vis in situ resource conservation, archaeology and the historic preservation movement continued to diverge from one another, a phenomenon that had begun during the Depression (King and Lyneis 1978; King et al. 1977). Even so, it was largely through the efforts of the latter movement the National Historic Preservation Act (NHPA) was passed in 1966 (see Birch and Roby 1984).

This law made the federal government responsible for a complex national system of identifying and preserving historical, architectural, archaeological and cultural properties of national, state and local significance. Among its provisions were the creation and management of a National Register of Historic Places and cost-shared support of State Historic Preservation Officers (SHPOs) and staff. These agencies were directed to undertake surveys, generate state plans and administer grants programs. Moreover, the act set up the Advisory Council on Historic
Preservation (ACHP) to advise federal agencies with heritage property concerns due to construction activities or ownership. Specifically, Section 106 of the act required such agencies to "take into account" the effect of their actions on such properties, as well as "afford the ACHP a reasonable opportunity to comment" on these actions. This was interpreted and implemented to require agencies to determine what impacts their actions would have on archaeological or historic sites potentially eligible for nomination to the National Register. It did not permit the veto of adverse actions or extend protection to National Register sites threatened by non-federal actions. As in the case with all U.S. federal legislation, protection of privately owned sites is possible only with owner cooperation. An aspect of this bill which was to have a far reaching methodological impact on American (and to an extent, Canadian) archaeology was the concept of site significance, a criterion required of a property for nomination to the National Register. The problems which this created will be returned to.

The next major legislative gain was the 1969 National Environmental Policy Act. NEPA required federal agencies to identify and evaluate their actions affecting the human environment and to assist in preserving important historic, cultural and natural resources. These provisions led to the inclusion of archaeological studies in some, but not all, environmental impact statements required of federal development proponents (see King et al. 1977:35-6). Despite the initial disciplinary reception of the bill as a reinforcement of the legal means to conserve the American archaeological heritage, the effectiveness of the act is in doubt in this regard. As a preservational tool this law has been compromised by a recent U.S. Supreme
Court interpretation that NEPA is procedural rather than substantive. This has rendered it "incapable of protecting the cultural environment" subsequent to an agency's determination in a properly executed e.i.s. that archaeological resources must be destroyed (Nurkin 1982:51).

Two years after NEPA's passage, Executive Order 11593 was issued to better meet the intent of the NHPA. The NHPA contained no provisions for carrying out surveys to identify sites eligible for nomination to the National Register prior to their possible impact by a federal project. It also neglected to provide protection to these sites while such a qualification was being established. EO 11593 partly redressed these deficiencies.

Then, in 1974 the Archaeological and Historic Preservation Act (AHPA) was passed. This long-awaited bill expanded the provisions of the Reservoir Salvage Act to all federal projects and authorized federal proponents to fund archaeological salvage projects out of their own budgets. Its enactment led to a surge in employment opportunities as many federal agencies (e.g., Bureau of Land Management, Fish and Wildlife Service, Water and Power Resources Service, Department of Agriculture, Department of Defence, etc.) acquired in-house archaeological expertise. At this time the NPS's Office of Archaeology and Historic Preservation (OAHP) took on the coordinating responsibilities of this body of legislation and began to forge a national preservation policy.

Up to the mid-1970s the most critical legislative advances in CRM were not sponsored or directly supported by the archaeological community. Behind these statutes, e.g., the NHPA and NEPA, were well organized special
interest groups, whose concerns were largely with the conservation and management of the built and natural environment. Having achieved passage of these statutes and facing the contracting economic conditions of the latter part of the decade, competition for the necessary conservation and management resources began among these groups. Coherent and coordinated efforts at Congressional lobbying by the archaeological community did not really take place until after enactment of the AHFA (Knudson 1984:259). No doubt the efforts of the small archaeological constituency promoting sponsorship of the Moss-Bennett Bill proved a useful learning experience for the discipline (see McGimsey [1985] for a personal account of this process).

After various organizational and regulatory accommodations were complete the following cumulative implications of NHPA, EO 11593, NEPA, and AHFA emerged: 1) each state was to generate a plan for managing historic properties (the RP3 process); 2) each state was to carry out a survey to record these properties (§110); 3) federal encouragement and fiscal assistance was provided to states to acquire historic properties; 4) federal agencies and recipients of federal assistance or permits were to consider the impact of their actions on historic properties and undertake protective or mitigative actions; 5) federal land management agencies were to locate historic properties and nominate them to the National Register; 6) federal agencies were empowered to allocate their own funds for protection or salvage; and 7) OAHP represented the Secretary of the Interior in providing advice to federal federal agencies with historic preservation responsibilities and determining National Register nominations (King and Lyneis 1978:876).
The most recent major legislation bearing on archaeological resource management was the 1979 *Archaeological Resources Protection Act* governing the treatment of archaeological resources on public lands. It served to clarify the definition of archaeological sites (but curiously excluded resources < 100 years old as well as bullets and "arrowheads" from protection), exempted site information from the Freedom of Information Act, provided criteria for permit issuance, and established punitive measures for illegal excavation and disposal of artifacts (Davis 1979).

Knudson (1984) has recently chronicled the negotiations and compromising that surrounded sponsorship of this bill. The archaeological coalition was here, for the first time, compelled to confront the political process head on, and deal with other interest groups who were opposed to aspects of ARPA. Knudson views this process as fostering disciplinary maturity and of lasting benefit. Given the numerous problems with the legislation in its current form, it appears that this experience was gained none too soon (and maybe just a little late). Dissatisfaction with several aspects of this statute has prompted Nurkin (1982) to make several suggestions for modification, particularly as regards its definitions of artifacts and sites, temporal restrictions, and exclusion of private land. As well, problems exist with ARPA's implications for archaeological resources on Indian lands (Holt 1985).

Finally, in 1980, the *National Historic Preservation Act* was amended. Accruing benefits from this included a strengthened position for historic preservation, program consolidation, and a needed affirmation of continuing public and fiscal support for historic preservation (Barker 1981; Friedman
1982a). These amendments also clarified the responsibilities of the Secretary of the Interior, the ACHP and various agency heads as regards the provision of better guidelines for the national historic preservation program. In this case as well, considerable cooperation and coordination of various lobbies, special interests groups, and governmental organizations were required to effect these statutory revisions.

A chronology of the growth of American archaeological preservation policy is presented in Table 3.2. Unmentioned go a host of rulemakings, regulations, guidelines, etc. initiated at the federal and state levels. From the foregoing it is clear that the evolution of public preservation policy in the U.S. overall has been dynamic, continuous, and progressive.

These legislative advancements did not occur in isolation. They profoundly influenced the development of domestic archaeology by furthering and greatly contributing to the academization of what is today probably the most important branch of American archaeology: CRM. As such CRM became a much discussed and studied subject area beginning in the early 1970s. In contrast to the Canadian academic reaction, which, as will be seen, was frequently one of begrudging condescension, American archaeology responded to CRM by incorporating it into the mainstream. By no means was this accomplished without controversy; but CRM's place as a critical and legitimate part of American archaeology was never at issue. On the publishing side several Academic Press volumes (including the first in its Studies in Archaeology series [McGimsey 1972]) appeared, book-length case studies and edited volumes proliferated, numerous articles occurred in major
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<tr>
<td>1906</td>
<td>Antiquities Act</td>
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<td>1935</td>
<td>Historic Sites Act</td>
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<td>1958</td>
<td>Federal Highway Act</td>
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<td>1960</td>
<td>Reservoir Salvage Act</td>
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<td>1969</td>
<td>National Environmental Policy Act</td>
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<tr>
<td>1971</td>
<td>Executive Order 11593</td>
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<td>1974</td>
<td>Archaeological and Historic Preservation Act (a.k.a. Moss-Bennett Bill)</td>
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<tr>
<td>1979</td>
<td>Archaeological Resources Protection Act</td>
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Periodicals and some journals (e.g., American Antiquity, Journal of Field Archaeology) began devoting entire sections to CRM. As well, the American Society for Conservation Archaeology formed in 1974 and began the ASCA Newsletter (now Report). Another trade publication, independant of any national society, followed in 1980: Contract Abstracts and CRM Archaeology (now American Archaeology). Other overt recognitions of the increasing importance of CRM were the growth of applied programs at some schools (often tied to contract offices), the creation of SOPA (Society of Professional Archaeologists), and, in the early 1980s, the Society for American Archaeology's maintenance of a Legislative Policy Coordinator in Washington who served as a congressional lobbyist.
Space does not allow a comprehensive survey of CRM's recent evolution. Instead, the really interested reader is referred to Fowler's (1982) review. Nonetheless, a sampling of its milestones, highlighting those which influenced, or, as will be elaborated upon in chapter 4, sharply contrasted with the way Western Canadian a.r.m. was coevally practiced, merits discussion.

McGimsey's (1972) Public Archeology chronicled the founding phase in CRM's ontogeny. Its presentation of the need for and philosophy of archaeological preservation, description of a model state archaeological program (based on the Arkansas example) and encyclopedic exposition of then-current federal and state preservation laws and programs made the volume a source document and quasi-policy statement. McGimsey stressed the need for interaction between professionals and avocationalists and recognized the role politics played in developing archaeological programs. As well, the long term, practical benefits of archaeology were discussed, particularly from the standpoint of tourism. Finally, McGimsey sounded the alarm that the present generation of archaeologists would be the last to work with a large portion of the resource base in a reasonably undisturbed state. In fact, he predicted the resource's extinction within 50 years and laid the responsibility of properly managing its depletion on the doorstep of practicing archeologists.

Virtually concurrently a number of articles on a.r.m. appeared. Scoville, Gordon and Anderson (1972) offered guidelines for archaeological programs conducted in conjunction with environmental impact statements. Davis (1972) identified the resource depletion problem as having crisis...
dimensions, itemizing numerous cases of site losses in substantiation, lamenting the stasis in federal salvage funding, and urging greater professional activity in the public arena. Gruhn (1972) agreed with Davis' findings, adding King's (1971) insight that much of the methodological ethos of the new archaeology (then spreading like a contagion) was incompatible with the salvage ethic. This divergence led her to despair that archaeology might become paralysed, caught between, on the one hand, the practical needs (and often promiscuous results) of data preservation and, on the other, the more selective requirements of scientific, hypothetico-deductive research.

Unquestionably, the most significant article to appear in the early 1970s was Lipe's (1977) thoughtful and clearly written look at the reasons for resource conservation and the short- and long-term tasks which logically followed. Rightly noting the resource's non-renewability and the state of urgency, Lipe conceived the "conservation ethic" and prioritized mitigative treatments of archaeological resources so: avoidance first, in situ preservation second, with excavation as the last resort. He explicitly acknowledged the fundamental motivational differences between leisurely, academic research and emergency, salvage archaeology. And he expressed the conviction that "pure" researchers had to view their activities as destructive to the resource and urged greater prudence and involvement from them.

Lipe also went to some length to discuss the societal benefits of archaeology and its resources. He asserted that archaeological resources had social values, imprecisely understood. Archaeology's positive impact on other disciplines, its ability to round out the cultural identity of the
American Indian and provide all peoples with a sense of cultural relativism were identified as benefits derivable from archaeology's practice. To achieve greater recognition of these and increase support for conservation policies, public education tactics were promoted. The use of media opportunities and the education system along with more involvement with avocational groups and planning processes were suggested as ways to enhance archaeology's public profile.

Lipe also set out some of the basic programmatic principles which were to guide CRM studies for a decade. Recognizing that complete surveys of development project areas were exorbitantly expensive, he advocated multiphase sampling programs, reserving 100% inventory only when precise development project locations were finally settled upon. Problem orientation, representative site sampling methods, the adoption of regional frameworks in research designs --- in short, the basic procedural directives of the neo-archaeology --- were advocated for salvage projects.

A variety of other concerns were touched upon. The need to establish a system of archaeological preserves which accommodated both representivity as well as uniqueness was identified. Furthermore, Lipe saw the need to develop site protection techniques. He also anticipated several key problems with CRM contracting, e.g., the elevation of cost considerations over potential scientific contributions, unstable performance standards, the tendency for junior, and often professionally uncommitted personnel to carry out salvage projects, etc. Finally, Lipe foresaw the growing collection and record storage requirements and forecasted the increasing importance of institutionally housed archaeological resources, especially when field
research possibilities became exhausted.

The importance of Lipe's article, given its scope, clarity of expression and prolepsis cannot be overstressed. He anticipated many of the issues which CRM was to face later in the decade and some which are just now emerging. As well, he provided ways to integrate salvage and scientific archaeology, reckoning that, ideally, the latter's standards of practice (e.g., problem orientation, regional approaches, sampling, etc.) could be adopted in CRM contexts; since proper attention to sampling would provide some guarantee that representative data would be acquired. Lipe divined so much so accurately it is difficult not to regard a lot of the ensuing CRM literature as derivative.

On the eve of the Moss-Bennett bill's enactment, a major CRM conference was organized in Denver (Lipe and Lindsay 1974). Published papers covered the strain on the profession which, though already being experienced, would mount as a result of improved legislation and funding. Topics included the proliferation of consulting firms; archaeology as business; the need for professional standards, appropriately trained practitioners, large-scale data management and storage systems, cooperative mechanisms between professional archaeologists, institutions, federal bureaucracies, etc; the change in goals from resource consumption by elite user groups to acknowledging an ultimate responsibility to the resource base and accommodating the greater public interest in its conservation (Thompson 1974). That a restructuring of the profession was imminent was obvious to many at this meeting. However, few practical responses were forthcoming.

One enduring, structural result of the Denver meeting was the formation
of the American Society for Conservation Archaeology (ASCA). Originally conceived as a daughter society to the SAA, ASCA was to 1) serve as a clearing house for CRM information, 2) be a vehicle for actions promoting resource conservation, 3) develop a certification system for consulting archaeologists and 4) then disappear after turning over its functions to the SAA (Corbyn 1981). ASCA, though, did not fade away. Today ASCA continues to encourage scientific approaches to conservation archaeology and publish its Report containing news items, topical and substantive articles, and excerpts from the Federal Register which bear on resource preservation and management. Moreover, SOPA was formed soon thereafter to handle the discipline's professional concerns. Since then SOPA has formulated 1) a Codes of Ethics and Standards of Research Performance, 2) procedures for reviewing violations, deficiencies, and grievances, 3) a professional accreditation process, and 4) a directory of professional archaeologists (Davis 1982a).

Nineteen seventy-four also witnessed the Airlie House conference. Funded by the NPS, this meeting brought together senior CRM specialists and a number of neoarchaeologists. It focused on setting future courses of action in the management of America's archaeological resources. Seminars were held on legislation, resource management principles, guidelines for report preparation and evaluation, communications, Native American relations, and professional certification and accreditation. Of the resultant seminar reports those with abiding value dealt with 1) legislative consolidation, 2) simple management concepts (e.g., avoidance, preservation, resource investigation, significance determination) and procedures (e.g.,
agency compliance, sponsor-professional relationships, project planning, contracting and institutional responsibilities) and 3) reporting guidelines. Several CRM agencies adopted the report guidelines, along with their various research types, research design components and classes of reports, enshrining them in regulations and policies for consultants and others to follow. Because few designing the guidelines had direct h.r.i.a. experience, some unrealistic expectations crept in. Despite this, the Airlie House Report (McGimsey and Davis 1977) remains a useful summary of early resource management objectives.

Concern for conservation also became evidenced in significant advances in state support. From 1970 to 1974 20 state legislatures passed new antiquities laws, while others had legislation pending. 31 states had permitting systems, fiscal appropriations increased 44% to ca. $1.5 million, 37 full-time positions were created, and 15 management agencies had come into existence (Klinger 1975).

In the middle 1970s a few case studies appeared, Schiffer and House's (1975 [assemblers], 1977) Cache River project and Reher's (1977) lower Chaco River survey probably being the most renowned. Seen retrospectively, neither produced an exemplary h.r.i.a. Both sets of principal investigators used their impact statements to propound their own CRM philosophies and methodologies as well as publish short research articles by co-investigators. Assessing, and proposing specific means of mitigating impacts to archaeological resources were given short shrift. However, both studies showed how then current items on the neoarchaeological agenda (e.g., hypothesis testing, sampling methods, systematic surface collecting, lithic

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system studies) could be accommodated, at least in principle, in what hitherto had been viewed as theoretically sterile field opportunities. By so doing, by finding a bridge over the gap forseen by King (1971) and Gruhn (1972), CRM became intellectually legitimized. But, as will be shown, bestowing CRM with the cachet of processual archaeology, and simultaneously injecting unprecedented amounts of CRM monies to support processually oriented research did not necessarily improve the performance of, or results from, either. In fact, neoarchaeology's decline may have been hastened and CRM dangerously distracted due to the abandon with which the two endeavours embraced one another.

To be sure, the importance of Schiffer and House's and Reher's studies should not be diminished. They contain useful discussions on several key resource management areas: the nature and kinds of resource significance; discriminating direct and indirect impacts; the importance of deriving research results. Just as surely, however, their treatment of other issues reveals naivete, especially the notion that appropriate problem orientation can recover significant research results from any site. Restated, Schiffer and House (1975:163 [assemblers]) maintained that no archaeological resource could be shown to not contain information related to technical, theoretical, methodological or substantive domains of inquiry. They further contended that "scientific and historical significance are simply not convertible into monetary values" (House and Schiffer [assemblers] 1975:182). These and the more extravagant statements found in their 1977 rendition of the project were sufficiently dogmatic to discourage disagreement. What was missing was precisely how to maximize research returns from, say, a lithic scatter or
how to construct and defend a site salvage budget if, truly, the site's scientific and historical characteristics could not be valued. Whether Schiffer and House merely put the "not" on the wrong side of "simply" in the above quote, as hindsight would dictate, is an imponderable. But that the benefit-cost dilemma endures today remains, in part, a legacy of these early studies (cf., Schiffer and Gummerman 1977:246-7).

From the beginning these and a number of other problems arose in CRM. Fowler (1982:37-39) has recently reviewed the more recent ones. In order of their appearance the major CRM issues of the late 1970s and early 1980s included: 1) the assessment of resource significance, 2) client versus research orientation, 3) determining the adequacy of mitigation, and 4) academic reactionism. All have had their share of published comment yet none can be said to have been satisfactorily resolved. Since most of these concerns are common to Canadian a.r.m. a brief review of each within the American context is worthwhile. Such a review follows.

It should be noted that attention in both jurisdictions has lately been distracted from resolving these issues to defending the statutes and regulations undergirding the entire conservation effort. As the problem of deregulation is urgent, current and, therefore, of more than historical interest, discussion of its impacts will be withheld until chapter 4.

3.4.2.1 Significance

Recall that the NHPA required, among other things, that to preserve an archaeological resource and/or ensure sufficient funds for mitigation, its eligibility for inclusion on the National Register of Historic Places had to be demonstrated. To qualify a site had to be 1) associated with events
contributing to the broad patterns of U.S. history, 2) associated with American personages, 3) characteristic of a construction type, form of artistic expression, etc., and/or 4) shown to "have yielded, or ... be likely to yield, information important in prehistory or history" (ACHP 1974). To achieve Register status a site needed to display one or more of these significances. Most archaeologists confronting this demand sought its satisfaction in the last criterion (Nurkin 1982). Few questioned the conceptual roots of the significance issue since they are deeply embedded in the history of American historic preservation. Indeed, its essential tautological implications have just recently been identified (Tainter and Lucas 1983).

Even in the mid-1970s state and federal guidance on significance determination was largely absent and that which did exist varied from agency to agency (Klinger and Raab 1980). A 1976 OAHP memorandum contained several steps in evaluating Register status, the gist being that consideration be given to the relationship of a site's known or potential contents to understood or foreseeable research topics. Such an opinion made significance determination synonymous with demonstrable scientific investigation opportunities. Further, as the importance of most sites could only be assessed in comparison to others in a region, or in relation to theoretical perspectives, impetus was given to generating regional investigation frameworks and undertaking theoretical, or at least methodological inquiries. This was consistent with established neoarchaeological practice.

Unsurprisingly, much early writing on significance promoted its
evaluation via explicit, problem-oriented research, preferably within a regional framework (e.g., Raab and Klinger 1977). Most workers recognized that current research interests, capabilities and data bases in or for a given region would constrain many such designs. Thus, some said, the significance of sites should be assessed strategically, i.e., insofar as their investigation might compensate for these limitations. The selection of significant sites was to be founded on a qualitatively and quantitatively representative sample of resources which, individually, were relatively easy to interpret, undisturbed and environmentally exemplary of site contexts within the region (Glassow 1977). Acquiring such a sample for preservation, it was hoped, would accommodate the unforecastable needs of future workers.

Various types of resource significance had been discussed by Schiffer and House ([assemblers] 1975). Moratto and Kelly (1978) elaborated upon these, identifying historical, substantive, anthropological, social-scientific, technical, methodological, theoretical, general scientific, ethnic, and various forms of public significance which archaeological resources could possess. Truly, so many types of significance were recognized, while many of the implicitly used criteria for evaluating sites (e.g., egocentrism qua personal research interest, sensationalism qua uniqueness, age, etc.) were dismissed, it appeared as if Moratto and Kelly were saying that every site was significant. The imprecision of their conceptualization led them to declare that "various measures of significance may augment, crosscut or even contradict one another" (Moratto and Kelly 1978:2).

Obviously the actual determination of archaeological significance was
going to cause some problems. Early on it was recognized that the National Register had its limitations. Raab and Klinger (1977, 1980) averred the Register could not incorporate the volume of important resources likely to be found and, thus, could not be regarded as an effective management mechanism. Some demurred (e.g., Barnes et al. 1980) but the fact remained that the National Register was developed well before much of the legislation causing the eligibility of so many sites to be determined. At the same time, reiterations of Schiffer and House's ([assemblers] 1975) position on monetary valuations were being employed to discount significance assessment through benefit-cost analyses (BCA). To their credit, Raab and Klinger (1977:633) recognized that where BCA had to be used, it was "essential that well-conceived criteria of archaeological significance be developed in order that monetary values bear some meaningful relationship to archaeological goals." Again, such goals were to be set through problem-oriented research.

Early on, too, the notion of potential significance had to be dealt with. Given the pace at which the science of archaeology was perceived to be progressing in the mid-1970s, it was generally acknowledged that a significant site today would not necessarily be one tomorrow, and vice versa. The National Register criteria seemed to recognize this eventuality as well. Consequently, Sharrock and Graysön (1979) contended that the onus was on a investigator to show that a site wasn't, or could never be, significant before it was, say, permitted to be adversely impacted. Raab and Klinger (1979:329) were in basic agreement: "there is no reason why the widest range of archaeological resources cannot be accorded significance ... on the basis of problem-oriented research" and that, in
principle, by employing broad, productive, contemporary investigation strategies, an adequate sample of significant resources could be preserved.

As a polemic, this view of resource significance --- as dynamic and determinable through proper lines of inquiry --- remains little altered. Some studies, indeed, confirmed that the reasons for a site's significance may be transitory whereas the fact of its significance is not (Lynott f980:117). Recently, Dunnell (1982c, 1984a) has charged that problem oriented strategies for determining resource significance introduces unacceptable biases in the fundamental CRM endeavour of resource conservation. He regards academic research carried out within CRM programs as contradictory to resource conservation, and incompatible with the humanistic values underlying and sponsoring CRM policy. Instead of employing current scientific criteria in CRM decision-making, Dunnell advocates acquiring a spatially representative sample of the archaeological record for conservation. By selecting resources in this fashion, biases stemming from prior knowledge and contemporary research interests would be removed from the selection process. As interesting, and in some ways, as compelling as this radical recommendation is, how it would be effected remains unknown. Presently, most workers likely endorse Raab's (1984a) conventional view that explicit rationalizations (a.k.a. research designs) are required to make decisions concerning which resources should be retained (in whole or in part) and which should be written-off.

A few studies into the operationalization of archaeological significance cast doubt on the sincerity with which contemporary archaeology bonded with CRM, particularly from teleological considerations. A look at Kentucky
nominations to the Federal Register showed most sites were being preserved by nonarchaeologists for humanistic, not scientific reasons. Furthermore, the most often used criteria were threat of impact followed by site integrity; processual criteria (subsistence pattern, culture change, settlement pattern), though employed, were not pre-eminent concerns (Weinland 1980). More importantly, in Kentucky and elsewhere, despite a great deal of archaeological work devoted to determining eligibility, few properties ended up nominated to the National Register (Weinland 1980:18; LeBlanc 1983; Rogers and Schull 1983). Were the laws being exploited and their intentions overridden? Were preservational monies simply being siphoned off to assess significance (viz. to conduct problem-oriented research) while in situ resource conservation was ignored? These questions are uncomfortable ones, ones that Western Canadian archaeologists need not directly confront but cannot totally escape given the few archaeological resources designated under provincial laws (see section 4.3.8).

Site significance continues to be discussed. Some now see it as "a value judgement made for administrative reasons ... not an inherent property" (Wendorf [1977] in Weinland 1980:12); others believe it essentially a philosophical problem, perhaps even something of an absurdity inherited from logical positivism (Tainter and Lucas 1983). And a pragmatism is dawning that some sites indeed, are more important than others and that explicit bureaucratic procedures as well as implicit professional ones are in place to make realistic decisions regarding resource significance (Thompson 1979). Some even foresee the ultimate development of a long term national strategy for determining significant resources (Moratto and Kelly 1978). Whatever
the case, as an issue it is now overshadowed by more pressing ones (cf. Dunnell 1983:523).

3.4.2.2 Research versus Client Orientation

The second dominant problem arose fairly early in CRM's evolution, centred on the relative piety of CRM objectives. Quintessentially an ethical problem, this question surfaced: was the contract archaeologist's primary responsibility satisfying a client's legal compliance requirements or was it to make research contributions to the discipline? Much heat, acrimony and sanctimoniousness was generated in the ensuing debate. But the debate forced the entire question of ethics out into the open (see various papers in Green [editor] 1984).

From the beginning of CRM opportunities, academics had been quick to point out the advantages institutional contracting units offered: objectivity, continuity, established physical plants and specialized facilities, and the value added of interaction with "pure" researchers. Judged not insurmountable were difficulties in scheduling contracts within the academic year and matching the interests of faculty and graduate students with the requisites of contract-specified projects (Riley 1976). Non-academically based, consulting archaeology, tainted by profit maximization and competitive bidding, it was argued, could create the awkward "situation in which an unwilling client contracts for undesired work to a company which owes its continued existence to pleasing that client ... [causing] ... a clear case of conflict of interest when dealing with a public trust" (Macdonald and Townsend 1976:37). The fact university administrators might be as, or more interested, in the fiscal than the
scientific benefits of contract archaeology remained mostly unspoken (but see Raab 1982:127; Gummerman 1984:12).

Perhaps due to the longstanding association of salvage projects with universities and maybe because the academically based were the only ones with the time to write on the topic, the notion that contracting by public institutions was the most appropriate arrangement for operationalizing CRM seemed to carry the day. From this it followed that research orientations were to be given greater priority than the needs of the client. Remember that for many academicians problem-oriented investigation was regarded as not only feasible but imperative within CRM. Indeed, these tenets were almost the terms of CRM's endorsement (Gummerman 1973; Schiffer 1975; Grady and Lipe 1976; Lipe 1977; Schiffer and House 1977; Goodyear et al. 1978).

Nonetheless, in reality a great deal of impact assessment and mitigation was being carried out by the private sector over the late 1970s and early 1980s for reasons which have been well summarised by P.S. Miller (1984). In the interests of balancing professional service procurements, some federal agencies began restricting educational institutions from bidding (Lutz 1979:10; Corbyn 1979a,b, 1980a,b; Lincoln 1979). A few of these cases were protested by excluded or unsuccessful university bidders. Commonly cited were complaints that contract awarding to the lowest bidding private firm would lead to "boiler plate" archaeology and substandard collections curation (e.g., Skinner 1979). As the North American economy slowed down and competition was heightened, more business-like reasons were marshalled in the debate over the relative merits of private firm versus public institutional contracting (Schalk et al. 1982; Thompson 1982a, 1982b; Ambler
For the most part private sector involvement had little initial impact on the literature. Then some, led by Fitting (1978), challenged the belief that CRM's ultimate objective was the production of research results by defining and defending client-oriented archaeology. Client-oriented archaeology recognized that contract and academic archaeology were fundamentally different (e.g., Mayer-Oakes 1980). Whereas the former is conducted under contract to satisfy a client's legal obligations to identify, assess or mitigate impacts to heritage resources (Lindsay and Randall 1977:29), the primary concern of academic archaeology is the generation of knowledge for its own sake and its transmission to future generations. The success of client-oriented studies, then, must be judged insofar as prescribed regulatory requirements are fulfilled; no more, no less. Fitting also raised the point that attempts to undertake research in such contexts might, in fact, represent an abuse of contractual obligations, and therefore be illegal (also see Hester 1982). Fitting's candidness opened a well known debate (Fitting and Goodyear 1979; Raab et al. 1980).

The hubris which ensued aside, from this dichotomy two conclusions emerged. First, the imposition of purely scientific objectives is unethical if costs are increased above those otherwise sufficient to complete a contract (ACHP Task Force 1978:6-7). Second, underlying and vitalizing CRM and thus the contract between a client and consultant, is the mandate to preserve or protect public resources from unnecessary alteration or destruction. But, because the value of most resources is generally their content of scientific information bearing on the past, information which can
only be realized through research (Plog 1980; Spurling 1982), the door must be left ajar for such opportunities to be exploited. Accepting this, and after the recognition dawned that not all impact assessment or mitigation projects "lend themselves to problem oriented research" (Schiffer 1975:1), a more realistic approach to CRM studies started. The basis for this conceptual realignment is concisely stated by Patterson (1978:133):

"Any increases in archaeological knowledge and satisfaction of individual research goals are simply secondary effects, no matter how important ... That most contract work does lead to some increase in knowledge is a happy coincidence, which can be enhanced by the skill of individual workers ... Contract archaeology is really no different than professional consulting in other fields, such as ecology and engineering. Consultants are engaged to solve clients' problems, not research goals of the consultant."

By far the majority of CRM studies now undertaken are small-scale surveys which do not result in academically satisfying contributions and should not be expected to (Patterson 1982a; Tate and Rippetoe 1984; Aldenderfer and Schieppati 1984). Rather, accepting that some classes of CRM projects are proving unnecessary, most produce vital resource management information. A consensus is emerging that attempts to identify obscure research problems and tailor smaller resource surveys or inventories to address them is blatantly unethical. It also endangers the entire CRM enterprise insofar as some misappropriations have already fomented a backlash among the agencies and clients paying for the research (Padgett 1984).
The above procedural problems have lately forced the discipline to seriously conceptualize a body of archaeological ethics. This concern has spawned a number of principled statements over the years. Accepted standards of conduct were published by the SAA in 1961 providing for sanctions against members who collected data destructively, bought and sold artifacts, distorting evidence, etc. (Champe et al. 1961). These were superseded in specificity if not in force by SOPA's Code of Ethics (1976; see Davis 1982a). Basic principles of a.r.m. have been-enunciated by the SAA, as well (Knudson 1982). In the main, these statements of professional conduct were heavily weighted to the accountabilities and responsibilities of academics. They do not provide much guidance to government and private sector archaeologists faced with conflicts in their professional conduct (Wildesen 1984a).

Truly, the research-client orientation debate extracted a very important question: just who or what is an archaeologist accountable to? King (1983) has identified six entities archaeologists are responsible to: 1) the resource base, 2) colleagues, 3) research, 4) clients, 5) the law, and 6) nonarchaeologists. While, by definition it is possible to be responsible to inanimate objects or abstract ideas (e.g., resources, scholarship, the law), it is important to realize that, from a humanistic perspective, people matter, not things (McAllister 1982:59) and that it is primarily to people (clients, peers and the public) that archaeologists must answer. For people, in groups or alone, created the resource base, and now enact (or repeal) conservation laws, pay for archaeology, and value, ignore or disturb archaeological sites and objects.
Balancing ones' professional behaviour in an environment of dissonant demands from each of these groups can be extremely difficult (e.g., Fowler 1984). As it now stands, professional values and actions will be usually be conditioned by one's employment, whether for legal or careerist reasons. Whether morally defensive postures result is moot. Recognizing the disparate interests public archaeologists can experience, Knudson (1984), writing on the current situation in American archaeology (which also applies to the Canadian scene), recommends the adoption of situational ethics. Essentially a formalization of the way ethical decision-making has been handled throughout the evolution of American archaeology, situational ethics relies on present and past community standards of behavior, employs reason, regards decisions as hypothetical rather than categorical, is sensitive to complexities and renders choices on a case by case basis. Until, and perhaps even after, a strict and definitive ethical code for professional archaeologists is developed, most ethical decisions will be controlled by casuistry.

3.4.2.3 Adequacy of Mitigation

The major problem area which emerged was determining "adequate mitigation". Section 67(a) of the 1974 AHPA provided that up to 1% of the capital costs of federally contracted, permitted or guaranteed projects were allocable to mitigation programs (McGimsey and Davis 1977:12). This ceiling was lifted later by the 1980 amendments to the NHPA. Not unexpectedly, the data recovery requirements of several waterworks projects came to be in the millions of dollars (King 1980). Estimates varied as to the annual amounts being spent on CRM archaeology in the late 1970s: Schiffer (1979) computed
$50 million, the U.S. Comptroller General suggested about $100 million (General Accounting Office 1979:47), King (1979:351) figured $200 million, and Fitting (1981a:183) $300 million. Whatever the amount, the unprecedented level of funding caught the archaeological profession unprepared and provided diverse opportunities for projects to be mismanaged and financial and other profligacies to occur. That relatively few instances are known is to discipline's credit. Along with this rapid growth in professional opportunities came a variety of responses from federal agencies whose activities were subject to regulation. Considerable variations in the way federal agencies interpreted and implemented their CRM responsibilities resulted (Meiszner 1982).

CRM did not escape making its share of perceived and real mistakes. In 1977 the Kansas City Times published a series of articles charging that archaeologists were defrauding the public. The discipline was able to close ranks and discredit the allegation, at least as far as the profession was concerned (King 1977; Marquardt 1977; Jelks 1977). Then came the multi-million dollar, 1977 - 1979 New Melones project, at the time the last of a 30 year string of 15 separate studies. The project was plagued with just about every problem imaginable, as so well recounted by Fitting (1982a). One consequence was an investigation by the General Accounting Office (GAO; 1979, 1983). Its 1979 report concluded that the project's difficulties might have stemmed from an absence of a definition of satisfactory mitigation and proper direction.

This was the beginning. After the first New Melones report the GAO (1981a, 1981b) released the results of two more general investigations, one
encompassing virtually the entire federal CRM effort. The GAO (1981b) judged that the national archaeology program was not working well; that some studies were unnecessarily delaying projects; that the costs of surveying federal lands would be extremely expensive over the next 30 years (between ca. $400 million and $4 billion); that more interagency coordination and rulemaking was necessary; and that state historic preservation planning was often insufficient to make site significance assessments. Criticisms from other federal agencies began as well (e.g., Davidge 1982). As palliatives, the GAO recommended the ACHP require agencies to develop research questions for data recovery and promote peer review of large, controversial projects.

The bureaucratic and consulting sectors of the CRM community responded to the reports' specifics and tried to develop concepts of sufficient mitigation (e.g., Moratto 1982). The earliest reaction was from Corbyn (1980c) who stressed the need for reasonable levels of resource evaluation prior to designing data recovery programs. He also recognized that sufficient mitigation was probably an impossibility and that, instead, acceptable levels of mitigation should be striven for in the effort to balance the disciplinary, client and political exigencies of CRM projects.

The familiar refrain that adequate research designs would ensure adequate mitigation in CRM projects was played by some, albeit in a more diminuendo fashion. Glassow et al. (1981) contended that investigatory problems had to be carefully linked with data recovery and analysis procedures. Allowing research problems to evolve in tandem with project development, allocating sufficient funds to continuing analysis, using improved statistical and judgemental sampling to ensure both representative
data collection and observations on site spatial structures (e.g., Hackenberger 1982), it was suggested, could alleviate some problems. Recommendations also included more peer review of large projects, more attention to regional research designs and greater emphasis on research design development in teaching curricula.

In his response, Raab (1981b) retreated somewhat from his earlier position that improved investigation designs would ensure mitigation satisfactoriness and suggested that better project management methods would prevent many difficulties. Fitting (1981b), too, saw a partial panacea in increased efficiency in management and discussed the importance of unit costing, pricing and risk, overhead and other aspects of determining mitigation costs. Principal investigators of several large-scale studies began publishing articles on their administrative practices and organizations, showing how data recovery and processing components were integrated (e.g., Breternitz et al. 1980; Rodeffer and Chapman 1980; Knudson et al. 1982; Powell et al. 1983). These case studies joined a small independent literature on general management and business strategies (e.g., Butler 1978; Cunningham 1979; Walka 1979; Bleed 1983; and various papers in Portnoy 1978).

While there were no mea culpas, few attempted to counter the GAO's overall findings. It was criticized for recommending more regulation and ignoring the successes of many mitigation studies (Green 1982). Davis (1982b) saw little hope for positive responses if federal staffing deficiencies weren't corrected. And Friedman (1982b) was concerned with the accuracy of the GAO's $100 million estimate for annual archaeological
expenditures. But no one quibbled that guidance was needed. Whether to
effect it by regulation or by a professional consensus on pragmatic means to
determine just what was sufficient mitigation became the question.

The ACHP (1980) responded by producing a handbook, Treatment of
archaeological properties, which established guiding principles for the
Council's review of data recovery proposals. Among these was an affirmation
that research is in the public interest, but only when major questions are
addressed or when scientific investigation is brought to bear on local,
particularist subjects suitable for interpretive public programming. As
well, not all archaeological resources or research questions were to be
regarded as equally important. Also, resource preservation, whenever
possible, was to be explicitly favoured. Furthermore, both data recovery
and destruction were viewed as suitable treatments for archaeological
resources. Moreover, adequate archaeological activity was defined as that
sufficient to terminate a data recovery program approved through
consultations with the parties (e.g., government, consultants, proponents)
involved (King 1982). Just how helpful American CRM consultants found the
guidelines is problematic.

Nonetheless, a further move towards more practicality in research took
place in CRM. This is well articulated in Mayer-Oakes' (1982b) call for a
sophisticated culture history approach in American rescue archaeology. As
formulated, this strategy is founded on conventional domains of inquiry and
the expectation that many unpredictable research problems will be
encountered during the execution of large rescue projects. While such
projects should be geared to addressing premeditated scientific objectives,
unanticipated clusters of problems should be accommodated as they occur. Put another way, it is in the long-range public interest that narrow scholarly objectives should be subordinate to opportunities to broaden knowledge, regardless of how serendipitous their origins might be. Flannery (1982:275-6) and King (1983) evidently concur.

3.4.2.4 The Academic - CRM Gap

The fourth major difficulty in contemporary CRM is the cleavage between academic archaeology and CRM. It is uncertain exactly when this gap first appeared and its manifestations are often more implied than clearly enunciated. But Dunnell (1979, 1980, 1981, 1982b, 1983, 1984b) has been consistently concerned with its growing width and, as a pre-eminent North American scholar, should be well positioned to attest to its reality.

Over a very short period CRM brought about fundamental changes in the discipline (cf. Holden 1977). Obviously, the sheer number of practitioners increased greatly (Milanich 1981). A "spot check" in the late 1970s disclosed that state support had continued and grown over the earlier levels reported by Klinger in 1975 (Niquette 1979). Rogge (1980) found that the development of CRM programs in federal agencies, measured by the number of positions, fit an exponential model with a doubling period between 1 and 1.7 years. By 1980 more than 500 permanent or equivalent positions were filled in seven agencies alone. This compared with about 1000 full- and 250 part-time university and museum positions. Schiffer (1979) and Fowler (1982) likewise commented on the boom in CRM employment opportunities and recognized the ever-growing number of archaeologists in non-traditional employment: private consulting firms, engineering corporations, etc. In
several plains states, non-institutionally affiliated contractors had come
to dominate field activities (Eighmy 1983; P.S. Miller 1984). By the early
1980s estimates on the number of public and private sector archaeologists in
the U.S. ranged from 6000 (Fitting 1981:184) to 15 000 (Wiseman 1983:7).

Obviously, major structural accommodations were required. Regional and
specialized journals proliferated. So, too, did societies and associations.
In 1978 it became necessary to establish a special committee — the
Coordinating Council of National Archaeological Societies — to coordinate
and facilitate communication among the six major professional associations:
SAA, ASCA, SOPA, the Society for Historical Archaeology, the Archaeological
Institute of America, and the American Federation of Field Archaeology
(Schiffer 1979). Five years later discussions were held on amalgamating
these and other organizations which had since sprung up (Wiseman 1983).

Archaeology became more publicly accountable. As the amount of funds
expended on CRM programs grew, so did the responsibilities of archaeologists
to the public. Scrutiny by the media increased to the point it was not
unusual to find articles on consulting archaeology in The Wall Street
Journal (M.King 1981) and other papers and magazines. Many academics were
uncomfortable with the limelight, the new found public relations tasks, the
potential for scandal and the disclosure of the many limitations on
archaeology’s methods and techniques. Secrets of the sanctum sanctorum were
leaking out.

Significant shifts in authority and power resulted, which distorted a
formerly small and conservative discipline. The research versus client
orientation, already discussed, was an early symptom of the spilt between
academic archaeology and CRM. Then studies appeared to show that highly competitive bidding depressed rather than promoted scientific results (Lacy and Hasenstab 1983). As well, the quality of CRM reports began to be assailed (Longacre 1981; Schmidt 1984). Furthermore, the great expansion in field projects and increase in the number of practitioners was not leading to the expected breakthroughs in method and theory. These factors led to a mounting dissatisfaction on the part of scholars with the way CRM was affecting the discipline.

Some of this disaffection is captured in Adams' (1982) incoming SAA presidential remarks in which the academic position was expounded as follows. SOPA was a failure, one for which the SAA was increasingly compensating for by lobbying, professional standard setting, dealing with ethics cases, etc. These efforts were sapping the SAA's financial strength and creating an imbalance between the society's role as an intellectual, learned body and its newfound professional responsibilities. Adams decreed his intention to swing the SAA's focus back towards its original purpose: scientific communication.

This statement contrasted strongly with the aspirations of at least one former SAA president (McGimsey 1974, 1981) and engendered much discussion, most of it dissenting (e.g., Brose 1983; King 1983; Mayer-Oakes 1982c; Renfrew 1983; Wiseman 1983). To Adams' credit, he boldly stated his beliefs while many others remained silent. The few who had openly criticized the quality of CRM reports were rebuked for harbouring unreal expectations (Hester 1981) or being arrogant (Renfrew 1983). Granted, there are many problems with the standards of CRM reporting (cf., Zubrow 1984) but it must
remembered that CRM reports are not being written for scholars or scholastic purposes (contra Schmidt 1984). Rather, the majority are targeted at clients and regulators for compliance purposes. And this has not always resulted in poor scholarship (cf., Brose 1985). Still, many academic archaeologists no doubt remain sympathetic to Adam's revisionsism and Longacre's criticisms, not realizing they are no longer the primary consumers of archaeological information.

To be sure, the causes for the split could go deeper than concern for the maintenance of scholarly research and publication standards alone. Major sociological changes had taken place. According to Fitting (1981a:186-7):

"The fact is that academic employment has lost its old prestige. The highest salaries are now found among senior federal and private-sector cultural resources administrators, and academicians find it harder and harder to accept their former students as their own contracting officers. To confuse things further, the rapid development of private-sector employment has placed a greater value on hustle and utility than on academic credentials, allowing for the rapid advancement of people who would have traditionally been considered scholastically marginal. As it turns out, some of these traditionally marginal students now have incomes and prestige that approximate those of the bureaucratic archaeologists and exceed those of their academic colleagues ... Academic practitioners are miffed that they no longer have a clear monopoly on the status market. They also find it incomprehensible that agency and
private-sector practitioners do not sit and listen to them as would a roomful of dutiful students preparing for examinations. They write strident articles demonstrating that they are the possessors of true values, the supporters of faith in a world that is otherwise crass."

While these allegations may have overstated the reasons behind the academic malediction of CRM, they are hard to totally discredit.

Likewise, Fitting's (1979) earlier assault on archaeology's labour practices had also rung with some truth (also see Plog 1980). Using a parable, Fitting criticized exploitation of the traditional willingness of graduate students to make unreasonable personal sacrifices on behalf of "the discipline", especially in CRM contexts. He contended that archaeology outside the university was not so different from any other job and thus reasonable remuneration levels, field living conditions, and other benefits were legitimate costs of doing archaeology. Faculty who held promises of nonexistent university positions over the heads of zealous graduate students to squeeze more work out of them were, in Fitting's view, hardly behaving in a moral fashion.

Fitting, here and later (1984), challenged the long established means of depressing the price of university archaeology, as well as an implicit means of advancement for many academics. Following this further, if graduate students could be reasonably paid in CRM projects what inducement would exist for them to carry out the lengthy analysis of their professors' current research interests? As rewards, subsistence wages and second or third authorship on a refereed paper would contrast unfavourably with a
consultant's salary. Could it be that CRM employment was seen as a threat to a hidden, low cost labour pool hitherto the preserve of academics? And, if so, was it not in university scholars' interests to belittle the opportunity?

Some began to do so by criticizing the expenditure of funds on surveying marginal areas and excavating small, disturbed sites. Often this involved fantasies as to what could have been accomplished if comparable funding had been allocated to addressing pure research problems. How these problems were to be selected and by whom, of course, was obvious. Obvious, too, was that many academics continued to confuse their own pet problems, perquisites and career goals (tenure, promotion, status, travel, grants, sabbaticals) with the greater public interest in archaeology.

By the early 1980s the archaeological world had become more complex, more public, more ethical, more competitive, and more secular than could ever have been forecast in the late 1960s. Heretical assertions that academic archaeologists were really only instructors in anthropology with part-time archaeological research responsibilities and that those working in CRM were actually the full-time members of the profession were heard (e.g., Patterson 1982b). In the aggregate such adjustments and opinions bespoke of a fundamental transition in the discipline, tantamount to an attack on the Weltanschauung of many academics, senior ones especially. For those with little or no experience in the real world watched their carefully assembled expertise and artifice being devalued as students, colleagues, university administrators, government officials and so on became engaged with CRM programs and projects. Seen in this light much of the academic assault on
CRM could be simple self-defence, an effort to re-establish the older, more elite and secure order of things.

However, the gap between academic archaeology and CRM may be more apparent than real. Undoubtedly, much discontent exists with CRM's influence on contemporary American archaeology, some of it well founded, particularly as regards the fact its results do not measure up against those of much pure research. Yet the archaeological literature is not replete with specific criticisms. Undoubtedly the gap exists but it is probably best regarded as an pervasive attitude, aired over drinks at conferences (e.g., Flannery 1982) and in the occasional article (e.g., Stange 1984).

Most archaeologists now recognize that there are many kinds of archaeology, carried out for different purposes, incurring various responsibilities, involving different funding regimes, resulting in varying personal rewards, and eventuating in differential contributions to the discipline, sponsors, government and the public (Mayer-Oakes 1980:4-5; Hester 1982:23-4; King 1983). While a small reactionary cadre may continue to depreciate archaeological activities carried on outside the academy, the Juggernaut of professionalisation will be difficult to resist. As Fowler (1982:36) has commented, archaeology's transition from the ivory tower to a real profession, well underway, parallels that already made by other sciences. Today, in geology and hydrology, for example,

"the majority of the professionals are now in agencies and corporations ... [and] ... the principal orientation of the academic side now is to train professionals for agency and corporate employment and do 'basic' research".

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Thus, it seems that if current trends continue, or even diminish somewhat, a market induced, rather than an intellectual, rapprochement will close any gap between academic and secular archaeology.

3.4.3 Western Canada: The Disciplinary Response to A.R.M.

The Canadian academic community has yet to seriously face the impact of a.r.m. Few analytical articles have appeared concerning its raison d'être, its evolution, its practice, its legislative base, or its betterment. Since the literature is so impoverished vis-a-vis the American situation, identifying issues in Western Canadian a.r.m. with specificity is difficult.

Yet, although they appeared as issues at different times the same basic problem areas were shared by the U.S. and Western Canada. In Western Canada, the academic—resource management split has been evident since the development of conservation legislation and administrative bureaucracies. But other issues, such as the whole question of determining the adequacy of impact mitigation, are only now emerging. Significance evaluation and the ethics of contracting became issues considerably later as well. Nonetheless all have become concerns. In this section the way these issues evolved and were responded to will be examined. Discussion of the paramount problem today in the U.S. and Western Canada, adjusting to economic contraction, deregulation and political conservatism, will be deferred until chapter 4.

3.4.3.1 The Gulf With Research Archaeology

From its inception as a vocation Western Canadian archaeologists tended to appropriate salvage funds to do research, i.e., construct regional chronologies and pursue personal research interests. The phases of the Gulf of Georgia and lower Fraser Valley, the culture history of the southern
Continental facade and most circum-Shield plains and plateaus complexes were established over the course of early salvage projects. In the early halycon years this was defensible from the standpoint that many truly important sites were threatened and most archaeology at that time was salvage in both intent and actuality.

As the discipline expanded, though, the line between salvage and research remained blurred. While some workers confined their rescue efforts to sites actually in jeopardy, others did not. For example, after it was determined that the South Saskatchewan River basin was "poor in archaeological remains" (WCAC 1960:7; and contra Pohorecky 1973:54), rescue funds were reallocated to an excavation some distance from the proposed impoundment. Or consider that the Cactus Flower excavation (Brumley 1975) was outside the sponsoring project's impact zone (Reeves 1984). Additional instances are common knowledge. Many of these indiscretions were excused thus: since many significant sites, particularly those in riverine and littoral contexts, were or would soon be eroded by natural or anthropogenic agents, why not use available and otherwise scarce funding to excavate the nearest, most "important" sites, regardless of their relative safety from immediate impact or the obligation to satisfy the legal responsibilities of the developer paying for the project.

When only federal funds were at stake and compulsory legislations were weak or non-existent, there seemed to be little concern as to whether salvage monies were being properly used. There were few archaeologists or other stakeholders to argue otherwise; federal archaeological expenditures in the late 1960s and early 1970s were motivated more by the need to
alleviate youth unemployment than concern with rescuing endangered heritage resources (e.g., the Opportunities for Youth programs; Alexander et al. 1972). What arrested this cavalier use of salvage monies were the cessation of federal interests in rescue archaeology c. 1975 and the establishment of provincial regulatory agencies over the 1970s. As these agencies began compelling development-oriented provincial departments, Crown corporations, and private developers to carry out h.r.i.a./m.s., careful scrutiny was required of how closely these studies conformed to legally required scopes of work. Reallocations of impact assessment funds to "salvage" sites off rights-of-way or outside reservoirs could obviously not be tolerated.

Several established archaeologists were troubled with this new arrangement. And this fomented a more tractable gap between a.r.m. and academic archaeology than appears to have been the case in the U.S. Its root causes involve both the historical split in federal/provincial a.r.m. responsibilities together with the way archaeological belief and status systems developed in Western Canada.

In the decade following the WCAC's 1960 expression of concern over the lack of federal and provincial conservation policies, coordinated interprovincial efforts to marshall the required political and public support for federal policy action were few. Slightly more progress was made on the provincial front, with much of the impetus for heritage legislation in B.C., Saskatchewan and Manitoba coming from modest levels of grassroots public pressure. However, with the formation of the Canadian Archaeological Association (CAA) in 1968, a national body emerged which, right off the mark, recognized the need to promote national archaeological conservation.
Its first bulletin carried an article by J.V. Wright (1969) on the topic.

In this, his presidential address, Wright saw that the majority of land-altering activities across Canada were potentially injurious to archaeological resources. He also acknowledged that the magnitude of resource destruction was impossible to quantify, although it was clearly immense and beyond the abilities of the few archaeologists in Canada to cope with. A provincial survey showed numerous agents of site destruction, e.g., irrigation, flood control, hydroelectric projects, highway development, pipelines, urban expansion in the Prairie Provinces and urban expansion, logging, and hydroelectric development in B.C. Control of these assaults on Canada's prehistory called for a national salvage program. In Wright's view this would involve the establishment of an Archaeological Survey of Canada (to assess resources and "operate an effective contract salvage program") by the federal government together with the formation of provincial surveys with working arrangements with the federal body.

As envisioned, the CAA would facilitate communication "at both the professional and non-professional levels". The Council for Canadian Archaeology (CCA) would represent the professional interests of the discipline. Both the CAA and CCA would "act in unison as agencies of communication, education, unification and, when necessary, lobbying". Wright (1969) recognized, too, the need for effective legislation. In this regard, he recommended: 1) extension of the antiquities legislation governing the Northwest and Yukon Territories to Indian reserves, national parks and military bases in the provinces; 2) the application of provincial legislation to provincial parks, Crown lands, and, insofar as possible,
private lands; 3) the assumption of salvage responsibilities for federal and provincial land-altering projects by the corresponding archaeological agency, or directly by development proponents with government contracts or concessions; and 4) control over the export and sale of antiquities.

Virtually identical findings and recommendations are contained in a paper which appeared the following year. Asked by the National Research Council to evaluate five problem areas in salvage archaeology, the CCA (1970) concluded: 1) the rate of resource destruction could not be estimated due to insufficient quantitative information on either the number of resources present or the rate of their deletion; 2) the rate of data recovery from jeopardized sites was unknown but obviously insufficient and several factors such as inadequate legislation, few salvage archaeologists, and a lack of regulatory agencies, impeded acceleration; 3) federal legislation was restricted to the Territories and did not encompass Indian reserves, other federal lands or national parks, and even the strongest of the provincial acts (i.e., B.C.'s AHSPA) did not apply to private property; 4) tougher and more comprehensive federal and provincial legislation along with the creation of salvage agencies at both levels of government were needed; and 5) that a federal agency, the Archaeological Survey of Canada, be established:

"[whose] ... regular duties will consist of reconnaissance, of mapping and of assessing sites throughout Canada. The ultimate objective of the survey will be to locate sites on federal lands, to appraise their potential importance, and where necessary to carry out salvage excavations. The survey should also assist provincial agencies unable
to cope with major salvage problems" (CCA 1970:51-2; emphasis mine).

And so it came to pass that, in 1971, the Archaeological Survey of Canada (ASC) was founded as one of the four divisions of the National Museum of Man. Between 1972 and 1974, the ASC underwrote numerous salvage projects in the study area, concentrated in southern Alberta and along the south and central B.C. coast (Byrne 1974a, 1974b; Wilmeth 1975a; 1975b; 1975c).

From the outset, a distinction was drawn between salvage and research responsibilities within the ASC. As Byrne (1984) has recently documented, this functional bifurcation created a caste-like differentiation between the higher status activities of the ASC researchers and the lower ranked duties of those involved in the national salvage program. Byrne considers this distinction had long lasting and unfortunate consequences for a.r.m.'s image in Canada.

Curiously few of the ASC supported projects conformed to the mandate intended by the CCA. In 1972 and 1973, only 21% of assisted projects in Western Canada (2 out of 9 and 4 out of 20 projects, respectively) were within federal jurisdiction. The rate is much better in 1974 when all ASC supported projects were carried out on federally controlled lands. This improvement was pretty much illusory as only two projects were undertaken, one in B.C. and one in southeastern Alberta. That year limitations on the ASC's financial and human resources required the salvage program to be restricted only to those projects or areas under federal jurisdiction, it was said. The ASC also contended that the reduced national effort would not be unduly injurious to the resource base since most provinces now had their own salvage programs (Wilmeth 1975a). Since that time the ASC has been
largely absent from Western Canada, Wilmeth's work in B.C.'s Chilcotin Plateau, MacDonald's in the Skeena River/Prince Rupert area, Gordon's brief 1978 survey in northern Saskatchewan and Morlan's involvement at Head-Smashed-In in 1983 being the only exceptions. None of these activities related to resource management objectives.

It is possible that federal Treasury Board dictates closed the federal salvage effort in Western Canada after 1974. As well, the National Museums Act does not necessarily empower the ASC to manage archaeological resources. Conceivably, too, the ASC's policy change was motivated by the general federal disentanglement from provincial fields of responsibility over the early 1970s (Adie and Thomas 1982:223-55). But a few problems attend these otherwise straightforward explanations. B.C.'s leadership among the provinces as regards a.r.m. was widely acknowledged at the time (cf., CCA 1970:49). Why then, in the first two years of the ASC's salvage program, were 25% of all projects in the country carried out there? And why so few, say, in Saskatchewan and Manitoba, neither of which had strong legislation or a permanent regulatory agency? As well, why did Wilmeth allege that the provinces were able to assume the responsibilities of the federal salvage program in 1974, when the situation had not substantively improved for either Saskatchewan or Manitoba? Granted, they had in Alberta where the ASC had sponsored a cumulative 21% of all its national salvage operations. And where, by 1973, public pressure had been sufficient to move the provincial government to enact archaeological conservation legislation. With Byrne's departure from the ASC to head the ASA, the former's commitment to a.r.m. quickly eroded. And consider this final point. After 1975 the ASC's field
activities actually expanded. New positions were added; some large, long-term, costly and controversial projects (e.g., the Yukon Refugium Project [Morlan 1980]) were initiated; and frontier areas above 60° N began to be investigated. Few of these studies were inspired by conservational motives; most were carried out in the interests of personally motivated research. The opportunity costs of having such a relatively large proportion of the nation's federal and university researchers working in the Old Crow Basin have yet to be assessed. Despite the 60 odd papers produced during the course of the study, when all is said and done, a benefit-cost analysis of the returns to archaeology would probably show net present costs.

At least one surmise emerges from the above: in three short years the ASC's proposed mandate was transformed from the objectives of national salvage archaeology to the satisfaction of the research goals of in-house staff. When Wilmeth became chairman of the ASC's Salvage Program, this trend became explicit. One reason for this shift in policy may be found in Wilmeth's (1975a:vii) disappointment that several 1974 projects had produced, in his view, marginal or negative data. He also rued decisions to salvage sites where unpredictable, frequently limited results would be forthcoming. Perhaps this line of argument was pursued to the conclusion that it would be better to pull out of salvage ventures all together and invest in research projects with seemingly guaranteed returns.

The withdrawal of the ASC from a.r.m. had significant consequences. First, no agency was monitoring or mitigating culturally caused or naturally induced impacts to resources on federal lands. Parks Canada did open an archaeological office for the Prairie Region in 1975 but its mandate was
essentially the interpretive development of nationally significant historic sites. Federal a.r.m. involvement, then, went begging from 1975 on. This meant resources on about 93 000 km² or >3% of Western Canada (Swan 1978) had no protection against adverse impacts. When the effects of land-altering projects proceeding with federal funds or covered by federal-provincial cost-sharing agreements were factored in (e.g., Reeves 1978), the absence of federal presence in a.r.m. was all the more egregious.

The second consequence of the federal retreat can only be inferred from an attitude which started to be expressed about this time by senior academicians, many of whom either worked for the ASC or were associated with National Museum staff in one way or another, e.g., were friends or acquaintances, graduates of the same schools, members of the same committees, referees of the same publications, etc. Activities carried on under the aegis of salvage, conservation, resource management and so on began to be viewed as second class archaeology, the products of which were at best uncertain and whose objectives were at worst affronts to the aspirations and goals of science (cf., Byrne 1977:141; 1984). By looking at a.r.m. in such a way, the ASC's abrupt departure from the field seemed almost reasonable.

Cryptic justifications of this action still appear from time to time. Wright (1982:266), for example, recently expressed concern that the ASC's "traditionally strong research function is in danger of being 'gobbled up' by mitigation and management requirements". The shift in expounded priorities (i.e., from salvage to research) was skilfully executed. For within 13 years it was plausible for the ASC to defend itself from meeting
the objectives for which it was ostensibly created.

Granted, after 1975 archaeological resource management in Saskatchewan and Manitoba began to slowly catch up with the leads of British Columbia and Alberta. The Manitoba government established a Provincial Archaeologist's Office in 1974, although provincial heritage legislation remained un strengthened. And in Saskatchewan, the Curator of Archaeology at the SMNH became more and more involved in regulatory affairs despite the absence of effective legislation. Moreover, both provinces had hosted sizeable conservation projects over the early 1970s: the CDAP in Manitoba and the Churchill River Archaeological Project in Saskatchewan. In Alberta, dramatic changes were occurring due to the rise of consulting archaeology and the founding of the ASA. In B.C., a.r.m. was in the vanguard and some large impact assessments sponsored by B.C. Hydro and Power Authority were being initiated. So Wilmeth's (1975a) contention that the provinces were in a position to assume greater resource management roles was not without foundation, at least in the case of B.C. and Alberta.

From 1975 onwards the operationalization of a.r.m. took different courses in the four western provinces. In B.C. and Manitoba, the Provincial Archaeologists' Offices executed many h.r.i.a.s in-house, especially for line departments and crown corporations. While some market room was left open for private consultants, the large-scale projects tended to flow to the universities. In Saskatchewan the SMNH's Archaeology Division contracted out several small to mid-sized projects for the Department of Highways and SPC. The Saskatchewan Research Council generally garnered the big impact assessments and mitigations sponsored by SPC and other governmental
proponents. Only in Alberta had private consulting an opportunity to develop as neither the universities nor the provincial research council became involved in a.r.m.

Notwithstanding the apparently open field in Alberta, the province's consultants saw many impediments to getting on with the job of preserving or salvaging archaeological resources threatened by development. To Wilson and Poole (1978:11) government agencies were creating "undue interference and unfair competition" and implied that by taking on so much, the Archaeological Survey of Alberta was giving short shrift to more pressing areas of responsibility such as increased regulation of harmful industrial activity. To them some university research also infringed on consulting opportunities by creating "unreasonable, subsidized competition". Problems were also revealed in the consulting process. Unevenness in the application of legislation, the undesirable consequences of competitive bidding, an absence of standards of performance and professional credentials, superficial report reviews by government agencies, no long term resource management planning or goal setting, and the limited distribution and use of h.r.i.a./m. research were identified as the most significant shortcomings in contract archaeology. Of the more practical responses to these problems was Wilson and Poole's call for properly trained people to meet the challenges of consulting archaeology.

Reeves (1978), from his then unique position as both president of a heritage consulting company and university professor, could clearly see major changes occurring to Western Canadian archaeology. Academic placements were declining while the rate of position creation in the federal
and provincial governments was approaching the asymptote. This meant that the chief employment opportunities were in the private sector --- in freelance consulting, in the environmental and planning units of major corporations, and in multidisciplinary consulting firms. To Reeves and others (e.g., Byrne 1977), several adjustments to the discipline had to be made to secure these opportunities. Graduate training needed redirection and a new emphasis, specifically, on a.r.m. and related professional skill development, were required.

Effecting this meant fundamental changes to the Western Canadian archaeological ethos were necessary. Regrettably, the public service and consulting had come to be seen as the safety nets for the second best and not-very-bright, and these career areas were derided when not ignored by the professorial cognoscente (e.g., Byrne 1984; this view was not unique to the study area [see King et al. 1977:190-1; Pierson 1978; Dunnell 1982c]). As previously discussed, some traditionally trained academics viewed the growing importance and clout of a.r.m. hostilely and negatively, as a degradation of the purity of archaeological science (cf., Byrne 1977). Others just avoided it. For example, the Director of the National Museum, W. Taylor (1977:154-7) accused Canadian archaeologists of following too closely U.S. policies and legislation, as well as method and theory. He also warned them of becoming vulnerable to corruption by unprecedented employment and funding opportunities and bemoaned the discipline's bureaucratization. On the other hand, in his Ptolemaic tinkering with the Canadian archaeological strategy, Trigger (1977), while acknowledging its existence, neglected to include a.r.m. on the national curriculum.
For agency bureaucrats and heritage consultants this evasion of reality was disturbing. Operating in the greater economic and political milieu they could recognize 1) the necessity and legitimacy of disciplinary adjustments: 2) the greater public and political accountability; 3) the new informational and research needs of planners, resource managers, and site interpreters; 4) the increased stresses on curatorial institutions; and 5) the changes required in the educational arena (e.g., Turnbull 1977). Without an academic commitment to a.r.m., it was feared that the needed improvements in student training together with increased participation and commitment to conservation by disciplinary specialists would not come about, and Canadian archaeology would suffer as a result (Byrne 1977).

No major changes in ethos or the education of archaeologists were forthcoming, however. Granted, a few ad hoc courses in a.r.m. began being offered in 1976 at S.F.U., then U.B.C. and the University of Calgary. But none became permanent fixtures on university calendars until after 1980. Even now these courses are given intermittently and, with few exceptions, by non-specialists (see section 4.4.4). The almost total avoidance of a.r.m. by senior scholars, either as an area of research in its own right or a subject of analysis, indicates the opprobrium with which it was, and is still held by many members of the Canadian archaeological establishment.

The ASC's disengagement from "salvage archaeology' certainly contributed to the apotheosis of pure research over conservation, yet this does not totally account for the attitude to a.r.m. borne by Canadian academicians. To explain a.r.m.'s low prestige in Western Canadian archaeology (and perhaps the rest of the country), a closer look at Taylor's (1977)
objections to the Americanization of research methods and theories are revelatory. Taylor had been displeased that Canadian achievements were so often overlooked in the Canadian rush to follow trends in U.S. method and theory. This was particularly true for early (and subsequent) a.r.m. efforts. Statistical sampling techniques had been employed by the B.C. Provincial Archaeologist's Office as early as 1971 and increased in currency here and in Saskatchewan (Epp 1974) over the decade. Concern with regional research designs, the determination of resource significance, spatial analyses and sundry quantitative methods became generic algorithms for a.r.m. programs. As established members of the discipline absented conservation archaeology, young processualists and a generation of graduate students seeking employment filled the gap. The large budgets undergirding some contract projects provided unprecedented opportunities for investigations into regional settlement and subsistence studies, sampling problems and multidisciplinary research. Schiffer and House (1975) and other neoarchaeologists had demonstrated how the new archaeology's agenda could be prosecuted in a.r.m., thereby intellectually validating contract archaeology. With the early involvement of archaeologist in development project planning and the growing emphasis on in situ preservation, most impact assessments were at the level of inventory or evaluation. Excavation projects became comparatively rare except in emergency circumstances.

Consequently, much of the data produced by a.r.m. field projects were of little interest to culture historians. Reports of the larger projects emphasized quantitative methods and analyses, and were written in a very technical language, all but impenetrable to senior members of the.
discipline. The conflation of resource management with neoarchaeological procedures resulted in a literature that was esoteric to the archaeological establishment, whose education had largely ceased at the classificatory-historical threshold (sensu Willey and Sabloff 1980:83-180). Perhaps unable, perhaps unwilling to assess the legitimacy of this union, many senior Canadian archaeologists spurned both a.r.m. and neoarchaeology.

However, a.r.m.'s marriage with neoarchaeology, like its previous one with culture-history, was to be short lived. As the number of large h.r.i.a./m. projects declined and the dowry was drawn down, neoarchaeologists began to drift away from conservation archaeology. Few neoarchaeologists have sustained interest in research useful to the field of a.r.m.; specific impact assessment and mitigation projects are still opportunistically seized, but the generic problem domains of resource management and conservation are largely ignored. Evidently, the neoarchaeological commitment to a.r.m. has the same underlying self-serving motivation as the culture-historical school (Epp and Spurling 1984). And instead of developing techniques and methods to further management strategies, some of the neoarchaeologists also began to criticize the impact of a.r.m. on the discipline (e.g., Pokotylo 1982).

Its image declined to the point that in 1980 the Canadian Journal of Archaeology (the sole national journal) discouraged articles on a.r.m. topics. Eventually, Fladmark (1981:15-17) put into print what many had been unable or unwilling to. He essentially maintained that h.r.i.a./m. was void of research opportunities and suggested that academics return to carrying out real research. However, Fladmark did recognize a valid role
for a.r.m. as a subject of university instruction. The following year J.V. Wright (1982) expressed his objections to bureaucratic impediments to research and the fact junior managers could control the activities of senior researchers. He also stressed the ultimate purpose of archaeology was the generation of new knowledge (a.k.a. research) and that resource management was only a means to this end.

Over the early 1980s, the academic - a.r.m. split generated comment only from a few involved in consulting and government. B. Reeves (1982, 1984) persisted in calling for the teaching of a.r.m. in university departments and dressed down the senior members of the profession for their inaction in resource conservation. B. Byrne (1984) warned that if the status of resource management archaeology wasn't soon elevated and the entire discipline did not devote the majority of its efforts to conservation, the future of archaeology itself was imperiled. And Spurling (1984) strongly criticized the absence of a national a.r.m. program. The professoriate and ASC has neither commented or acted on these caveats.

Will the employment market effect the resolution of the split in Western Canadian archaeology? As the statistics presented in chapter 4 clearly show, most full-time archaeologists working in the study area are not affiliated with publically supported educational or research institutions. Most work as consultants, either for themselves or a firm, or in government regulatory agencies. Only recently (c. 1982) has the supply of archaeologists, trained in any fashion, outstripped the demand from government and the consulting service industry. However, competition for jobs has increased and chances for in-service training have ceased. The
current environment of economic austerity and high unemployment will presumably compel university departments to properly prepare and train graduate students in a.r.m. since this field holds the only opportunity for post-graduate employment now and in the foreseeable future. Departments that fail to do so will presumably experience falling enrolments and possible extinction. It can only be hoped that the academic attitude to a.r.m. will change prior to the ultimate replacement of current university and museum personnel through transfers and retirements.

3.4.3.2 Evaluating Significance

With the steady entrenchment of a.r.m. in the western provinces, a few introspective articles began appearing. One of the first was produced by staff of the Churchill River project (Epp 1974). From its beginning this study was operated as a complex, state-of-the-art environmental impact assessment (e.i.a.) and archaeological resources were just one of a number of ecosystem components investigated (Slaney & Company Ltd. 1973a, b). Epp demonstrated how an archaeological study component could be integrated into e.i.a. He identified the categories of information that should be sought for resources within an impact zone, promoted the use of sampling, resource testing, and mapping, but mostly was concerned with evaluating resources. To this end he proposed a matrix of social and financial values against which 11 site types were ranked. Under social values were historic, scientific, sentimental and aesthetic parameters. Financial values subsumed tourism and grant potential. By isolating these characteristics, Epp was actually setting out a scheme for ranking resource significance, a concurrent undertaking of many CRM archaeologists. While problems attend
Epp's scheme (Fladmark et al. 1977:307) new ground was broken in Western Canada by insisting that resources could and, in cases, had to be ranked. Another important aspect of this paper, although underdeveloped, was the recognition that impact assessment had a different purpose than academic research, but that, by using scientific methods, useful scientific data could be forthcoming from most studies.

Significance assessment remained an important issue in Western Canadian a.r.m. for the rest of the decade and into the 1980s. Although the motives for evaluating significance differed from the legislatively prescribed ones in the U.S., the operational procedures and problems experienced were not. It was evident to those involved in larger a.r.m. projects that resources had to be evaluated so that decisions could be rendered as to mitigative treatments. Most of the ranking methods owed much to the American research and discussion on the topic (e.g., Beirne and Pokotylo 1979; Spurling 1978 [assembler], 1980a; Conaty 1979; Burley 1982). Criteria common to most significance schemes included resource uniqueness; integrity; site content of data pertaining to chronology, paleoenvironment, socio-economy, and technology; and opportunities for methodological development, educational experiences and recreation. As well, multivariate statistical treatments were used in one case to dampen the effects of subjective judgement in the assignment of values to sites (Spurling [assembler] 1978:64-8).

Attention was focused on the topic in 1982 during the 14th Annual Conference of the Archaeological Association of the University of Calgary. While some of the papers recapitulated the American literature (e.g., Whitlam 1982), others treated the subject with refreshing innovation.
M.J. Wright (1982) argued that the selection of resources for mitigative treatment be dictated by the severity of anticipated impacts to them. Using the example of resource inundation through impoundment development, Wright suggested that assessment and mitigation actions should only be directed to those resources subject to the most pronounced impacts, i.e., those situated in erosional zones. Alternatively, Bobrowsky (1982c) held that the integrity of a resource be used as the critical variable in determining resource significance. A third contribution came from Conaty and Cormie (1982) who recommended the use of Bayesian statistics in resource assessment decision-making. In his comments on the session's papers, Dunnell (1982c) introduced the notion that CRM and problem-oriented research were fundamentally incompatible. Interestingly, Dunnell's concern was not J.V. Wright's (1982), i.e., that resource management or conservation would compromise research goals. Rather, Dunnell worried that the converse would occur, that resource significance determined in the context of current academic interests would provide for an archaeological record fatally biased to the present's research concerns.

The session provided a valuable discursive forum for a topic much easier to clinically inspect in the abstract than effect empirically. Most resource managers would agree that, currently, a small number of criteria are usually invoked to determine the significance of resources threatened by development impact. The capability of a resource to support research into a pressing problem domain, its integrity and the magnitude of impending impact are key considerations, all of which are balanced within an intuitive decision-making process subject to bureaucratic and political influence. In
large-scale projects, such as the Nipawin Reservoir Heritage Study (Burley et al. 1982), a less ad hoc, more systematized approach to significance evaluation is possible. However, imprecision and unrepresentivity in conserving archaeological resources will continue until a more rigorous and comprehensive approach to determining the value of archaeological resources at the provincial level are developed (e.g., Donahue 1982c).

3.4.3.3 H.R.I.A./M. versus Research

The orientation of h.r.i.a./m.s to satisfying the regulatory requirements of development clients rather than research objectives was initially recognized as more a potential than a real concern. Until recently, Alberta was the only province supporting a heritage consulting industry and it was here that the issue, if it existed at all, should have been most conspicuous.

Research in contract archaeology was treated in a session of the 1982 Calgary conference. From the papers presented it was plain that problems with the returns of contract archaeology were occurring (Brink 1982). Brumley (1982:28) concluded "that much of the work that is presently carried out is useless" as regards the production of meaningful research results. Yet, it was also possible for Reeves (1982) to list legitimate advances to Alberta prehistory forthcoming from consulting studies. The reasons for the deficiencies identified by Brink and Brumley were not judged as necessarily due to client orientation. The absence of reporting standards (Brumley 1982), the quality of graduate training and the heavy demands on the small number of consultants (Reeves 1982) were marshalled as factors conditioning the low output of traditional research results.
By the time of the conference the provincial regulatory agencies had gained sufficient experience with contracted studies to recognize research results could not be expected from most h.r.i.a.s, particularly smaller ones (Spurling 1982). Given this, a consensus appeared that if research contributions were to be coaxed out of the numerous, small scale h.r.i.a.s occurring every year, it would (and should) be up to the government agencies to consolidate, analyse, synthesize and publish the data produced by such studies (Brumley 1982; Spurling 1982). Other palliatives recommended were that agencies develop regional research objectives and methodological guidelines for consultants to follow; greater involvement by universities (Pokotylo 1982); and increased forward planning and baseline inventory research by regulatory agencies.

Noteworthy in the Western Canadian treatment of this issue was that it was not viewed as an ethical problem, but rather a technical or structural one. Despite Fladmark's (1981) contention to the contrary, up to 1981 very few instances could be adduced whereby medium to large scale heritage impact assessments or mitigation studies had not resulted in informational gains to the discipline. The reasons for this had much to do with the primitive state of the study area's data base plus the fact most of the larger projects had been undertaken by universities or other public institutions which tended to concentrate on producing research contributions rather than resource management information.

Maintaining symmetry between research and management objectives within contract archaeology is difficult for consultants, private or public. On one hand are the professoriate and museum researchers who insist advancing
the academic side of the discipline should come first; on the other are clients and resource managers who need low cost locational and assessment data on resources, practical mitigation recommendations, timely and plainly written reports, and a minimum of proselytism. Widespread failure to sustain this symmetry has probably contributed as much to a.r.m.'s gravest present problem, that of defending its existence in a contracting economy and hostile political environment, than any other factor.
3:5 THE REAL AND PRESENT DANGER

The academic-resource management split, significance assessment and research versus client orientation issues arose somewhat later in Western Canada than in the U.S. Determining what adequate mitigation constituted for different classes of impact management projects is only just emerging, and, as such, it is bound up in a much more serious problem which confronts both a.r.m. and CRM. The 1980s are witnessing major social, economic and political changes. Many of the environmental and social policies established during the preceding decade are being examined. Laws and regulations controlling industrial developments are being reformed and those protecting amenity resources which interfere with economic growth are under very close scrutiny or repeal. In the domain of archaeological resource management or CRM the question which is being more frequently asked does not concern how much mitigation is enough, but whether mitigation of resource impacts or even simple resource identification is justified.

In the U.S. there have been three major assaults on the regulations driving CRM. All are technical and difficult to abridge. The first became manifest in 1980 when, as part of its 1980 amendments to the NHPA, Congress authorized (directed?) the ACHP to review agency programs. The Council's position was that the interests of a.r.m. had to be balanced with those "of Native Americans concerned with sacred sites and burials, with the interests of economic development, with the interests of energy independence, and with the interests of personal freedom" (Aldrich 1982:4-5). In finding this balance the Section 106 process, requiring federal agencies to take into account the effects of their actions on cultural resources, was to be
streamlined and made more programmatic. Project specific reviews were to be correspondingly decreased in this new approach.

Taking into account the GAO's (1981b) findings the Council pursued two tacks ostensibly to insure that impact assessment and mitigation projects would be founded on sound research and be oriented toward significant research questions. The first revolved around establishing national archaeological research topics (King 1981); the second, and most contentious, involved prescribing predictive sampling methods in the place of intensive survey coverage and site salvage in areas affected by federal projects (especially reservoir and surface coal extraction projects). Essentially the Council challenged the assumption held by many CRM practitioners that Section 106 required 100% surface survey of federal properties or areas affected by Federal projects as well as the supposition that all sites so adversely affected should be scientifically investigated. Rather, the Council suggested, archaeologists should become involved in both predicting the locations of significant archaeological resources and planning research priorities for decisions concerning their salvage. The development of HMPs (Historic Management Plans), which were to result from this prediction and planning, soon became a very contentious issue.

At about the same time, the second onset occurred. The Bureau of Land Management's Office of Surface Mining (OSM) dealt CRM dual blows by 1) failing to comport with a 1980 agreement to regularly consult with state authorities regarding the need for archaeological surveys of proposed mine areas and 2) changing its own criteria for determining lands unsuitable for coal mining. Specifically implicated by the latter modification are public
and private lands eligible for inclusion in the National Register, together with privately owned lands already in the Register, which are now opened up for mining. Only public lands already on the register are deemed unsuitable (Niquette and Davis 1983). In effect this erodes the protection of cultural resources situated on large parcels of land in the eastern U.S. and left only two avenues open for managing archaeological resources. Sites eligible for National Register listing could be protected at the discretion of state governments during the approval process for surface mining programs or under the Lands Unsuitable for Mining petition procedure. Niquette (1984) has described the complex, bitter and unsatisfactory petition process.

The third major attack on CRM also focused on the ACHP regulations. In 1983 the Office of Management and Budget (OMB), a superagency charged with (de)regulatory policy-making and budgetary restraint (Tolchin 1984), argued that Section 106 provisions exceeded the Council's statutory authority. Instead of interpreting the "opportunity to comment" clause as regulatory in force, OMB concluded that compliance only requires the provision of documents for token review. This position, until recently, was largely supported by opinions forthcoming from the Justice Department. The 106 regulations are still in effect at the time of writing, awaiting 1) the issuance of new regulations, 2) a court settlement of legal action taken under the regulations, or 3) Congressional clarification of the ACHP's powers. Looming is the possibility that any one of these eventualities could disable the regulations behind the federal archaeological preservation program (Spatz 1983; Niquette and Davis 1983).

These assaults have combined and concretized in the cultural resource
management program designed for the McKinley mine, a surface coal mine located in the San Juan Basin of New Mexico. This appears as the first major project to conform to the proposed Office of Surface Mining Programmatic Memorandum of Agreement (OSMPOA). The OSMPOA is to be "the instrument by which the Advisory Council on Historic Preservation renders its comments under Section 106 of the National Historic Preservation Act, on all aspects of the federal surface coal program" (King 1984a:83). It represents a marked discontinuity in the way CRM projects have been carried out on lands under federal jurisdiction. For, within the agreement, regional planning and predictive modeling would replace the conventional sequence of total surface survey, site classification, significance determination and impact mitigation.

At the McKinley mine, 100% inventory and assessment studies carried out between 1975 and 1977 in the southern two-thirds of the mine area found ca. 300 heritage resources, 52% of which were determined eligible for inclusion on the National Register. To complete its h.r.i.a. responsibilities, the proponent suggested preparation of a comprehensive plan (HMP) which did not involve 100% survey but, rather, consisted of predictions on site distributions and classes, the generation of research questions, the development of an appropriate sampling survey strategy and site treatment plans (Keel and King 1982). This proposal conformed to the OSMPOA thrust.

Despite the provision for consultation over all but the terminal pre-implementation phase of the plan, the state SHPO, as well as numerous other stakeholders including the SAA, objected to the plan. This forced a review by the Council which eventually endorsed it. The basis of opposition stems
from both disciplinary and legal implications of the plan. From the scientific perspective, several (e.g., Merlan 1982) have judged the plan porous. For example, it apparently does not provide in any unambiguous way for surveys of areas which are judged to not contain sites. Furthermore, the plan calls for the determination of site significance prior to any sites being found. At its most extreme, resource prediction without any confirmatory fieldwork whatsoever seems permissible under the OSMPMOA (Klesert 1984). These flaws aside, there is the more generic concern found in some workers' (Ambler 1984; Brose 1984; Condie 1984; Nelson 1984; Schaalma 1984) cautions against overcommitment to sampling and prediction in a world which frequently does not admit precise forecasting.

From the legal standpoint, objections derive from the transfer of resource management authority from government agencies to the coal company. Some claim the OSMPMOA flaunts federal law (i.e., EO 11593 and the NHPA) which require federal agencies to locate all properties eligible for National Register status. As well, in the McKinley mine case, it is the proponent's consultant who will develop the plan and determine where sites are located, how they will be found and whether they are significant. Consequently, results and recommendations favourable to the proponent (but perhaps injurious to the resource base) seem inevitable. Moreover, the site mitigation treatments were to be partially determined with respect to benefits and costs, the latter to include the proponent's direct and indirect costs of carrying out the mitigation (Merlan 1982).

The OSMPMOA has its defenders, to be sure. King (1984) contends the OSMPMOA and its manifestation in the McKinley mine case represent a
reasonable response to the need to rationalize CRM, which, by the late 1970s, was spinning out of control, producing relatively little significant information and costing the discipline support among industry and government. For example, he contends that intensive, complete survey does not guarantee all archaeological resources or, for that matter, any unique ones will be identified. King believes by requiring a plan, robust regional research designs will have to be developed in advance of any field studies. Subject to professional and public review prior to implementation, the likelihood a field project will result in innovations, consistency, cost-effectiveness, comprehensiveness and genuine research contributions is optimized. Plog (1984) recites safeguards against an overly rigid approach to implementation written into the McKinley mine study, e.g., expansion of research questions in response to unanticipated resource types and survey redesign if sample results are higher than the initial projections.

As regards the question of whether the OSMPMOA contravenes federal legislation, King (1984a) notes the lack of an explicit requirement for survey anywhere in law and that predictive modeling may, in fact, be more efficient in finding all eligible sites than comprehensive survey. He also counters the claim that government was ceding its authority to industry arguing that the HMP must be submitted to a designated responsible agency (e.g., the OSM or another federal or stage agency) which then would distribute the plan to other concerned parties for comment. King (1984a) provided assurances that the ACHP would serve as a court of last resort should irresolvable deficiencies be found by other agencies. As envisioned, following the plan's approval review agencies would participate in
monitoring the plan's implementation. If required, the ACHP would retain its oversight responsibilities throughout. Presently, there seems to be some ultimate control over the process, should there be serious shortcomings in the way the OSM or other agencies acquit their responsibilities.

There is insufficient information to determine if these shake-ups, shake-outs, and shake-downs bode complete ill for CRM. What is obvious is the close scrutiny which national CRM programs are under (as witnessed by a 1984 national television special) and the fairly radical steps being taken by federal archaeo-bureaucrats to preserve its basic tenets. In these parlous times, the remedies developed in the U.S. bear close watching for parallel reactions against a.r.m. are emerging north of the 49th parallel.

Since 1980 several very large h.r.i.m.s (i.e., > $500 000) have been initiated in Western Canada. Difficulties have been encountered with many of these. Some, despite their evident potential, have yet to result in any significant contributions to regional culture history or to general methodology, technique or theory; some have occasioned proponent audits and investigation by national development associations; some have undergone mid-project cut-backs. But all these projects have either been appropriately concluded or currently have sufficient momentum to make premature closure unlikely. The problem which Western Canadian a.r.m. now faces is rationalizing future mitigation projects. This may very well require developing benefit-cost analyses which demonstrate the public's economic and social interests are served by a continuation of the process whereby they, as taxpayers, ratepayers or consumers, fund archaeological projects. This, and related structural issues, are examined in the following chapter.
FOUR

THE RULES AND THE GAME: A.R.M. POLICIES, PRACTICES, PARTICIPANTS AND PROBLEMS

Mere anarchy is loosed upon the world,
The blood-dimmed tide is loosed, and everywhere
The ceremony of innocence is drowned;
The best lack all conviction while the worst
Are full of passionate intensity.

W.B. Yeats
"The Second Coming" (1921)
4.1 INTRODUCTION

4.1.1. Introduction

This chapter's intent is to summarize a.r.m policies, practices, problems and policy-making procedures current in Western Canada. My original conceptualization seemed pretty straightforward: a statutory review, an investigation of the four regulatory agencies (e.g., Hammell 1976:31) and other groups participating in Western Canadian a.r.m., the administrative and implementation problems and a summary. Two recent events, however, caused me to expand its coverage. These were: 1) a Saskatchewan Department of Finance recommendation (as leaked in the March 7, 1983 edition of the Regina Leader Post) to abolish the Heritage Resources Branch, and 2) the British Columbia Utilities Commission's ([BCUC] 1983a,b) virtual exemption of B.C. Hydro and Power Authority from undertaking mitigation measures for heritage resource losses which would occur as a result of the Peace River Site C power project. My proximity to both issues warranted extending the chapter's scope to discuss the political and bureaucratic environment of a.r.m. and also present an analysis of, and users-guide to, policy-making processes.

Before proceeding it is important to provide some definitions for the word policy, for it has several uses, conceptual and otherwise (cf., Meeham 1985). Following Heighton and Heighton (1978:392), a policy can refer to a philosophical concept: "the collective searching and actions of communities, organizations and political agencies for solutions to mutual problems". Secondly, policy can be seen a product, "either documents or conclusions drawn by persons who are responsible for improving community living
conditions and for the amelioration of social problems". Thirdly, there is
the view of policy as a process "through which communities and agencies
provide an element of stability (ordered change through time) and improve
their social and physical environments by planning for desired future
goals". And finally, policy may be regarded as a "framework for action ---
as both the product and the process which, if clearly delineated, can serve
as a guide for action to effect desirable changes in community". All four
meanings are employed hereinafter.

Political, bureaucratic and public policy-making processes, frequently
imbued with "rational choice" theoretics (Luke 1985), will increasingly
influence a.r.m.'s course throughout the decade. The 1980s are witnessing a
growing scarcity of the resources allocable to solve or palliate pressing
social and economic problems. Hard and fast decisions will be made by those
in positions of political authority over which of the plural policy
interests are accommodated and which are left out. Archaeology's only viable
response to this environment is to become immediately involved in decision-
making processes. Methodological refinements and the production of
substantive research results will remain significant disciplinary outputs,
but largely insofar as how effectively the former can reduce project costs
and the latter can be monetized and made relevant to decision-makers and the
general public. Many environmental disciplines now recognize that efforts
to improve technical fixes, so current in the 1970s, have been subordinated
in importance by the need to understand and influence economic, social and
political values (e.g., A. Thompson 1983; Beanlands and Duinker 1984;
Wildesen 1984b; Miller 1985a). This means the traditional, inward looking
conception of archaeology must be turned around (Epp and Spurling 1984). Instead of reacting to external pressures and recissions, it is time to become proactive and anticipatory of public, economic and political concerns and expectations. Important to this is developing an understanding of bureaucracy and its workings. Inquiries into bureaucratic structures and decision-making are not only worthwhile inquiries in and of themselves; the results of such investigations may be used to influence, perhaps even change the social order (cf., Barrett 1984). For archaeology, protracted scientific insularity could prove suicidal, not only to public archaeology but (inevitably) to the academic variety, as well.
4.2 AN INTERPROVINCIAL STATUTORY AND ADMINISTRATIVE COMPARISON

4.2.1 The Statutes, Regulations, Policies and Guidelines

Table 3.1 lists the legislation current in the four western provinces which vitalize the a.r.m. enterprise, viz., *The Heritage Conservation Act* (R.S. Chapter 165; Government of British Columbia 1979), *The Alberta Historical Resources Act* (Chapter 5 of the Statutes of the Government of the Province of Alberta 1979b), *The Heritage Property Act* (Government of Saskatchewan 1980), and the recently passed (but, as of this writing, unproclaimed) *Heritage Resources Act* (Government of Manitoba 1985). From these public statutes flow the mandates of the four archaeological resource management agencies.

Given the fluid nature of provincial law-making due to changing economic, social and technological conditions, such laws are continually undergoing amendment. Recessionary economic conditions and the incumbency of conservative governments in some provinces has accelerated reformational pressures. Today, statutes, regulations, policies and agencies are under review, as central agencies try to "sunset" decreasingly necessary responsibilities. This has been the case for British Columbia and Saskatchewan in the last three years. Running counter to this trend, during the Spring 1985 sitting, the Legislative Assembly of Manitoba replaced the obsolete, 17 year old *Historic Sites and Objects Act* with far stronger legislation modeled after the ARHRA and HPA. Suffice to say, a statutory comparison at any point in time is subject to revision --- the present review is no less prone to this than if it were conducted at any other time.

Notwithstanding this legislative flux, there remain considerable
discrepancies between the letter and spirit of a statute and the ability to implement and administer it. A good example comes from B.C. where the present act does not require a permit for site survey or inventory, both critical components of an impact assessment. To get around this deficiency, which did not exist under the former AHSPA, the provincial archaeologist is obliged to process a ministerial order to authorise such activities. Because of the inefficiencies involved, permits are now issued for such work, even though there is no statutory provision for this. Such a circumvention is an attempt to match the spirit of the law by surpassing its literal meaning. Another example comes from Manitoba where, up to 1985, gaps in its legislation meant that much enforced a.r.m. activity was based upon a liberal, modern interpretation of the intent of The Historic Sites and Objects Act. In jurisdictions having comparatively strong legislation, the letter of the law may be impossible to meet due to the limited personnel and fiscal resources provided to administer an Act. For example, there is little immediate benefit to an a.r.m. agency authorized to require h.r.i.a.s of all developments injuring archaeological resources if staffing levels permit very few development proposals to be vetted. Arguably, only in Alberta has the provincial government seen fit to provide sufficient professional staffing to carry out effectively the legislated responsibilities (see Table 4.8; Donahue 1984:2). And, no doubt, the ASA would challenge its abilities in this regard.

Accepting the need to achieve consensus, the inability of legislators and bureaucrats to foresee all future exigencies and situations, and other factors, the heritage conservation laws of Western Canada, like most other
pieces of legislation, were drafted in skeletal form. Many formal definitions and interpretations, procedures, standards of performance and reporting, the qualifications of "permittable" archaeologists, and so on were left out of the Acts themselves to be written into regulations, policies and guidelines. These instruments differ in the following ways. For regulations to come into effect, they must be approved by the Lieutenant-Governor-in-Council; for policies, by the responsible minister; while guidelines need only be approved by the deputy minister (see section 4.3.2 for a discussion of the deputy's role) though some may be brought forward to the minister for nominal endorsement. Such means of rulemaking provide much needed flexibility in carrying out legislative intentions but, in so doing, confer considerable authority to the Cabinet and even more so to the bureaucracy.

The four western a.r.m. agencies have utilized these devices to varying degrees, with Alberta having the heaviest "red tape" burden and, at least at present, Manitoba the least. Regulations passed thus far by Saskatchewan deal with definitions of terms (e.g., medicine wheel, pictograph, petroglyph, the age of a heritage property, etc.). Going one better, Alberta (Government of the Province of Alberta 1979b) has entrenched its research permit requirements in regulations. These oblige anyone wishing to gain a permit in Alberta to demonstrate the completion of a thesis M.A. on an archaeological topic; to have supervisory and independent experience in the type of work proposed in the permit application; to, upon award of a permit, maintain a catalogue and provenience of all recovered artifacts in conformity within certain standards; and to submit a typewritten report,
according to strict, prescribed standards and timelines. The ASA also has had policies endorsed covering winter studies, report authorship and several other aspects of field work. It also has developed numerous guides for operational definitions, proposal formats, verbal permits and so on. Policy statements and guidelines are disseminated to consultants and researchers through its Survey Notes series.

The ASA's greater policy-making ability (derived from its larger professional complement) and accumulated experience, together with the fact so many professional consulting firms active in the Prairie Provinces are headquartered in Alberta, has caused both Saskatchewan and Manitoba to adopt or adapt its policies accordingly, but at lower levels of authorization. For example, many of Alberta's regulations regarding permit responsibilities, including its separation of research and h.r.i.a. activities, are found in Saskatchewan's permit policy. Likewise, up to passage of its new legislation, the Archaeology Division (AD) of Manitoba's Historic Resources Branch used a word-for-word version of the ASA's Interim Guidelines, Historical Resources Impact Assessments for its h.r.i.a. guidelines. Broken down into referral review, inventory, evaluation and determination of mitigative measures phases, these guidelines also contain a suggested format for h.r.i.a. report contents.

Saskatchewan has also developed h.r.i.a. guidelines, which owe as much to those in force in North Dakota (which were liberally based on the Airlie House Report) as they do to the Alberta effort. Noteworthy is that the guidelines of the western provinces east of the Rockies are in draft or interim form. Consequently, developers or their consultants deviating from
the guidelines are not necessarily contravening provincial law. Conformity has been enforced, instead, by the timeliness with which reports are processed through the regulatory mill; extreme deviations being the most likely to require rewrites and postponement of clearance for developments to proceed. For present purposes, little space is devoted to these guidelines as they are either being rewritten or written de novo in adjustment to the regulatory realities of the mid-1980s.

Counter to the trend of interim and transient guidelines, the Resource Management Division (RMD), Heritage Conservation Branch, British Columbia Ministry of Provincial Secretary and Government Services (1982) recently released a handsome document entitled Heritage resource impact assessment: a guide for the development industry. Based upon Germann's (1981) Masters of Resource Management research project, but less detailed, these guidelines make a useful distinction between impact assessment and management, the former primarily concerned with locating and evaluating resources and impacts to them, and the latter referring to measures to prevent or accommodate adverse development impacts. The guide identifies five study types: 1) heritage overview assessment, 2) detailed inventory assessment, 3) detailed impact assessment, 4) impact management through mitigation or compensation and 4) impact management by surveillance and/or monitoring. Each is cross-referenced to the stages of a major development project and the phased informational needs of other regulatory participants in the impact assessment process such as the Energy Project Coordinating Committee, the Coal Guidelines Steering Committee, the Metal Mines Guidelines Steering Committee and the Linear Guidelines Steering Committee (see section 4.4.1).
How workable and acceptable these guidelines prove in practice will no doubt soon be apparent given the deregulatory thrusts of the B.C. government.

Rather than exhaustively describe all the legislation, regulations, ministerial policies and guidelines current in Western Canada, a tabularized statutory and administrative comparison is provided in Table 4.1. From this it is evident that the Saskatchewan Heritage Property Act is the most powerful, even more so than the parallel Alberta act and the as yet unproclaimed Manitoba one, in terms of its inclusivity and penalties. Yet, again, it must be borne in mind that laws, even very powerful ones, have blindspots and are only as good as the means provided for their administration and implementation and the political will to enforce them.

4.2.2 Limitations of Provincial Heritage Acts

Despite the evident comprehensiveness of such statutes as the Alberta and Saskatchewan acts, and pursuant regulations, policies and guidelines, it is not uncommon for provincial agencies to consult Attorney Generals'/Justice Departments on points of law. The discretionary nature of these acts, the precedentary nature of Canadian law, the existence of superseding or contradictory legislation, and the ever-changing technological, political and economic environment, means that cases arise situated on the margins, or outside of provincial law. Two critiques of the B.C. Heritage Conservation Act and the The Heritage Property Act of Saskatchewan have been carried out by Germann (1979) and Johnson (1982), respectively. For the most part their findings can be extended to all the provincial heritage acts.

Weakening B.C.'s legislation, and all others, is their discretionary nature (Germann 1979). In all cases, the responsible minister "may" require
<table>
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<tr>
<th>Component</th>
<th>British Columbia</th>
<th>Alberta</th>
<th>Saskatchewan</th>
<th>Manitoba</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Inclusivity of Act</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crown ownership of archaeological objects</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>method of controlling disturbance to most resources?</td>
<td>permit</td>
<td>permit</td>
<td>permit</td>
<td>permit</td>
</tr>
<tr>
<td>prohibition of removal or sale of objects?</td>
<td>yes - removal</td>
<td>designated only</td>
<td>yes</td>
<td>removal only</td>
</tr>
<tr>
<td>registration of objects?</td>
<td>no</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>resource types explicitly protected from alteration except under permit?</td>
<td>burials none</td>
<td>pictographs</td>
<td>petroglyphs, boulder, effigies, medicine wheels</td>
<td></td>
</tr>
<tr>
<td>special treatment of skeletal material following excavation?</td>
<td>no</td>
<td>no</td>
<td>yes</td>
<td>no</td>
</tr>
</tbody>
</table>

(continued)
Table 4.1 A Statutory and Administrative Comparison of the B.C. Heritage Conservation Act, the Alberta Historical Resources Act, the Saskatchewan Heritage Property Act, and the Manitoba Heritage Resources Act (continued)

<table>
<thead>
<tr>
<th>Component</th>
<th>British Columbia</th>
<th>Alberta</th>
<th>Saskatchewan</th>
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<tbody>
<tr>
<td>Permitting</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>permit required to investigate sites?</td>
<td>yes - designated sites only</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>permit controls site treatments?</td>
<td>yes - designated sites only</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>other means?</td>
<td>Ministerial order</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>professional requirements for h.r.i.a. investigations?</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>level of qualification?</td>
<td>M.A. or equivalent education and experience</td>
<td>M.A. with same as thesis or B.C. equivalent education and experience</td>
<td>same as B.C.</td>
<td></td>
</tr>
<tr>
<td>third party review of credentials upon application?</td>
<td>no</td>
<td>yes</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>avocational permitting system?</td>
<td>no</td>
<td>no</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>Impact Assessment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>act provides for impact assessments?</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>act provides power to order investigations?</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
</tbody>
</table>
Table 4.1 A Statutory and Administrative Comparison of the B.C. Heritage Conservation Act, the Alberta Historical Resources Act, the Saskatchewan Heritage Property Act, and the Manitoba Heritage Resources Act (continued)

<table>
<thead>
<tr>
<th>Component</th>
<th>British Columbia</th>
<th>Alberta</th>
<th>Saskatchewan</th>
<th>Manitoba</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impact Assessment (continued)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>minister is ultimate authority regarding impact assessments?</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>minister is operational authority in ordering impact assessments?</td>
<td>yes and ADM</td>
<td>no - ADM</td>
<td>no - Supervisor, ARMS</td>
<td>no - Chief, AD</td>
</tr>
<tr>
<td>minister is ultimate authority in assessing study and clearing project?</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>operational authority in assessing quality of impact assessment?</td>
<td>Chief, Resource Management Division</td>
<td>Head, Research Management Section</td>
<td>Supervisor, ARMS</td>
<td>Chief, AD</td>
</tr>
<tr>
<td>impact assessment program?</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>impact assessment guidelines?</td>
<td>yes</td>
<td>yes - interim</td>
<td>yes - interim</td>
<td>yes - interim</td>
</tr>
<tr>
<td>steps in process?</td>
<td>4 - 5</td>
<td>2 - 4</td>
<td>1 - 6</td>
<td>flexible</td>
</tr>
<tr>
<td>overview</td>
<td>yes</td>
<td>sometimes</td>
<td>sometimes</td>
<td>sometimes</td>
</tr>
<tr>
<td>survey</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>assessment</td>
<td>yes</td>
<td>sometimes</td>
<td>sometimes</td>
<td>sometimes</td>
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<tr>
<td>mitigation</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>monitoring/surveillance</td>
<td>yes</td>
<td>sometimes</td>
<td>sometimes</td>
<td>sometimes</td>
</tr>
</tbody>
</table>

(continued)
Table 4.1 A Statutory and Administrative Comparison of the B.C. Heritage Conservation Act, the Alberta Historical Resources Act, the Saskatchewan Heritage Property Act, and the Manitoba Heritage Resources Act (continued)

<table>
<thead>
<tr>
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<th>Saskatchewan</th>
<th>Manitoba</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impact Assessment (continued)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>all types of resources included?</td>
<td>yes</td>
<td>yes</td>
<td>no - archaeological sites only</td>
<td>yes</td>
</tr>
<tr>
<td>any project types exempted by act?</td>
<td>no</td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>is &quot;formal&quot; order issued to developers to conduct h.r.i.a.?</td>
<td>yes</td>
<td>not</td>
<td>usually</td>
<td>not</td>
</tr>
<tr>
<td>Investigation Proposal Review</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>review system?</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>in-house review only?</td>
<td>no</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>types reviewed externally?</td>
<td>some</td>
<td>pure research</td>
<td>none</td>
<td>none</td>
</tr>
<tr>
<td>Funding</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>compensation for land or other restrictions?</td>
<td>maybe</td>
<td>maybe</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>fund available for developers to meet costs of impact assessment?</td>
<td>no</td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
</tbody>
</table>

(continued)
Table 4.1 A Statutory and Administrative Comparison of the B.C. Heritage Conservation Act, the Alberta Historical Resources Act, the Saskatchewan Heritage Property Act, and the Manitoba Heritage Resources Act (continued)

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<th>Saskatchewan</th>
<th>Manitoba</th>
</tr>
</thead>
<tbody>
<tr>
<td>Funding (continued)</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>funding guidelines?</td>
<td>-</td>
<td>-</td>
<td></td>
<td>yes</td>
</tr>
<tr>
<td>does province pay in whole or in part for impact assessment work?</td>
<td>yes</td>
<td>no</td>
<td>small projects</td>
<td>no sometimes</td>
</tr>
<tr>
<td>Authorization</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>minister empowered to compel developer to pay?</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>is power applied?</td>
<td>partially</td>
<td>yes</td>
<td>yes</td>
<td>probably</td>
</tr>
<tr>
<td>is power explicit in act?</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Punitive Measures</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>maximum penalty?</td>
<td>is an offence</td>
<td>$50 000</td>
<td>$250 000</td>
<td>&lt;$50 000/ day for contravention</td>
</tr>
<tr>
<td></td>
<td>$50 000</td>
<td>1 year</td>
<td>(corporate)</td>
<td>(individual)</td>
</tr>
<tr>
<td></td>
<td>$5000</td>
<td>imprisonment</td>
<td>$5000</td>
<td>6 months</td>
</tr>
<tr>
<td></td>
<td>6 months</td>
<td>imprisonment</td>
<td>imprisonment</td>
<td></td>
</tr>
<tr>
<td>minister empowered to issue stop work order?</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>minister empowered to rescind development approvals by other agencies?</td>
<td>no</td>
<td>yes</td>
<td>possibly</td>
<td>yes</td>
</tr>
</tbody>
</table>
Table 4.1  A Statutory and Administrative Comparison of the B.C. Heritage Conservation Act, the Alberta Historical Resources Act, the Saskatchewan Heritage Property Act, and the Manitoba Heritage Resources Act (continued)

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<th>Alberta</th>
<th>Saskatchewan</th>
<th>Manitoba</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Powers of Site Designation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>province can designate resources?</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>municipality can designate resource?</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>is compensation automatically applied?</td>
<td>maybe</td>
<td>maybe</td>
<td>no</td>
<td>no</td>
</tr>
</tbody>
</table>

a developer to undertake an h.r.i.a. or h.r.i.m. study. While there are as yet no reported examples where political directives have been received by a line agency to ignore a development having potential adverse impacts on archaeological resources, the doors remain open.

In B.C., the minister can require the owner of a heritage resource to undertake evaluative or mitigatory investigations, whereas the Saskatchewan and Alberta statutes use the more inclusive term person. Since owner is not defined in The Heritage Conservation Act, Germain (1979) considers the resultant ambiguity could mean that a developer who had not yet purchased a project area could be exempted from undertaking any necessary archaeological investigations until ownership was established in fact. This problem also existed in the previous Manitoba legislation.

Another drafting error noted by Germain (1979:13) is the failure to
protect sites after the completion of survey or excavation. As well, offences under the B.C. act pertain to an owner's failure to "preserve the heritage site until the site survey or site investigation is completed", but does not apply to a failure to "pay for the site survey or site investigation" (Sections 7[3], 29, The Heritage Conservation Act). The inability to extend penalties to cover non-payment could result in lengthy, confrontational and unsatisfactory litigation between consultants and developers.

There remain other problems common to all four legislations. First is whether a charge against a unpermitted collector or excavator would stand up in court. Offences generally consist of mens rea, the mental element, and actus rea, the physical element. These concepts figure prominently in the distinction between ignorance of the law or mistakes of fact. The former cannot be used as a defence but the latter argument can. According to Mewill and Manning (1978; in Johnson 1982), the law recognizes three kinds of offences:

1) those requiring affirmative proof by the Crown of mens rea,
2) those prohibiting certain acts and not requiring proof of mens rea but which permit the accused a defence upon his showing on the balance of probabilities an honest mistake upon reasonable grounds as to facts which, if true, would make his act innocent, and
3) those prohibiting certain acts and not requiring proof of mens rea and where it is not open for the accused to exculpate himself by showing an honest and reasonable mistake."

For Saskatchewan, Johnson (1982) sees little problem with a charge against
someone digging up a burial or vandalizing an excavation, but thinks the Crown would be less successful against a surface collector who could argue he or she was picking up artifacts for their aesthetic, as opposed to heritage, value. The B.C. law explicitly uses the word "knowingly" in Section 6.2 which prohibits persons from disturbing, altering or destroying sites without permits. In this instance, Germann (1991) contends the onus is on the Crown to demonstrate mens rea: that the charged intentionally, and with knowledge of the consequences, committed an offence. This, he feels, could make a conviction under Section 6.2 impossible. Omitting the term "knowingly", such as in the Saskatchewan Act, could remove this problem and permit the establishment of actus rea or, better yet, strict liability, whereby the accused would be required to show his or her innocence on a balance of probabilities.

The second deficiency is that contraventions to provincial acts are summary as opposed to indictable offences. The latter come under the Criminal Code and refer to serious crimes like armed robbery and murder which are under federal jurisdiction. Summary offences are provincial in scope and include violations of motor vehicle and liquor acts. "Since the Criminal Code is a federal statute it does not apply to provincial statutes unless referentially incorporated thereby" (Johnson 1982:31), a province may be unable to successfully prosecute a resident of another province or country for a summary offence. While a charge can be laid and a warrant issued, if the accused does not voluntarily appear, s/he cannot be compelled to comply or the Province cannot take action in the external jurisdiction. Thus, a person excavating a site in a province other than that in which s/he
was resident who was apprehended in the act could escape punishment by simply returning to their home province. Problems stemming from the distinction between summary and indictable offences include the visits of out-of-province collectors to border areas of Saskatchewan and Alberta and the recent auctioning of large artifact collections from British Columbia and Saskatchewan at a Alberta venue. In the latter case, there was no legal means to prevent the auction since the Alberta statute can only be used to interdict the sale of artifacts which can be shown to have been illegally collected within that province. Until federal legislation is enacted to cover such activities under the Criminal Code, or the provinces establish reciprocal legislation, these inter-jurisdictional lacunae will continue as major deficiencies in the conservation of the national heritage.
4.3. **THE A.R.M. BUREAUCRACIES**

4.3.1 The Fiscal Restraints

It is an incisive truism that a budgetary allocation "states in dollar terms what value the society places on various public sector activities...it states who is to get what in any given year as a result of a complex series of government decisions, and it is therefore a tangible expression of the wider political process within government and the society" (Adie and Thomas 1982:141-2). Further, according to Chandler and Chandler (1979:3), "spending figures offer one means for estimating the relative importance among policy fields...[and that]...tracing expenditures over time can reveal policy trends and changes in the priorities of policy-makers". This being so, a direct comparison of appropriations to the four a.r.m. agencies would seem to starkly show the importance each government places on a.r.m. (for a parallel see Amir's [1984] analysis of expenditures on Israel's environmental protection programs). But for various reasons this is not strictly the case. Before this comparison, the annual budgeting process undergone by provincial governments bears brief examination.

Budgets are generally prepared by a department during the summer and fall preceding the fiscal year in which the budget will be expended. Requests are made in two forms: A budget and B budget requests. A budgets are base budgets, consisting of the amounts needed to sustain existing programs with or without inflationary increases. B budget requests are for new programs or major additions to existing ones. The bulk of provincial estimates are made up of A budgets and it is now not uncommon for a department to receive a directive that no B budget requests will be
entertained. Today, in some jurisdictions, a budget request may be disallowed inflationary adjustments or may suffer real, across-the-board cuts to the base itself.

As everyone who can read a newspaper knows, the fiscal year of Canadian governments runs from April 1 to March 31. Around the beginning of the fiscal year last minute adjustments will be made, preparatory to the Minister of Finance's budget speech setting forth the fiscal support old and new programs will enjoy. For a public servant in these parlous times, the period from mid-March to mid-April can be a time of stress and excitation.

The spending estimates are broken down by department and, in turn, by program in the Blue Book or Main Estimates. For those interested in the financial apportionment a department or major program received, the Blue Book can be a wealth of data. However, the Blue Book may obscure as much as it reveals and can actually distort the fiscal picture of a department or program (Adie and Thomas 1982:165). For example, Saskatchewan's Blue Book for fiscal year 1984/1985 shows major budget and staff cuts for the Heritage Conservation Branch when, in fact, these recissions were made the preceding year. Also, the estimates may not show the amounts allocated to small agencies such as Saskatchewan's Heritage Conservation Branch's Archaeological Resource Management Section (ARMS); instead, man-year and operating allotments for the entire division are given. Hidden as well may be the inter-departmental transfers which bolster the budgets of both B.C.'s Resource Management Division ($200 000 from the Ministry of Highways) and the ASA (an annual allocation of $150 000 by Treasury Board to handle the h.r.i.a. responsibilities of Alberta Highways and Parks and Recreation).
Furthermore, Blue-Book figures are only estimates. Minor, off-the-books enrichments and reallocations may be made within a major program. Thus analyses of the financial health of a province's a.r.m. program cannot rely on Blue Book figures. Nor can they be based upon departmental annual reports, for most of the same constraints apply to these as well.

Consequently, the following historical comparison of the funding provided a.r.m. agencies is based on a survey of current and former officials in the four jurisdictions. The data are not as robust as would be desirable since many of the responding agency managers did not have complete series of budget statements. Still, the data are all that is likely to be available for this period, now and in the future.

At first blush, inspection of Table 4.2 (the amounts allocated to all agencies in current-to-the-year dollars), Table 4.3 and Figure 4.1 shows that Alberta and B.C. have expended significantly more on a.r.m. than Manitoba and Saskatchewan. Yet there are major differences in the rates of development and land disturbance between the four provinces (section 2.4). Similarly, there are variances in the abilities of the four provinces to pay for a.r.m. activities given the unequal distribution of natural resource assets and resultant powers of revenue generation (see ECC 1982: Table B-1). And finally, there are demographic differences to consider (Table 2.2).

These factors complicate analysis of the data presented in Tables 4.2 to 4.5. Since 1970 about $15.3 million current-to-the-year or 7.1-million 1970 dollars have been allocated to the four Western Canadian a.r.m. agencies. Approximately 40% of this has gone to support the HCB's Resource
Table 4.2 Western Canadian A.R.M. Agency Budgets Unadjusted For Inflation

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>RMD</th>
<th>ASA</th>
<th>ARMS</th>
<th>AD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970/1971</td>
<td>8000</td>
<td>25000</td>
<td>52000</td>
<td>175000</td>
</tr>
<tr>
<td>1971/1972</td>
<td>25000</td>
<td>20000</td>
<td>52000</td>
<td>175000</td>
</tr>
<tr>
<td>1972/1973</td>
<td>52000</td>
<td>20000</td>
<td>25000</td>
<td>100000</td>
</tr>
<tr>
<td>1973/1974</td>
<td>175000</td>
<td>52000</td>
<td>25000</td>
<td>130000</td>
</tr>
<tr>
<td>1974/1975</td>
<td>225000</td>
<td>20000</td>
<td>52000</td>
<td>70000</td>
</tr>
<tr>
<td>1975/1976</td>
<td>325000</td>
<td>219700</td>
<td>250000</td>
<td>100000</td>
</tr>
<tr>
<td>1976/1977</td>
<td>352000</td>
<td>258907</td>
<td>425000</td>
<td>130000</td>
</tr>
<tr>
<td>1977/1978</td>
<td>425000</td>
<td>464268</td>
<td>301083</td>
<td>80000</td>
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<tr>
<td>1978/1979</td>
<td>552000</td>
<td>380925</td>
<td>112000</td>
<td>57000</td>
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<td>1979/1980</td>
<td>625000</td>
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<td>112000</td>
<td>112000</td>
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<tr>
<td>1980/1981</td>
<td>642000</td>
<td>652340</td>
<td>29000</td>
<td>20000</td>
</tr>
<tr>
<td>1981/1982</td>
<td>718803</td>
<td>791437</td>
<td>29000</td>
<td>20000</td>
</tr>
<tr>
<td>1982/1983</td>
<td>755909</td>
<td>874803</td>
<td>122023</td>
<td>340000</td>
</tr>
<tr>
<td>1983/1984</td>
<td>654625</td>
<td>990533</td>
<td>135000</td>
<td>517900</td>
</tr>
<tr>
<td>1984/1985</td>
<td>529579</td>
<td>1173700</td>
<td>149700</td>
<td>318300</td>
</tr>
</tbody>
</table>

Management Division, 42% to the ASA, 4% to ARMS and 15% to Manitoba's Archaeology Division. In constant dollar terms, all agencies show positive budgetary growth rates over the periods they have been in existence. The RMD budget has grown an average of about 39% a year, the ASA's 12%, ARMS' 69%, and Manitoba's 16%. When (ignoring the variables' interdependence) the data are regressed against the annual GDP values (Table 2.1), high positive correlation coefficients are forthcoming (B.C. - .96; Alberta - .98; Saskatchewan - .97; and Manitoba - .84).

These trends are misleading, however. In B.C., Alberta, and Saskatchewan, the periods of significant budgetary growth occurred just after the agencies were created. Since this time, budgetary changes have either been modestly incremental or, as is the case for B.C. and
Table 4.3 Western Canadian A.R.M. Agency Budgets in 1970 Dollars

<table>
<thead>
<tr>
<th>Fiscal year</th>
<th>RMD</th>
<th>ASA</th>
<th>ARMS</th>
<th>AD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970/1971</td>
<td>8 000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1971/1972</td>
<td>24 295</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1972/1973</td>
<td>48 282</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1973/1974</td>
<td>150 862</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1974/1975</td>
<td>174 961</td>
<td></td>
<td></td>
<td>54 432</td>
</tr>
<tr>
<td>1975/1976</td>
<td>227 591</td>
<td>153 852</td>
<td></td>
<td>70 028</td>
</tr>
<tr>
<td>1976/1977</td>
<td>229 765</td>
<td>168 999</td>
<td></td>
<td>84 856</td>
</tr>
<tr>
<td>1977/1978</td>
<td>256 333</td>
<td>267 954</td>
<td></td>
<td>48 251</td>
</tr>
<tr>
<td>1978/1979</td>
<td>306 837</td>
<td>278 534</td>
<td></td>
<td>31 684</td>
</tr>
<tr>
<td>1979/1980</td>
<td>318 066</td>
<td>271 275</td>
<td></td>
<td>56 997</td>
</tr>
<tr>
<td>1980/1981</td>
<td>296 536</td>
<td>301 312</td>
<td>13 395</td>
<td>92 379</td>
</tr>
<tr>
<td>1981/1982</td>
<td>295 075</td>
<td>324 892</td>
<td>50 092</td>
<td>139 573</td>
</tr>
<tr>
<td>1982/1983</td>
<td>282 056</td>
<td>326 419</td>
<td>50 394</td>
<td>193 246</td>
</tr>
<tr>
<td>1983/1984</td>
<td>230 909</td>
<td>349 394</td>
<td>46 994</td>
<td>112 275</td>
</tr>
<tr>
<td>1984/1985</td>
<td>178 912</td>
<td>396 553</td>
<td>50 574</td>
<td>108 455</td>
</tr>
<tr>
<td>Total</td>
<td>3 028 480</td>
<td>2 839 164</td>
<td>211 449</td>
<td>992 176</td>
</tr>
</tbody>
</table>

Figure 4.1 Western Provincial A.R.M. Agency Budgets in 1970 Dollars
Table 4.4 Percentage Changes in A.R.M. Agency Budgets In Current-to-the-Year (A) and 1970 (B) Dollars

<table>
<thead>
<tr>
<th>Fiscal year</th>
<th>KMD</th>
<th>ASA</th>
<th>ARMS</th>
<th>AD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>1971/1972</td>
<td>213</td>
<td>204</td>
<td></td>
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</tr>
<tr>
<td>1973/1974</td>
<td>237</td>
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<td>1974/1975</td>
<td>29</td>
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<td></td>
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<td>1975/1976</td>
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<td>29</td>
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<td>1978/1979</td>
<td>30</td>
<td>20</td>
<td>13</td>
<td>4</td>
</tr>
<tr>
<td>1979/1980</td>
<td>13</td>
<td>4</td>
<td>6</td>
<td>-3</td>
</tr>
<tr>
<td>1980/1981</td>
<td>3</td>
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<td>1981/1982</td>
<td>11</td>
<td>0</td>
<td>21</td>
<td>8</td>
</tr>
<tr>
<td>1982/1983</td>
<td>5</td>
<td>-4</td>
<td>11</td>
<td>0</td>
</tr>
<tr>
<td>1983/1984</td>
<td>-13</td>
<td>-18</td>
<td>13</td>
<td>7</td>
</tr>
<tr>
<td>1984/1985</td>
<td>-19</td>
<td>-23</td>
<td>18</td>
<td>13</td>
</tr>
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</table>

Mean Annual Change

<table>
<thead>
<tr>
<th>RMD</th>
<th>ASA</th>
<th>ARMS</th>
<th>AD</th>
</tr>
</thead>
<tbody>
<tr>
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<td>39</td>
<td>22</td>
<td>12</td>
</tr>
<tr>
<td>88</td>
<td>69</td>
<td>27</td>
<td>16</td>
</tr>
</tbody>
</table>

Mean Annual Change since 1981

<table>
<thead>
<tr>
<th>RMD</th>
<th>ASA</th>
<th>ARMS</th>
<th>AD</th>
</tr>
</thead>
<tbody>
<tr>
<td>-4</td>
<td>-11</td>
<td>16</td>
<td>7</td>
</tr>
<tr>
<td>88</td>
<td>69</td>
<td>21</td>
<td>11</td>
</tr>
</tbody>
</table>

Saskatchewan, actually decreasing since the beginning of the decade. The 1% increase in the ARMS' allocation (Table 4.4) is chimerical in that it represents a year-end enrichment rather than a permanent addition to the base. The B.C. decrease has been partially offset by the injection of lottery dollars which do not appear in the agency's budget. The Manitoba allocation has fluctuated widely over the last 10 years, perhaps because its funding is partially based on lottery receipts. Consequently, a trend is absent in the Manitoba series. Suffice to say that the only agency exhibiting sustained budgetary growth is the ASA. It has been increasing by
7% above inflation since 1981 and, in 1984/85, contributed 54% of the ca. 2.2 million current dollars the four western governments allocated to their a.r.m. agencies. The B.C. agency's funding was reduced almost to 1974/75 levels while the Saskatchewan agency's support was almost the same as 1982/83. For B.C. and Saskatchewan these downsloping trends are alarming, for they may continue.

Still, the ability of the four western provinces to pay for a.r.m. has to be considered. One of the simplest ways to derive an estimate of this ability is to standardize the data of Tables 4.2 and 4.3 in terms of the per capita cost of each agency (Table 4.5; Figure 4.2). Somewhat surprising from this transformation is that the averaged per capita agency support is higher for Manitoba than B.C. In fact, the highest per capita cost for any province was borne by Manitobans in 1982/83.

Yet even this comparison is incomplete. The impact regulatory activity has on provincial a.r.m. expenditures remains to be analysed. Regulatory interventions in the Canadian economy have grown enormously: almost 30% of the Gross Domestic Product is controlled to some extent by regulations. As discussed in section 4.5.4, regulatory procedures can be an expedient and effective means of accommodating various public demands and concerns which do not involve direct (and possibly unpopular) political action. One reason governments develop regulatory responses to policy areas is that the costs of such policies are borne indirectly. By making favourable or unfavourable decisions over rate increases or imposing environmental impact assessment requirements on development projects, a regulatory agency does not
Table 4.5 Per Capita Contribution to A.R.M. Agency Budgets

<table>
<thead>
<tr>
<th>Fiscal year</th>
<th>RMU</th>
<th>ASA</th>
<th>ARMS</th>
<th>AD</th>
</tr>
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<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>1970/1971</td>
<td>$0.00</td>
<td>$0.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1971/1972</td>
<td>0.01</td>
<td>0.01</td>
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<td></td>
</tr>
<tr>
<td>1972/1973</td>
<td>0.02</td>
<td>0.02</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1973/1974</td>
<td>0.08</td>
<td>0.07</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1974/1975</td>
<td>0.10</td>
<td>0.07</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1975/1976</td>
<td>0.13</td>
<td>0.09</td>
<td>$0.12</td>
<td>$0.07</td>
</tr>
<tr>
<td>1976/1977</td>
<td>0.14</td>
<td>0.09</td>
<td>0.14</td>
<td>0.09</td>
</tr>
<tr>
<td>1977/1978</td>
<td>0.17</td>
<td>0.10</td>
<td>0.23</td>
<td>0.14</td>
</tr>
<tr>
<td>1978/1979</td>
<td>0.22</td>
<td>0.12</td>
<td>0.25</td>
<td>0.14</td>
</tr>
<tr>
<td>1979/1980</td>
<td>0.24</td>
<td>0.12</td>
<td>0.26</td>
<td>0.13</td>
</tr>
<tr>
<td>1980/1981</td>
<td>0.24</td>
<td>0.11</td>
<td>0.30</td>
<td>0.14</td>
</tr>
<tr>
<td>1981/1982</td>
<td>0.26</td>
<td>0.11</td>
<td>0.35</td>
<td>0.15</td>
</tr>
<tr>
<td>1982/1983</td>
<td>0.27</td>
<td>0.10</td>
<td>0.37</td>
<td>0.14</td>
</tr>
<tr>
<td>1983/1984</td>
<td>0.23</td>
<td>0.08</td>
<td>0.42</td>
<td>0.15</td>
</tr>
<tr>
<td>1984/1985</td>
<td>0.18</td>
<td>0.06</td>
<td>0.50</td>
<td>0.17</td>
</tr>
</tbody>
</table>

Mean Annual Cost
- $0.15
- $0.08
- $0.29
- $0.13
- $0.11
- $0.04
- $0.20
- $0.09

Mean Cost Since 1981
- $0.24
- $0.09
- $0.41
- $0.15
- $0.14
- $0.05
- $0.36
- $0.14

A: current-to-the-year dollars; B: constant (1970) dollars; -: data unavailable
(totals subject to rounding errors)

directly affect government expenditures or effect tax escalations (Adie and Thomas 1982:145; Chandler and Chandler 1979:129). So, while the costs of such decisions must ultimately be borne by the rate-payer, tax-payer, or consumer, government estimates do not reflect these.

A line regulatory agency receiving very modest budgetary support may, through its regulation of industry actions, cause as much funding to be allocated to a.r.m. as does a much better endowed agency in another
jurisdiction. The trouble is the real expenditures will not show up in agency budgets (or anywhere else) so another data source has to be consulted. Unfortunately, when annual data on total provincial a.r.m. expenditures was first sought (Spurling 1981), I found that no province was tracking these figures. Eventually, B.C. and Manitoba resource managers were able provide estimates which, along with those for Saskatchewan, are presented in Tables 4.18 and 4.19. The ASA, however, was unable and, to an extent, unwilling to make best guesses on total yearly funding levels. Estimates for the ASA's budget were provided, however.

We now turn from the analysis of agency funding and fiscal impact to the very important intra-governmental contexts in which the four a.r.m. units operate.

4.3.2 The Departmental Environment

As we have seen, the mandates of the a.r.m. bureaucracies in Western Canada are broad and, in cases, concentrate considerable discretionary power
in a small number of administrators. Regulations, policies, guidelines and less formal rules of procedure have been developed to facilitate the day-to-day and middle-range management of archaeological resources in the four jurisdictions. But this is not the full story of government involvement in Western Canadian a.r.m. Since these agencies do not operate in isolation from the bureaucracies of which they are but a minor component, it is important to consider the greater organizational and political environment from which flow authorization and control of their management styles, policy arenas, funding, size, and existence.

It is impractical to extensively document the organizational configurations of the four provincial departments containing a.r.m. agencies. With current efforts to trim civil services, departmental reorganizations are much in vogue. This trend, combined with ongoing adjustments in response to budgetary impositions and the tendency of newly elected governments to tinker with departmental formats (and names) causes bureaucratic structures to be fluid and unstable. It follows, then, that from both inter- and intragovernmental perspectives, no two departments are similarly configured. Nonetheless, the basic vertical (some would say militaristic) features of the line departments with heritage conservation responsibilities are unlikely to change. Because of my familiarity with Saskatchewan Culture and Recreation (SCR), it will be used as a model for describing a "typical" department (see Figure 4.3). The make-up of other Departments housing a.r.m. agencies, i.e., the B.C. Ministry of Provincial Secretary and Government Services, Alberta Culture, and Manitoba Culture, Heritage and Recreation will also be covered.
The Saskatchewan model fits midway between the more homogeneously arranged Alberta Culture, whose programs are functionally split between culture and heritage, and the heterogeneous Ministry of Provincial Secretariat and Government Services, an umbrella department under which is found the B.C. Heritage Conservation Division, the B.C. Provincial Museum, the provincial archives, the Queen's Printer, the Personnel Services Branch, the Construction and Maintenance Division, the Postal Branch, two lotteries, the B.C. Arts Board, the Consultative Committee on Cultural Heritage, the B.C. Building Corporation and several other agencies. Organizationally, SCR is closest to its Manitoban counterpart although it contains fewer branches.

Archaeological regulatory agencies are found at or close to the bottom of the organizational chart. Parallel to them are similar units composed of historians, planners, architects, and technical support staff, all of which report to a director. Combined, these form Saskatchewan's Heritage Resources Branch, B.C.'s Heritage Conservation Branch or Manitoba's Historical Resources Branch. The Alberta case is somewhat different in that the ASA is horizontally equivalent to institutions like the Provincial Museum of Alberta, the Tyrrell Museum and the provincial archives which are under the assistant deputy minister's (ADM) span of management. In the other western provinces, such lateral equality takes place higher on the organizational chart.

It is at the branch tier in B.C., Saskatchewan and Manitoba and the section level in Alberta that statutory divergences and significant disciplinary cleavages take place within a department (Figure 4.3). At the
same rank may be found entities dealing with cultural affairs, recreation and sports programs, regional services, financial and personnel administration, and so on. These units are grouped into structures presided over by either an assistant deputy minister (Saskatchewan) or deputy minister (British Columbia, Alberta, Manitoba).

Within any department, the deputy minister (DM) is the chief administrator, key to setting policy directions and negotiating fiscal resources. Appointed by the premier and often drawn from the public service, the DM is the bridge between the shifting political arena, represented by the minister, and the permanent civil service. A DM's effectiveness turns on his or her ability to personally work with a minister. Considerable trust is necessary between the two as the deputy is privy to the concerns of interest groups, has a better grasp of specific issues, and must bring forward alternative policy or decisional responses for political action. A deputy's loyalties must often be divided by incompatible demands: their interest in furthering or defending their department, their responsibility to the government of the day as well as their own professional standards of conduct, the need to fairly allocate resources to agencies under their aegis, their accountability to various legislative committees, and their responsibilities to their departments' client groups (Adie and Thomas 1982: 126).

Considering that a department may employ hundreds of people engaged in a multiplicity of activities, functions and tasks, it is obvious that, from the DM's perspective, an a.r.m. agency is but a bit player among many
Figure 4.3 A "Typical" Departmental Structure: Saskatchewan Culture and Recreation

Minister

Boards and Commissions (e.g., Saskatchewan Heritage Advisory Board, Saskatchewan Heritage Property Review Board, Arts Board, Western Development Museum, SaskSport Trust, etc)

Office of the Deputy Minister

Programs Services Division

Heritage Conservation Branch

Archaeological Resource Management Section

Administrative Services Division

Museums Branch

Planning and Assistance Section

Facilities Branch

Architectural Advisory Service Section

Financial Administration Branch
already crowding the policy stage. The scope of a department's operations may not permit a DM to learn the name of the provincial archaeologist, let alone those of agency staff. In the larger bureaucracies, (especially federal ones), it may be somewhat of a coup if the DM is even aware of what a lower level agency's exact function is.

At the top of the organizational chart is the minister, a Member of the Legislature, the cabinet, numerous committees, his or her own political party, and the representative of a constituency. Of themselves, these obligations impose large demands on a minister's time. One estimate exists that Ministers may be able to devote, at best, one day a week to departmental business (Adie and Thomas 1982:289). This being so, it is a rare minister indeed who has a detailed working knowledge of a department's functions, let alone who would consider trying to administer it. By default, managerial authority is delegated to the senior officers, the DM in particular.

Branch directors, ADM's, and DM's come from a variety of professional and non-professional backgrounds. To be sure, few have training in archaeology. The current branch director in B.C. and the former one in Manitoba lack(ed) both archaeological or historical backgrounds. Rather, their expertise resided, at their recruitment, in parks planning and interpretation. Saskatchewan's Director of Heritage Resources has had graduate level coursework in archaeology but his professional experience, gained in Alberta, is in historic site conservation. Moving up to the next step in the organization plan, most of the ADM's have been drawn from fields quite separate from heritage disciplines, save Alberta whose ADM for
Historical Resources has a Ph.D. in archaeology and formerly directed the ASA. More usual is the Saskatchewan case, where the ADM for SCR's operations branch was recruited from the Public Service Commission. DM's can draw from an even broader spectrum of specialties which may not even be found within the department which they administer. Currently, the only western DM with any archaeological background is Manitoba's who, among other involvements in cultural development, assisted in the excavation of Head-Smashed-In buffalo jump in Alberta and the Last Mountain House historic site in Saskatchewan. Again, more typical is the Saskatchewan instance in which the current deputy, formerly a professional football player, gained departmental experience as the Director of the Sports and Recreation Branch as well as the Western Canada Lotteries Foundation.

As knowledge of, and sensitivity to, heritage conservation issues diminishes as one moves up the organizational ladder, the role of the branch director becomes increasingly important. Given the long lines of reporting, agency heads must rely upon their directors to convey policy, budgetary or administrative concerns to higher level decision-makers. Unfortunately, not all have the requisite professional competence or commitment to effectively bring forward to their superiors the myriad technical concerns and issues which confront their subordinate archaeological resource managers. What most of these individuals do possess is a decade or more of bureaucratic experience, a valuable (but not necessarily overcompensating) asset. As occurred in academia, the early 1970s were a time of expansion and staff recruitment for government. The higher status accorded university employment and the large demand versus
small supply of those in what became the heritage conservation disciplines meant that the "best and the brightest" frequently became faculty members while the others often filled the ranks of the civil service and soon lost the impetus to complete advanced degrees. Despite sometimes marginal professional qualifications and little or no training in public administration, those who entered the bureaucracy earliest often rose the most rapidly. Professionally accredited archaeologists, historians, architects, planners, etc. tended to be added to heritage conservation units much later and, generally, at junior levels. Few of these individuals entered the civil service with any previous exposure to public administration and most carried into their positions narrow concepts of their duties, responsibilities and professions. As a consequence, policy judgements made at this level often have their genesis in conservative professional ethics or standards which may not coincide with higher level policy requirements (Gustafsson 1983). Unrestrained fealty to narrow academic values by new recruits can cause errors in judgement, professional and political embarrassments and, at worst, discreditation of the discipline within a department or government.

These factors have conspired to make heritage conservation a difficult administrative area. Over the 1970s many long-time middle managers became accustomed to operating in an environment of incremental staff and budgetary growth, so recent governmental contractions have strained their managerial abilities. On the one hand, they must deal with the external problems of monetary cutbacks, staff deletions, public sector union protections (a.k.a. "bumping"), program evaluations and justifications required by central
agencies (discussed below), overt political interferences, and increased adversarial relations with the development community. On the other are the internal stresses emanating from the professional staff under their direction. For the latter, opportunities for upward mobility are shrinking as are their abilities to maintain or enhance their program areas. Formally untrained in program administration, forced to cope with increased workloads and rapidly changing priorities, often confused by the mixed signals coming down the bureaucratic pipeline, disciplinary specialists tend to vent frustration at their directors. Reinforcing this tension is the often wide gap in remuneration between professional staff and the quasi-professional branch manager.

Nonetheless, the experience, personalities, and communication skills of heritage program directors can be as, if not more, important as their professional credentials. It is at their level that policy concerns and personnel matters must be brought forward, that budgetary requests must be developed and defended, that delicate political issues must be identified and optional responses prepared for the ADM and DM. Heritage conservation units must compete for scarce fiscal and staff resources with other branches on the same organizational tier. Consequently, a director's interpersonal skills, understanding of departmental protocol, and accumulated "debts and favours" to other directors or senior managers can determine how well or poorly a program does at budget time vis-a-vis other divisions or branches. These informal "rules of the game" of course are operational at the next level, where ADM's, representing their mixes of branches and sections, must contest for budgetary allocations. And this also extends to the deputy and
ministerial levels where fiscal apportionments to the departments themselves must be advocated and defended.

The final bout in this exercise is undertaken before the Treasury Board, a cabinet committee with decision-making powers over expenditures. Here, ministers and their deputies present and justify their departments' requests and long-range plans. Treasury Board and its analysts interrogate departmental representatives and negotiate the department budget for the next fiscal year. Transformed into estimates, departmental requests are introduced in the yearly budget speech at the beginning of the fiscal year.

The provincial legislature, the only body constitutionally empowered to authorize such public expenditures, is really little more than a "policy refinery". Given the facts of majority governments, increased party obedience and the limited analytical resources available to backbenchers, government MLA's almost always defer to Cabinet directives (Chandler and Chandler 1979:114-5). While government backbenchers do influence policy, they are more often oriented to satisficing constituency interests, and deference to Cabinet decisions such as those on budgetary matters becomes routine (cf., Brown-John 1981:199).

The competition between departments for resources has been disciplined recently by some governments through the establishment of spending limits set according to overall priorities. In this process, policy sectors are identified, each of which is provided with an "envelope" of financial resources (Adie and Thomas 1982:156). A department like SCR may be the social policy envelope, vying for a fixed number of dollars with larger and more powerful departments like Health, Social Services and so on. The
majority of the budgets of the larger social policy departments are fixed, statutory expenditures (a.k.a. entitlements) such as medicare and welfare benefits. Indexed to inflation, tied to uncontrollable demographic factors (Schick 1983), and generally considered inviolable, if not the determining, characteristics of the modern welfare state, entitlements leave fiscal decision-makers little flexibility to realize economies or make significant reallocations within a particular envelope. Therefore, any new programs or enrichments to existing ones depend upon underexpenditures by, or the elimination of, adjoining programs. With their greater political clout, their ability to produce "hard" supporting data, and their provision of vital services, the other departments in the social policy envelope generally fare considerably better during redistribution exercises than those composed of soft sectors like culture, recreation and heritage.

However, a minister's political acumen, administrative skills, understanding of, and loyalty to, his or her department, and relationships with the premier and other cabinet ministers may decisively influence the results of the budgetary battle. Unfortunately, departments with heritage responsibilities seem to be training grounds for ministers on the way up to more senior cabinet posts, or waiting rooms for those on the way out. Rotating ministers (and to a lesser extent DMs) has become a fact of life for most departments. From the year of their inceptions, with the exception of Alberta, the western provincial a.r.m. agencies have experienced an inordinate number of ministerial changes. From 1970 to 1980, ministers changed six times in B.C.; between 1980 and 1984, ministers were shuffled five times in Saskatchewan; from 1974 to 1984 there have been six different
ministers in Manitoba; yet from 1975 to 1985 Alberta has had only two different ministers. In the extreme case of Saskatchewan, this trend of a virtual annual ministerial replacement carries back to SCK's creation in 1972. The negative correlation between the number of ministerial changes and size of a.r.m. allocations from province to province (Tables 4.2 and 4.3) is illuminating, underscoring the potential importance the minister has in securing and defending departmental allocations.

4.3.3 The Nature of Policy-Making

Obviously the structure of bureaucracies place boundaries on the process of developing, implementing and administering policies. An understanding of governmental organization and budgeting is important for those within and outside the public sector wishing to increase the effectiveness of archaeological resource management. But without an appreciation of how policy is made, attempts by archaeo-apparatchiks, academics, consultants, avocational societies, and the concerned public to exert positive influence are likely to fall short of the mark or be a waste of effort. Therefore, to round out analysis of the relationship between public administration and a.r.m., an introduction to public policy-making is warranted.

First of all, further definition of public policy is required. Unfortunately, this seemingly straight-forward notion becomes extremely complex upon close examination. Dye's (1978) "public policy is what governments choose to do or not to do" seems to best capture the essence of the concept. Dye recognizes that policy is the result of a long series of actions, involving many decisions by various levels of bureaucrats and politicians, together with inputs from the public and special interest
groups. Also acknowledged is the importance of non-decisions. Given the multitude of worthwhile and sometimes conflicting, incoherent, and impossible demands made on government, only a small number can be dealt with. The choice to neglect a problem area and maintain the status quo is a much a policy response as is positive action (Adie and Thomas 1982:89).

There are at least four major theories of public policy (Aucoin 1979), three of which, due to their currency, merit mention (cf., Chandler and Chandler 1979:121-3). The first is the comprehensive rationality theory which presupposes the abilities of a decision-maker to identify and separate a problem from a bundle of similar ones, relate the problem to goals and objectives, analyse all the ways of achieving the goals, predict the consequences of all alternative policy responses, compare the alternatives and their possible outcomes, and make a choice which will best permit reaching the specified goals. Systems analysis, operations research, computer applications and various forecasting methods are frequently marshalled by policy rationalists (Adie and Thomas 1982:97).

Because of the failure of the rational theory to approximate reality, to accommodate the limited time-frames and information available to arrive at decisions, and the mixed, frequently conflicting values bound up in social issues, many argue that disjointed incrementalism is a more appropriate theoretical framework with which to analyse the making of policy. Incremental theory holds that policies are engineered by a "muddling through" process. Accordingly, decision-makers make use of intuition, best guesses, prior experience, and nonsystematic and unstructured analyses to select policy choices from a limited number of slightly or incrementally
different alternatives. This theory suggests that no radical departures from the status quo can be expected, despite any amount of rhetoric, planning and interventions for substantive alterations in course. The policy maker attempts to satisfy present demands and leave open chances to improve a policy after its implementation. The theory does not negate the possibility of major changes in policy, but suggests that such change will occur piecemeal. Support for the theory has been derived from studies of expenditure histories which disclose small increments or decrements to programs over time, rather than sudden large enrichments or cuts (Aucoin 1979; Adie and Thomas 1982:97-9).

Midway between rationalism and incrementalism is mixed scanning, which recognizes the differences in the routine incremental style of decision-making at lower bureaucratic levels and the style possible at higher echelons. In the latter arena, the theory goes, significant policy innovations can take place when decision-makers allocate the necessary effort and resources to scan alternatives using rational techniques. The strength of this approach is it can account for major policy redirections which have occurred due the application of new technology or information, or where existing policies were so fundamentally unsatisfactory that mere incremental changes were unacceptable (Adie and Thomas 1982:100).

In practice, Canadian public policy is realized through the following mechanisms: acts of the legislature, ministerial policy statements, regulations, tax incentives, Crown corporations, departmental practices, and the setting of precedents by ministers and officials. Over the last eight decades, decisional authority has been steadily transferred from the
Legislature to the cabinet and, inexorably, from the cabinet to the bureaucracy. The reason for this is straightforward: social issues and problems have become extremely complex, surpassing the managerial and judgemental abilities of elected officials (Chandler and Chandler 1979:97).

The bureaucracy, comprised of planning units, policy and research groups, regulatory bureaus, review panels, and so on, all staffed with experts of varying degrees, comes by this power honestly: "highly specialized knowledge gathered by large organizations is required to find solutions to current problems" (Adie and Thomas 1982:103). So the increasing technical and social complexity of government accounts for this shift of policy-making ability. What this means is that the average minister, usually at best an enlightened amateur, lacks the time and expertise to cope with the multifaceted concerns of his or her department, constituency, party and government. The bureaucratic support required by a minister is aptly shown by how attacks or inquiries are handled. It is the apparatchik who formulates responses to questions in the House, who writes ministerial letters for signature, who prepares briefing notes, who drafts ministerial speeches and so forth (cf., Brown-John 1981:197). Important to explaining this shift in authority is the fact that politicians are transitory compared to the professional bureaucrats who, given their greater accessibility to special and public interest groups, are able, not only to offer expert technical, administrative and financial advice on policy options, but are able to do so continuously. Moreover, bureaucrats are often key actors in forewarning, negotiating, and legitimising client group acceptance of programs (Chandler and Chandler 1979:114; Richardson and Jordon 1983).
The actual policy-making process has a fair amount of circularity. Bureaucrats generally prepare policies at the behest of their political masters. Affected interest groups are consulted and the results are brought forward to the political level for decision. The bureaucracy then implements the policy. What this leads to, however, is an inability to pinpoint "how and by whom political decisions, i.e., 'authoritative allocation of values for a society,' are actually made" (Gustafsson 1983:272). While this "system" serves to spread the risks of decision-making around, it also can decouple the evolution of policy from the wider democratic process, since, as frequently happens, departments and client groups can coordinate pressure on cabinet to enact policies for which broad societal consensus may be lacking or undemonstrated (Richardson and Jordon 1983).

Acknowledging the need to maintain flexibility in an environment of accelerating social and economic change, cabinets and legislatures tend to "pass general, 'skeletal', legislation and entrust to the bureaucracy the responsibility for filling in the specific content of such legislation through regulations and other forms of subordinate law-making" (Adie and Thomas 1982:104; and see Chandler and Chandler 1979:109). The submergence and diffusion of policy-making authority to the lower tiers of departments and agencies is evident in the powers delegated to the archaeological resource management and numerous other bureaucratic units in Western Canada.

4.3.4 Drawing in the Reins

The delegation of policy-making has significant budgetary ramifications. Supplied with wide powers and vague ministerial guidelines, agencies seek to
maximize their policy-making scopes by interpreting their mandates as broadly as possible. Depending on one's perspective, bureaucratic units also attempt to maximize their budgets and enlarge the demands client groups make of them for the sake of encouraging their own growth; or, more benignly, because their staff genuinely desire to improve services for the betterment of their client groups and society at large (Chandler and Chandler 1979:109). Also at work is the motivation to maintain or enlarge "organization slack": the ability to acquire technological or other innovations, absorb failures and study new ideas before they are needed (Walker and Chaiken 1982). Operational too is the reward system of the civil servant. This consists of stepped increases in remuneration, job security by virtue of accumulated seniority, more supervisory duties, enhanced decision-making abilities, and greater complexity in the work performed. Usually, the only method of career advancement (or, as is increasingly the case today, retention) is to be part of an expanding agency. Aggregated, these factors are generally seen as driving requests for more spending, staffing and rule-making.

Faced with declining revenues and upwardly spiralling deficits, most governments have instituted mechanisms to evaluate and control the myriad programs which proliferated over the 1960s and 1970s. While the use of resource envelopes have placed ceilings on expenditures in various policy areas, there have been concerted attempts to make intra-envelope allocations on the basis of reformational policy analysis systems such as the Planning, Programming, Budgeting Systems (PPBS). PPBS and its rational relatives (e.g., Program Management Information System [PMIS], Management by
Objectives [MBO], and the more distant Zero Based Budgeting [ZBB]), are designed to control fiscal resource appropriations and measure program performance. Although differing in details, most of these systems share the setting of definable problems and objectives; analysis of the objectives and the means to attain them; the phrasing of budgetary requests in terms of programs designed to reach the objectives; a projection of the midrange costs involved; the establishment of annual plans to achieve the objectives; and a monitoring system involving a comparison of program results in relation to progress made towards attaining the objectives in combination with ongoing reassessments of both the objectives and the program. In Saskatchewan, these methods have been intermittently used since the late 1940s (Chandler and Chandler 1979:10/) and currently PMIS is a forward planning instrument of some departments, SCR included.

Because a preferred analytic technique of these systems is benefit-cost analysis (section 4.5.3), measurable objectives and program outputs are required. For a.r.m. administrators and those of many other programs concerned with the provision of intangible public benefits, providing measures and indicators of progress towards achieving program objectives can be very difficult. Speaking as an administrator who has developed five PMIS documents over as many years, I can attest to the vicissitudes. Specifying broad program objectives (e.g., decreasing resource loss, increasing the benefits of appropriate resource uses, and adding to knowledge) is a fairly straightforward exercise. But how can the activities of an a.r.m. program be demonstrated as effectively achieving these? A seemingly simple projection such as the annual number of archaeological projects is
problematic. For example, it is hard to predict, from year to year, the number of development projects which will occur and which will require h.r.i.a.s. Even the number of permit applications, a gross indicator of the level of archaeological conservation and research in a province, cannot be accurately forecasted. For a line regulatory agency with limited abilities to undertake field studies oriented towards the attainment of these objectives, and lacking an accurate estimate of the number of resources within its jurisdiction, let alone the rate of resource loss, it is often impossible to demonstrate a program's success within the framework of a rational planning and evaluation system. Serious despondency can set in when the manager is then required to monetize a program's benefits to a taxweary public.

However, it is precisely these "hard" data which are sought by the policy, planning, and evaluation units attached to the offices of ADMs and DMs. Staffed by Masters of Business Administration (MBAs), Masters of Public Administration (MPAs) and old policy hands these groups undertake ongoing evaluations of departmental programs and liaise with the central agencies of finance departments. Called Budget Bureaus, Bureaus of Management Improvement, and Treasury Board Secretariats, these latter groups, which are independent of any department save their own, function to assess the performance of other ministries. Using interviews, reviews of PPBS or similar plans, and the guidelines imposed by the executive (i.e., the Lieutenant Governor-in-Council comprised of the cabinet and deputy ministers), such central agencies carry out evaluations of the benefits and costs of departmental programs and try to constrain expenditures (Chandler
and Chandler 1979:135). Generally, these agencies are also staffed by metadisciplinary professionals (again, mostly MBAs and MPAs) who have no loyalties to the line departments under investigation, or any deep understanding of the policy fields being scrutinized. The adversarial nature of their inquiries is often barely concealed.

Were it not for the growing realization within public administration that for many programs benefits and costs are not only difficult to distributionally map but defy conventional, short term measurement, the already stressful and tumultuous working environment of the archaeological resource manager would become completely untenable. Surely, if government itself cannot accurately predict its revenues and expenditures over the midrange, how can a line department be expected to accurately plan its programs and forecast its attainment of objectives over a multi-year span. Not to be overlooked either is the frequent failure of cabinet to articulate priorities which are then allowed to filter down through the departments (Chandler and Chandler 1979:107).

The ultimate goal of PPBS and PMIS was to provide a means of relating spending to objectives. Yet, the discovery that not all objectives were quantifiable meant it became impossible to cost out the program activities necessary to achieve them. These difficulties, combined with the high temporal and personnel costs of developing PPBS plans, has caused their decline. Still, PPBS and its analogs compel program managers to become aware of and refine their goals, causing some efficiencies and economies to be realized. At least in Saskatchewan, PMIS continues to be used to hone and justify programs, although as a budgetary tool it has been aborted.
Recognition of the flaws of PPBS and other rational budgetary systems reinforced the cogency of budgetary incrementalism. Throughout the reign of rational systems, incremental expending was more or less operational anyway. Instead of linking spending to program objectives, the goals of incremental budgeting are imprecise and surficial. It is a bottom-up form of fiscal planning, organized according to line items (e.g., temporary and permanent man hours, expendable and nonexpendable equipment and supplies, contracts, rentals, etc.), which, over the course of a fiscal year, can generally be merged and shifted according to managerial and political exigencies. These adjustments take place at the margins of budgets and stabilize expectations. Such a budgetary configuration becomes uncondusive to assessing program performances since it leaves little room for analyses of effectiveness or value for dollars spent (Schick 1983).

But what it does permit is the furtherance of very significant but implicit and unstateable political goals such as re-election. For incremental budgeting accommodates pragmatic choice-making. Accepting that decision-makers do not enjoy the luxury of lengthy and exhaustive deliberations, satisfying the plurality of societal interests requiring financial interventions exceeds the evaluative and forecasting abilities of government. Short-sighted and expedient, incremental budgeting offers a simple, adaptive means to oil the squeaky gears in the policy-making process. Bargaining, compromise, and other ad hoc techniques of the free-wheeling political process are invoked. Less systemic and managerially defensible, incrementalism conforms more closely to political realities than PPBS, PMIS, MBO, ZBB or any other planning and evaluative system. By
default, incrementalism seems the prevalent budgetary methodology, although aspects of rationalism have been retained by most provincial governments (Adie and Thomas 1982:167-8; Chandler and Chandler 1979:127).

This circumstance has its advantages. "The ultimate expression of politics" (Adie and Thomas 1982:142), public budgeting puts in tangible, monetary terms the extent to which society values a public sector program. Incrementalism is congruent with the interests of citizen groups with stakes in the making of public policy. As will be seen, the use of rational policy-making techniques, due to their technocratic underpinnings, can exclude citizen input in policy making. Incrementalism, arguably, predominates for the very reason of citizen involvement in policy decisions.

4.3.5 The Environment of Scarcity: Welcome to the Eighties

Western governments at the national, provincial or municipal levels are facing formidable problems characterised most starkly by high deficits and unemployment. The reasons for this are several. Tarschys (1983:20b) conceives of a "scissors crisis", viz. "a growing divergence of government receipts and outlays" and attributes the malaise to the fundamental failure of the Keynesian welfare state which saw the commingling of political and economic forces leading to governments less concerned with balancing the budget than the economy. Offe (1983) has summarized the pathologies thus: the existence and expansion of social entitlements has made labor extremely expensive and unwilling to adjust to infrastructural changes, and weakened the work ethic; state efforts to smooth out economic crises have subverted the useful functions such perturbations performed in shaking out and reorganizing market forces; and the nonproductive public sector's
proliferation has placed an unsustainable burden on the private sector, which faces scarce sources of capital and tends to postponement investments, assuming the longer its members wait, the more likely government will intervene with incentives such as tax exemptions. Furthermore, entrenched, articulate, sophisticated and powerful interest groups are active on so many fronts defending their policy turfs, governments have little room to innovate or change (Tarschys, 1983).

The creation of governmental agencies in so many fields has led to what some view as an overcrowded policy environment. Hallmarks of this are programs which arose out of a need to respond to one policy area which now stifle and cancel out effects of programs active in other policy fields (Wittrock, 1983). Welfare state governments have traditionally attempted to achieve societal consensus or compromises by relying upon the involvement of (some say excessively) large numbers of interest groups in the development and initiation of policies. A major benefit of these relationships has been to relieve government overload and permit the informal coordination of policy development. But the open invitation to participate in the policy process has caused problems in recognizing which groups have a legitimate argument for access, and determining how and when to close this access. Adding to these difficulties are the emergence of groups supporting non-negotiable issues or positions opposed to those of other groups, and the strain the sheer volume of interventions place on the bureaucratic networks available to handle them. The impedance experienced by some groups trying to penetrate the policymaking system has led to unconventional forms of participation, e.g., protest marches, demonstrations, and terrorism. These
factors have led to reactive rather than proactive forms of bureaucratic problem-solving and the immobilization of government's ability to innovate new solutions (Wittrock 1983: Richardson and Jordon 1983).

This paralysis has widened the gulf between what politicians say and what is in fact possible to do. Now, many politicians must make policy decisions founded on little or no analysis of impacts. Such policies tend to be symbolic in content rather than substantive and often are never intended to be carried out. Any adverse political consequences arising out of unfulfilled expectations or recognized contradictions, it is assumed, can be resolved by incrementalist engineering. For the near-run, symbolic and pseudo-policy-making purchases time and maneuverability. Fields most likely to experience symbolic treatments are those where the effects of a policy will be hard to measure or where the strength and longevity of public or special interest group concern is intermittent or uncertain (Gustafsson 1983). In most provinces the heritage conservation policy area has been accommodated more symbolically than substantively for these very reasons.

Obviously, the continued growth of the public sector, a given of the 1960s and 1970s, is no longer a tenable expectation. Most governments are closing the deficitary gulf by decreasing public outlays. Methods in use include new forms of indexing, various policy restraints and deletions, budgetary decentralization schemes like envelopes, and improved cash management systems. For politicians and public servants alike, the abolishment of jobs and programs is neither easy nor pleasant. Irrespective of the ideological dispositions of the governments they represent, senior bureaucrats and cabinet ministers are expected to defend their departments.
This makes significant changes difficult. It is also hard for central agencies to provide incentives for organizations to cut-back. Too often, coercive methods result in costly and frequently effective departmental defenses which consume temporal and financial resources which could be better deployed in meeting retrenchment objectives (Tarschys 1983). And efforts to increase productivity by contracting programs and services are frequently countervailed by decreases in staff morale and, ultimately, lower productivity. In such an environment the more highly qualified and innovative employees who have the chance are likely to leave public service. Those choosing or forced to remain will suffer professional erosion by cutbacks in travel, conference participation (an acknowledged means of idea-sharing and innovation diffusion) and other means of self-development. The net result is more mediocre standards of performance.

To be sure, public sector budgeting is now mostly decremental, the mirror image of incremental. Most agencies expect and receive less. Budgetary success is now viewed as damage containment rather than program expansion. Contrary to B.C., where some social programs have been abolished outright and across-the-board cuts have been made in almost all others, most provinces are contracting budgets at the margins --- using line items such as salaries, out-of-province travel, vacant positions, etc. Since decrementalism is only in an early phase, it is possible for many programs to absorb losses by eliminating organizational slack. Continued cuts to the budgetary base, however, could weaken some agencies to where they are no longer able to deliver services or defend themselves (Schick 1983).

Fiscal contraction removes most opportunities for program innovation.
Managers attempt to first trim program components which will have no visible impact on the public. Usually this involves eliminating organization slack, that part of a budget available for planning and technological or policy innovations. Walker and Chaiken (1982) contend that the only innovations likely during fiscal contraction will be those which serve to lower costs and increase productivity (although increasing productivity in government agencies is not a straight-forward task [see Balk 1985]).

Upon examination, the redistributitional subtleties of incrementalism will be shown to have caused some agencies to gain (be cut comparatively less or actually receive increases) while others will continue to bear the brunt of retrenchment. To a certain extent, efforts by innovative agency heads can be decisive in maintaining innovations in policy and service delivery, even in a contracting fiscal environment. More crucial yet is the mobilization of concerted, protracted and strategic public pressure to apply leverage on the processes determining which programs win and which lose.

4.3.6 A History of Agency Staffing

During the early years of its development, Western Canadian archaeology lacked a broadly based, large and savvy constituency. Its absence did not affect the four agencies until very recently. As just seen, all enjoyed general increases in fiscal support since inception. This has now changed and, except for the ASA, all faced decremental budgets in fiscal year 1984/85 (Table 4.3). Because the major part of an agency's allocation goes towards salaries, decreases in base budgets translate to decreases in human resources. This, in turn, depresses the traditional job market for graduating students and lowers career mobility for civil servants.
consultants and academics.

Human resource reductions or hiring freezes can dramatically affect small and moderately sized bureaucratic units. When organization slack shrinks or when positions are lost, the ability to make innovative policy or procedural changes is diminished. While large organizations may be able to realign staff functions to meet extant or emerging priorities, this is not possible for agencies comprised of four or five people. Some agencies must adopt conservative and/or diffident approaches to enforcing statutes and regulations. Standards of public and professional service can decline and previously performed functions may disappear altogether.

Viewed over the long term, like budgetary appropriations the pattern of agency staffing across Western Canada has been positive. Table 4.6 and Figure 4.4 depict the history of permanent staffing while Table 4.7 shows that of temporary staffing in the four a.r.m. units. Evident is the preponderant size of the ASA, which employs more professionals on a permanent basis than all other agencies combined. In terms of permanent positions there has been an overall annual growth rate of 21% in B.C., 46% in Alberta, 58% in Saskatchewan and 17% in Manitoba. As regards temporary staffing, B.C.'s percentage decrease cannot be computed but registers an absolute decline. Alternatively, Alberta has experienced a 41% increase, Saskatchewan 17% and Manitoba 41%. Once again, however, these figures obscure more recent, disturbing trends. Between 1981 and the spring of 1985, permanent staffing has remained constant in B.C., and grown by 13% in Alberta, 58% in Saskatchewan and 38% in Manitoba. For the same period, rates of change in temporary staffing have decreased to nothing in
Table 4.6 Number of (A) and Percentage Changes in (B) Permanent Staffing of Western Canadian A.R.M. Agencies

<table>
<thead>
<tr>
<th>Fiscal year</th>
<th>RMD</th>
<th>ASA</th>
<th>ARMS</th>
<th>AD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>1970/1971</td>
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<tr>
<td>1971/1972</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1972/1973</td>
<td>2</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1973/1974</td>
<td>3</td>
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<td>4</td>
<td>50</td>
<td>3</td>
<td>200%</td>
</tr>
<tr>
<td>1975/1976</td>
<td>6</td>
<td>50</td>
<td>3</td>
<td>200%</td>
</tr>
<tr>
<td>1976/1977</td>
<td>6</td>
<td>0</td>
<td>5</td>
<td>67</td>
</tr>
<tr>
<td>1977/1978</td>
<td>7</td>
<td>17</td>
<td>6</td>
<td>20</td>
</tr>
<tr>
<td>1978/1979</td>
<td>8</td>
<td>14</td>
<td>11</td>
<td>83</td>
</tr>
<tr>
<td>1979/1980</td>
<td>8</td>
<td>0</td>
<td>15</td>
<td>36</td>
</tr>
<tr>
<td>1980/1981</td>
<td>9</td>
<td>13</td>
<td>15</td>
<td>0</td>
</tr>
<tr>
<td>1981/1982</td>
<td>9</td>
<td>0</td>
<td>17</td>
<td>13</td>
</tr>
<tr>
<td>1982/1983</td>
<td>9</td>
<td>0</td>
<td>18</td>
<td>6</td>
</tr>
<tr>
<td>1983/1984</td>
<td>9</td>
<td>0</td>
<td>18</td>
<td>0</td>
</tr>
<tr>
<td>1984/1985</td>
<td>9</td>
<td>0</td>
<td>24</td>
<td>33</td>
</tr>
</tbody>
</table>

Mean Change 21% 46% 58% 17%
Change Since 1981 0% 13% 58% 38%

Figure 4.4 Number of Permanent Staff of Western Canadian A.R.M. Agencies
Table 4.7 Number of (A) and Percentage Changes In (B) Temporary Staffing of Western Canadian A.R.M. Agencies

<table>
<thead>
<tr>
<th>Fiscal year</th>
<th>RMD</th>
<th>ASA</th>
<th>ARMS</th>
<th>AD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>1970/1971</td>
<td>6</td>
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<td></td>
<td></td>
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<tr>
<td>1971/1972</td>
<td>10</td>
<td>67</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1972/1973</td>
<td>15</td>
<td>50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1973/1974</td>
<td>40</td>
<td>167</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1974/1975</td>
<td>75</td>
<td>53</td>
<td></td>
<td></td>
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<td>1975/1976</td>
<td>75</td>
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<td>2</td>
<td>1</td>
</tr>
<tr>
<td>1976/1977</td>
<td>80</td>
<td>7</td>
<td>4</td>
<td>100</td>
</tr>
<tr>
<td>1978/1979</td>
<td>50</td>
<td>-25</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>1979/1980</td>
<td>55</td>
<td>10</td>
<td>9</td>
<td>80</td>
</tr>
<tr>
<td>1980/1981</td>
<td>35</td>
<td>-30</td>
<td>7</td>
<td>-22</td>
</tr>
<tr>
<td>1981/1982</td>
<td>7</td>
<td>-80</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>1982/1983</td>
<td>4</td>
<td>-43</td>
<td>8</td>
<td>14</td>
</tr>
<tr>
<td>1983/1984</td>
<td>3</td>
<td>-25</td>
<td>7</td>
<td>-13</td>
</tr>
<tr>
<td>1984/1985</td>
<td>0</td>
<td>*</td>
<td>20</td>
<td>185</td>
</tr>
<tr>
<td>Mean Change</td>
<td>*</td>
<td></td>
<td>41%</td>
<td>17%</td>
</tr>
<tr>
<td>Mean Change 1981</td>
<td>*</td>
<td></td>
<td>47%</td>
<td>17%</td>
</tr>
</tbody>
</table>

* cannot be computed due to 0 values.

B.C. but risen in Alberta by 47%, 17% in Saskatchewan and 41% in Manitoba. Table 4.7 shows the initial effects of the B.C. government's program to reduce its public service.

As of November 30, 1985 there were 21 people employed in administrative, management and primary research positions (Table 4.8) in Western Canadian a.r.m. agencies. Omitted from this list are about 15 individuals who occupy technical support positions. The average rate of personnel turnover is very high: 1980 was the average year in which people assumed their present positions. The educational background of agency staff is fairly parochial.
### Table 4.8 Permanent Professional Staff of Western Canadian A.R.M. Agencies

<table>
<thead>
<tr>
<th>Name of Agency</th>
<th>Name of Individual</th>
<th>Year of Recruitment</th>
<th>Institution of Highest Degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resource Management Division</td>
<td>A. Charlton</td>
<td>1981 (r)</td>
<td>Simon Fraser</td>
</tr>
<tr>
<td></td>
<td>B. Apland</td>
<td>1981 (r)</td>
<td>Simon Fraser</td>
</tr>
<tr>
<td></td>
<td>J. McMurdo</td>
<td>1973</td>
<td>Simon Fraser</td>
</tr>
<tr>
<td></td>
<td>S. Acheson</td>
<td>1976</td>
<td>Victoria</td>
</tr>
<tr>
<td>Archaeological Survey of Alberta</td>
<td>P. Donahue</td>
<td>1981 (r)</td>
<td>Wisconsin</td>
</tr>
<tr>
<td></td>
<td>D. Burley</td>
<td>1982 (r)</td>
<td>Simon Fraser</td>
</tr>
<tr>
<td></td>
<td>G. Ward</td>
<td>1984 (r)</td>
<td>Alberta</td>
</tr>
<tr>
<td></td>
<td>J. Brink</td>
<td>1983</td>
<td>Alberta</td>
</tr>
<tr>
<td></td>
<td>M. Magne</td>
<td>1985 (r)</td>
<td>U.B.C.</td>
</tr>
<tr>
<td></td>
<td>J. Ives</td>
<td>1979</td>
<td>Michigan</td>
</tr>
<tr>
<td></td>
<td>B. Ball</td>
<td>1980</td>
<td>Simon Fraser</td>
</tr>
<tr>
<td></td>
<td>B. Rohnagan</td>
<td>1983 (r)</td>
<td>Calgary</td>
</tr>
<tr>
<td></td>
<td>R. Vickers</td>
<td>1980 (r)</td>
<td>Calgary</td>
</tr>
<tr>
<td></td>
<td>H. Pyszczyk</td>
<td>1984</td>
<td>Simon Fraser</td>
</tr>
<tr>
<td></td>
<td>M. Forsman</td>
<td>1977</td>
<td>Simon Fraser</td>
</tr>
<tr>
<td></td>
<td>B. Vance</td>
<td>1978</td>
<td>Alberta</td>
</tr>
<tr>
<td>Archaeological Resource Management Section</td>
<td>B. Spurling</td>
<td>1980</td>
<td>Simon Fraser</td>
</tr>
<tr>
<td></td>
<td>P. Froese</td>
<td>1981</td>
<td>Michigan</td>
</tr>
<tr>
<td></td>
<td>C. Germann</td>
<td>1981</td>
<td>Simon Fraser</td>
</tr>
<tr>
<td>Archaeological Division</td>
<td>L. Pettipas</td>
<td>1974</td>
<td>Calgary</td>
</tr>
<tr>
<td></td>
<td>G. Dickson</td>
<td>1979</td>
<td>Winnipeg</td>
</tr>
</tbody>
</table>

*Note: *r* = replacement*

Only four people achieved their highest degrees at institutions outside the study area. Simon Fraser University has produced the majority (43%) followed by the Universities of Calgary and Alberta (14% each). There is only one female in a permanent professional position, an embarrassing and alarming social statistic but one not uncommon in archaeology (see Gero 1983, 1985).
4.3.7 Agency Structures

Seemingly by trial and error the four agencies have converged on roughly similar operational models. This involves a functional split between 1) resource management or impact assessment and 2) research or resource inventory and evaluation. In B.C., Alberta and Saskatchewan, staff either review and process proposals for land-altering developments or carry out research or inventory development and management.

This functional division is best understood with reference to the ASA's organizational chart (Donahue 1985:Figure 1). The ASA's Resource Management Section receives development proposals through various referral networks administered either internally or by other government agencies (see section 4.4.1). Proposals are sorted and screened and those judged to have potential adverse impacts are forwarded to the Research Section for detailed evaluation by the regional archaeologist. S/he evaluates the development proposal and generates project specific h.r.i.a. requirements. These are sent to the developer or administering authority under the Assistant Deputy Minister's signature, having passed through the chain of command consisting of the Head of Research and Director. Resultant study reports by consultants are vetted by the regional archaeologist for sufficiency and conformity to permit requirements. Assuming all requirements are met, the proponent is issued clearance to proceed with the development.

The ASA's Resource Management Section is responsible for more than coordinating the receipt and distribution of development proposals. It also manages the provincial resource inventory and negotiates and processes the designation of provincially significant sites —— historic, prehistoric and
palaeontological. Likewise, the Research Section does more than require and review h.r.i.a./m.s. Staff undertake baseline field research within their designated regions or specialities (e.g., paleoecology, historic archaeology), manage artifact collections and associated documentation produced intramurally or by consultants, assist the Historic Sites Service in archaeological site development (e.g., Head-Smashed-In) and carry out policy studies.

The other provincial a.r.m. units have solved the same functional problems, perforce, in more modest ways. Although the basic dichotomy between resource management and resource evaluation is maintained in the other jurisdictions, there are dissimilarities. B.C.'s Resource Management Division, the first to assign regional responsibilities to its professional staff, has since abandoned this approach. Presently, its staff is divided into impact assessment and inventory sections and undertake no field research. Saskatchewan's ARMS is set up in the same fashion and is incapable of carrying out sustained research projects. Manitoba's Archaeology Division has a similar core organization of responsibilities. However, Manitoba has six archaeologists employed on term appointments who are tied to single or continuing projects and who carry out a considerable amount of in-house impact assessment and research.

Because of its size, budget, facilities and professionally motivated staff, the ASA is unquestionably the *ne plus ultra* a.r.m. agency in Western Canada. Housed in a renovated Anglican college on the University of Alberta campus, with state-of-the-art laboratories, offices, equipment and a comparative faunal collection, the ASA has a facility most university
departments would envy. In conjunction with the Historic Sites Service, the ASA operates an interpreted site (Strathcona Science Park) and is developing another (Head-Smashed-In). These expensive public programs surpass the site development and operational abilities of the federal government at the present time (see section 4.4.9). Its in-house publication series numbers over 25 Occasional Papers including annual reports, various thematic research studies, and a new manuscript series introduced in 1985. These series disseminate more research results on Western Canadian archaeology than any other outlet, regional or otherwise. The only other agency currently publishing research results is Manitoba's Historic Resources Branch. And the only remaining series is published by Simon Fraser University. The B.C. Heritage Conservation Branch's Occasional Papers and the SMNH's Pastlog and Anthropological Series have been interrupted by budgetary problems. Finally, staff of the ASA are encouraged to publish and give professional papers (Donahue 1984:3). These capabilities and accomplishments simply cannot be emulated by the other three a.r.m. agencies.

4.3.8 An Inter-agency Performance Appraisal

It can be asked whether the ASA's decided advantages contribute significantly more to the effective management of Alberta's archaeological heritage vis-a-vis the other three agencies' abilities to manage their province's. It is difficult to objectify what constitutes effective management, insofar as, by definition, management implies both control and careful use. In lieu of more precise and consensually determined measures, three data sets will be used to analyse the accomplishments of the four
a.r.m. agencies: 1) the number of development projects reviewed (Table 4.9); 2) the number of permits issued (Table 4.10; Figure 4.5; and 3) the number of resources recorded (Table 4.12; Figure 4.6). None directly address the careful use aspect of management but they do reflect yearly impacts to resources, archaeological activity and additions to the known resource base.

As noted above, all agencies have systems for reviewing land-altering developments. Conditioning a referral network's scope is the number of personnel which can develop and maintain the system(s) and carry out reviews. Whereas the RMD, ARMS, and AD can dedicate one or two staff to reviewing development proposals, the ASA has people assigned exclusively to screen subdivision applications, industrial developments and government proposals. Its referral system is by far the most encompassing. The ASA receives two and a half times as many development proposals as the other agencies combined (Table 4.9). With the exception of Manitoba, all others have registered modest escalations in the number of proposals received since 1981 despite ongoing deregulation and the general economic slowdown.

Table 4.10 displays the number of permits (both research and impact assessment/mitigation) issued annually since the start of permit systems in each province. Since its permit system did not come into effect until well into 1981, the number of applied projects in Saskatchewan has been reconstructed from files and interviews and is substituted in column B. No distinction is drawn between impact assessment and mitigation because this information was not provided by the other agencies. The number of h.r.i.a./m.s was determined by subtracting the number of pure research projects estimated by each agency (Table 4.23) from the total number of

232
Table 4.9 Number of (A), and Percentage Changes in (B) Development Projects Screened or Reviewed Annually

<table>
<thead>
<tr>
<th>Year</th>
<th>RMD A</th>
<th>ASA B</th>
<th>ARMS* A</th>
<th>AD A</th>
<th>AD B</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970/71</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1971/72</td>
<td>5</td>
<td>67%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1972/73</td>
<td>3</td>
<td>-40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1973/74</td>
<td>50</td>
<td>1567</td>
<td>8</td>
<td>10Q</td>
<td></td>
</tr>
<tr>
<td>1974/75</td>
<td>250</td>
<td>400</td>
<td>12</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>1975/76</td>
<td>300</td>
<td>20</td>
<td>25</td>
<td>108</td>
<td>4</td>
</tr>
<tr>
<td>1976/77</td>
<td>400</td>
<td>33</td>
<td>80</td>
<td>220</td>
<td>30</td>
</tr>
<tr>
<td>1977/78</td>
<td>600</td>
<td>50</td>
<td>837</td>
<td>946</td>
<td>50</td>
</tr>
<tr>
<td>1978/79</td>
<td>700</td>
<td>17</td>
<td>3498</td>
<td>318</td>
<td>65</td>
</tr>
<tr>
<td>1979/80</td>
<td>800</td>
<td>14</td>
<td>6723</td>
<td>92</td>
<td>75</td>
</tr>
<tr>
<td>1980/81</td>
<td>1000</td>
<td>25</td>
<td>5800</td>
<td>-14</td>
<td>80</td>
</tr>
<tr>
<td>1981/82</td>
<td>2200</td>
<td>120</td>
<td>5800</td>
<td>0</td>
<td>120</td>
</tr>
<tr>
<td>1982/83</td>
<td>1700</td>
<td>-23</td>
<td>8250</td>
<td>8</td>
<td>135</td>
</tr>
<tr>
<td>1983/84</td>
<td>1400</td>
<td>-18</td>
<td>5100</td>
<td>-18</td>
<td>130</td>
</tr>
<tr>
<td>1984/85</td>
<td>1400</td>
<td>0</td>
<td>8000</td>
<td>57</td>
<td>235</td>
</tr>
</tbody>
</table>

Mean 721 159% 3678 160 92 101% 672 34%

Mean
Percentage Change Since 1981

* Prior to 1980/81 review responsibilities were held by the SMNH

permits issued per year. Table 4.11 presents the percentage change in the number of permits granted as well as those for h.r.i.a./m.s. Over the period in which each permit system has been in effect there has been positive growth in the total number of permits issued in B.C. (1%), Alberta (31%), Saskatchewan (11%) and Manitoba (18%). However, since 1981 this trend has only been maintained in B.C. (5%), Saskatchewan (11%) and Manitoba (5%). Alberta has registered a decline of -13%.
Table 4.10 Number of Permits Issued Annually (A: Total; B: R.R.A./M.)

<table>
<thead>
<tr>
<th></th>
<th>RMD.</th>
<th>ASA</th>
<th>ARMS</th>
<th>AD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>1970/71</td>
<td>0</td>
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<tr>
<td>1971/72</td>
<td>49</td>
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<tr>
<td>1972/73</td>
<td>42</td>
<td>20</td>
<td></td>
<td></td>
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<tr>
<td>1973/74</td>
<td>37</td>
<td>27</td>
<td>12</td>
<td>1</td>
</tr>
<tr>
<td>1974/75</td>
<td>34</td>
<td>24</td>
<td>32</td>
<td>25</td>
</tr>
<tr>
<td>1975/76</td>
<td>22</td>
<td>14</td>
<td>56</td>
<td>45</td>
</tr>
<tr>
<td>1976/77</td>
<td>23</td>
<td>16</td>
<td>81</td>
<td>65</td>
</tr>
<tr>
<td>1977/78</td>
<td>37</td>
<td>33</td>
<td>109</td>
<td>95</td>
</tr>
<tr>
<td>1978/79</td>
<td>29</td>
<td>24</td>
<td>116</td>
<td>103</td>
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<tr>
<td>1979/80</td>
<td>37</td>
<td>32</td>
<td>210</td>
<td>196</td>
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<td>1980/81</td>
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<td>202</td>
<td>192</td>
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<tr>
<td>1981/82</td>
<td>38</td>
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<td>213</td>
<td>202</td>
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<td>1982/83</td>
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<td>155</td>
<td>139</td>
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<td>1983/84</td>
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<td>33</td>
<td>114</td>
<td>98</td>
</tr>
<tr>
<td>1984/85</td>
<td>39</td>
<td>25</td>
<td>98</td>
<td>86</td>
</tr>
</tbody>
</table>

* permit system started midway through 1981/82

Figure 4.5 Number of Permits Issued by A.R.M. Agencies

![ Permit System Chart ]
Table 4.11 Percentage Change in Number of Permits Issued Annually (A: Total; B: H.R.I.A./M.)

<table>
<thead>
<tr>
<th>Year</th>
<th>RMD A</th>
<th>RMD B</th>
<th>ASA A</th>
<th>ASA B</th>
<th>ARMS A</th>
<th>ARMS B</th>
<th>AD A</th>
<th>AD B</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970/71</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1971/72</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1972/73</td>
<td>-14%</td>
<td>-17%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1973/74</td>
<td>-12</td>
<td>35</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1974/75</td>
<td>-8</td>
<td>-11</td>
<td>167%</td>
<td>2400%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1975/76</td>
<td>-35</td>
<td>-42</td>
<td>75</td>
<td>80</td>
<td>180%</td>
<td>317%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1976/77</td>
<td>5</td>
<td>14</td>
<td>45</td>
<td>44</td>
<td>250%</td>
<td>-43</td>
<td>-44</td>
<td></td>
</tr>
<tr>
<td>1977/78</td>
<td>62</td>
<td>106</td>
<td>35</td>
<td>46</td>
<td>43</td>
<td>19</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>1979/80</td>
<td>28</td>
<td>33</td>
<td>81</td>
<td>90</td>
<td>-67</td>
<td>31</td>
<td>-9</td>
<td></td>
</tr>
<tr>
<td>1980/81</td>
<td>-5</td>
<td>-6</td>
<td>-4</td>
<td>-2</td>
<td>480</td>
<td>6</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>1981/82</td>
<td>9</td>
<td>13</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>-6</td>
<td>-8</td>
<td></td>
</tr>
<tr>
<td>1983/84</td>
<td>36</td>
<td>14</td>
<td>-26</td>
<td>-29</td>
<td>-43%</td>
<td>-71</td>
<td>28</td>
<td>81</td>
</tr>
<tr>
<td>1984/85</td>
<td>-13</td>
<td>-24</td>
<td>-14</td>
<td>-12</td>
<td>65</td>
<td>91</td>
<td>-9</td>
<td>-14</td>
</tr>
</tbody>
</table>

Mean 1% 6% 31% 23% 11% 90% 18% 38%

Mean Since 1981 5% -3% -13% -17% 11% 13% 5% 25%

* Because of its magnitude this increase has been excluded from the computation of the mean of the series for Alberta.

The number of h.r.i.a./m. projects/year have risen over the long run in all jurisdictions but, since 1981, have begun to decrease in two of them. In Alberta and British Columbia there have been negative rates of growth. And in Alberta the drop in the rate of increase of h.r.i.a./m. projects is greater than the overall drop in the rate of increase for the total number of permits. That is, since 1981 the number of impact assessment and mitigation studies has shrunk proportionately faster than the number of archaeological projects in general.
From a resource management standpoint, a measurable outcome of both the review of development projects and the number of archaeological projects (either research or h.r.i.a./m.) is the number of resources annually entered into the provincial inventories. Increases to archaeological knowledge gained through research or mitigatory programs, while indisputably the paramount outcome of regulatory activities, defies conventional means of quantification; otherwise it could be used to compare the relative effectivenss of the four agencies. Up to fiscal year 1984/85, the four a.r.m. agencies had records for the following number of archaeological resources: 1) B.C. - 16,165; 2) Alberta - 16,647; 3) Saskatchewan - 6,875; and 4) Manitoba - 2,699. Table 4.12 and Figure 4.6 depict the growth in archaeological resources recorded since 1970.

Viewed over the entire time series, the ASA has the highest rate of inventory development (1012 resources/year; 106% increase/year) while the B.C. Resource Management Division has the second highest actual number of resources recorded annually (872 resources/year). However, both Manitoba (142%) and Saskatchewan (50%) register a higher mean annual growth rate than B.C. (45%). After 1981 the rates of escalation show a different picture. B.C.'s rate of inventory growth is reduced to 13%, Alberta's to 20%, Saskatchewan's to 48% and Manitoba's to 3%.

Having presented these data on management activities it is appropriate to ask the following questions bearing on each agency's performance:

1. What sort of relationship is there between the number of development proposals reviewed by an agency and the number of impact assessments or mitigations required by the agency?
Table 4.12 Number of (A) and Percentage Change (b) in Archaeological Resources Recorded Annually

<table>
<thead>
<tr>
<th></th>
<th>RMD</th>
<th>ASA</th>
<th>ARMS*</th>
<th>AD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>1970/71</td>
<td>250</td>
<td></td>
<td>35</td>
<td>120</td>
</tr>
<tr>
<td>1971/72</td>
<td>2000</td>
<td>700%</td>
<td>130</td>
<td>271%</td>
</tr>
<tr>
<td>1972/73</td>
<td>1500</td>
<td>-25</td>
<td>200</td>
<td>54</td>
</tr>
<tr>
<td>1973/74</td>
<td>1650</td>
<td>10</td>
<td>5494**</td>
<td>335</td>
</tr>
<tr>
<td>1974/75</td>
<td>1200</td>
<td>-27</td>
<td>227</td>
<td>505</td>
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<tr>
<td>1975/76</td>
<td>850</td>
<td>-29</td>
<td>1739</td>
<td>866%</td>
</tr>
<tr>
<td>1976/77</td>
<td>900</td>
<td>-6</td>
<td>1382</td>
<td>-21</td>
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<tr>
<td>1977/78</td>
<td>750</td>
<td>-17</td>
<td>469</td>
<td>-66</td>
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<tr>
<td>1978/79</td>
<td>650</td>
<td>-13</td>
<td>937</td>
<td>100</td>
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<tr>
<td>1979/80</td>
<td>500</td>
<td>-23</td>
<td>845</td>
<td>-10</td>
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<tr>
<td>1980/81</td>
<td>450</td>
<td>-10</td>
<td>1083</td>
<td>28</td>
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<tr>
<td>1981/82</td>
<td>422</td>
<td>-6</td>
<td>1303</td>
<td>20</td>
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<tr>
<td>1982/83</td>
<td>886</td>
<td>110</td>
<td>1111</td>
<td>-15</td>
</tr>
<tr>
<td>1983/84</td>
<td>599</td>
<td>-32</td>
<td>645</td>
<td>-42</td>
</tr>
<tr>
<td>1984/85</td>
<td>478</td>
<td>-20</td>
<td>1389</td>
<td>115</td>
</tr>
<tr>
<td>Mean</td>
<td>872</td>
<td>45%</td>
<td>1012</td>
<td>106%</td>
</tr>
<tr>
<td>Mean Since 1981</td>
<td>596</td>
<td>13%</td>
<td>1112</td>
<td>20%</td>
</tr>
</tbody>
</table>

* prior to 1982 the Saskatchewan inventory of archaeological resources was managed by the SMNH.

** consolidation of site inventories of various provincial institutions; excluded from computation of percentage increases.

2. What is the relationship between the number of development proposals screened and the number of resources recorded annually?

3. What is the relationship between the level of general archaeological activity (pure research plus h.r.i.a./m.) and the number of resources recorded annually?

4. And finally, what is the relationship between the number of impact...
To address these questions the non-percentage values presented in Tables 4.10 to 4.12 were analysed using the SIMREG (simple regression) subroutine provided on the diskette developed by Wolfe and Koelling (1983). The results of 15 analyses are provided in Table 4.13.

As regards the first question, there are moderately high correlation coefficients between the number of development proposals screened and h.r.i.a./m.s required by the RMD, ASA and ARMS. The Manitoba agency shows a weak negative relationship, which may be explained by its comparatively
inferior legislative mandate over the period in question. These statistics merely imply that, for the three westernmost agencies, the number of developments subject to review are correlated with the number of impact assessments or mitigation projects.

Interestingly, the number of development proposals reviewed are negatively correlated with the number of resources recorded per year in B.C. B.C.'s moderate negative correlation coefficient is probably due to ASAB's heavy investment in regional survey in the early 1970s, a stronger commitment to provincial research by the academic community and the fact the province has hosted several large-scale impact assessments. The Peace Site C and Hat Creek h.r.i.a.s, for example, resulted in the recording of hundreds of sites but only required one proposal review each. The indifferent correlation coefficient produced by the Alberta data cannot be accounted for in the same ways. Rather, the implication may be that many of the development reviews and resultant h.r.i.a.s have yielded negative survey results. Moderately and highly positive correlation coefficients were forthcoming for Saskatchewan and Manitoba, respectively. Since neither province hosts particularly active research communities these values perhaps point to a fairly effective approach to industry regulation insofar as the discovery of resources is fairly strongly correlated with the reviewing of development proposals.

While all provinces for which data are available show positive correlation coefficients when the total number of permits issued are regressed against the number of resources recorded, no strong relationships are evident. Since permits are issued for various types of research and
Table 4.13 Correlation Coefficients Computed by Simple Regression of Data Arrayed in Tables 4.10, 4.11 and 4.12

<table>
<thead>
<tr>
<th>Regression (Independent by Dependant Variable)</th>
<th>Correlation Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-RMD</td>
</tr>
<tr>
<td>Developments Screened by H.R.I.A./M.s</td>
<td>.60</td>
</tr>
<tr>
<td>Developments Screened by Resources Recorded</td>
<td>-.56</td>
</tr>
<tr>
<td>Total Permits Issued by Resources Recorded</td>
<td>.46</td>
</tr>
<tr>
<td>Total H.R.I.A./M.s by Resources Recorded</td>
<td>-.37</td>
</tr>
</tbody>
</table>

* insufficient data due to introduction of permit system in 1981/82.

resource management studies which include site survey and excavation, these weak correlations are not unexpected.

To an extent, the number of site impact mitigations carried out under permit may also be influencing the results of the analysis of the fourth question, i.e., the relationship between the number of h.r.i.a./m.s and the number of resources annually recorded. The B.C. and Alberta data produce a negative and small positive correlation coefficients, respectively, from this regression. At any point in time, both provinces have had comparatively large inventories and correspondingly greater resource management responsibilities. Historically, B.C. and Alberta experience a higher rate of economic development than their eastern neighbours. Thus, regulated land developments come into conflict with recorded resources more frequently and, consequently, site mitigations account for a greater
percentage of h.r.i.a./m. permits than in Saskatchewan or Manitoba. These factors plus the survey efforts of the academic community and the ASAB are probably responsible for the negative correlation between recorded resources and the number of h.r.i.a./m.s in B.C. As mentioned above, Alberta does not have the same level of academic activity as B.C. and the removal of this source of inventory data may account for the positive but very low correlation coefficient (Table 4.13). Saskatchewan and Manitoba, in comparison, both show higher correlation coefficients between the number of h.r.i.a./m.s per year and the number of resources recorded annually.

There are numerous uncertainties built into these four analyses. For example, the tabularized data are mostly estimates; distinctions between survey and excavation (test or otherwise) cannot be drawn; and some agencies issue single, blanket permits to cover several small-scale surveys, while some large projects receive a single permit to conduct intensive surveys, impact assessments and mitigations. These and other more subtle factors compromise and reduce the sturdiness of the tabled correlation coefficients. Nonetheless, the basic relationships of the regression analyses probably approximate reality.

From this interagency comparison it emerges that the fiscal and staffing advantages do not always result in more effective resource management. For instance, although the ASA may be capable of reviewing a great many development proposals and subsequently is in a position to require a correspondingly large number of h.r.i.a.s, greater control and more effective use of the resource base do not necessarily follow. Above it was suggested that a major reason for the low correlation coefficient produced
by the regression of impact assessments or mitigations with the number of resources located was due to the high incidence of mitigation studies (which would result in few additions to the Alberta inventory). Yet this is not the whole story. Take the number of subdivision proposals screened in fiscal year 1983/84 by the ASA --- 2300 (Donahue 1984:6). Of these, 14 are reported as being subjected to impact assessments resulting in 9 recorded resources, the majority of which were isolated finds (Prager 1983). In fact, 86% (12/14) of the 1983 and 77% (17/22) of the 1982 subdivision proposals imposed with h.r.i.a. requirements yielded either no, or insignificant, heritage resources. The frequency of negative h.r.i.a. results associated with other developments (e.g., gas well sites, small pipelines, etc.) reported in the ASA's annual report abstracts also significantly depressed the value of the correlation coefficient produced by the regression of such studies against recorded resources. The higher correlation coefficients forthcoming from the same analyses for Saskatchewan and Manitoba reflect their agencies' greater caution in requiring impact assessments. This caution, while enforced by legislative and political agendas, appears to result in a more effective management efforts.

4.3.9 Some Fundamental Resource Management Problems

More fundamental problems affect archaeological resource management than the match of regulatory requirements and simple outputs like the number of resources annually entered into a provincial inventory. One concerns the reliability of the provincial inventories themselves. An unknown but relatively large percentage of the sites recorded prior to the promulgation of heritage legislation and the establishment of regulatory agencies either
cannot be relocated or no longer exist. Recording standards during the early years of Western Canadian archaeology left much to be desired from the standpoint of current management needs. Numerous site forms completed during the 1950s and 1960s lack maps, legal property descriptions, and as-found artifactual data. Sometimes this information was purposely suppressed by researchers; in other cases, resources reported by private citizens or avocationalists were never verified by qualified personnel. Since no agency has had the ability to systematically monitor all its recorded resources, an untold number have been subsequently lost due to natural erosion and unregulated landsurface disturbances (e.g., agriculture, rural roads, pothunting, etc.). Exacerbating provincial inventory unreliability is the h.r.i.a. process itself. By far the majority of site surveys undertaken nowadays are associated with land-altering developments. What this means is that most resources entering provincial inventories are destroyed or disturbed shortly after their discovery and recording.

In summary, provincial inventories comprise a mix of poorly or imprecisely described sites together with an increasing and probably larger number of well recorded ones. Unfortunately, an unknown but probably significant percentage of the recorded resources no longer exist. Despite their inherent uncertainties, provincial inventories remain the basic management and decisional tools of every a.r.m. agency. As a rough and ready instrument for most short-term management and planning, the inventories suffice. Purging their uncertainties would require considerable enhancements to agency budgets. Such remain remote possibilities, at least in the present decade.
Unfortunately, the lack of robust and comprehensive inventories compromises the longer term efforts of heritage resource conservation. There are four fundamental problem areas which are more or less shared by all four agencies. No a.r.m. program has: 1) confident estimates of the number or types of resources within its jurisdiction; 2) control over the number of resources disturbed or destroyed per year; 3) estimates of either the extinction horizon for its total resource base or for specific site classes; and 4) a reliable and representative sample of resources preserved either in situ via designation procedures or ex post facto through excavation and perpetual institutional curation of recovered artifacts and records.

The first three of these desiderata form a cascading chain of compounded uncertainties. Lacking a reliable census of archaeological sites, most resource management decisions become strictly judgemental ones. Without such data triage decisions (R. Thompson 1982) to conserve a resource at all costs, conserve it if possible, or allow it to be written-off are arbitrary. If the number of total resources is unknown, a decision to preserve a site is as defensible as a decision to allow the same site to be destroyed. On the one hand, the absence of this basic information can foster an overzealous approach to resource conservation, wherein every threatened resource is treated as if it was the last of its kind (which, in some cases, may well be true). On the other, prodigal management practices may result founded on the assumption that similar or identical sites remain in quantity (which may also be true).

Three agencies have heroically estimated the number of resources within their jurisdictions. Survey data provided Donahue and Spurling (n.d.)
produced these approximations of the number of sites per province: Alberta - 4.4 million; Saskatchewan - 150 000; and Manitoba - 200 000. The B.C. RMD declined to approximate the provincial resource base. The Saskatchewan estimate is based on a sample survey undertaken by the SMNH, the reliability of which cannot be evaluated since the field and computational methods have yet to be revealed. It is even less clear as to how the forecasts for Alberta and Manitoba were arrived at or why Alberta should contain a resource base 29 times the size of Saskatchewan's and 22 times larger than Manitoba's. What is evident from comparing these estimates is the high degree of doubt characterizing all of them.

Because no agency has a firm idea of the number of resources within its jurisdiction, it is extremely difficult, if not impossible, to ascertain the rate of resource loss or disturbance. The ASA has recently produced two conflicting parameters. Donahue (1982c:256) has suggested that 5200 sites may have been extirpated per year between 1974 and 1982. However, our agency survey (Donahue and Spurling n.d.) produced an estimate of 16 000 sites destroyed annually in Alberta. Since the estimation procedures for both figures are unknown, there is no basis for choosing between them or assessing their relative precision. Wisely perhaps, the other three agencies declined to propose resource loss rates.

Without controlling for this vital statistic, there is no way of rationally determining an agency's effectiveness. How can one tell if an agency's efforts are significantly contributing to resource conservation? If more fiscal support and staffing is required and, if so, how much more? If stricter legislation is needed? If the agency's objectives need resetting?
Such questions are empirically unanswerable without information on the amplitude of resource loss.

From this desideratum it follows that the time at which archaeological resources will be essentially extinct cannot be determined for B.C., Saskatchewan or Manitoba. Uncautiously accepting its projected resource base, using the two loss rates and assuming both remain stable, would mean Alberta's archaeological resources will be exhausted some time between A.D. 2257 and A.D. 2828. Pursuing this further, should the grand mean of 1012 sites recorded per year (Table 4.12) be sustainable, 291 911 resources would be recorded in Alberta by A.D. 2257, ca. 7% of the estimated resource base. If the slower loss value obtains, 869 763 sites (20%) would be documented by A.D. 2828. Even at the slightly higher recording rate prevailing since 1981 (i.e., 1112 sites/yr), by A.D. 2257 only 319 111 (7% of the estimated resource base) would be documented and by A.D. 2828 only 954 063 sites (22%) would be inventoried in Alberta. Indeed, in the absence of any resource losses at all it would not be until A.D. 5927 (at the average recording rate since 1981) or A.D. 6316 (at the overall average recording rate) that all archaeological resources in the projected data base would have been discovered. By the same token, all Saskatchewan resources would be located between A.D. 2239 and 2402 and all Manitoba's between A.D. 2882 and 3812.

However, it is very unlikely the resource recording amplitudes of Table 4.12 could be maintained very far into the future. Most accessible and obtrusive resources will soon, or may already, be documented. Accelerating resource destruction by natural and unmonitored cultural factors should also be presumed. As discovery problems and resource decay rates escalate, fewer
resources will enter provincial inventories. Thus, the number of resources recorded annually should fall to rates well below those of the past decade.

Although equally unsupported by empirical investigation or sophisticated modeling, extinction horizons of between A.D. 2125 and 2150 are probably more realistic for Western Canada. These projections are intuitively derived but take into consideration the pace at which land development has accelerated since WW II (see sections 2.2 and 2.3). Table 4.14 shows the number of resources which could be recorded in each province at current rates of inventory development at the two centenary quartiles. For the reasons just discussed, these estimates are extremely optimistic.

Deriving an estimate for the extinction horizon is crucial for non-renewable resource management insofar as available management techniques can only seek to control the rate at which the resource diminishes; there is no way of preventing the eventual loss of all but a few in situ resources short of a total, and improbable reorientation of the economic system. Yet, by gaining and then exercising this control, the extinction horizon can at least be deferred as long as possible. To prolong this delay the need and urgency of doing so has to be demonstrated. And this leads us back to the problem of determining the rate of resource loss, for without this statistic there is no way of establishing the date of extinction. Extending the life span of the resource base will require mobilizing the concern of government and the various sectors of society discussed in section 4.4 who can influence government to take action. A far more convincing justification for this concern can be mounted if a true crisis is shown to exist.
Table 4.14 Optimistic Estimates of Recorded Resources in Provincial Inventories By A.D. 2025 and A.D. 2050

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<thead>
<tr>
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<th>A.D. 2025</th>
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<th>A.D. 2050</th>
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<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>B.C.</td>
<td>51,917</td>
<td>(4%)</td>
<td>73,717</td>
<td>55,501</td>
</tr>
<tr>
<td>Alberta</td>
<td>58,139</td>
<td>(1%)</td>
<td>83,439</td>
<td>(2%)</td>
</tr>
<tr>
<td>Saskatchewan</td>
<td>20,938</td>
<td>(14%)</td>
<td>29,999</td>
<td>(20%)</td>
</tr>
<tr>
<td>Manitoba</td>
<td>7,127</td>
<td>(4%)</td>
<td>9,827</td>
<td>(5%)</td>
</tr>
</tbody>
</table>

A: growth based on overall average rate of resources recorded per year
B: growth based on rate since 1981 (Table 4.12)

percentages refer to percentage of estimated resource base; * B.C. estimate not available

To this point the concept of resource extinction has been used without qualification. Let it suffice to say that the complete and ultimate extirpation of archaeological resources in any jurisdiction is unlikely. Rather, the ability to undertake research into many contemporary topics, such as regional settlement systems and intersite social and economic relationships, will be precluded. Probable, too, is the exhaustion of opportunities to investigate the prehistory of major physiographic areas, e.g., the Pacific Coast, the major drainage systems and all those parts of the study area with agricultural capability. Ongoing erosion and stepped increases in land use will surely destroy most sites in these situations. To be sure, sites which have been capped will remain under highways, parking lots, and various urban and rural developments above grade. Relict resources will also occur under reservoirs and impoundments. Also, isolated sites will survive in deeply buried contexts throughout the study area and
the remoter recesses of the Canadian Shield and montane areas. How useful these residuary samples will be for addressing future archaeological problems cannot be forecast. Those resources intentionally and properly covered by fill, overburden, asphalt, etc. may prove to be exceedingly valuable to future generations (Chace 1983). On the other hand, the array of impacts to which inundated sites are subject may greatly restrict the type of research feasible on those resources located in reservoirs (Lenihan et al. 1981). Rare and randomly distributed sites will be fortuitously found in deep excavations or high latitude/altitude areas, although the special constraints on preservation attached to the latter resource types will surely condition the scope of future studies as they do today’s. Thus extinction as applied to a future state of Western Canada’s archaeological resource base should be regarded as a facultative extinction, an accelerating narrowing of investigative possibilities and opportunities. Not only will research be physically limited by the quantity and quality of the remaining resource base, but increasingly stringent legal and ethical proscriptions will also be in play, further restricting field studies.

Yet the resource base is decaying at an unknown and essentially uncontrolled rate. Realising this, the question arises as to what legacy a responsible and forward-looking social science should strive to leave its successor? Quite clearly, the h.r.i.a./m. process does not guarantee a representative archaeological futurity, either in the ground or in the museum. More and more, resources are excavated, physically protected or avoided on the basis of engineering, economic and political exigencies; not due to considerations of achieving temporal, spatial and cultural
representivity. Likewise, problem-oriented research does not contribute to the conservation of a representative sample of in situ or curated archaeological resources. Accepting Dunnell's (1984a) insight that pure research systematically biases the surviving archaeological record, problem-oriented approaches may work against resource preservation.

In their wisdom, those who drafted the heritage legislations of the four western provinces provided instruments by which the concerned public, different levels of government, and the profession can attempt to bequeath the future a small sample of archaeological resources. All statutes provide for a form of site designation, whereby a province or municipality is invested with the power to identify, recognize, preserve, develop and control alterations to and future dispositions of real property exhibiting heritage significance. Having roughly the same objectives as the American National Register of Historic Places (section 3.4.2), the site designation process permits the banking and enhancement of important historic and prehistoric sites for the use, enlightenment and enjoyment of future generations.

The ways in which the provinces and municipalities are authorized to designate properties vary from jurisdiction to jurisdiction. The main features of the procedures are as follows. The Lieutenant-Governor-in-Council in B.C., and the responsible ministers in Alberta, Saskatchewan and Manitoba may provincially designate heritage resources when it is deemed in the public interest to do so. Candidates for designation are usually intially selected by heritage conservation units, sometimes on the suggestion of the public or profession. Following background historical,
architectural, scientific and/or legal research, the sites are then brought to the attention of the provincial heritage advisory boards in Alberta and Saskatchewan, which, in turn, make recommendations to the responsible minister for decision. Appointed boards in Alberta and Saskatchewan are authorized to hear appeals of designation and recommend repeals or ameliorative measures. Owners of provincially designated sites, buildings, lands, structures and so on are eligible for compensation in B.C. and Alberta if it is deemed their property value has been depreciated. Section 75 of Saskatchewan's HPA, however, explicitly refuses to recognize depreciation as an effect of designation, whether or not this is in reality the case. Grant monies and/or tax reliefs are available to assist owners to rehabilitate, stabilize or otherwise enhance or conserve designated sites.

Whereas the provincial designation process is designed to facilitate the conservation or recognition of provincially significant properties, municipal designation provides for the similar treatment of regionally and locally important sites. In all western provinces municipal councils are empowered to designate such properties as occur in their jurisdiction. Appeal procedures have been established so that parties objecting to municipal designation can be heard. Statutory provisions for compensation, grants-in-aid and tax incentives are also in effect (although, as in the case of provincial designation, the HPA does not explicitly provide for compensation).

Designation procedures provide both the public and profession with legal means to protect and preserve archaeological resources either at the provincial or municipal level. Compared to other actors in the heritage
conservation movement, archaeology's special interest groups have been slow to use designation as a preservation tool. Table 4.15 exhibits the post-1970 pattern of archaeological resource designations or protections across Western Canada. Not shown are designations or protections prior to 1970. Consequently, an additional 18 designated sites in B.C. and 16 in Saskatchewan are excluded from Table 4.15.

The number of heritage property designations in any single province consist largely of historic structures and sites. Historic places are more obtrusive and easier to identify. They can be photographed, walked through, and visually and intellectually appreciated with a minimum of visitor effort. An understandable story - a famous person's life, a battle, an ethnic event, the development of a business - is usually attached to a historic site. Older building stock lends character and enforces a human scale to urban streetscapes. The historic built environment is part of community fabric. Renovated and restored, such structures can continue their original functions or serve new ones with considerable cost-effectiveness compared to new construction. For these psychological, social and economic reasons, the historic preservation movement, which encompasses well organized and funded organizations like Heritage Canada along with local community committees, has been very successful in pressing governments to designate and conserve historic resources. No wonder the majority of heritage designations are undertaken to preserve and commemorate historic resources.

Given the very nature of the resource base, and the isolationism pervading much professional activity in the last two decades, the special interest groups involved in archaeological preservation have been
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<th>ASA</th>
<th>ARMS</th>
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<td>0</td>
<td>-</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>1971/72</td>
<td>0</td>
<td>1</td>
<td>2</td>
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</tr>
<tr>
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<td>2</td>
<td>1</td>
<td>1</td>
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<td>1</td>
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<tr>
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<td>1984/85</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Mean/yr</td>
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<td>1.5</td>
<td>.6</td>
<td>.67</td>
</tr>
<tr>
<td>Total</td>
<td>7</td>
<td>18</td>
<td>9</td>
<td>10</td>
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comparatively less successful in effecting in situ resource retention.

Because of its preponderant membership and polito-economic clout, there is much to recommend, as King et al. (1977) have done, a sincere integration of historic preservation concerns with archaeological ones. Provincial governments recognize the cognate relationship between the two policy areas: single pieces of legislation cover the conservation of both prehistoric and historic resources, and are administered by heritage conservation bureaucracies comprised of archaeologists, architects and historians. Unfortunately, the essential similarity of the two policy areas remain under-recognized by archaeology's special interest groups. Many gains could eventuate by a greater appreciation of the similarities between the two
efforts and an increased effort to bring the two closer together.

How powerful a preservation tool is designation? Theoretically, it provides direct and permanent control over anthropogenic alterations to a resource. Yet, without a form of on-site security or periodic monitoring, the effects can be very hollow. For example, vandalism may continue unchecked. Neither does statutory protection insure security from natural disturbances. Consequently, all of the western provinces have designated or protected resources which, subsequently, have been degraded. On a site by site basis, designation alone does not guarantee comprehensive resource protection.

Another difficulty is that, as presently constituted, designation is ineffective in preserving a representative sample of resources. While provinces have developed criteria for guiding the selection of provincially significant resources for designation, the criteria are, perforce, imprecise and capable of admitting a wide array of sites. But since designations can be made for a variety of scientific, social, economic and political reasons, and ultimately involve political decisions, considerable scope remains for non-rational and unrepresentative site designations. The discipline partially introduces bias by supporting the choice of sites excavated by senior researchers. Useful as "witness" areas (O'Keefe and Prott 1984:262) and serving to preserve the remainder of usually important sites, resource designations made on the basis of a site's association with one of archaeology's pioneers does not necessarily ensure the selected site is representative of a province's resource base.

What is required is a more systematic and orderly method for designation
decisions. Provincial preservation plans are needed in which all known and conceivable classes of archaeological resources are identified according to hierarchically ordered chronological, economic, technological, ideological, ethnic and geographical variables. Quotas could be developed for each major class with managerial attempts made to slot the most suitable sites into these. Newly discovered resources or those for which more information becomes available would be appraised against the plan's criteria and the number of available slots remaining in their class. Selected sites could then be brought forward to the political level for designation. Such a plan would not be static; adjustments would be made in response to research advances, the diminution of the resource base and the overriding need to acquire a qualitatively and quantitatively representative sample of the archaeological resources within a jurisdiction. A significant advantage of this planning instrument is its potential to deflect designations motivated strictly by economic or political considerations.

Despite the obvious benefits of such a plan, only Alberta has developed such a device (Alberta Culture n.d.). The extent to which is currently employed in heritage preservation decisions is problematic. Thus, it is not known how well the plan works. Alberta though has taken the initial steps in a very important process: the classification, identification and long-term preservation of representative sites by rational procedures.

Far less than half a percent of the known resources of Western Canada have been designated. Few efforts are being made in or out of government circles to meaningfully increase this amount. This must change else a.r.m. continues as a haphazard albeit scientific destruction of the resource base.
4.4 THE OTHER PLAYERS

4.4.1 The Other Regulatory Agencies and E.I.A.

Seen in a pan-government context, the four Western Canadian a.r.m. agencies are but small components of a matrix of regulatory decision-making processes governing land use and economic development within a provincial jurisdiction. Both vertical (intradepartmental) and horizontal (interdepartmental) linkages bind the bureaucratic organizations making up this network. The a.r.m. agency positions in the vertical dimension have been discussed in section 4.3.2. Presented here are the formal administrative relationships operating between the archaeological agencies and other regulatory bodies, especially those attached to departments which condition the h.r.i.a./m. process.

A number of line agencies participate to varying degrees in heritage resource management. These include regulatory units attached to provincial Departments of Environment (DOEs) and Special Committees of Cabinet which administer statutes, regulations and policies concerned with environmental assessment and protection. To a lesser and mostly latent extent the Attorney-Generals or Justice Departments which develop, interpret and enforce provincial legislation are also involved. Considered part of the judicial bureaucracy are law enforcement agencies such as the R.C.M. Police. Up to the point of writing, the judiciary has had a relatively minor role in a.r.m. Only in B.C. have charges been laid and a court case convened over damages caused to archaeological resources. Attorney-Generals Departments have essentially served consultative roles. Finally, there are the various planning authorities created by and tied to local and municipal governments.
These bodies become intermittently engaged in archaeological management issues through their licensing, permitting and zoning authority. Left to section 4.5.4 are the arms-length Boards of Inquiry, Utility Commissions, etc., established on an ad hoc basis to study and make recommendations on specific development proposals, policy areas and rate increases. Having mentioned these other participants in a.r.m., this section will concentrate on those responsible for coordinating and implementing environmental impact assessment (e.i.a.).

DOEs and Special Cabinet Committees become involved in a.r.m. through the environmental impact assessment process. E.i.a.

"refers to a process or set of activities designed to contribute pertinent environmental information to project or programme decision-making. In doing so it attempts to predict or measure the environmental effects of specific human activities or do both, and to investigate and propose means of ameliorating those effects" (Beanlands and Duinker 1983:18).

All western provinces have e.i.a. systems which usually include, as one component, consideration and amelioration of land development impacts on archaeological resources. Indeed, the reticulated e.i.a. procedure provides the chief interface between environmental and archaeological regulators. While B.C., Alberta, Saskatchewan and Manitoba have evolved roughly similar operational methods for e.i.a., legal and institutional foundations vary as do preparation and presentation formats (Rydant 1984). Specific environmental assessment acts have only been passed by Saskatchewan (in 1980) and B.C. (in 1981). Prior
to these promulgations, e.i.a.s were mandated by general existing statutes, policies or guidelines. Such is the case today in Manitoba and Alberta which lack separate statutory authorization. E.i.a. in these provinces relies on generic legislation or policy directives (Couch 1983:5).

In brief and much simplified form, the e.i.a. procedure can be seen as comprising the following principles and steps. A proponent wishing to undertake a development project which affects the biophysical, social or economic environment (e.g., a mine, major highway, hydroelectric facility) is required to initiate an environmental assessment of their activities. The proponent's first step is to submit a development proposal to the lead coordinating and regulatory agency, usually an assessment/planning branch or division attached to a provincial DOE. Since, in any given year, such agencies screen a large number of proposals, sieving mechanisms are employed to sort routine developments with minor impacts from those with significant adverse effects. Depending on the magnitudes of expected impacts the lead agency may 1) exempt a development from assessment requirements and permit it to proceed; 2) issue either standard or project specific guidelines for the development; 3) initiate a technical review by other agencies; and/or 4) call for a review via public hearing.

In the case of projects for which standard guidelines are insufficient, an environmental impact statement (e.i.s.) may be required. Funded by the proponent and usually requiring the hiring of one or more consultants, this documentary and legal device: 1) sets out the justification and alternatives for the project; 2) describes the project along with the environment with and without the development; 3) forecasts the project's environmental effects;
and 4) proposes mitigative measures. The e.i.s. is evaluated by the lead or coordinating agency as well as by other technical panel members. When a hearing is undertaken an appointed board or panel publicly vets the e.i.s. together with the affected public, special interest groups and proponent (Couch 1983:5; see section 4.5.4).

The a.r.m. agencies figure in the process in the following ways. Together with various resource management bodies (i.e., those responsible for wildlife, critical habitats, forestry, etc.) and other regulatory offices (e.g., energy and mines, labour, socio-economics, etc.) an a.r.m. agency usually assists the lead agency to develop guidelines for both the construction of common and well studied projects (e.g., small voltage electrical transmission lines, minor roads and highways projects, mineral exploration) as well guidelines for determining which types of projects should be subject to e.i.a. Thus, an a.r.m. agency can specify the types of project proposals to be screened and reviewed by a DOE.

The second entree by which an a.r.m. agency becomes involved is during technical review. Development proposals required to undergo this process are those which have been screened and are deemed to be sufficiently large, complex or environmentally damaging that evaluation by disciplinary specialists and regulatory agencies external to a DOE is required. The technical review involves the circulation of a proposal to all government agencies with statutory or management responsibilities potentially implicated by the development. Agencies are requested to comment on the project prospectus, to state any concerns, and make known any study or design requirements which should be met before the development proceeds.
Where larger developments such as mines, dams, large highway projects and so on are involved, the aggregated requirements of various agencies often become project-specific guidelines for an e.i.a. By fulfilling its part in the technical review process an a.r.m. office can require an h.r.i.a./m. to be built into an e.i.a. as well as prescribe its scope and depth. Following its completion and packaging into an e.i.s., the participating agencies critique the e.i.a. methods, results and recommendations. The identification of deficiencies and their correction by the proponent can undergo several iterations before the e.i.s. meets the satisfaction of all concerned.

From the vantage of an a.r.m. agency a provincial DOE or its analog is the primary referral mechanism through which information on and control over development projects is gained. However, only major development projects generally come to an agency's attention through the e.i.a. process. Mid-size projects having only selective adverse impacts and exempted from an e.i.a. reach an agency's notice through project screening guidelines. However, obtaining knowledge of and control over the numerous small-scale developments (housing subdivisions, minor highway projects, land improvements, etc.) is often more difficult since their proponents are not necessarily required to submit proposals to provincial DOEs. Acquiring the ability to scrutinize developments like these requires that an a.r.m. agency build its own referral systems with 1) the licensing or permitting agencies of other departments; 2) development oriented government departments (e.g., Departments of Highways); 3) local councils or planning authorities from which small-scale developers must gain approvals; and 4) sometimes, private
proponents themselves.

According to Couch (1983:11) about 45 statutes in British Columbia refer to environmental and social impact. Among these the principle ones are The Environment and Land Use Act (1979), The Environment Management Act (1981) and The Utilities Commission Act (1980). Referral networks between agencies with regulatory or management stakes in certain types of development have been instituted, coordinated by a lead agency endowed with the statutory regulatory authority. The chief referral systems are supported by permitting legislation such as The Land Act administered by the Ministry of Lands, Parks and Housing, The Waste Management Act and The Water Act administered by the Ministry of Environment (MOE) and The Ministry of Forests Act.

In B.C., developments are subject to screening at a very early phase in the planning process through a preliminary environmental assessment (PEA). Carried out either by a proponent or the MOE, a PEA analyses existing data available for a proposal and determines further informational requirements. Two basic purposes are served by a PEA. First, the MOE is able to make an informed decision whether to require (and, if so, determine the constituents of) an e.i.a. Secondly, the proponent acquires guidance for achieving his or her project approval.

The Environmental and Land Use Act mandates the existence of the Environment and Land Use Committee (ELUC), a cabinet committee chaired by the Minister of Environment and backed up by a technical group comprised of deputy ministers. ELUC's role is to develop programs which enhance environmental awareness and concern, minimize environmental degradation by
resource development or land use, and advise the B.C. cabinet on
environmental issues. The act provides cabinet with the ability to make
Orders-in-Council and regulations pertaining to any environmental or land
use matter. As of 1983 regulations had yet to be enacted although
guidelines for various sector developments are in place (Couch 1983:11).
These cover the processes by which proponents can coordinate project
planning within a phased assessment of a project's environmental, social and
economic effects so as to meet the requirements of various provincial
statutes. The Energy Project Coordinating Committee, the Coal Guidelines
Steering Committee, the Metal Mines Guidelines Steering Committee and the
Linear Guidelines Steering Committee have been established to administer the
procedural guidelines for developments in these industrial sectors (British
Columbia Ministry of Provincial Secretary and Government Services 1982:10).

To appreciate the way The Environment and Land Use Act is implemented, a
discussion of how most projects proceed through the environmental assessment
procedure is required. The Guidelines Steering Committee (GSCo) is the
principle interagency coordination unit. Through it a development proposal
is distributed to other ministries for review and comment. After assembling
external agency comments the Committee notifies the proponent whether an
e.i.a. is necessary. Where this is determined the developer must follow
whichever of the four guidelines apply. In stage one of the guideline
process the proponent carries out an assessment of the project's
environmental impact, assembles engineering and financial data to identify
the preferred development option, and often provides mitigatory plans,
design information and the results of public consultation. During the
assessment, the developer and his or her consultants maintain contact with the Committee and the other governmental regulatory agencies. Through these liaisons, terms of reference for a detailed environmental assessment of the preferred alternative are worked out. The results of this detailed e.i.a. are then presented in a stage two report. On the basis of this document, the GSCo recommends that ELUC 1) make a decision-in-principle over the project's environmental consequences and any additional studies which may be required or 2) hold a public hearing before rendering such a decision. Decisions are transmitted to the proponent by ELUC along with terms and conditions for project development.

The second major piece of environmental legislation, The Utilities Commission Act, creates a program for evaluating and certifying major energy projects. Under the act a proponent applies to the Minister of Energy, Mines and Petroleum Resources for an Energy Project Certificate. The Certificate stipulates the terms and conditions of approval for a project to be constructed. To apply, a proponent is basically compelled to carry out an e.i.a. and present an e.i.s. with its application. Beyond focusing on project induced impacts, the application usually contains benefit/cost analyses and identifies compensation and mitigation opportunities.

The bureaucratic unit responsible for coordinating energy development proposals is the Energy Project Coordinating Committee (EPCC). This group facilitates information exchange between the proponent and various review agencies as well as assisting in e.i.a. design and e.i.s. preparation. Moreover, the EPCC often vets the application and appurtenant materials for sufficiency prior to their formal submission to the minister. Following its
receipt, the minister informs the proponent of any shortcomings in the application requiring rectification before a decision will be made. With advice from the BPCC, the Minister of Energy, Mines and Petroleum Resources together with the Minister of the Environment may either exempt a project from the act's provisions or order a hearing by the BCUC for review and decision.

If an exemption is made the EPCC oversees the compilation of terms and conditions by all appropriate agencies. These terms and conditions become enshrined in the Exemption Order. The EPCC also coordinates the preparation of terms of reference for ministerial use in determining the issues to be considered in a BCUC hearing. The format of the public hearings are also directed by the two ministers. Subsequent to the hearing the Commission presents a report and makes recommendations to the Lieutenant Governor-in-Council. Cabinet then approves or denies the issuance of a Certificate. In the case of a decision of the first kind, cabinet may develop and attach any mitigatory or compensatory conditions to be adhered to during project construction and operation (Couch 1983:15; BCUC 1983a:35-6). The preparations behind and the results of a recent BCUC hearing into the Peace Site C project is briefly discussed in section 4.5.4.

The final major piece of B.C. legislation is The Environment Management Act. It gives the MOE considerable protection and management authority. Perhaps its most significant aspect is explicit provision for e.i.a.s of actions which have potential negative impacts. Since similar procedures for environmental assessment (as above) are in place, this provision is usually only brought to bear on projects otherwise insufficiently covered. Also apropos of this authority, the Minister of Environment may issue an

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environmental protection order to arrest or defer development activities having detrimental environmental effects. And the minister may establish boards to hear appeals of decisions made under the act (Couch 1983:11-16).

In Alberta, e.i.a. is mandated by The Land Surface Conservation and Reclamation Act (1973). Here, a development coming under the act is regarded as a project or activity which will impact the existing environment and cause one or more of these surface alterations: linear, extractive, impoundment or intensive land use. Ordering a proponent to conduct an e.i.a. is at the discretion of the Minister of Alberta Environment. However, e.i.a.s are routinely required of such major developments as oilsands recovery projects, coal mines, power generation projects, petrochemical refineries and plants, transmission lines, pipelines and water resource schemes. The lead agency is the Environmental Assessment Division which coordinates the interagency referral and e.i.s. review system.

The e.i.a. process is structured thus. The proponent is responsible for ascertaining whether an impact assessment will be required. To do so a prospectus is forwarded to Alberta Environment where a group of directors screen the proposal and recommend whether an e.i.a. should be required. In the event an assessment is deemed unnecessary the proponent proceeds to acquire any needed permits or licences directly from individual regulatory agencies or authorities. Alternatively, where an e.i.a. is requested Alberta Environment, agencies of other departments with concerns and the proponent work together to determine its scope and substance. Moreover, the proponent must launch a public consultation program and encourage local community involvement (see Kupchanko 1984).
Energy developments for which an e.i.a. has been ordered are also required to file the e.i.s. with the Energy Resources Conservation Board or ERCB (see Millard 1984; Railton 1985). Following its submission the Environmental Assessment Division coordinates an interagency review. Identified deficiencies are transmitted either directly to the proponent or via the ERCB, depending on the nature of the proposed development. Corrections and any additional data are then filed by the proponent. If the ERCB is involved the e.i.s., along with supplemental information, become exhibits in a public hearing. At the hearing's conclusion, the ERCB makes recommendations to cabinet regarding the project's acceptability. Advisement of a favourable decision is accompanied by an approval to the same effect from the Minister of Environment. Cabinet may then issue an Order-in-Council approving the project. However, this is not the end of the e.i.a. procedure. Before a project is considered acceptable, the proponent must have approvals from all review agencies (Couch 1983:19).

What this means for the ASA is that final control is maintained over the form and quality of all h.r.i.a./m. studies pursuant to an e.i.a. As alluded to above, over the past decade the ASA has developed a number of direct referral linkages with 1) government departments like Transportation, Energy and Natural Resources, Recreation and Parks, Environment (itself a development proponent) and Public Works; 2) various groups like the Coal Exploration Review Committee, the Development and Reclamation Review Committee and the Crown Minerals Dispositions Review Committee; and 3) authorities responsible for approving General Municipal Plans and Area Structure Plans (Donahue 1984). By maintaining such a large referral
network the ASA is able to screen and examine a far greater number of land altering developments than would be possible if the e.i.a. process was relied on solely.

Environmental assessment in Saskatchewan is vitalized by The Environmental Assessment Act. This statute empowers the Minister of Environment to require an e.i.a. of any development which may 1) affect rare or endangered environmental features; 2) significantly pre-empt the use of a provincial resource; 3) create pollutant handling or disposal requirements not governed by other statutes; 4) induce broad public concern as to its environmental impacts; 5) utilize a new technology in the use of a resource which causes environmental change; or 6) have a significant direct or indirect effect on the environment. E.i.a. is currently administered by the Assessment and Coordination Branch of Saskatchewan Environment, assisted by a panel consisting of various government agencies such as ARMS. To expedite the assessment process 10 sets of guidelines, ranging from those that deal with preparing project proposals to those concerned with developing and reclaiming sand and gravel pits.

The Environmental Assessment Act contains several important features. It empowers the responsible minister to establish boards of inquiry and to grant funds to intervenors. It also authorizes provincial judges to issue orders to environmental officers to enter and search private property. Of all the Western Canadian environmental statutes, this legislation places the most stress on public involvement. Although enforcing screening and inter-agency review procedures similar in most respects to the other provincial acts scrutinized above, The Environmental Assessment Act requires that
developments undergoing screening are publically announced. In addition, proponents imposed with an e.i.a. must facilitate public participation in the early phases of the study and report upon the results in the e.i.s. Moreover, upon receipt of the final e.i.s., an opportunity for formal public comment on the document is provided. At any time the minister may establish a Board of Inquiry or require the proponent to sponsor public information meetings. When the minister is satisfied that all statutory needs have been met, a decision will be tendered concerning whether the project will be approved (and under what conditions) or be denied. As in Alberta, for a development to proceed approvals must also be achieved from other departments with relevant regulatory concerns and responsibilities (Couch 1983:21-2).

E.i.a. in Manitoba is undergirded by a 1975 cabinet directive which brought the Manitoba environmental assessment and review process into being. As of 1983, administration of this process was the responsibility of the Manitoba Environmental Assessment and Review Agency (MEARA) of the Environmental Assessment and Review Support Services of the Department of Consumer and Corporate Affairs and the Environment (DCCAE).

The e.i.a. process here is unique in that, by definition, proponents are restricted to development oriented government departments or Crown corporations. Also unlike the other jurisdictions, within MEARA guidelines proponents screen their own project to ascertain whether project proposals need to be forwarded to MEARA. If the proponent decides its project will have no significant adverse environmental effects, the project can go ahead as long as all relevant legislation is complied with. On the other hand,
when significant impacts are projected the proponent generates a project proposal and submits it to MEARA. In turn, an Initial Environmental Evaluation is developed by the DCCAE which recommends mitigatory measures or the need for an e.i.a. On the basis of this document MEARA determines if the project should proceed in accordance with the suggested mitigatory measures or brings forward the need for an e.i.a. to the Minister of DCCAE. The minister may decide upon mitigatory measures or require an e.i.a. Should the latter decision be made, MEARA develops project specific e.i.a. guidelines and communicates them to the proponent. MEARA is also responsible for reviewing the e.i.s. and making recommendations to the minister. Final decisions on the disposition of a project rest with the Minister of DCCAE and Cabinet. Public participation in the e.i.a. can be invited by either the proponent or, upon the receipt of the e.i.s., by the minister, who may also require that public hearings be held (Couch 1983:23).

From the preceding review of e.i.a. practice the variety in approaches by the western provinces is clear. This is particularly evident in the importance ceded the role of the public in identifying, analysing and evaluating environmental impacts, especially those to community socio-economies. Manitoba's process is the least stringent whereas Saskatchewan's appears the strictest (Rydant 1984). Despite their differences, the four basic processes seem disciplined, comprehensive and detailed. But in fact e.i.a. has become a pliable, at times token, procedure. Development proposals are more and more treated on a situational basis in which informal and unwritten rules of procedure apply. Study and mitigatory requirements along with go/no-go decisions are increasingly the subject of negotiation,
mediation and compromise between developers and regulators. While this administrative flexibility offers efficiencies (e.g., Curtis 1983; Amy 1983), the social, economic and political dimensions of a proposed development may impinge upon and ultimately compromise the relevance and objectivity of e.i.a. (Rydant 1984).

As decision-making tools the e.i.a. processes operating in the western provinces are imperfect in other ways. Considerable criticism surrounds the quality of environmental information proponents assemble to forecast the effects of their projects. And, notwithstanding a few inherent, structural contradictions, one of the most powerful instruments of e.i.a. -- the public hearing -- tends either to be underused or not used at all by the scientific community and other groups with sophisticated and vested interests in environmental conservation or resource management. Because of their import, these two issues are reserved for exploration in section 4.5.2 and 4.5.4, respectively. We must first resume discussion of the other participants in a.r.m. For these include both those who gather decisional data and those who can influence the decision-making process.

4.4.2 The Development Community

The silent partner in a.r.m. is the development community. Virtually no articles have been produced by the small realty firms, government departments, Crown corporations, multinationals and so forth evaluating or commenting on the impact of heritage conservation legislation on their activities (although see Kenny 1982, 1984; ASCA Proceedings 1982). Instead of airing their concerns or problems in the academic literature, proponents
state their positions in meetings and correspondence with their consultants and regulatory agencies, through lobbying efforts and, most recently, in public hearings. Rather than comment on compliance problems in the literature, proponents use much more expeditious and effective methods such as defensive negotiation in parallel with political and legal processes. Without access to company archives the following discussion is circumscribed by opinion, inference, and personal experience. Since the development community both causes and pays for the majority of resource conservation projects the lack of hard data need not deter analysis of their roles, attitudes and problems.

The economic ramifications of heritage legislation were not fully realized by the development community during the passage of the enabling statutes. Since no significant negative interventions were made during the public hearings associated with the AHRA, HPA and HRA (the last held in 1985), it may well be that heritage regulatory activity has not seriously impinged upon industry activities. Furthermore, heritage legislation's history of unanimous consent by provincial legislatures implies that few lobbying efforts were undertaken by the development community.

Let us put these laws in historical context. Heritage conservation acts came about during the 1970s, a time when environmentalism was a cause célèbre, when public support for the protection of environmental quality and its willingness-to-pay for the necessary programs and regulations was high. Continued strong economic growth like that of the previous decade was presumed and the costs of environmental regulations were assumed to be sustainable. Cultural heritage conservation became a natural adjunct to
this broad-based concern for improved or retained environmental quality. However, the administrative and compliance costs of environmental programs were unknown. Before discretionary assessment and mitigatory mandates were enshrined and the environmental movement approached the asymptote, some Western Canadian public utilities had voluntarily funded limited archaeological salvage projects. The support for such studies by B.C. Hydro, Saskatchewan Power, and Manitoba Hydro in advance of a legal requirement to do so exemplified the acceptance of heritage conservation as pro bono (chapter 3). Whether these efforts reflected utility-wide policies or the prerogatives of key senior managers requires further study. Nonetheless, they represented a commitment, albeit a token one compared to the American salvage effort, to archaeological conservation. Most corporate decision-makers probably did not envision stricter laws would dramatically elevate the costs of a.r.m.

Following the passage of legislation, project review systems were developed by a.r.m. regulatory agencies. First, they focused on large or so-called mega- and mini-mega projects (sensu Beck and Dugan 1983) proposed by Crown power corporations, Departments of Highways, large mining companies and the oil and gas industries. Most of these developers had already been initiated in e.i.a. and salvage archaeology. Given the high capital cost of the projects targeted by a.r.m. agencies for more stringent heritage resource studies, the larger developers were not averse to extending the scope of e.i.a.s to cover archaeological resource conservation.

During the later 1970s and early 1980s regulatory agencies expanded into existing, or built ad hoc referral networks with other government agencies,
as discussed in the previous section. These referral systems brought many small projects under the purview of a.r.m. agencies, especially those which, because of their magnitude, were exempt from formal environmental impact assessments. Consequently, many projects causing limited or negligible environmental impacts apart from those to heritage resources were imposed with h.r.i.a. requirements. Examples include housing, recreational and industrial subdivisions; small highway and road upgradings; gas and oil wells and transmission systems; electrical transmission facilities; private land drainage and irrigation systems; etc.

Small private developers were, and continue to be unpleasantly surprised by h.r.i.a. requirements. Used to gaining speedy approval from other agencies, strained by short and seasonally governed building schedules, with tight and expensive financing arrangements, and facing an unsympathetic taxation structure, some small developers became strained by this added regulatory burden. On the other hand, government departments and Crown corporations encountering assessment or mitigatory stipulations generally absorbed the costs uncomplainingly. Their construction projects were, after all, undertaken in the public interest and associated heritage studies were difficult to envision as otherwise. Thus, a dichotomy evolved between the small private developer and the large public developer undertaking minor land alteration projects, although a.r.m. agencies treated both equally as regards their abilities-to-pay.

By the conclusion of the 1970s the ability-to-pay for environmental enhancements declined in real terms (Cummings et al. 1983). The energy boom in combination with volatile inflation rates tended to insulate Western
Canada from more global economic trends into the early 1980s. But in both the U.S. and Canada annual productivity growth sharply deteriorated relative to that of the 1960s (e.g., Thurow 1984). Inflation and unemployment climbed while capital formation rates fell. The economic slowdown was most striking in mining, construction and utilities. Among other contributing factors (see Peskin et al. 1981), economists assign 12 – 20% of the blame for the decline in productivity to the regulatory activities of different levels of government (Haveman and Christiansen 1981; Christiansen and Haveman 1982:116). Put in monetary terms for one year (1976), the cost of U.S. federal regulations has been estimated at $66.1 billion (Etzioni 1983). The Organization for Economic Cooperation and Development, which includes most first world nations, recently estimated that its members allocate between .5 and 2% of GNP to environmental programs (Yurko 1985).

Business was compelled to deploy a rising proportion of labour and capital to meet regulatory encumbrances. Designed to protect the public and environment from the external costs of industrialization, meeting regulatory requirements at worst negatively affected measurable outputs in marketed goods and services, and at best caused labour inputs to grow without compensatory increases in output. The adverse effects of environmental policies on business include forestalled investment, the addition of legal and administrative structures to cope with environmental regulations, as well as investment uncertainties due to problems interpreting existing, and anticipating future, requirements. Unfortunately, as Bernstein (1981), Christiansen and Haveman (1982), Peskin et al. (1981), and Peskin (1981) acknowledge, conventional measurements of macroeconomic performance are
insensitive to the benefits derived from enhancements to the environment or health and safety improvements. Perhaps if such benefits showed as outputs in national income accounts a positive picture of regulation would emerge.

Over the late 1970s and early 1980s wage earners sought to offset higher prices through salary settlements. Because part of the price rise derived from environmental protection laws, Bosworth (1981) considers workers were really striving for double compensation: higher salaries and environmental enhancements. Neither business management or government adequately explained or conferred the nonmonetary benefits of improved environmental conditions to workers or the public. When, in the early 1980s, taxpayer and consumer resistance to higher prices and taxes began in earnest, the ability to provide this double compensation became jeopardized. Indeed, some studies suggested concern for the environment was eroding (e.g., Parlour and Schatzow 1978). Because the advantages of such regulations were neither monetized or concretely displayed, workers tend(ed) to demand higher wages rather than further environmental benefits. Fingers began to be pointed and environmentalism, in some quarters, was "blamed if not for the sins of the world, then at least for the ills of the economy" (Brown 1981:7). What some are calling the decade of scarcity and deregulation ensued.

The 1980s began with governments making sustained efforts to contain inflation by permitting high unemployment and foregone real output. Today, unemployment is being fought by tolerating high government deficits at the provincial and national levels. Governments are experiencing great internal and external pressures to bring public debts down without achieving this through higher personal and business taxes. Environmental protection
policies, even well founded and cost-effective ones, which increase prices, reduce revenues and have high administrative costs are being reviewed, reformed, or abolished. A concrete example of this is the trimming of $44.1 million from Environment Canada and the National Research Council by the new federal government (The Globe and Mail, November 17, 1984:12) despite the fact polls disclose a majority of Canadians oppose relaxation of environmental regulations (Mothersill 1983:10; Quinn 1985). As discussed elsewhere in this chapter, some a.r.m. programs are being scrutinized and shrunk as part of government-wide regulatory relief measures.

The question must be asked as to what the financial implications of h.r.i.a./m. really are? Exactly how significant is the direct cost contribution of private and government developers? We have seen that estimates for the costs of CRM vary from $200 to $300 million (King 1979; Fitting 1981a). It is difficult to generate a similar approximation for Canada, although data gathered by Donahue and Spurling (n.d.) suggest that around $9 million may have been spent on a.r.m. in 1981. Of this figure, the Western Canadian development community contributed about half.

Table 4.16 exhibits estimates of a.r.m. costs borne by public and private developers while Table 4.17 and Figures 4.7 to 4.9 show the same thing in constant (1970) dollars. The utility of these data is weakened by two factors. Foremost, the annual figures are very rough estimates. The amounts were provided by the four provincial agencies, none of which keep accurate records. This is because the costs of h.r.i.a./m.s are usually not divulged by either heritage consultants or private developers. Therefore, private sector costs cannot be accurately tracked. Recognizing this, the
Table 4.16 Public and Private Proponent Monies Expended on A.R.M. In
Thousands of Dollars (not adjusted for inflation)

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<td>a</td>
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<tr>
<td>1971/72</td>
<td>50</td>
<td>50</td>
<td>0</td>
<td>*</td>
</tr>
<tr>
<td>1972/73</td>
<td>250</td>
<td>200</td>
<td>50</td>
<td>*</td>
</tr>
<tr>
<td>1973/74</td>
<td>250</td>
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<td>75</td>
<td>*</td>
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<td>1974/75</td>
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<td>250</td>
<td>0</td>
<td>*</td>
</tr>
<tr>
<td>1975/76</td>
<td>450</td>
<td>400</td>
<td>50</td>
<td>*</td>
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<td>1979/80</td>
<td>1200</td>
<td>650</td>
<td>550</td>
<td>*</td>
</tr>
<tr>
<td>1980/81</td>
<td>1500</td>
<td>850</td>
<td>650</td>
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<tr>
<td>1981/82</td>
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<td>250</td>
<td>*</td>
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<tr>
<td>1982/83</td>
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<td>*</td>
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<tr>
<td></td>
<td>860</td>
<td>170</td>
<td>690</td>
<td>390</td>
</tr>
<tr>
<td>Total</td>
<td>11</td>
<td>634.7002</td>
<td>4632</td>
<td>2235</td>
</tr>
<tr>
<td>Mean</td>
<td>776</td>
<td>467.309</td>
<td>224</td>
<td>335</td>
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</table>

a: total b: government and Crowns c: private sector *: data unavailable
(totals are subject to rounding error)

ASA declined to give annual figures until 1984/1985 --- the only estimate
which exists prior to this is for 1981 when about $2 million was spent on
A.R.M. (Donahue 1981)

There are also variations in the periods for which the data are
available. B.C. and Manitoba provided information since the formation of
their regulatory agencies (thus the monetary contribution of the CDAP is
unconsidered); Alberta did likewise but only for expenditures from
government; and for Saskatchewan, estimates go back 9 years before ARMS'
creation.

These problems notwithstanding, Tables 4.16 and 4.17 yield some valuable
Table 4.17 Public and Private Proponent Monies Expended on A.R.M. in Thousands of 1970 (Constant) Dollars

<table>
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<td>a</td>
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<tr>
<td>1970/71</td>
<td>50</td>
<td>50</td>
<td>0</td>
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<tr>
<td>1971/72</td>
<td>243</td>
<td>194</td>
<td>49</td>
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<tr>
<td>1972/73</td>
<td>232</td>
<td>162</td>
<td>.70</td>
<td>*</td>
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<tr>
<td>1973/74</td>
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<td>216</td>
<td>0</td>
<td>*</td>
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<tr>
<td>1974/75</td>
<td>350</td>
<td>311</td>
<td>39</td>
<td>*</td>
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<tr>
<td>1975/76</td>
<td>280</td>
<td>263</td>
<td>18</td>
<td>*</td>
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<td>1976/77</td>
<td>392</td>
<td>261</td>
<td>131</td>
<td>*</td>
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<td>1980/81</td>
<td>508</td>
<td>393</td>
<td>115</td>
<td>*</td>
</tr>
<tr>
<td>1981/82</td>
<td>532</td>
<td>378</td>
<td>164</td>
<td>*</td>
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<tr>
<td>1982/83</td>
<td>507</td>
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<td>332</td>
<td>*</td>
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<tr>
<td>1983/84</td>
<td>386</td>
<td>262</td>
<td>124</td>
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<tr>
<td>1984/85</td>
<td>291</td>
<td>57</td>
<td>233</td>
<td>132</td>
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<tr>
<td>Total</td>
<td>5990</td>
<td>3818</td>
<td>2183</td>
<td>1120</td>
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<tr>
<td>Mean</td>
<td>399</td>
<td>255</td>
<td>146</td>
<td>112</td>
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a: total  b: government and Crowns  c: private sector *: data unavailable

(totals are subject to rounding errors)

Observations, accepting that total values are conservative. Since 1970 more than 10.2 million constant (1970) dollars or 20.2 million current-to-the-year (undflated) dollars have been spent on a.r.m. If the costs to Alberta developers since 1978 are assumed as equal to those in B.G., the total expenditure for the study area is over 27 million undflated dollars or 13.2 million 1970 dollars. Removing Alberta from the analysis, B.C. private and public developers have contributed about two-thirds, Saskatchewan's about one quarter and Manitoba's about 8% of the total (although Manitoba's contribution would be larger if the total CDAP funding was factored in).
Figure 4.7 Total Monies Expended by Developers on A.R.M. in 1970 Dollars

Figure 4.8 Public Sector Developer Monies Spent on A.R.M. in 1970 Dollars
Analyzed in terms of government (line department plus Crown corporation) vs. private sector allocations, the public sector has provided ca. 64% of the total support in B.C., 72% in Saskatchewan and 48% in Manitoba. For 1984/85, public proponents accounted for 62% of a.r.m. activities in Alberta. Whether these proportions have more general applicability is unclear. Discrepancies in private and public sector costs probably reflect a mix of differences in accounting procedures, the extent of government intervention in provincial economies and the relative powers of legislation. For example Manitoba's recently replaced heritage conservation statute was very weak, a fact shown in the small private sector contribution to a.r.m.

As seen in Tables 4.18 and 4.19, overall trends can be interpreted as generally positive. Since 1970, B.C. has experienced an average growth of
Table 4.18 Annual Percentage Changes in Public and Private Propoqent Expenditures in Thousands of Dollars (not adjusted for inflation)

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<td>1970/71</td>
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<td>400</td>
<td>300</td>
<td>-</td>
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<tr>
<td>1971/72</td>
<td>400</td>
<td>0</td>
<td>-</td>
<td>60</td>
</tr>
<tr>
<td>1972/73</td>
<td>0</td>
<td>43</td>
<td>-100</td>
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<td>180</td>
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<td>13</td>
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Mean: 49 31 71 17 41 37 25 125 9

a: total b: government and Crowns c: private sector *: data unavailable; -: data inappropriate for determining trend

(totals are subject to rounding error)

49% or 32% (constant dollars) in total support for a.r.m. studies; Saskatchewan 41% (30%); and Manitoba 125% (104%). An examination of the subtotals shows that only in Manitoba has there been a real decline — a 6% real decrease in the private sector contribution. However, since 1981 overall funding has been falling in all jurisdictions. With regard to the statistics presented in Table 4.19, B.C. registers a real decline of 12%, and Manitoba of 184% while Saskatchewan posts a negligible gain of .05%. In Alberta the government content has marginally decreased by an average of 1.25% since 1981.
Table 4.19  Annual Percentage Changes in Public and Private Monies Proponent Expenditures in Thousands of 1970 (Constant) Dollars

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<th>Manitoba</th>
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Mean 37 29 40 a: total b: government and Crowns c: private sector *: data unavailable; --: data inappropriate for determining trend

(totals are subject to rounding errors)

These downward trends could be seen as encouraging from the development community's point of view. In the fiscal year ending March 31, 1985, the total spent on a.r.m. by the development community across Western Canada was just over $2 million. The private sector content was ca. $880 000 or 43% of the aggregate.

The cumulative value expended on resource management since 1970 by the development community is not large. Thirteen plus or minus a million or so 1970 dollars is a small amount measured against the direct costs of complying with many other government regulations. And, disaggregated, the
costs of archaeological studies incurred by any single construction project are almost always small. This being so, why should a.r.m. managers and consultants be concerned about deregulation?

There are outstanding problems. As noted above, developers differ in their abilities to directly and indirectly pay for a.r.m. Two basic types of proponents exist, the first comprising small private developers and municipal governments, the other including large developers such as private firms, Crown corporations and provincial or federal government departments.

Of these small businesses and municipalities are the most adversely affected by h.r.i.a./m. requirements. Common examples are realty firms and private land owners seeking to create residential, recreational or industrial subdivisions. Since proponents must achieve local and/or provincial government approvals for land use changes or rezonings, their proposals are vetted by some a.r.m. agencies, of which, until recently, the ASA was the most assiduous (Donahue 1984, 1985). For a small but significant proportion of properties under review having high potentials for archaeological resources, h.r.i.a. requirements are imposed. First time developers, in particular, can be hard-hit by the unanticipated costs and delays of such requirements. Fluctuating interest rates, uncertainties in the time necessary to achieve regulatory approvals and a competitive market leave a very short period for small business and municipalities to make investment decisions. Over most of the study area, archaeological studies are only possible during seven months of the year (April to October). Because of this, when a h.r.i.a. requirement is levied, the period between the decision to invest and actual construction can be lengthened by months.
Small scale development proponents consequently can experience problems with financing and may see profitability dramatically decline.

Another difficulty experienced by small business and municipal proponents is the direct expense of compliance. The ASA has estimated that small residential subdivision h.r.i.a.s cost an average of ca. $1300, $8.00 per housing unit, or $32.00 an acre (Donahue, personal communication 1984). While these amounts do not appear large, they can add appreciably to the front-end costs for developers operating close to the margin. Lot prices have to be adjusted upwards which can influence how attractive they appear to potential buyers. Moreover, although h.r.i.a. costs are project expenses and thus can be written-off against taxes, the amounts are recoupable only after the development is completed and all lots are sold. Obviously, when significant heritage resources are located and require impact mitigation, small developers experience even greater hardships. In the case of one housing subdivision near Calgary, archaeological mitigation increased the cost per unit by $118, and provoked a letter of concern to the Alberta government from the Housing and Urban Development Association of Canada. The ASA has recently responded to this and modified its review procedures (Donahue 1985:1).

Small developers have a legitimate complaint. Their ability-to-pay for impact assessments and mitigation studies are significantly less than that of large private and public corporations or government departments. Yet provincial statutes treat both as equally liable to assessment or mitigation impositions. While this equality under law theoretically affords uniform protection to heritage resources, it does not conform to the basic equity.
objective of public policy since the investors in this protection differ substantially in their abilities-to-pay. Large-scale developers can distribute the costs of archaeological conservation across different income classes throughout a region, province or market area. Small developers must pass costs onto a much more restricted part of the population. Their consumers do not derive significantly greater benefits from archaeological conservation beyond those they would otherwise as taxpayers, ratepayers or consumers of the products of large scale developers. Thus these consumers are, in a sense, being double billed. And the resistance of prospective consumers to higher prices creates considerable hardship for the small developer saddled with h.r.i.a. compliance costs.

The large development oriented companies responsible for the mining and energy projects in the study area appear to be less concerned with the direct costs of undertaking h.r.i.a./m. s than with the indirect costs of compliance. After all, companies operating solely in the private sector can also write-off direct costs against taxes. As well, they usually have substantial capital bases capable of absorbing and carrying-over the expense of archaeological and other environmental studies. Furthermore, the allocations necessary to satisfy study requirements are almost always very small in relation to the capital costs of construction. Moreover, many firms are multinational and have considerable experience coping with the environmental regulations of different provinces, the U.S. and other nations. Some companies place a high priority on meeting environmental protection objectives (e.g., Mothersill 1983) and have created environmental units with close reporting links to senior decision-makers. Professional
staff of these units evaluate e.i.a. requirements for their reasonableness, negotiate terms of compliance with regulatory agencies, hire consultants and monitor their activities, and review and edit consultants' reports before they are forwarded for agency review. For all these reasons, h.r.i.a./m.s are increasingly being accommodated earlier in the planning and budgetting phases of construction projects. As a result, senior management groups are becoming less unpleasantly surprised by impact assessment impositions. Such advantages and institutional adjustments shield large corporations from the shocks of environmental and heritage regulations in ways impossible for the small business community.

The Crown corporations and provincial or federal government departments have accommodated environmental and heritage conservation policies in similar fashions. However, Crown corporations do not pay taxes and compliance costs must be passed on to rate payers. Line departments do not pay taxes either and pass costs to capital budgets on to the taxpayer. Both types of proponent are now responding to pressures to keep rate and tax hikes to the bare minimum. Crown corporations like the provincial power utilities are making investment decisions very carefully, in light of the high cost of borrowing and the resistance to higher rates exhibited by provincial utility commissions. The federal and provincial governments, in their attempts to shrink deficits, are imposing decremental budgets on development oriented departments. Such factors are causing these traditionally supportive proponents to question or oppose h.r.i.a./m. requirements (see section 4.5.4.3).

Thus the larger proponents have problems with the direct costs of
meeting a.r.m. requirements, particularly the Crowns and line departments. But like the small developers, there are difficulties with the indirect, largely administrative compliance costs. Construction projects undertaken by the public and private sector have complex management and decision-making structures. Decisions on project siting, design, staging and feasibility are typically diffused among planning, engineering and economic groups at the lower to middle levels of the proponent's organizational structure. Their decisions become compounded as these groups reduce uncertainties over the project planning-to-completion period. For major undertakings (e.g., power generation facilities, water supply projects, major highways, pipelines, etc.) this period can be a decade or more in length (e.g., Railton 1985).

As a development evolves, various economic, engineering, legal and political milestones are achieved. Environmental and heritage conservation requirements are usually met after economic and engineering decisions have been made on a project's feasibility and siting and just before legal and political approvals are gained. A compressed time-frame is left open for impact assessments of any kind, except in the exceptional cases of developments with well known impacts in well studied areas. Consequently, most environmental studies proceed under the assumption that the project will probably go ahead. Consequently, most consultants are compelled to understate the problems of predicting environmental impacts and stress mitigative actions to be taken during construction. While some observers would argue this supports the view that e.i.a.s represent tokenism rather than a commitment to environmental conservation, it is simply a fact of
current economic and political reality (Hirst 1984a).

Although this is now changing, a.r.m. agencies often neglected to fully apprise and acknowledge the complexity of industry decision-making and the logistics of construction projects. Since there are no necessary deadlines for agencies to conclude their statutory reviews of development proposals and h.i.s.s., delays were caused to construction projects while project specifications and consultant reports were deliberated upon. As well, some agencies occasionally imposed difficult, sometimes infeasible and open-ended study requirements (cf., Fitting 1982b) which agency guidelines did little to explicate, expedite or justify. Frequently h.r.i.a. stipulations did not take into account the internal commitments already made by developers and the timelines which had to be met. And, too often, a.r.m. agencies failed to explain their requirements or recognize their essential service role with industry. This resulted in the imposition of inadequate, badly timed or excessive h.r.i.a./m.s.

Take, for example, the 11th hour discovery of a significant resource (which we shall call HaSl 1) in conflict with a proposed provincial highway, the right-of-way of which has been legally surveyed. A sudden avoidance directive issued by an a.r.m. agency may have extremely onerous implications for the responsible Highways Department. These can include resurvey, redesign, property reassembly, seasonal adjustments in construction scheduling, perturbations to annual budgets, legal changes to construction contracts, delays in other projects, broken political commitments, etc.

From an agency's perspective, the mitigation of impacts to HaSl 1 by avoidance may clearly be the most satisfactory alternative; but from the
proponent's vantage such a solution will be very unsatisfactory, since unforeseen project costs are incurred in planning, engineering, inter- and intra-departmental negotiations and general administration. Simply put, the Highways Department's concern centres on the indirect costs caused by sudden uncertainty and crisis management. For these reasons, and the fact that many natural resource developments cannot be moved, the avoidance option has so far been limited to planning small subdivisions, altering minor linear developments, and the relocation of the Trans-Canada Highway at Banff (Fedje 1984) and Alberta Highway 968 (Gryba 1983). Had the last two highway projects conflicted with sites containing other than Paleo-Indian deposits, they would likely have been subjected to a lesser form of mitigation.

Such problems can be evaded. In this hypothetical example, the ideal resolution would have the a.r.m. agency involved earlier in the project planning and requiring a thorough initial impact assessment. Had this course been followed, the conflict between the proposed right-of-way and HaSI 1 may have been identified in the siting stage and relocation could have been pursued in an orderly and cost-effective fashion. Failing this (and accepting that there will always be 11th hour conflict discoveries), the agency could concede the developer's commitment to the right-of-way and accept mitigation by scientific excavation. By doing so, the indirect costs incurred by the Department of Highways would be significantly reduced even though the direct cost of funding the excavation may equal that of the construction costs of avoidance. A.r.m. agencies must become familiar with the constraints and procedures of developers if adversarial and internecine relationships are to be obviated. Until such adjustments are made in a.r.m.
regulatory procedures, the *deus ex machina* approach of a.r.m. agencies will continue to frustrate public and private sector proponents.

To an extent large public and private developers have brought this upon themselves. There are no archaeologists on the staff of major private corporations headquartered in Western Canada. Only two Crown corporations, SPC and Petro-Canada, have staff with archaeological training in their environmental offices. There are valid reasons for the absence of corporate expertise: the need for a.r.m. investigations is discontinuous and companies seek to maintain third party impartiality by hiring external consultants (cf. Patterson 1982c). But this means the regulatory agencies must deal with the biologists, geologists, etc. who usually staff environmental units or, in the case of proponent's lacking such units, project engineers. Not all environmental specialists or engineers have the backgrounds to appreciate the time needed for, the expense of, or the uncertainties surrounding h.r.i.a./m. Too often, a.r.m. agencies are invited to participate so late in the evolution of development that even the most reasonable study requirements appear inopportune and impracticable to the proponent. The absence of in-house archaeological expertise also causes project managers difficulties interacting with and administering consultants. This can promote neglect of consultant activities and cause embarrassing problems when regulatory agencies find deficiencies in h.i.s.s and fail to provide construction clearance. Unfortunately, the intermediary efforts of in-house specialists sometimes only exacerbate confrontation between developers and regulatory agencies (cf., Daneke 1983:8).

The only realistic way to shrink the indirect costs of compliance and
reduce conflicts between the development community and a.r.m. agencies is for the latter to become involved increasingly early in the development process and gain a proactive position (Hirst 1984a; Engelman 1981). A.r.m. officials must learn the diverse paths along which developments evolve. They must assist in the design of flexibly tiered impact assessments which provide the correct amount and kind of information at the right time in the developer's decision-making sequence (Lee 1982). To do so, agencies must become quickly acquainted with the social, economic and political climate of individual projects and try to accommodate the different, and sometimes idiosyncratic, approaches to project management of some proponents (Rydant 1984). Finally, agencies must communicate h.r.i.a./m. results to proponents in factual and interpretable ways (Robinson 1982).

Most a.r.m. agencies realize their regulatory procedures require constant change and reform. For achieving authentic reform has less to do with weaker laws and regulations, new guidelines, budget cuts and staff reductions than with measurable improvements in regulatory performance. Becoming more effective in a.r.m. requires agencies to adapt to different development contexts, to learn from past mistakes but still be willing to risk making additional ones, and to offer developers technical and financial help in planning and constructing their projects at the earliest opportunity.

4.4.3 The Consultants

The transformation of archaeology into a business is a very recent phenomenon, one which occurred entirely within the last decade as a response to the passage of provincial heritage legislation. Initially greeted
by the archaeological establishment with trepidation and suspicion (e.g., MacDonald 1976, editor), heritage resource consulting proved to be one of the only areas of disciplinary expansion through the late 1970s and early 1980s. As the ranks of universities, museums and government agencies were filled, students graduating with Masters and Ph.Ds perforce gravitated towards private sector employment. Some started firms early on in Alberta (e.g., Lifeways, Aresco) and Manitoba (e.g., PaleoSciences); some, having gained experience in these companies, later went on to develop their own; others went directly from university to proprietary consulting; and a few left government to pursue more independent opportunities. University professors and some of the institutions got into the act as well. In fact, B. Reeves of the University of Calgary was the first to start a consulting company in the study area. Virtually all academics working in Western Canada have carried out some contract work although few are listed on the provincial rosters of heritage resource consultants.

As of July 1984, there were 48 heritage resource consultants and consulting firms on the lists maintained by the four regulatory agencies (see Table 4.20). Originally, most consultants were headquartered in Alberta (Spurling 1982). This is no longer the case. As of 1984 there were 22 individuals, firms or institutions with B.C. addresses, 14 with Alberta ones, three in Saskatchewan and 9 in Manitoba. When the number of consultants listed as operative, but not headquartered, in the various provinces are included, British Columbia retains dominance. Twenty-seven consultants are listed for B.C., 18 for Alberta, 18 for Saskatchewan and 10 for Manitoba. The grand total consists of 17 incorporated firms (six in
B.C., five in Alberta, one in Saskatchewan and five in Manitoba), 28 individuals or proprietarily owned companies (14 in B.C., 9 in Alberta, one in Saskatchewan, and four in Manitoba) and three public institutions or agencies (two in B.C. and one in Saskatchewan).

Currently, the market for archaeological consulting services is saturated. The last few years of economic decline and regulatory reform have led to a slump in industry's demand for heritage consulting services. This situation stands in sharp contrast to Reeve's (1982) expectations for a stepped increase in the need for such. Viewed from the Alberta perspective of 1981, the peak year (Donahue 1985), there seemed to be reasons for optimism as well as alarm that the demand for consulting services could exceed supply and cause considerable embarrassment for the profession. With over 100 people employed on contract projects some of the leading firms began to expand, setting up offices in other provinces and overcapitalizing, building new facilities and acquiring expensive equipment. However, the boom was shortlived and, by 1983, less than 25 people were employed, the dollar value of work had decreased from one third to one quarter of that of the previous year, branch offices were closed, buildings were for sale, and pessimism for the future prevailed (Reeves 1984). Consulting archaeology's decline was not as dramatic in the other western provinces due to differences in economic performances, government a.m. styles, the extent to which public institutions and agencies were involved, and the ways in which contracting opportunities evolved (Reeves 1984). Still, it remains that consulting opportunities have been reduced across Western Canada. This
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Table 4.20 Heritage Consultants in Western Canada

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* information current to July 1984
+ listed in province ** resident in province but not listed there
I incorporated firm P public agency or institution
I individual consultant, proprietary ownership
has created a serious problem for students trying to establish careers; for consulting is the only form of employment available to them, now and probably in the future.

The deficiencies in academic training noted above have seriously affected the ability of most entry-level professionals to seize and cope with the consulting opportunities which do exist. Carrying unrealistic expectations of how archaeology should be done and what its result should be; saddled with a value system typically derogating non-academic employment; lacking many business skills or experience (e.g., unit costing, project scheduling, proposal writing, project management, cash flow control, accounting, insurance and taxation requirements, the worries of "receivable days", etc. [Reeves 1984; Fitting 1984]); untrained in technical writing (e.g., Cheney and Schleicher 1982); and usually versed in the legislations, regulations, guidelines and ad hoc procedures of various provincial agencies --- freshly minted students are suddenly thrust into a highly competitive milieu. Instead of finding a cornucopia of opportunities to apply lithic use wear studies, carry out ethnoarchaeology or conduct novel sampling designs, the hard-edged reality of commercial archaeology is encountered. Finding a niche (sensu Peters and Waterman 1982:182-6) to undertake even surface survey of minor linear developments can be difficult, let alone discovering a niche for the more esoteric talents developed in the university environment. Nowadays, the consulting market is dominated by several firms having protected, long-standing client relationships with energy companies, public utilities, and government departments. This is the case today in Alberta and becoming increasingly common in British Columbia.
In Saskatchewan, the SRC has a virtual monopoly on major contracting opportunities, largely due to a lack of within-province competition. And Manitoba Culture, Heritage and Recreation administers and manages most large, publicly funded h.r.i.a.s in that province, leaving a very narrow window for even established consultants, let alone entry level individuals.

A contentious issue in contract archaeology has been the adoption of consulting roles by universities, regional colleges, Crown-owned agencies such as the SRC, and even provincial museums. Prevalent in British Columbia during the middle to late 1970s, and continuing today in Saskatchewan, the solicitation and undertaking of large-scale and smaller contract projects by publically supported institutions effectively discourages the formation of private firms and shuts out existing companies from adjacent provinces.

University department and public agency consulting has its positive, short term benefits, but these are counter-balanced by the long range consequences. From the university point of view the injection of contract monies into institutional accounts can offset diminishing grant funds, open new areas of research, supplement the salaries of staff with "soft" positions, support proposals for new positions, provide jobs and experience for undergraduates and graduate students, and augment the institution's relevance to the public. From the regulatory agency's perspective, university involvement lowers and spreads around h.r.i.a. costs and usually results in more innovative research designs and more robust scientific products (Pokotylo 1982; Spurling 1982).

But problems exist. For example, Raab (1982) avers that those recruited to undertake contract studies for universities face considerable
institutional obstacles in acquitting their responsibilities. Moreover, university departments and arms-length government agencies typically have problems meeting time-lines, overlook confidentiality strictures and often have a hidden agenda (i.e., an inclination to use contract monies to address at times tangential academic problems rather than for the purposes intended). While government regulatory archaeologists can experience frustration due to lackadaisical interpretations of contract mandates, industry clients can become extremely agitated by institutional approaches to contracting. Delays in tendering legislatively required h.i.s.s translate into delays in project approvals; the inclusion of pure research initiatives adds to the cost of an h.r.i.a. but often has no bearing on whether the results will be accepted by the regulatory agency (i.e., research may be an unnecessary add-on); many reports are written for an academic audience and are incomprehensible to industry specialists; and, maybe most importantly, because public institutions are less financially dependant upon clients than private sector consultants, the client's command and control abilities are weaker. Private consultants are generally more professional in their project management. Industry also wants seasoned, expert evaluations and opinions from the consultants it engages and pays professional fees for; it does not want the work of untested students who are usually covertly responsible for carrying out many aspects of university contracts (Epp and Spurling 1984).

The heritage service industry unsurprisingly regards involvement by publically subsidized institutions or agencies as an anathema. Public agencies have a significant competitive advantage over private firms. As
discussed above, most h.r.i.a.s required of large scale public projects have gone to public institutions. Private firms have been left the smaller, predominantly linear developments: pipelines, highway upgradings, electrical transmission lines, oil and gas drilling projects, subdivisions, etc. This market segmentation has suppressed development of applied research and large project management skills in the private sector. Only in Alberta and recently in B.C. have a few firms been able to acquire big, multi-year contracts and enjoy the attendant stability, profit-margins and experience.

A market breakdown showing the number of and changes in four classes of h.r.i.a./m. contracts is provided in Tables 4.21 and 4.22. In light of the numerous omissions in the tables, the information exhibited must be viewed as rough approximations only. However, the presented data should be revelatory of general trends in the consultant marketplace. Not surprisingly, since the formation of management agencies in each province, there has been real growth in all classes of h.r.i.a./m. save the very largest which includes projects in excess of $100 000 (in Manitoba there has been only one project of this size since CDAP). Only in Alberta have the number of large scale studies grown and this was a recent and perhaps short-lived phenomena. The biggest overall increases have been the number of projects under $50 000. Following 1981 there were decreases in the number of projects worth more than $50 000 in B.C. and Saskatchewan although their number rose in Manitoba. In Alberta there has been a steady decline in the total number of projects across all classes, even in the lowest cost class. This trend is somewhat masked in Table 4.22 by the figures for 1981/82, the
Table 4.21 The Size of Heritage Resource Impact Assessments and Mitigations

<table>
<thead>
<tr>
<th></th>
<th>B.C.</th>
<th>Alberta</th>
<th>Sask.</th>
<th>Manitoba</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a</td>
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<td>c</td>
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</tr>
<tr>
<td>1984/85</td>
<td>14</td>
<td>20</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

a: projects < $10,000  b: projects > $10,000 < $50,000  
c: projects > $50,000 < $100,000  d: projects > $100,000

...year the consulting industry peaked.

...shake-out among the smaller firms throughout the study area. Today's consulting market is thin. Smaller developers caught in the cost-price squeeze and collapsing demand for housing developments, petroleum products, etc. are effectively lobbying governments for relief from regulations of all kinds. Even traditionally supportive government departments and public utilities are closely watching expenditures, cutting back on the number of new developments and frequently questioning the need to undertake assessments of projects with limited environmental impacts. Thus the conventional niche of many small consulting companies is shrinking.
Table 4.22 Percentage Changes in the Size of Heritage Resource Impact Assessments and Mitigations

<table>
<thead>
<tr>
<th>B.C.</th>
<th>Alberta</th>
<th>Sask.</th>
<th>Manitoba</th>
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</thead>
<tbody>
<tr>
<td>a</td>
<td>b</td>
<td>c</td>
<td>d</td>
</tr>
<tr>
<td>a</td>
<td>b</td>
<td>c</td>
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<tr>
<td>a</td>
<td>b</td>
<td>c</td>
<td>d</td>
</tr>
<tr>
<td>a</td>
<td>b</td>
<td>c</td>
<td>d</td>
</tr>
</tbody>
</table>

1970/71
1971/72 -60
1972/73 50 0
1973/74 233 900
1974/75 0 -25 0 100
1975/76 20 0 200 100 0
1976/77 -33 33 0 * 200 0 17 100 -50
1977/78 -13 -25 33 0 * -17 * 0 0 -50
1978/79 -29 -20 -25 50 -2 0 * 20 * -57 0 0
1979/80 0 25 67 33 104 100 * 100 0 * 133 50 *
1980/81 -20 0 0 -50 -19 250 * 25 -17 * 57 0 *
1981/82 150 60 -60 -50 8 157 * 0 400 -60 * 0 * -33 200
1982/83 -90 21 0 0 -28 -53 * 0 4 100 * -67 * -25 33
1983/84 800 0 50 0 -28 -13 * 100 -81 25 * 0 30 67 -75
1984/85 55 -31 -33 0 -18 86 * * 160 -40 * 0 -.08 -20 * 0 *

Mean Growth
76 72 10 -2 2 75 * 33 101 28 -17 15 17 40

Growth Since 1981
229 13 -11 -13 -17 44 * * 121 6 -17 15 3 40

a: projects < $10 000
b: projects > $ 10 000 < $ 50 000
c: projects > $50 000 < $100 000
d: projects > $100 000
*: information cannot be computed or is unavailable

Reinforcing this trend is the growing involvement of the Saskatchewan and Alberta a.r.m. agencies at the front-end of many developments. Concerned with making decisions on the need for h.r.i.a.s for smaller developments without sufficient information; sympathetic to the financial impacts such requirements have on smaller developers; contending with the deregulation Juggernaut; having numerous unhappy experiences with the way small scale h.r.i.a.s have been conducted by private consultants; enjoying
an increased capacity to both thoroughly review project proposals (due to a decrease in their number) and undertake field studies; and with an increased knowledge of the minimal impacts some development projects actually cause -- regulatory agencies are frequently carrying out initial assessments for small-scale developments, exempting others, and providing services to government departments, services formerly provided by private consultants. This penetration of the consulting theatre has further shrunken the market for private companies and accelerated the shake-out.

To an extent the consulting industry has brought this intervention upon itself. During the height of the energy boom the demand for h.r.i.a. services outstripped the supply of competent and qualified consultants. Firms became staffed with some undertrained and/or uncommitted M.A.s and B.A.s, who were unprepared to independently carry out h.r.i.a./m.s (Spurling 1982:52). Over this period some marginal archaeology was done (as humorously documented by Brink 1982). Whether diverted by work-load pressures or more attention to the profit margin than the literature, some consulting reports were, at best, little more than very simplistic artifact or site description or, at worst, thinly disguised chicanery. The potential for abuse lent impetus to continued institutional consulting as well as the need for regulatory agencies to become more involved in front-end decision-making, as well as study surveillance and post-study monitoring and audit.

Problems with unprofessional consultant behaviour is not restricted to h.r.i.a.; they are found within the field of environmental assessment generally. Early in the development of e.i.a., articles appeared expressing fear that boilerplate studies which sacrificed scientific objectives for
business ones would come to predominate (e.g., Ghiselin 1975; Schindler 1976; Hanson 1976). Similar concerns were recapitulated in the CRM literature (e.g., MacDonald and Townsend 1976; Fitting and Goodyear 1979; Raab et al. 1980). Just as many ecologists questioned such assertions (Auberbach et al. 1976; Cowan 1976; Loftin 1976), so too have archaeologists (Reeves 1982; Epp and Spurling 1984). Yet the problem exists that bad and unethical work remains possible. Imputable causes range from an absence of self-regulation by a professional association, deficiencies in judicial control and public participation mechanisms in environmental decision-making, and, in some jurisdictions, the ineffectiveness of market forces in inducing appropriate performances (cf., Moy 1983).

Although most consultants will be hostile to this idea, (and several will be undeservedly penalized by its manifestations), and despite Moy's (1983) assertions to the contrary, the current market catharsis will probably have salutory effects. Many clients and governments agencies now have a considerable body of experience with h.r.i.a. As well, industry and government are more freely talking with one another about heritage issues (Robinson 1982). Consultants have reputations, not just for doing the most for less, but for doing the most, the best. Those striving to protect and enhance corporate images will survive the shakeout. They will be leaner, more productive, more competent, more professional, and more attentive to the needs of clients, government, the public, and the discipline.

Acknowledging the need for heritage consulting to expand as a business, as an employment opportunity for graduating students, and as a third-party constituency in the policy-making process, the profession as a whole must
make some adjustments. Three alterations to the discipline's current course are needed. First, regulatory agencies must develop an appreciation of the constraints consultants operate under and be more elastic and explicit in their expectations and requirements. Second, universities must overhaul their curricula and give students the skills necessary for real world careers. Finally, public institutions should retreat from directly competing with independent consultants in the heritage services marketplace.

The bulk of contract opportunities must be reserved for private sector companies. Universities should refrain from undertaking contract work. Granted there are advantages to their involvement (e.g., Pokotylo 1982:10) but these countervailed by some long-term disadvantages. For example, take the often used argument that contract projects provide students with employment and hands-on training which will assist them in gaining postgraduate jobs. From the outset of heritage consulting and over the subsequent short-term, there was a certain amount of truth to this. But now the first generation of students with this background are out in real world, many struggling as consultants and potentially facing unfair competition from their former university as well as other institutions. The premise behind the academic argument for bidding on contracts, thus, directly contradicts its effects: intervention by academic institutions only forecloses employment chances for former students (Spurling 1982).

University efforts would be better allocated to applied research activities which augment, rather than restrict, a.r.m.'s development (Epp and Spurling 1984). Such a withdrawal, redeployment, and market segmentation will further the discipline's progress towards becoming a mature profession.
4.4.4 The Academic and Museum Research Communities

About 1970 a significant change in the demographic characteristics of the discipline began: employment opportunities other than those provided by universities and museums commenced. Today in Western Canada more archaeologists work in bureaucracies and consulting firms than in public institutions. Academic and museum position formation peaked in early 1970s then rapidly flattened out. Since the beginning of the present decade there have been no new positions created in either institution.

Not only have the university and museum been eclipsed as the major employers of archaeologists, they have also ceded pre-eminence as the major undertakers of field work. Table 4.23 and Figure 4.10 shows the number of pure research projects carried out between 1970 and 1983. Approximately 390 such investigations have been prosecuted. The annual rate of increase in such projects is positive: B.C. shows an overall growth of 7%, Alberta 5%, Saskatchewan 12% and Manitoba, 18%. However, compared to the total number of archaeological projects in the study area, pure research has been generally declining proportionate to the number of h.r.i.a./m. studies. Table 4.24 displays the percentage academic studies comprised of the total number of permits issued in the four Western Canadian jurisdictions since the inception of their permit systems. Despite the very recent increases in pure research projects, the mean percentage of academic research projects ranged between a low of 15% (Saskatchewan) and a high of 26% (B.C.).

Contrasting these averages to the percentages which pure research projects constituted of the permits issued in the early to mid-1970s, the
Table 4.23 Number and Percentage Growth in Pure Research Projects

<table>
<thead>
<tr>
<th></th>
<th>B.C.</th>
<th>Alberta</th>
<th>Saskatchewan</th>
<th>Manitoba</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970/71</td>
<td>22</td>
<td>-</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>1971/72</td>
<td>25</td>
<td>-14%</td>
<td>4 33%</td>
<td>2 -50%</td>
</tr>
<tr>
<td>1972/73</td>
<td>22</td>
<td>-12</td>
<td>2 -50</td>
<td>3 50</td>
</tr>
<tr>
<td>1973/74</td>
<td>10</td>
<td>-55</td>
<td>1 -50</td>
<td>4 33</td>
</tr>
<tr>
<td>1974/75</td>
<td>10</td>
<td>0</td>
<td>7 -36%</td>
<td>1 0</td>
</tr>
<tr>
<td>1975/76</td>
<td>8</td>
<td>-20</td>
<td>11 57</td>
<td>0 -100</td>
</tr>
<tr>
<td>1976/77</td>
<td>7</td>
<td>-12</td>
<td>16 45</td>
<td>1 100</td>
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<tr>
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<td>-43</td>
<td>14 -13</td>
<td>0 -100</td>
</tr>
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<td>0</td>
<td>14 8</td>
<td>1 100</td>
</tr>
<tr>
<td>1980/81</td>
<td>5</td>
<td>0</td>
<td>10 -29</td>
<td>2 100</td>
</tr>
<tr>
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<td>-20</td>
<td>11 10</td>
<td>0 -200</td>
</tr>
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<td>1982/83</td>
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<td>16 45</td>
<td>4 400</td>
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<tr>
<td>1983/84</td>
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<td>200</td>
<td>16 0</td>
<td>6 50</td>
</tr>
<tr>
<td>1984/85</td>
<td>14</td>
<td>16</td>
<td>12 -25</td>
<td>6 0</td>
</tr>
<tr>
<td>Total</td>
<td>157</td>
<td>151</td>
<td>31</td>
<td>48</td>
</tr>
<tr>
<td>Mean</td>
<td>11</td>
<td>7%</td>
<td>13 5%</td>
<td>2 12%</td>
</tr>
</tbody>
</table>

- information unavailable

proportionate decrease of academic participation in field activities is very evident.

We have seen some of the effects the shift from dominance has had on American archaeology. The expansion of the discipline into government and consulting strained relations between those within and those outside the academy. Operational values and ethics had to be formulated and articulated by the latter. Often these were at variance to the traditional and mostly implicit set carried by institutional archaeologists. Several academics have expressed unhappiness with the effects of this transformation and withdrawn their services (section 3.4). Little has been forthcoming from
Figure 4.10 Number of Pure Research Projects

Table 4.24 Percentage of Research Projects in Relation to All Projects

<table>
<thead>
<tr>
<th>year</th>
<th>B.C.</th>
<th>Alberta</th>
<th>Saskatchewan</th>
<th>Manitoba</th>
<th></th>
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<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td>1971/72</td>
<td>51%</td>
<td>-</td>
<td>-</td>
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<td>1972/73</td>
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<tr>
<td>1984/85</td>
<td>36</td>
<td>12</td>
<td>14</td>
<td>-</td>
<td>14</td>
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</tbody>
</table>

Mean: 26% 19% 15% 20%

- information unavailable
nonacademics in response, possibly because those outside institutions have less time and do not need to publish, perhaps because some nonacademics harbour a lingering sense that they should be doing something else, or maybe they feel such criticism does not warrant the dignity of response.

Academics are by no means unanimous in their reaction to the heterodoxy. Dunnell, for one, has persistently admonished the discipline for the gulf between academic and public archaeology (cf., Willey and Sabloff 1980:262; Stange 1984). He sees the research archaeologist's responsibility to be the development of practical methods and strategies to effect preservation of the resource base since this is the only means of ensuring the discipline's future. Indeed, he (1983:523) inclines to the view that "failure to seize the opportunity afforded by CRM to conserve the archaeological record effectively must be counted as the single most important issue in Americanist archaeology".

The tension between private or public resource management and research archaeology has been documented predominantly from the professoriate's vantage. References to the inherent unproductiveness of a.r.m. studies and the need to re-establish academic archaeology as a purer endeavour have been remarked upon. But, at least in Western Canada, many of those involved in academic archaeology really never took resource management very seriously, and, for the most part, do not fully understand its purpose and methodology. Instead of viewing resource management as a central function, attention was focused on the student employment and training possibilities. Where it suited department chairpersons and those academics able to engage in consulting, a.r.m.'s means were opportunistically seized. Unfortunately, a commitment
to its ends has yet to emerge.

This section will examine and refute the extreme academic view of a.r.m.

It is not my intent to diminish the important contributions academic archaeology has made and must continue to make. Indeed, without the involvement of university and museum researchers knowledge of regional prehistory and the fur trade would be virtually nonexistent. And without the earlier guiding efforts of the first generation of professional archaeologists towards the drafting and enactment of conservation legislation, Western Canadian a.r.m. could be vastly different. But because of the continuing misunderstanding many academics still have concerning what must be conceded as the only conceivable course for the discipline, an aggressive argument pro a.r.m. is necessary. Such a defence, unfortunately, involves what some may perceive as an uncalled for assault on the status quo.

It is useful to establish the basic parameters of the academic and institutional community. A listing of all professional-level archaeologists employed in universities or museums in Western Canada as of 1984 is provided in Table 4.25. Given is their name, institution of present employ, known or estimated date of recruitment, involvement in regional studies and educational background. Found at the end of the table are summary statistics which reveal some interesting data. The majority of those listed are employed by universities (73%), were recruited prior to 1975 and are male (88%). This glaring gender bias is not unusual and, in fact, penetrates the discipline (Gero 1983; and shown herein). Of the 41
Table 4.25 Full-time Employed Archaeologists in Universities and Museums in Western Canada

<table>
<thead>
<tr>
<th>Name</th>
<th>Institution of Current Employment</th>
<th>First Year of Employment</th>
<th>Regional Research</th>
<th>Institution of Highest Degree</th>
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</thead>
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<tr>
<td>R. Matson</td>
<td>British Columbia</td>
<td>1972</td>
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<td>Cal. Davis</td>
</tr>
<tr>
<td>R. Pearson</td>
<td>British Columbia</td>
<td>1971</td>
<td>no</td>
<td>Yale</td>
</tr>
<tr>
<td>D. Pokotylo</td>
<td>British Columbia</td>
<td>1978 (r)</td>
<td>yes</td>
<td>British Col.</td>
</tr>
<tr>
<td>R. Carlson</td>
<td>Simon Fraser</td>
<td>1966</td>
<td>yes</td>
<td>Arizona</td>
</tr>
<tr>
<td>J. Driver</td>
<td>Simon Fraser</td>
<td>1981 (r)</td>
<td>yes</td>
<td>Calgary</td>
</tr>
<tr>
<td>K. Fladmark</td>
<td>Simon Fraser</td>
<td>1972</td>
<td>yes</td>
<td>Calgary</td>
</tr>
<tr>
<td>B. Hayden</td>
<td>Simon Fraser</td>
<td>1974</td>
<td>no</td>
<td>Toronto</td>
</tr>
<tr>
<td>P. Hobler</td>
<td>Simon Fraser</td>
<td>1967</td>
<td>yes</td>
<td>Arizona</td>
</tr>
<tr>
<td>E. Nelson</td>
<td>Simon Fraser</td>
<td>1975</td>
<td>yes</td>
<td>McMaster</td>
</tr>
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<td>J. Nance</td>
<td>Simon Fraser</td>
<td>1974</td>
<td>no</td>
<td>Calgary</td>
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<tr>
<td>R. Shutler</td>
<td>Simon Fraser</td>
<td>1979</td>
<td>no</td>
<td>Arizona</td>
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<tr>
<td>M. Skinner</td>
<td>Simon Fraser</td>
<td>1976 (r)</td>
<td>yes</td>
<td>Cambridge</td>
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<tr>
<td>D. Mitchell</td>
<td>Victoria</td>
<td>1965</td>
<td>yes</td>
<td>Oregon</td>
</tr>
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<td>N. Roland</td>
<td>Victoria</td>
<td>1976</td>
<td>no</td>
<td>Cambridge</td>
</tr>
<tr>
<td>M. Chapman</td>
<td>Langara Col.</td>
<td>1974</td>
<td>yes</td>
<td>Simon Fraser</td>
</tr>
<tr>
<td>J. Baker</td>
<td>Okanogan Col.</td>
<td>1974</td>
<td>yes</td>
<td>Simon Fraser</td>
</tr>
<tr>
<td>D. French</td>
<td>Okanogan Col.</td>
<td>1980</td>
<td>yes</td>
<td>Victoria</td>
</tr>
<tr>
<td>J. Haggerty</td>
<td>B.C. Prov. Museum</td>
<td>1972 (r)</td>
<td>yes</td>
<td>Wash. State</td>
</tr>
<tr>
<td>R. Inglis</td>
<td>B.C. Prov. Museum</td>
<td>1980 (r)</td>
<td>yes</td>
<td>Toronto</td>
</tr>
<tr>
<td>G. Keddie</td>
<td>B.C. Prov. Museum</td>
<td>1972</td>
<td>yes</td>
<td>Simon Fraser</td>
</tr>
<tr>
<td>O. Beattie</td>
<td>Alberta</td>
<td>1980 (r)</td>
<td>yes</td>
<td>Simon Fraser</td>
</tr>
<tr>
<td>A. Bryan</td>
<td>Alberta</td>
<td>1964</td>
<td>no</td>
<td>Harvard</td>
</tr>
<tr>
<td>R. Gruhn</td>
<td>Alberta</td>
<td>1964</td>
<td>no</td>
<td>Radcliffe</td>
</tr>
<tr>
<td>C. Hickey</td>
<td>Alberta</td>
<td>1974</td>
<td>no</td>
<td>Brown</td>
</tr>
<tr>
<td>D. Lubell</td>
<td>Alberta</td>
<td>1970</td>
<td>no</td>
<td>Columbia</td>
</tr>
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</table>

(continued)
Table 4.25  Full-time Employed Archaeologists (continued)

<table>
<thead>
<tr>
<th>Name</th>
<th>Institution of Current Employment</th>
<th>First Year of Employment</th>
<th>Regional Research</th>
<th>Institution of Highest Degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>N. David</td>
<td>Calgary</td>
<td>1980</td>
<td>no</td>
<td>Harvard</td>
</tr>
<tr>
<td>R. Forbis</td>
<td>Calgary</td>
<td>1964/1983</td>
<td>yes</td>
<td>Columbia</td>
</tr>
<tr>
<td>J. Helmer</td>
<td>Calgary</td>
<td>1981</td>
<td>yes</td>
<td>Calgary</td>
</tr>
<tr>
<td>D. Kelley</td>
<td>Calgary</td>
<td>1968</td>
<td>no</td>
<td>Harvard</td>
</tr>
<tr>
<td>J. Kelley</td>
<td>Calgary</td>
<td>1968</td>
<td>no</td>
<td>Harvard</td>
</tr>
<tr>
<td>V. Markotic</td>
<td>Calgary</td>
<td>1965</td>
<td>no</td>
<td>Harvard</td>
</tr>
<tr>
<td>J. Raymond</td>
<td>Calgary</td>
<td>1970</td>
<td>no</td>
<td>Illinois</td>
</tr>
<tr>
<td>B. Reeves</td>
<td>Calgary</td>
<td>1971</td>
<td>yes</td>
<td>Calgary</td>
</tr>
<tr>
<td>M. Wilson</td>
<td>Calgary</td>
<td>1981</td>
<td>yes</td>
<td>Calgary</td>
</tr>
<tr>
<td>E. Milne</td>
<td>Medicine Hat Col.</td>
<td>1970</td>
<td>yes</td>
<td>Calgary</td>
</tr>
</tbody>
</table>

**Alberta**

- G. Arthur Regina 1970 yes Calgary
- C. Wattral Regina 1971 no Minnesota
- U. Linnamae Saskatchewan 1971 yes Calgary
- J. Millar Saskatchewan 1969 yes Calgary
- Z. Pohorecky Saskatchewan 1964 no Cal. Berkley
- E. Walker Saskatchewan 1980 (r) yes Tex. Austin
- M. Hanna Sask. Mus. Nat. His. 1984 (r) yes Calgary

**Saskatchewan**

- L. Allaire Manitoba 1975 no Yale
- G. Monks Manitoba 1977 yes British Col.
- C. Shay Manito ba 1967 yes Minnesota
- W. Wade Manitoba 1972 yes Colorado

(continued)
Table 4.25 Full-time Employed Archaeologists (continued)

<table>
<thead>
<tr>
<th>Name</th>
<th>Institution of Current Employment</th>
<th>First Year of Employment</th>
<th>Regional Research</th>
<th>Institution of Highest Degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>C. Meiklejohn</td>
<td>Winnipeg</td>
<td>1970</td>
<td>no</td>
<td>Toronto</td>
</tr>
<tr>
<td>J. Steinbring</td>
<td>Winnipeg</td>
<td>1964</td>
<td>yes</td>
<td>Minnesota</td>
</tr>
<tr>
<td>B. Nicholson</td>
<td>Brandon</td>
<td>1980 (r)</td>
<td>yes</td>
<td>Simon Fraser</td>
</tr>
<tr>
<td>E. Syms</td>
<td>Mus. of Man &amp; Nature 1980</td>
<td></td>
<td>yes</td>
<td>Alberta</td>
</tr>
</tbody>
</table>

(r) indicates replacement position

Summary Statistics for Table 4.25

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of archaeologists (museum, college and university)</td>
<td>56</td>
</tr>
<tr>
<td>Number of university archaeologists</td>
<td>41</td>
</tr>
<tr>
<td>Number of college archaeologists</td>
<td>5</td>
</tr>
<tr>
<td>Number of museum archaeologists</td>
<td>10</td>
</tr>
<tr>
<td>Number of females</td>
<td>7</td>
</tr>
<tr>
<td>Number of females in university positions</td>
<td>3</td>
</tr>
<tr>
<td>Number of females in college positions</td>
<td>3</td>
</tr>
<tr>
<td>Number of females in museum positions</td>
<td>1</td>
</tr>
<tr>
<td>Number of regional specialists</td>
<td>38</td>
</tr>
<tr>
<td>Number of regional specialists in universities/museums</td>
<td>23/10</td>
</tr>
<tr>
<td>Mean percentage of regional specialists per university depart.</td>
<td>60</td>
</tr>
<tr>
<td>Percentage of regional specialists for Western Canada</td>
<td>68</td>
</tr>
<tr>
<td>Mean year of recruitment for university departments</td>
<td>1972</td>
</tr>
<tr>
<td>Mean year of recruitment for departments and colleges</td>
<td>1973</td>
</tr>
<tr>
<td>Mean year of recruitment for departments, colleges and museums</td>
<td>1973</td>
</tr>
<tr>
<td>Mean year of replacement per department</td>
<td>1979</td>
</tr>
<tr>
<td>Mean year of replacement per museum</td>
<td>1980</td>
</tr>
<tr>
<td>Mean year of replacement per Western Canada</td>
<td>1980</td>
</tr>
<tr>
<td>Where most university archaeologists received highest degree</td>
<td>Calgary 9; Harvard 5; Arizona 3; Minnesota 3.</td>
</tr>
<tr>
<td>Where most college archaeologists received highest degree</td>
<td>Simon Fraser 2.</td>
</tr>
<tr>
<td>Where most museum archaeologists received highest degree</td>
<td>Alberta 2; Washington State 2.</td>
</tr>
<tr>
<td>Where most regional specialists received highest degree</td>
<td>Calgary 10; Simon Fraser 6; British Columbia 4.</td>
</tr>
</tbody>
</table>

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university archaeologists just over half (56%) are involved in regional studies. Adding in museum archaeologists boosts the number of regional specialists to 38 or 68% of the total number of archaeologists. This could increase if the trend of replacing vacant positions with people having regional research interests persists. Most regional specialists and university employed archaeologists received their ultimate training at the University of Calgary. As expected, regional schools place second and third among universities producing regional specialists. But this does not hold for schools training (all) university archaeologists. Following the University of Calgary, American universities rank number two and three. Nonetheless, by sheer weight of numbers the University of Calgary's dominating influence on the course of regional studies and, to an extent, on university affairs in the region is shown.

One further observation merits discussion. The rate of faculty replacement to date has been very low. The average year of recruitment for university professors was 1972. Mean dates of recruitment for colleges and museums are just slightly later. What this means in terms of a.r.m. is that the majority of senior faculty and museologists, especially those in decisional capacities, were trained and hired well before a.r.m. had evolved into a serious enterprise. The lack of appreciation for and understanding of a.r.m.'s principles, procedures and objectives may be partially accounted for by this fact.

Today, however, the public service and private consulting are the major, and perhaps only markets for career-path students. Yet, no university program in the study area provides courses in a.r.m. policies,
methods and techniques on a consistent and comprehensive basis. Where such courses are offered at all they tend to be taught by those with intermittent involvement or experience gained in exceptional contract projects. Only at the University of Calgary is the topic covered on a continuous basis by an individual active in consulting (Reeves 1984). The evasion of a.r.m. as key curriculum is hard to reconcile with the accelerating specialization toward numerous subdisciplines, especially those rooted in the hard sciences. Up to the early 1980s employment in a.r.m. and derivative contract opportunities was regarded as convenient means of employing undergraduates and graduates until the former become the latter and the latter get "real jobs" in the academy. Such real jobs are, and will continue to be rare.

This conservativism to an extent still works against the overall health of Western Canadian archaeology. University departments have not responded to the need for generalists, for people trained in archaeology and various aspects of resource management. Even the exemplary MA or Ph.D gets little exposure to e.i.a. (e.g., Lee and Wood 1985); public policy and program administration; law; managing human performance; microeconomics; urban and regional planning; site presentation, interpretation and development; public relations; technical and popular writing; business administration; negotiation; taxation; professional ethics; museum exhibitry, curation and conservation; and other fields so necessary outside the university setting. Perpetuating this closed and shrinking pedagogic system is the fact most academics never experienced professional employment outside a university. Few had or sought job opportunities in business or line government agencies. Considering the average year of faculty recruitment, it is not difficult to
see why the lack of concern for applied issues persists. But what this means is that most academics have never confronted archaeological problems in real time and with real money. The development of realistic solutions to the many practical problems which cannot be solved by contemporary research methods remain neglected. Much research ends up having little value for those charged with producing and implementing public policies because practical constraints are ignored. Overconcern with ethereal methodology, together with the striving for levels of intellectual satisfaction and detail beyond that supportable in real time and money, renders much that is taught inapplicable outside the university (Mitchell and Sewell 1981).

This contributes to a distorted view of the costs and efficiencies of academic research, a view which underpins some recent expressions that university research is more cost-effective than a.r.m. research. It is evident that the time between the initiation of "pure" research projects and the release of results is, with little exception, much longer that the planning-to-completion period for contract projects. While it is true that, due to the speed with which they must be completed, many a.r.m. investigations have produced a "grey", sometimes scholastically marginal literature. Yet they have produced a huge evidential literature which is largely ignored by pure researchers (although Fladmark's [1982] summary of B.C. archaeology is a noteworthy contrary example).

Academic and museum researchers frequently under-appreciate the real costs and constraints of field work and analysis. The use of field schools and other forms of student labour keeps "pure" research incredibly low (e.g. Fitting 1984). Contemporary a.r.m. projects are not shielded from overhead
and physical plant costs by the public investment in university education and museum operations and more closely approach the true costs of doing archaeology today (Epp and Spurling 1984).

There are obvious intrinsic variances in responsibility, motivation and Weltanschauung between academic and public archaeologists. Academics are primarily responsible to students, themselves as professionals and their emically defined concept of the discipline. The immediate impacts of their activities and decisions primarily affect the careers of students, the publication of papers and the awarding of grants. Because of this limited, immediate impact political and social constraints on their activities are relatively few. Nonetheless, up to this point in time a small number of academics have wielded considerable power over the direction of archaeological science in Western Canada. Decisions over what is meritorious research, who should receive Social Sciences and Humanities Research Council monies, and who should be permitted to publish monographs and papers has been concentrated in a very few hands. The negative aspects of such a consolidation of influence elsewhere has been remarked upon (Dunnell 1982b; Zubrow 1981). The question must be asked: is it appropriate or desirable that such a small, comfortable academic community, with such a low turnover rate, early average date of recruitment and similar educational background ought to continue to exclusively forge the course of research in Western Canada? For this system fosters liberty without accountability. Under present circumstances, personal research goals can be pursued to the exclusion of perhaps more pressing public and pan-disciplinary ones. At best, this freedom creates a false view of the world, one which is often
erroneously extended to non-academically employed archaeologists. At worst, it has allowed a few to do whatever they thought was archaeology at public expense with often limited payoffs to either the discipline or the public.

Reinforcing the academic epistemology is its reward system. The incentives of tenure, promotion, status, study leaves, sabbaticals, research and travel grants, and so on have led to the well known "publish or perish" syndrome (see Broad [1981] for discussion on the qualitative and inflationary effects of this syndrome on the scientific literature). The need to publish in quantity limits what is considered suitable research. Topics worthy of investigation must be relatively short term, reducible to a small number of defensible conclusions, tightly focused and, above all, of concern to other academics. Since resource management research opportunities tend to be topically just the opposite they are of little current concern to Western Canadian academics (Epp and Spurling 1984). Beanland and Duinker's (1983) and Railton's (1985) comments on the unfortunate consequences of this reward structure for the e.i.a. enterprise can be echoed for a.r.m.

More worrisome is that not only are university departments failing to produce students with useful and useable job skills, some downgrade employment in the real world. Pure, unfettered research is elevated as the apogee of archaeology. Directed, applied or publically oriented research is relegated to the nether regions (cf., Raab 1984b). Accepting the value of esoteric research as self-evident, that research is an end rather than a means, and believing the promise of eventual academic employment, graduate students often acquire a self-sacrificing devotion to furthering a narrow concept of the discipline, sometimes at great psychological and financial
expense (see Fitting 1979, 1984). At the extreme this zealotry resembles that more often encountered in fringe religions than in contemporary professions. Those fortunate enough to achieve a job in the outside world often have a very exaggerated idea of archaeology's importance which can take years to adjust to the realities of business or government. It comes as somewhat of a shock to the neophyte that an entirely different set of motivations and benefits exist outside academia (cf., Dyckman 1978:284; Section 4.3.4). Here, the greatest rewards come to decision-makers, while research is seen as a necessary technical support service. And an archaeologist's accountability is not to academics -- it is to the public, their elected representatives, clients or shareholders.

The failure of graduate schools to acknowledge and instigate an appreciation of this value system can cause considerable trauma for entry level public service or consulting archaeologists. Overdedication to an academic ethos can lead to errors in judgement; failures to discern the nuances of decision-making and other administrative processes; and hostility from co-workers, superiors, and the agencies and companies with which s/he must continually interface. Untrained and carrying idealistic goals and values, archaeologists new to government or business can discredit the entire a.r.m. undertaking by attacking problem-solving in immature, controversial, and other embarrassing ways.

Contributing to such attitudes is the fact many academic institutions have stressed "technological thinking", a style of conceptualizing and treating problems exclusively based on logical positivism, empiricism and the use of quantitative methods, while neglecting alternatives perhaps more
useful in dealing with environmental (and archaeological) problems (D. Miller 1985a). Archaeology's rush to apply the methods of other disciplines in the late 1960s and 1970s so to increase its scientific stature is well known (e.g., Gummerman and Phillips 1978; Schiffer 1981; Moore and Keene 1983). This resulted in the scientism (viz. "an exaggerated trust in the efficacy of the methods of natural science to explain social or psychological phenomena, [or] to solve pressing human problems"; Webster's 1973:1034) found in some workers writings, especially in those of the early converts to the new archaeology (e.g., Martin 1971; Fritz and Plog 1970; Watson et al. 1971). Recently, sober analyses of the impact of such technological thinking have appeared (e.g., Wylie 1982; Gero et al. [editors] 1983; Hodder 1985), with specific criticisms levelled at archaeology's assumption - its activities are apolitical in practice and effect. For a rm the limits of empiricism, objectivism, reductionism and quantification in problem solving are encountered when decisions involving psychosocial values are required (Miller 1985b).

Integrating or replacing technological approaches to problem solving with alternative paradigms (e.g., Barrett 1984; Christensen 1985) must rate high on the list of changes necessary to make academic institutions more relevant in the intellectual and sociological environment of the current decade. Universities must recognize, teach and investigate the very real differences between disciplinary research and what Berry (1978) calls policy research. In his words:

"The object of the former is to advance knowledge in the particular scholarly concerns of a discipline by arriving at empirically valid and
theoretically significant conclusions about the phenomena deemed to be relevant by the discipline in question. Such research begins with an intellectual problem posed by previous research or theory, and proceeds at a pace dictated only by the demands of scholarship. The intended audience is the discipline's teachers and researchers; and the self-corrective method employed is the adversary proceeding of replicative studies and scholarly reviews.

"Policy research is significantly different from disciplinary research in several respects. Its object is to provide information immediately useful to policy makers who need to make a decision dictated by non-disciplinary imperatives. The intended audience is the decisionmaker, to whom it must be made intelligible and convincing if it is to be useful. There are no counterparts of disciplinary research's self-corrective methods. Seldom is there time to collect new data or to engage in prolonged analysis. And, most profoundly, the policymaker must contend every day with the differing and changing goals of competing interest groups in a society that values democratic pluralism as an end in itself" (Berry 1978:205).

Recognizing the inherent ideological content of its activities (e.g., Leone 1982a,b), academic archaeology's responsibility now is to overcome its inertia, encourage non-technological thinking and start to value and accommodate policy research and activity within its ethos, research programs and career advancement systems (cf., Barrett 1984; Beanlands and Duinker 1983; Weaver 1985a,b; Wallace 1984).

Happily, the cleavage between academic archaeology and a.r.m. in the
study area will probably close in this decade. Again, there are no significant post-graduate employment opportunities outside of a.r.m. markets at the present time or in the near future (cf., Kidd 1981). As the entry qualifications for real world careers stiffen and opportunities for on-the-job training shrink, serious students will demand specialized, career-path instruction in a.r.m. Departments wishing to sustain current course offerings and enrollment levels will be obligated to recruit resource management specialists from industry and government who can build a.r.m. programs. Those which do not will incrementally shrink as tenured faculty retire and are not replaced.

While such a reconciliation will reduce the tensions between academic and public archaeologists, will the gulf between the two endeavours be bridged? An emerging issue bearing on this question concerns the opportunity costs of academic research. With a steadily declining resource base, can the excavation of pristine and unthreatened sites continue? Up to 20 (52%) of the 38 institutionally employed archaeologists in Western Canada undertake such research in any given year. With the limited professional resources allocable to these activities, would not their diversion to more urgent management and conservation problems be not only more conscionable but more cost-effective than permitting a continuance of laissez faire research archaeology? Besides just site impact mitigation a host of pressing resource management topics require attention, that, for various reasons, remain outside the abilities of agency and consultant archaeologists to tackle (Epp and Spurling 1984). As well, numerous museum and university collections require analysis and write-up. Given present
and future legacies it is not difficult to envision legislative prescription and proscription of academic research as one of the contentious issues of the 1990s.

4.4.5 The Curators

To this point the role of museum archaeologists has been treated as coordinate with university researchers. This really under-represents the scope of responsibilities museum personnel have. Exhibitry and curation are also vital components of the museological enterprise.

Originally, archaeological research by provincial museums was oriented to acquiring artifacts and site contextual information for public interpretation via display techniques, publication and extension programs. The importance of these activities cannot be overstated. Museums provide the most immediate and reinforceable exposure to archaeology the majority of people gain in their lifetimes. And the public currently enjoys exceptional archaeological and ethnographic displays at the BCPM and MMMN.

However, after the establishment of permanent galleries and exhibits from 1955 (SMNH) to 1980 (British Columbia Provincial Museum [BCPM], U.B.C.'s Museum of Anthropology, the Provincial Museum of Alberta [PMA]) field work continued to be undertaken for pure research purposes. Given the lengthy planning, design, preparation and construction periods for display development, and considering the expense of exhibitry, gallery changes were and remain infrequent. Thus many museum archaeologists came to enjoy spare research and development capacities. Often this professional time was directed to site excavations and surveys far in advance of any defined needs for the information obtained. Unfortunately, the lack of an immediate
purpose for data recovery created an asymmetry between the number of excavated sites and the number analysed and reported upon. Most museums are now contending with backlogs of staff-acquired collections needing analysis which have no apparent display or interpretive end-uses.

At the same time, museum researchers recognized the need to build provincial site inventories and basic data management systems. Over the 1960s and 1970s a fair amount of professional activity was also devoted to organizing collections and associated site information, undertaking salvage excavations, developing avocational societies and pressing for greater government involvement in conservation. In these endeavours are found the geneses of the four Western Canadian a.r.m. agencies.

Due to the costs involved the design of new, and improvement of existing displays continues at a reduced pace. As well, field work by the PMA, the SMNH, and MNMM has declined in recent years. The BCPM remains comparatively active, albeit under fairly extraordinary circumstances insofar as its Archaeology Division has been conducting inventory studies under contract to B.C. Hydro and Parks Canada (Haggerty and Inglis 1984). Instead of actively amassing new collections by in-house field investigations most provincial museums are now turning to the analysis and write-up of their legacy of stored assemblages, while, at the same time, either gearing up for, or already attempting to cope with a stepped increase in curatorial responsibilities caused by the proliferation of a.r.m. projects.

Forseen by Lipe (1977:38-9) as early in 1972, and recognized subsequently (e.g., Lindsay et al. 1980; Lindsay and Williams-Dean 1980;
Ford 1984) museum facilities have been greatly strained by the increased demands placed on their repositorial capacities by the growth in data recovery projects required under legislation. In the study area this problem has not reached the crisis stage it seems to have in the U.S. (Marquart et al. 1982; Raab 1983; Schaafsma 1984). Nonetheless, assuming the continuation of the a.r.m. enterprise, it is only a matter of time until the present abilities of provincial, university and regional museums to absorb incoming collections from the public and projects carried out by staff, independent researchers and heritage resource consultants are exceeded.

The management of artifact collections and associated data is a complex and expensive business. Collections must be processed, catalogued, accessioned, conserved, stored, and maintained so that they are accessible, and retain their scientific value to future researchers. Adequate complements of trained curators and preservation specialists must be hired, sufficient and secure storage facilities must be found or built, manual or computer based data and records management systems must be constructed, maintained and updated, and the costs of these basic museological responsibilities must be borne far downstream, i.e., in perpetuity. While parts of collections comprised of lithic and some types of ceramics have relatively simple and straightforward storage requirements, this is not the case for metal objects, leather, wood, other perishables or the written and photographic records which accompany the recovery of all artifact classes. More expensive and stringent preservational facilities are needed for these. Clearly, over the long term (e.g., three or more generations), the
curatorial and storage costs of existing collections will be very high. Add to this the volume of materials produced by future a.r.m. and research projects which will require repositories and costs can only steeply accelerate.

Who is to pay these expanded curatorial expenses --- the taxpayer, ratepayer, consumer or the developers sponsoring heritage resource impact investigations? In the U.S. a consensus is emerging that museums should demand initial processing and long term curatorial costs be built into the line items of research and a.r.m. contract budgets (Marquardt et al. 1982). Indeed, formulae for determining the expenses of processing and 100 year curation have been generated. Some federal agencies have begun to adopt the notion that the developer should pay for storage. For example, unable to identify an institution in Washington State willing to accession artifact collections from the Bonneville Second Powerhouse Project, the State Office of Archaeology and Historic Preservation proposed the Corp of Engineers pay additional costs (up to $200 000) for the storage of recovered artifacts (GAO 1981a:27-28).

In Western Canada it is unlikely that proponents will be assessed repository costs, at least at provincial institutions. The Crown has claimed ownership of archaeological objects in some provinces. Thus these jurisdictions could be viewed as indirectly responsible for the ex situ curation of archaeological materials. Furthermore, for 75% of the provincial museums, research or contract monies dedicated to the storage of artifacts would simply go into general revenue accounts and would not necessarily have a positive effect on these institutions' annual budgets.
Only for the Manitoba Museum of Man and Nature, an arms-length agency, is it
envisionable that storage payments could supplement the annual operating
budget. Consequently, there appears little incentive for museum directors
and department managers to consider implementing user fees for curation.

Again, institutions in the study area have not yet reached the point
where facility saturation has become a crisis. Yet the day cannot be far
off. Already some institutions have released policies stipulating minimum
standards for the documentation and preparation of collections which must be
met before they will be accepted for perpetual curation. The costs of
bringing site assemblages up to these standards will have to be explicitly
embedded in research and contract budgets. For it will take adequate funds
and properly trained cataloguers on the staff of field projects to process
collections and organize and duplicate the field notes, maps, photographs,
and other documentation required by museums. Increasingly it will become
incumbent upon field archaeologists to consult with repository personnel
ey early in the research design stage to arrange for curation, become briefed
on acceptance standards, and determine and predict the spatial and handling
requirements of the recovered data. This consultation process has evident
advantages for both the curator and the researcher or consultant. The
former will know when and what to expect in the way of increased collection
responsibilities and will be able to plan ahead; the latter will be able to
budget for pre-accessioning preparation and reduce or eliminate the costs of
interim storage.

Less obvious benefits accrue to the field archaeologist from early and
ongoing involvement in curation problem-solving. In the near future,
curators will be more and more compelled to "edit" their holdings. For the most part this will involve separating site collections into smaller groupings according to their storage requirements and probability of imminent reinvestigation (Ford 1984:137). If space is at a premium, parts of some assemblages may have to be destroyed or discarded. Indeed, this is happening today at some institutions. Because curators and archaeologists may differ over what portions rate first order, second order, or third order treatment, it will be up to the archaeologist to justify which parts should remain accessible, which should be hived off and stored in bulk, and, perhaps, which items should be jettisoned. Ultimately the museum will remain the decision-maker where accepting collections is concerned.

The long-term curation problem has been likened to a ticking bomb (Raab 1984). Some embarrassing outcomes are predictable if heritage resource consultants, academic researchers and regulatory agencies do not recognize the crucial role museums play in the a.r.m. process. For example, imagine the consequences should an a.r.m. agency require a developer to carry out a mitigation project which results in a large artifact collection for which no repository can be found, either because space does not exist or because the collection was improperly readied. The developer could argue that its money was mis-spent preserving data nobody wants. The regulatory agency could be discredited and the consultant saddled with storing material at his/her own expense.

But there are even more fundamental issues. If archaeology presumes to be a science, then one of the only ways the results of its "experiments" are reproducible and useable is through restudy of the way data was acquired and
the physical data itself. Museums serve to house both the "experiment's" documentation and the physical evidence produced. Researchers and consultants who fail to provide for the replicability of their work by improperly preparing their collections and recording their recovery procedures for curation and archiving are clearly not furthering the discipline's aspirations towards becoming a science. Furthermore, the time is not that far off when most field work opportunities will have been precluded. Archaeologists of the future will be dependant upon the collections being made today, for which both adequate curation has been arranged and, which, beforehand, have been assiduously organized and documented (cf., Kolata 1981).

4.4.6 The Professional Associations

Under the rubric of special interest groups are found three provincial associations and two national bodies. The organizations are mostly concerned with the advancement of the discipline as a vocation. The provincial associations are largely devoted to lobbying government for greater support in research and resource management and, at least on the provincial level, exhibit an increasing interest in insuring fairness in regulatory rulemaking and standard setting. The Canadian Archaeological Association (CAA) has been mostly concerned with scholarly matters, as witnessed by the content of its annual meetings, its journal and newsletter. Finally there is the Council for Canadian Archaeology (CCA), a group ostensibly comprised of all archaeologists in the nation holding the
doctorate. In the past it seems to have operated as a conveyance for federally employed archaeologists to influence federal government policy on the development of the National Museum of Man and formation of cultural policy. Since its participation in the 1981 Federal Cultural Policy Review Committee hearings (section 4.5.4.3), it appears to have become moribund and little more can be said of its current purpose and activities.

The first of the provincial groups to form was the Association of Manitoba Archaeologists, Inc. (AMA). Impetus for its establishment in 1973 was provided by the GDAP which was experiencing some turbulence and required professional support. About 30 individuals presently belong to the AMA, not all of whom are professionally employed in the discipline. The AMA recognizes itself as a lobby group and, to this end, has developed policies on burials, professional standards of conduct and h.r.i.a. guidelines (Mallory 1978). It holds annual business meetings at which emergent issues are discussed and associational positions arrived at.

Essentially the same functions are carried out by the Saskatchewan Professional Archaeologists Group (SPAG). It formed in 1977 as a chapter of the Saskatchewan Archaeological Society (SAS) to encourage the development of heritage legislation. Consisting of about 25 academics, consultants, bureaucrats and graduate students, and exclusively professional in membership, SPAG continues as a watchdog and lobby for a.r.m., research and public education.

The remaining professional organization was founded in 1979 in Alberta. Of the three, the Association of Consulting Archaeologists (ACA) is the most guild- and business-like group since its membership is limited to
consultants and its explicit purpose is to promote their self-interest. The ACA consists of about 15 firms or individuals (M. Quigg, personal communication, 1984). It functions to press the Alberta government for stronger enforcement of the AHRA, more effective and efficient regulatory procedures, and other measures advantaging contracting. To date its major accomplishment has been to have the Minister of Alberta Culture undertake a management review of the ASA (Donahue 1985).

On the national level is the CAA. As of July, 1983, the CAA comprised about 330 members, 122 (37%) of which were resident in Western Canada (CAA Newsletter 3[2]). Traditionally, the CAA has served the academic needs of the discipline in Canada and taken much the same role as the SAA: publishing a scholarly journal, (latterly) a topical newsletter and holding an annual conference which, like the SAA meetings, are "usually rather well attended for purposes of social and economic interaction" (King 1976:21). Moreover, the CAA has very recently moved towards developing national policies for heritage conservation and interventions in public hearings concerning resource conservation (e.g., Sym 1983, 1984; Fladmark 1985). Currently, under the presidency of R. Janes (a seasoned archaeo-apparatchik), the CAA is making considerable headway in lobbying the Minister of Communications to establish federal heritage legislation. The CAA federal heritage policy committee has managed to bypass the bureaucracy and meet with the minister's aides, an advanced tactic for a new lobbying group (see section 4.5.4.2).

Having taken these tentative steps towards intervention in public policymaking, Canadian archaeology exhibits most of the characteristics of a profession (e.g., Mann 1978). To be sure, attaining true professional status
will be difficult and controversial. Resistance can be anticipated from senior ranks of CAA, particularly those in academic employ who may view professionalization as an infringement on academic freedom. Notwithstanding this potential opposition, its younger and secularly employed members will likely move the organization towards greater activism in policy fields.

Pursuant to this, two provincial organizations are currently investigating professional association status such as that enjoyed by the medical, architectural and engineering disciplines. Both SPAG and the AMA have discussed reformation as SOPA-like organizations. Recognizing 1) the difficulties SOPA is experiencing in gaining acceptance and members (M.E. King 1983), 2) problems with balancing professional interests with those of the public (Moy 1983), 3) the small number of practicing professionals in each province together with 4) the lengthy process of acquiring statutory endorsement by respective provincial legislatures, it may take a decade or more before the first truly professional archaeological association emerges. Given these constraints, it may be desirable to consider an alliance with an established professional groups (e.g., SOPA or the Canadian Society of Environmental Biologists) or prosecute the formation of an pan-disciplinary organization like a Canadian Association for the Advancement of Science (cf., Thompson 1985).

The benefits of self-governance and licensing, of establishing fee structures, codes and ethics, and acquiring the legitimacy in the political arena accorded professional societies far outweigh the benefits of muddling through typical of the current situation. For one thing, the creation of professional associations would relieve the omnipresent and sometimes
overbearing bureaucratic sheparding of archaeological issues. Academics, consultants and government regulators alike would experience less confrontational and more consensual relationships if, together, they could better control decisions on the discipline's development.

4.4.7 The Avocational Societies

Avocational or amateur archaeological societies exist in all four Western Canadian provinces. More diligent scholarship might reveal earlier organizations but the first known to me was the short-lived Regina Archaeological Society which formed in 1911 (Dyck 1980). With the deflation and exposure of many sites during the "dust-bowl" years and the joblessness and increased leisure time caused by the Depression, artifact collecting under the guise of avocational archaeology flourished in Saskatchewan during the early 1930s. In 1933 the SAS was established in Regina, followed two years later by the Saskatoon Archaeological Society (Carlson and Jones 1985). Although the former ceased independent operation in 1952, the latter continues in existence and may well be the oldest avocational group in Canada. Re-established in 1963 the SAS now incorporates the Saskatoon society as its most active chapter. The next province to evidence such public interest was Alberta where, in 1960, the Archaeological Society of Alberta (ASocA) started in Edmonton (Coutts 1981). The following year, the Manitoba Archaeological Society Inc. (MAS) was established. Finally, in 1966, following a series of public lectures on archaeology in Vancouver and the proselytizing efforts of Roy Carlson, the Archaeological Society of British Columbia (ASBC) came into being (Bunyan and Gurnsey 1985).

Currently, all these societies are regionalized to an extent. The ASBC
is made up of branches in Victoria, Vancouver Abbotsford, Kitimat and the west Kootenays; the ASocA has centres in Calgary, Edmonton, Lethbridge and Medicine Hat; and the SAS is comprised of five chapters in Regina, Saskatoon, Swift Current, Biggar and Kindersley. The MAS also maintains chapters and a separate group, the Archaeological Society of South-Western Manitoba (ASSWM) which formed in 1973, served people in the Brandon area until the early 1980s.

Behind the creation of each of these societies was a small group of professional archaeologists or members of allied professions, e.g., Worden and Carlson in B.C.; Bayrock and Forbis in Alberta; Mayer-Oakes in Manitoba (Coutts 1981; Putt 1984). Most are still supported by professionals, often by involvement in society executives. Since their establishment memberships have achieved relatively stable levels. According to polls taken in May, 1983 and September 1984, the ASBC has about 300 members; the ASocA, 160; the SAS 300; and the MAS, 350. Time series information on membership numbers is not available for all societies. This is unfortunate. It would be useful to analyse the growth and decline in society numbers according to changes in legislation, professional involvement and key members.

Regrettably demographic and socio-economic profiles are unavailable for the three westernmost societies. The single survey known to me (Monks 1980) showed the MAS was mostly comprised of urban, married males between 30 and 39 years of age. Occupationally, "archaeologists", educators and students predominated. Thereafter, diverse other vocations (e.g., retirees, farmers, clerics, technicians, self-employed individuals, etc.) had roughly equal representation. Middle to low income earners were significantly more
prevalent than those in higher income groups.

Given the diversity in membership, and assuming it is mimicked in the other societies, divergent ideas would be expected as to what an association's function(s) should be, dependant on an individual's stake in the discipline. Considering what little has been written from either the professional and avocational positions, there is surprising unanimity.

Professionals support avocational associations for a variety of reasons. Societies can play a critical role as a lobby or special interest group (Dyck 1977; Pendree and Epp 1983; Frison 1984b). Ostensibly at arms-length to bureaucracies and the political arena, societies can bring leverage to bear on policy issues. By participating in public hearings, legislative and development decisions affecting archaeology can be influenced. By writing to cabinet ministers and university presidents, guidelines and regulations can be modified or implemented, feedback as to how well programs are functioning can be provided (cf., Friedman 1979) and the need for professional position creation or retention can be pressed. By interacting with the media, public concern can be generated and awareness can be raised. By face-to-face contacts with cabinet ministers or backbenchers, budgetary allocations can be enhanced. Through these mechanisms, avocationalists potentially wield considerable power in the forging of provincial policies.

Secondly, in some provinces professionals have called upon society members to assist in emergency mitigation projects. Avocationalists then have provided a semi-skilled labour pool at little or no cost to the discipline when crises have arisen. Appreciating the real costs of doing archaeological field work, this "sweat equity" has, and (where condoned)
continues, to represent a considerable investment in resource conservation.

A third benefit provincial associations provide professionals is their communication system. By publishing newsletters and journals, and holding chapter and annual meetings, societies provide apparatus for professionals to rapidly disseminate new information to the avocational community, the interested public and other professionals. As well, they are provided with a chance to write for non-academics, a useful and frequently underdeveloped skill (cf., Fagan 1984).

From the perspective of the non-professional, however, the advantages of membership have been devalued in recent years. Originally, archaeological societies were joined by people interested in artifact collection or excavation, for primarily recreational and acquisitive reasons. For many, societies provided for sharing information on recovered artifacts and new found sites. Over the 1970s the growing sophistication required in field work and analyses together with the expanding number of professionals came to displace avocationalists from such traditional endeavours. With passage of conservation legislation, their participation in fieldwork became restricted in British Columbia, Saskatchewan and Manitoba, and interdicted in Alberta. With professionalization much academic archaeology found in reports and regional journals became impenetrable, irrelevant and uninteresting to lay readers' (cf., Putt 1984). Few efforts were (or, are being) made to remedy this (cf., Spurgeon 1977; Fladmark 1981).

Surprisingly, at least in Saskatchewan and Manitoba, while membership levels did not increase during this decade, neither did they dramatically decline.

To prop provincial associations up during this transitional period,
museum and regulatory archaeologists recommended avocationalists divert their attention from destructive and increasingly illegal recreational activities like artifact collecting and pot hunting, to constructive, conservational ones. Dyck (1977) suggested that, in addition to their roles as advocates and defenders of the profession, association members carry out systematic surveys, monitor and report local resource management problems and attempt to increase awareness of resource conservation at the community level. To these, Simonsen (1977) added an oversight function — monitoring professional activities to ensure the highest possible standards of conduct were being observed.

Simonsen also cautioned that both watchdog and advocacy roles would be compromised for avocational groups consisting of large numbers of professionals. He recognized their abilities to influence public policy were warranted on the political level by the assumption that avocationalists have no direct, vested interest in any fiscal enrichments bestowed on regulatory agencies, museum programs or university departments (cf., Dyck 1977:6-7). Governments, he observed, were more likely to be swayed by groups whose concerns are more closely aligned with those of the general public than associations that merely represent a "small self-interest group" (Simonsen 1977:8). As well, Simonsen considered a peer-group ethic would be ineffective in guaranteeing high standards of performance whereas a society without professional bias could better enforce such standards.

But what of the non-professional members of these societies? What do they consider the role of their organizations to be? Little has been forthcoming concerning these questions. Johnson (1979) and Pendree and Epp
(1983) suggest curiosity and sheer interest are the chief motivations of membership. In terms of purpose or function, Johnson (1979), Russell (1979) and Pendree and Epp (1983) believe an avocational society should actively assist in resource conservation and the generation and communication of archaeological knowledge to the public. As well, lobbying for the enhancement of legislation and professional efforts are considered a major responsibility (Johnson 1979; Russell 1979; Coutts 1981; Pendree and Epp 1983). Some also suggested avocational associations should be considered paraprofessional workforces able to assist in rescue excavations, record sites, and monitor resource impacts. Thus far, few have complained in writing of the gulf between professional and amateurs. Coulton (1979) argued that the concept of an "archaeologist" be broadened enough to encompass those with little or no formal training, as long as they shared a concern for increasing archaeological knowledge. He also believed that those with little training should be permitted to carry out their own field programs in cooperation with professionals. Coulton did not really express his view of the avocationalist's role so much as defend the amateur's freedom to actively participate in field archaeology (presumably in reaction to the curtailment of amateur field activities after passage of the AHRA.

If it can be assumed the above writers faithfully represented the views and aspirations of their societies' members, the consensus seems that avocationalists perceive their role as supporting the vocational community and the general conservation effort through participation in the political process and actual field activities. No concern existed that the effectiveness of avocational societies could be compromised by professional
involvement. Rather, vocationalist participation was encouraged (Johnson 1979).

Thus there seems to be common agreement that provincial associations have three essential functions. First is the dissemination and communication of archaeological knowledge within and external to a society's membership. To these ends, all provincial associations publish newsletters or journals and hold annual meetings. Publications include(d) The Midden (ASBC), Alberta Archaeological Review (ASocA), Saskatchewan Archaeology and Saskatchewan Archaeological Society Newsletter (SAS), the Manitoba Archaeological Quarterly (MAS) and the now defunct Archae-Facts (ASSWM). As well, since 1980 the ASocA, SAS and MAS have all published edited volumes on the archaeology of their respective provinces. The journals and newsletters have usually been edited by government archaeologists. This has led one association, the SAS, to upgrade its journal to the extent all major articles submitted are refereed while a separate newsletter carries short contributions and news items.

Another communication task undertaken by some groups is educational extension. Russell (1979) saw public relations as an important initiative of the ASBC, particularly the need to improve archaeology's image. Other societies have adopted this objective. The SAS, for example, sponsors a provincial lecture tour by its education officer during the winter months. Seminar topics have covered site recording techniques, heritage legislation, how to obtain an avocational permit, artifact and faunal identification, and so forth. In Manitoba, the MAS has sponsored a cable television series interpreting archaeology to the public (Putt 1984).
The second major function of avocational societies is that of the special interest group. All societies have carried out successful lobbying as witnessed by the development of provincial legislation over the last two decades (chapter 3). Activities in this regard have included the 1975 ASBC meeting with the incumbent NDP caucus; the briefs given by the ASocA (1973) and the SAS (1980) during public hearings into the need for heritage legislation; the SAS's annual meeting with the Minister of SCR; the SAS's intervention when it seemed the Saskatchewan Heritage Conservation Division was to be abolished; and the ASBC's participation in the Site C hearing (section 4.5.3.4) and continuing attempts to influence federal policy-making concerning the export of archaeological objects (Bunyan and Gurnsey 1985).

Most of these efforts were successful in furthering provincial archaeology; a few were not. Yet the important point is that the effort was made at all. Although the growing importance of public participation in environmental, political and economic decision-making will not be examined until section 4.5.4 suffice to say there is no indication that the accommodation of citizen involvement in public policy-making will be discouraged and every indication it will increase.

But this leaves the archaeological constituency in a difficult and disadvantaged situation vis-a-vis other disciplines or interest groups. The main problem is that there is a very small and fragile third party interest in archaeological issues. Special interest groups supporting arts and multiculturalism programs have far larger memberships and are considerably more sophisticated in their approaches to pressuring government on policy and funding issues. These coalitions sometimes directly compete with
heritage organizations for the same rare resources: money and personnel. In budgetary battles the former will likely continue to maintain the upper hand until such time as archaeological and heritage societies develop greater acumen in policy issues and increase the general public support for their causes. Even within the general heritage conservation movement, archaeological associations are frequently in a competitive situation with historic conservation groups. The latter appear to enjoy greater public support for the conservation of their resources (e.g., White 1982) and have a much more visible and appreciable resources (i.e., historic structures). Hence, within the heritage conservation effort itself archeological concerns are presently subordinate to historic resource ones.

Archaeology's ascent from near the bottom of policy priorities can only be realistically achieved through the actions of avocational societies. Of late, the academic community has more or less ignored opportunities to influence decisions affecting the long term security of the resource base. Even if the majority of academics were to become more socially responsible, there are too few of them to mount effective opposition campaigns or interventions to inappropriate public policy decisions (cf., Elton 1983). Archaeologists directly working for government cannot oppose their political masters' policies or development decisions. Consequently, the avocational associations remain the bulwarks and the true defenders of the faith. For it is through these organizations concerned professionals can don the viels of anonymity and, together with avocationalists, exert political influence.

The seriousness with which governments recognize, and respond to special interest (or, in bureaucratic terms, client or target) groups is often
measurable by the amount of support extended to them. Notwithstanding the
cynical position that this support is co-option, most provincial
associations receive grants for their journals or newsletters, annual
meetings, educational programs and special projects and events. To be sure,
the funding of these activities can have Machiavellian overtones. The
provision of grants monies may represent an attempt by government to control
and defuse otherwise independent and vocal citizens coalitions --- a buy-off
of sorts. Seen another way, by allocating modest funds to volunteer
organizations so they can operate needed programs, governments can be spared
the greater expense of establishing permanent agencies to deliver them.
Finally, as discussed in section 4.5.4, there exists the everpresent
possibility that some special-interest groups are simply the creations of
bureaucrats needing clients to support or implement policy initiatives. The
pedigree of provincial societies dispells the last interpretation of their
genesis, but not necessarily that for their continued support. For the
above reasons, both vocational and avocational members must carefully guard
against overdependency on government largesse for the existence and policy
direction of their associations and become more self-reliant.

A third and less developed function of provincial societies is as a
volunteer workforce. In B.C., Saskatchewan and Manitoba the
tradition of avocational inclusion in professionally directed field
projects continues, although only in the last two provinces is there a
significant level of participation. Non- and paraprofessionals are also
involved in the Volunteer Regional Advisor Programs coordinated in B.C. in-
house by the HCD and externally by the SAS in Saskatchewan. Begun in B.C.
in 1974 and adopted in Saskatchewan in 1984, the VRAP is comprised of volunteers in local communities throughout the province who undertake public relations tasks regarding heritage conservation and monitor, record and report heritage resources and threats to them (Dyck 1979 [compiler]). Participants receive small stipends to defray expenses incurred during their activities. Another type of project avocationalists in B.C. are involved in is the ASBC's recording of private collections.

The extent to which avocationalists should be permitted to independently carry out such activities as site survey, surface collection or excavation is controversial. In the Prairie Provinces, avocational archaeology has historically resulted in some meticulous research, particularly as regards data recovery. However, a redundant problem has been that many of the more ambitious excavation projects were never written up (Pendree and Epp 1983:207-8). Numerous difficulties and uncertainties surround field projects undertaken by semi-trained volunteers and non-professionals (e.g., Clarke 1978). Presently, in B.C., Alberta and Manitoba, avocationalists are ineligible for permit status. This was also the case in Saskatchewan up to 1984 when, bowing to popular and nascent political pressure, as well as pragmatism, ARMS introduced a permit system for avocational archaeology. Although permits to carry out excavations are preferentially granted to those with relevant experience, demonstrated proficiency, and (usually) support from a professional, permits for site survey and surface collection are being issued much more liberally.

The reasons for democratizing field work opportunities in this fashion were not solely due to political expediency. From 1980 to 1983, SAS members
recorded ca. 11% of the sites entered into the provincial inventory. Thus, a considerable level of unpaid and informal site survey was being undertaken. It bears repeating that prevailing economic and political conditions place severe constraints on the abilities of agencies to manage and conserve the archaeological resource base. Also, the magnitude of the rate of resource loss clearly surpasses the ability of agencies to cope, under current (and, one suspects, even under vastly improved) staffing and funding regimes. Eliciting cooperation in a.r.m. from the avocational community, then, has much to recommend it. By condoning survey and collection by volunteers, by providing means for including this part of the public in the more basic aspects of data discovery and recovery, grass roots support for research and resource conservation is reinforced. Many geographic areas which would otherwise be unsurveyed will be inspected, many sites which would be vandalized or lost will be more systematically collected and recorded, and citizens in many communities who would never become aware of archaeology or sensitized to conservation will be informed on these issues by avocationalists living in their communities who are involved in permitted site survey and collection. An additional benefit stemming from a more open permit system is that the collections curation crisis can be partially alleviated. Allowing private citizens to house collections for specified periods, with the understanding that certain provisions apply (i.e., full reporting of collections, access to collections by researchers, secure storage conditions), deflects the costs of curation from public institutions (Pendree and Epp 1983).

Enlarging opportunities for non-professional involvement in a.r.m. is
increasingly finding favour in the American context (cf., King 1979; DeBloois 1982). While tradeoffs are undoubtedly incurred in the quality of information recovered, the analyses undertaken and the security of collections curation, it is evident that the professional a.r.m. community would be much less effective in these areas on its own.

The Saskatchewan program is only in its first year of operation. It remains to be seen how effective the avocational permitting system will prove, though initial indications point to optimism. Another initiative being considered in Saskatchewan (Pendree and Epp 1983:203-4) and elsewhere is the development of a training certification program such as exists in Arkansas (Bronitsky 1980; Early and Chapman 1980; Early 1983). The Arkansas program provides avocationalists the chance to develop skills in survey, excavation and laboratory analysis. Graduated levels of competence are recognized to which participants can aspire depending on their personal interests and objectives. Taken to its logical conclusion, there should be no reason why avocationalists could not be professionalized to the point they could undertake independant research and conservation projects and, perhaps, even contract work.

The huge and well educated post-war cohort is aging and within two or three decades will be retiring. This trend, combined with shorter work-weeks, job sharing and persistently high un- or underemployment will foster increased leisure time and demands by large sectors of the public for meaningful forms of recreation. Presumably, government's abilities to provide "soft" social services such as archaeological resource management will remain or become even further stressed by unstable revenue bases.
Consequently, it makes great sense for new partnerships, linkages and networks to be forged between professions and the various publics, client groups and government in the co-production of goods and services (Naisbitt 1982:189-205; Van Til 1984). Co-producing services such as a.r.m. that are now provided solely by government agencies may not only secure such programs, but also may offer "a means of supplementing and stimulating them and of lessening some of the most dangerous fiscal, psychological and political side-effects of excessive bureaucratization, centralization, and depersonalization of governmentally administered programs" (Nielsen 1979:251 as quoted in Van Til 1984:320). Expanding citizen participation in archaeology in innovative ways through accelerated professional support and assistance of existing voluntary organizations is clearly mandated by projections of Western Canada's social, demographic and economic milieu for the near future.

Avocational archaeology has a respectable history of support for archaeology as a vocation, both in Canada and the U.S. (e.g., Chapman 1985). Having been assigned by much of the discipline to the "amateur" wilderness during the 1970s, there are indications a concerted, professional effort may be underway to meaningfully reintegrate the avocationalists (e.g., Sabloff 1985). As should be evident, there are an overwhelming number of reasons why this is overdue.

4.4.8 Western Canadian Indians

The final special interest group considered here is that comprised of Western Canada's first peoples. Historically, archaeologists and Indian peoples in the study area have had few points of interaction. This was
particularly the case in the Prairie Provinces where most lands were surrendered when treaties were struck over a century ago (chapter 2). In B.C., where aboriginal title is still an unsettled and contentious issue, attempts to facilitate native interest in their heritage began after passage of the AHSPA, the establishment of ASAB, and the appointment to it of two Indians in 1973. ASAB shortly thereafter received a series of recommendations from the B.C. Union of Indian Chiefs respecting archaeological activities. From these came two significant policies: 1) permits for archaeological work would only be granted where a researcher or consultant acquired permission from the band in whose aboriginal territory the study was to take place and 2) all recovered artifacts were to be held in trust for Indian bands. Although the first policy caused some researchers difficulties in starting up projects, where problems in gaining permission occurred it was often possible for the native ASAB members to mediate resolution (Carlson 1979c).

Archaeologists and natives in B.C. have enjoyed reasonably cordial relationships since this time. Projects directly funded or administered by the HCB have been encouraged to preferentially hire Indians where possible and this has heightened awareness among native bands and tribal councils of archaeology's methods and goals. There are now instances where bands have contracted heritage consultants to undertake resource inventories of traditional lands or vet developer's h.r.i.a.s for errors or omissions. Similar alliances and applications have developed in the American southwest (e.g., Doyel 1982).

Mutually beneficial interactions in the Prairie Provinces are more
recent. Confrontation between archaeologists and natives was more the rule in the early 1970s. However, this situation is changing. Councils of the Blood Reserve in southern Alberta (Wells et al. 1984; Conaty and Tailfeathers 1985) and the James Smith Reserve in central Saskatchewan are undertaking heritage resource projects, assisted by professional archaeologists. Indian consultants have also assisted in the thematic planning of the Head-Smashed-In and Wanuskewin sites (see below). These and other cases where archaeology is being applied to further understanding and appreciation of Native Canadian heritage at the behest of Indian peoples can only be welcomed and encouraged.

Certainly there are many initiatives which could be undertaken by the profession: pressing for Indian participation on Heritage Advisory Boards, affirmative hiring policies on archaeological projects and engaging knowledgeable people as consultants in site interpretive developments and enhanced educational participation in Native Studies programs, especially those courses extended to reserve communities. Above all, Western Canadian archaeologists should make every effort to learn the concerns of the descendents of the cultures they are studying, design their projects within any social or religious constraints (cf., Winter 1980; Holt 1982; Adams 1984; Ferguson 1984) and, insofar as possible, around the research interests of the Indian communities.

Through these initiatives the discipline's vulnerability to Trigger's (1980a; 1984b) allegations can be diminished. There is much cogency to the argument that archaeology has reinforced, rather than challenged the Western European attitude to North American Native cultures as unchanging and
backward (Blakey 1983), a view that has persisted since the Valladolid debate of 1550 (Berger 1983). All sectors of the discipline are culpable. Cultural resource managers have tended to see sites and areas simply as manageable resources, and failed to take into account native concepts of sacredness and property (Winter 1980; Spry 1983); culture historians often perceive native cultures as aggregations of artifacts and technological traditions; and, in the absence of literature to the contrary, ethnoarchaeologists seem to conceive of their informants as exhibits in a "living folk museum" (Berger 1983:14), happily preserved for narrow scientific purposes despite the social and health pathologies the subjects may suffer by remaining in a relatively unacculturated state. It is time that archaeologists pay more than lip service to the American Anthropological Association's (1973:1) statement that the individuals we study "must come first."

No doubt there will be difficulties, and perhaps radical transformations of the discipline (see Ucko 1983) reforming such attitudes. New interpersonal skills have to be developed (e.g., Holt 1985), information has to be shared, attention has to be given to the aspirations, goals and self-images (e.g., Landsman 1985) of communities and the larger constituencies in which they organize, and hindrances to, as well demands for control over research must be expected (cf., Langford 1983). A recurrent strain is the shifting and sometimes volatile nature of band/tribal council politics (cf., Tennant 1983). The archaeologist who enjoyed support and cooperation from a council one year might find just the opposite situation the next due to factional electoral changes. As well, the exploitation by native groups of
research and rescue projects for unrelated political and economic purposes must be anticipated (Winter 1980; and cf., Ucko 1983). But these difficulties will not disappear by ignoring them. Instead, unless the discipline adopts a more socially responsible and interventionist role, these problems will increasingly impinge upon archaeological activity.

A critical flashpoint, of course, remains. The treatment of burials continues an unresolved but quickly surfacing problem area in the four western provinces. Although the issue of disinterment and post-exhumation curation has yet to approach the status of a controversy as seen in California (Meighan 1984) or Australia (Lewin 1984), the potential is ever present. Under provincial laws in situ skeletal materials and, in cases, the loci of their interment are protected either implicitly or explicitly. No jurisdiction, however, has developed regulations or guidelines covering the exhumation of skeletal materials. Indeed, only one statute addresses the status of the remains following excavation: Saskatchewan's HPA. Section 65 stipulates that all human skeletal material predating A.D. 1700 must be forwarded to the responsible minister for reinterment after its scientific analysis or any other research or educational purpose the minister determines necessary. All Native remains postdating A.D. 1700 are to be made available to the band council nearest the site of discovery for reinterment subsequent to scientific examination or other research or educational purpose decided upon by the minister. Although this section does not stipulate that analysis of skeletal remains must take place, the minister can permit or order this. By coincidence Section 65 incorporates many of Rosen's (1980) recommendations for the treatment of burial sites.
To this point, Section 65 has not been challenged formally. However, it is obvious here and in the other Western Canadian jurisdictions, that the responsible minister has discretionary powers to dispose of skeletal materials according to political expediency and exigency. If the correct amount of pressure was exerted by a band council to return or reinter, say, a provincial museum's skeletal collection, this could very well occur. Alternatively, as almost happened recently in Saskatchewan (below), the responsible minister could order burial removal without the consent of local bands. Assuming the scientific utility of excavating and analyzing Canadian Indian skeletal material (e.g., Canadian Association for Physical Anthropology [CAPA] 1979), the discipline must develop a casuistry for defending or opposing such actions. It is well and fine for the CAA to endorse the CAPA position regarding human skeletal remains (Wright 1983) --- this action will be meaningless in the face of political will to the contrary. At the base of justification must be the recognition that Western Canadian osteo-archaeology normally operates in cultural systems where western scientific values have, if any, a very tenuous place, where scientific excavation is frequently sacrilege, where digging up the ancestors for the sake of research may be a fundamental offense of community and ethnic values. Acknowledging this, handling burial excavations on a case by case basis, explaining the purpose of such research and its benefits to Indian groups, and being prepared to graciously abandon a project if it is opposed, are unquestionably very conscientious and ethical recourses (cf., Hanna 1980).

On the other hand, the discipline must also develop an ethos regarding
situations where burial excavation may be required in the face of Indian opposition. In 1985, in Ft. Qu'Appelle, Saskatchewan such a situation arose when a condominium developer encountered an unmarked, early historic graveyard. Following the dismissal of an interlocutory injunction against further development of the site by the Saskatchewan Court of Queen's Bench, a political decision was taken to disinter the burials, a move opposed by the plaintiff, a 25 000 member Indian organization. This evolved into a heated media battle, in the midst of which the discipline formed a circle to prevent any of its members from participating in the removal. The Saskatchewan premier finally intervened and a resolution was soon forthcoming which saw the site's preservation and appropriate compensation for the developer. But prior to this, the discipline's withdrawal nearly forced the affected developer to contract undertakers, who would have accomplished the work in 3 person days (whereas an archaeological consulting firm estimated the job would take 50 person days). The loss in information recovery would have been considerable, although most archaeologists considered the damage to the discipline's standing with Indian groups would have been far more costly. To my knowledge, this is the first case in the last decade where burial removal without Indian consent has been considered. Since it may not be the last it is imperative the discipline develop a code of ethics which addresses this problem. In light of this it is encouraging that the SAA is devoting considerable attention to the treatment of Indian burials (Dincauze 1985).

Increasing awareness among, ceding some measure of control to, and cooperating with Native American communities on all archaeological issues
and policies will be necessary only a short distance downstream.
Confronting this inevitability now and preparing realistic accomodations are the only courses of action open. Both the discipline and the very important special interest group comprised of Western Canada's first peoples stand to greatly benefit.

4.4.9 The Public

The general public, obviously, cannot be considered a special interest group. Its aspirations, concerns and values as regards archaeological activities, while not well understood, can be expected to be sporadic and not well developed. Consequently, the public constitutes the most difficult segment of society to deal with when analysing archaeology's impact and support. As taxpayers, ratepayers, consumers, resource owners and voters, this preponderantly large group ultimately funds all "pure" research and mandates all resource conservation activity. The attitudes and awareness of the public vis-a-vis these endeavours is almost completely unstudied. What exactly is their willingness-to-pay for resource custodianship or a heretofore esoteric scientific enterprise? If the cost per capita for these activities was common knowledge, would most people feel cheated or well served? And most importantly, has the average Western Canadian's knowledge of and appreciation for the region's prehistory and early history been significantly augmented by 35 years of archaeological research and 15 years of resource management? These questions cannot be satisfactorily answered at present. But they must be asked and the answers regarded as desiderate.

Some idea of the public investment in a.r.m. is shown in Table 4.26 and Figures 4.11 and 4.12, which display the per capita a.r.m. expenses in
Table 4.26 Per Capita Dollar Expenditures on A.R.M. Projects

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Total: 6.73 3.49 4.43 2.33
Mean: .45  .23  .30  .16

Saskatchewan

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Total: 4.11 1.61 5.16 2.42
Mean: .82  .32  .37  .17

Manitoba

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Total: 4.11 1.61 5.16 2.42
Mean: .82  .32  .37  .17

A: total a: total (1970 dollars); B: developers; b: developers (1970 $$)
Figure 4.11 Total Per Capita Expenditure on A.R.M.

Figure 4.12 Per Capita Expenditures on A.R.M. by Development Community
terms of the monies spent by developers as well as the total provincial expenditures (i.e., developer plus agency expenditures [Table 4.5]). For fiscal year 1984/85 more was spent on a.r.m. projects per capita in Manitoba than any other western province. In descending order, Saskatchewan, Alberta and B.C. followed. In terms of per capita expenditures by the development community, Saskatchewan citizens spent 18 cents, B.C. consumers 10, Manitoba's 8 and, surprisingly, Alberta's only 6 cents. A province by province comparison reveals the following. B.C.'s highest total and developer per capita expenditures occurred in 1979/80. Since 1981 these costs have declined by -18% and -20% per year and the total 1984/1985 expenditures are about the same as they were in 1973/74. Saskatchewan citizens spent the most per capita on the a.r.m. enterprise in 1981/1982. Since this fiscal year expenditures have fluctuated. Manitoba's per capita costs peaked in 1975/76 both in terms of developer expenses and total expenditures. Similar to the Saskatchewan case, since 1981/82 no trends are evident.

Granted there are problems with a strict interpretation of these figures. In some cases, h.r.i.a.s have been paid for by companies resident in provinces other than where the work was carried out. As well, cost per capita is not a robust measurement. Even so, considering museum, university and federally funded programs are excluded from this table, the individual citizen seems to pay a healthy amount for Western Canadian archaeology.

Clearly, the "general public" is a deceptive, if not untenable concept. In truth, there are many publics with both transitory and dogmatic interests and concerns (Fazio and Gilbert 1981). Leaving apart those sectors which
can be slotted into special interest groups, the easiest way to identify archaeology's publics is to focus on the interests vested in the subject rather than try and define the groups holding these. E.M. Davis (1979) has attempted a typology of interests which is used below in abbreviated form.

His first type of interest is founded on romanticism --- the use of the human past as a source of bolder, more heroic, mysterious, catastrophic, and, finally, more nonsensical explanations of cultural evolution and events than existing evidence permit. While the profession has persistently decried this attitude and misconstrue1 of archaeology's goals and pratice, little concrete has been to disabuse the public (cf., Cole 1980; Fagan 1984; Feder 1984). One can only wonder whether the average Western Canadian considers his or her dollar better (or, perhaps, is being) spent seeking ancient astronauts rather than recovering and interpreting the prosaic data on past cultures embedded in shell middens, lithic scatters and stone circles.

Esthetic interest comes next on Davis' list. Underpinning this is the public's appreciation of craftsmanship and artistic ability, whether it be incorporated in a utilitarian tool such as an arrowhead or an ideotechnic item like a funerary vessel. Without entering a discourse on the theory of aesthetics or the powerful linkages between contemporary and prehistoric art (e.g., Lippard 1983), suffice it to contend the ability to recognize and empathize with artistry executed in very different milieux and at remote time periods is among the hallmarks of being human. Unfortunately, this appreciation has led to personal acquisitiveness, the destruction of numerous archaeological sites in pursuit of esthetically pleasing artifacts
and the antiquities market. Nonetheless, the capacity of the aesthetic, experience to bridge millenia and experiential boundaries counts both as an easily defended reason for archaeological activity and a way to interpret the past to the public. Archaeology's job regarding this interest is to enforce the need to properly research and preserve the physical contexts wherein are found the artifacts eliciting the aesthetic response.

Discussed at length in section 4.4.5 is what Davis calls the hostile interest. This third attitude is found within the development community and among some property owners whose holdings include archaeological sites. To these groups archaeological activities sometimes are regarded as expensive impediments to construction, land development and profit-taking.

The fourth public interest is founded on the concern for furthering knowledge of our species and is held by "people who see archaeological materials and information as representing the lives of real people who lived in the real past" (E.M. Davis 1979:9). Manifest in such global initiatives as UNESCO recommendations (O'Keefe and Prott 1984:8-9) and increasingly expressed by diverse segments of society (e.g., farmers, urban dwellers and members of other professions), Davis considers this humanistic view of archaeology to stem from improved public education fostered by the school and university systems, not from the few outreach efforts made by the discipline itself (cf., Fagan 1984).

According to Davis, a fifth source of interest stems from people's concern for their social and cultural roots. In efforts to preserve, understand and promote local history, environmental and built landmarks, ethnic traditions, and national identity he sees a means of individual self-
actualization. Lipe (1984) would suggest this interest is founded on the associative and symbolic values of heritage resources. Granted, the use of archaeological data has been employed, at times perverted, for the darker purposes of imperialism, colonialism and nationalism (e.g., Ford 1973; Trigger 1984b). But seen in a more benign light, this interest also undergirds the rationale for national and provincial historic site development and probably sustains local archaeological societies. Appreciating these facts, the archaeologist's responsibility may well be to develop a socio-political critique of archaeological practice, and to frustrate distortions of the past which ratify and legitimize prevailing social ideology that reinforce contemporary social and economic inequalities (see Leone 1982a; Meltzer 1981; Gero et al. [editors] 1983).

In recent years the neoarchaeology has suppressed, even disparaged, this very powerful source of concern for and interest in the local and cultural-specific by focusing on the discovery of abstract general laws and the identification of cross-cultural technological and economic phenomena. A compensatory shift back to a historical particularist heuristic is already evident in some recent writings (e.g., Hodder 1978; Kohl 1981:111-2). Whether the emergence of a full-blown neo-Boasian research program should be welcomed or encouraged remains moot — much depends on the form(s) taken. However, studies devoted to the vernacular, to revealing what is locally and temporally consequential about a specific area's past rather than attempts to demonstrate how that past is analogous to that of, or is repeated in, other regions or on continents conform more closely to post-processualist precepts than neoarchaeological ones (Hodder 1985). A focus on local
cultural differences instead of pan-cultural similarities offers both new research directions to the discipline and direct benefits to the public, whose archaeological interests are strongly circumscribed by what prehistory means in the context of their own community's heritage.

Accepting the reality of these interests we must ask how political value is imputed to archaeological activities. Two opinion polls, one recent and one over a decade old, have touched upon these questions. The 1971 survey by the Alberta Environmental Conservation Authority (1972) found that 63% of Albertans were concerned with the preservation of the province's heritage. The recent poll commissioned by the Ontario Heritage Foundation found only 43% of respondents supported grants to archaeological research (White 1982). Neither survey is that useful since the first does not specifically address the issue and the second is concerned with public awareness outside Western Canada. Until more public opinion research is carried out we can only assume the public holds option, existence and bequest values (see section 4.5.3.3) for archaeological resources which approximately aggregate to current levels of expenditure on research, conservation and public education.

Unfortunately, accurate opinion polling is very expensive. Since archaeological issues are not high on the agendas of most decision-makers, sufficiently sophisticated surveys are unlikely to be employed in the near future to assist arguments for enhanced budgets and programs. Apart from this disadvantage the lack of public attitudinal data also means that we are deprived of the information needed to maximally deploy our scarce resources to increase public awareness (assuming this is needed). Decisions
whether to argue for increased publication programs, improved museum exhibits, interpretive site developments, greater attention to school curriculum development are necessarily replaced by ad hoc and muddling through processes. Only in Alberta --- the single jurisdiction which can afford to do so --- are these initiatives being made without decisional criteria. The remaining provinces must be far more judicious, selective, and modest in their efforts.

Strides have been made in eliciting the interest of the print media. Local newspapers, the Canadian Press, MacLeans, Heritage Canada and Equinox consistently carry archaeological stories or articles. Both MacLeans and Heritage Canada have devoted sections to the topic. Archaeological stories have had far less success with television pickup and coverage. To be sure, much of archaeology, like the stuff of other sciences, is difficult to deal with visually (Fulford 1984). The basic activities and results of archaeology by any conventional yardstick are visually unimpressive or, as some industry insiders claim, boring. Only by appreciating the rules governing what is exciting TV content and by developing the marketing and communication skills necessary to effectively use this overpowering media can archaeology hope to popularize its endeavours and educate the majority of its ultimate supporters. Since footage of square holes and humble stone tools are, and will remain, far less dramatic than accident scenes and far less diverting than cop shows, efforts must be made to tell the larger stories of prehistory both accurately and entertainingly. It must be remembered that we are vying for the precious leisure hours of the public, hours which are already being filled by densely and cleverly packaged
information and solicitations to buy, vote, learn and recreate. Perhaps by borrowing from the video industry, by using music, performance art, and computer graphics, archaeological information can be synthesized into interesting and informative vignettes which will capture a small audience share. The technology and expertise exists and the rock music industry has brought the cost of a three minute video down to ca. $50 000. What is required of archaeologists is to accept that our information is amenable to dissemination in non-print, non-academic and entertaining forms, learn visualization and other communications skills, and develop professional liaisons with the film and video industry.

Another alternative to public education which is conceptually more conventional, yet, in fiscal terms, still experimental, is the presentation of archaeological sites as interpretive facilities. The reconstruction of historic resources (military forts, fur trade posts, ranches and so forth) is not new --- Parks Canada and provincial departments of Parks and Recreation have faithfully or, in the case of the latter, sometimes expeditiously erected facsimiles of historic structures to educate the visiting public regarding the nation's or province's heritage and/or earn tourist dollars for a local area. The use of prehistoric sites for these dual purposes has only recently been undertaken, for reasons which are now explored.

Parks Canada's involvement in interpretive development is legislatively mandated by The Historic Sites and Monuments Act (1953) and The National Parks Act (1968) although the federal government was commemorating nationally significant heritage properties decades prior to explicit
legislative authorization (e.g., Johnston 1985). Currently, Parks Canada maintains small archaeological staffs in Calgary and Winnipeg to assist in site development. In recent years Parks Canada has developed a national systems plan to rationalize site significance and selection for interpretation. To date, only Alberta has cloned the systems plan for decisions on resource protection, interpretation and development (Alberta Culture n.d.). The expertise for this, and much else, arrived with the diaspora of key prehistorians, historians and planners from Parks Canada Prairie Region, which began in 1979.

Unfortunately, neither plans' structure is sympathetic to the thematic development of prehistoric resources. Burley (1984) attributes this to the absence of anthropologists or archaeologists on the task force behind the systems plan and the de facto assumption of the federal responsibility for prehistory by the National Museum of Man. Because of this split, Parks Canada became dedicated to historic archaeology while the ASC presumed its role to be pure research. Prehistoric site investigations to support development purposes fell in the interstice. Notwithstanding this separation, Parks Canada has been drawn into small prehistoric projects due to the need for resource inventories and impact assessments within National Parks (e.g., Fedje 1984; Sumpter et al. 1985). However, despite the addition of prehistorians to its staff, only two sites are under consideration for development by Parks Canada: the Melitta Mounds in southwestern Manitoba (Syms 1978) and the Gray Burial site in southwestern Saskatchewan (Millar 1978). Fiscal constraints will likely focus Parks Canada's efforts into the 1990s on operating and maintaining existing sites,
rather than acquiring and developing new ones.

Provincially, the responsibility for site development falls to either the four heritage conservation units (section 4.3) or the planning/interpretation/visitor services sections of the separate provincial departments with mixed mandates for parks, recreation or tourism. As just adumbrated, quite different approaches to research, fidelity, interpretive styles and goals are present. The former agencies try to stress pre-development investigation and authenticity in execution while the latter concentrate on the rebuilt-environment for enhancing visitor experience and tourism revenue generation. For these reasons perhaps it is fortunate that provincial parks departments have, to this time, ignored archaeological sites as candidates for park development (cf. Putt 1984).

Acknowledging that opportunities for in situ interpretation differ, Burley (1984) has broken prehistory presentations at the provincial level into three types. The first encompasses spin-off efforts associated with large mitigation projects with some longevity and accessible locations (e.g., the Stott site, [Tisdale 1978], the Site C project [Spurling 1980a, 1980b], the Nipawin Reservoir Heritage Study [Burley and Meyer 1981] and the St. Mungo excavations [Johnson 1983]).

From the last of these has come the only published assessment of a structured program. Working from the St. Mungo Cannery Site, situated near New Westminster in the most densely populated part of the study area, Johnson (1983) reports some statistics and observations on a joint ASBC/Provenance Research Inc. interpretation program. Between February and August, 1983, school and public tours of the site under salvage excavation
were offered. Over 18 000 people visited the site. Statistics for February and March showed that, of the one third of eventual visitors, about half were subadults presumably part of school tours, and the rest was made up of independantly motivated visitors (Charlton, in-house statistics, 1983). The most attractive visitor experience was the chance to screen spoil material. Such spin-off programming can serve to enhance public awareness with a minor outlay. As a bonus, by operating structured tours in concert with sizeable excavations, work is not unnecessarily interrupted by drop-in visitors (Burley 1984).

The second type of interpretive programming involves limited capital investments in purchasing and signing sites. Little to no infrastructure construction is involved. A parking lot, walk/stairway, directional and interpretive signage are all that is usually provided. Rock art sites such as Petroglyph Park on southern Vancouver Island, Writing-on-Stone in southern Alberta and St. Victor in southern Saskatchewan comprise most of the resources of this type so far developed. Since providing for site security is too costly, damage has occurred to some and forced consideration of off-site interpretations.

The final type of development requires intensive capital investment into on-site infrastructure (Burley 1984). Because of this only three such projects have been undertaken, two by Alberta Culture and one, just now in the post-design stage, by the Meewasin Valley Authority, a municipal agency primarily funded by the Saskatchewan government and City of Saskatoon. The first such development was the Strathcona site, located in a petrochemical subdivision near Edmonton. Since the late 1970s the site has evolved from
a candidate for impact mitigation into a zoo-like arrangement of fences and boardwalks entered through a visitor interpretation centre-cum-laboratory. Within the fenced area, field school students of the University of Calgary excavate a lithic workshop while as many as 15 000 visitors per year (Alberta Tourism and Small Business 1985) watch them, either guided or unguided, from the boardwalks.

Head-Smashed-In Buffalo Jump, a World Heritage Site, is undoubtedly the flagship of prehistoric site presentation in Canada. About 10 million dollars is being dedicated by Alberta Culture to the planning, research and development of a large and complex bison procurement system which first operated over 6000 years ago (Reeves 1983). To this point, site assessment (Brink et al. 1984) is close to completion and construction has begun on the interpretive centre. When it opens in 1987, marketing forecasts suggest 200 000 people/year may visit the site (Alberta Tourism and Small Business 1985). The run-off revenue has not been ignored by the local business people in Ft. MacLeod, the nearest town.

Less far along is the Wanuskewin (formerly Tipperary 'Creek') Heritage Park, a constellation of more than 15 prehistoric and two historic resources including a large ceremonial circle with a central cairn, bison jumps, bone beds, tipi rings, multi-component habitation sites, and the remains of a 1903 homestead. In short, just about every major site type in the northern Plains occurs. Over 1983 a team of landscape architects, interpretive planners, archeologists, architects and native advisors completed a master plan for the site's interpretation and management (Landplan Collaborative Ltd. 1984) and in 1985 a tourism impact study was conducted (Derek Murray...
Consulting and Associates Inc. et al. 1985). Plans for the site include a visitor centre, guided tours, and a trail system linking interpretive nodes (i.e., individual sites) manifesting hunting, gathering, spirituality and habitation themes (Spurling and Walker 1984). Whether funding will be forthcoming to develop the site remains an open question. However, the site's location just 3 km north of Saskatoon, a city of 160 000, and a projected visitation level of 110 000 people/year (assuming a capital investment of $5 200 000, an annual operating budget of $1 100 000, and a 14 year investment recovery period) augurs well for eventual development on economic grounds. The requisite political and academic support exists. The site has been provincially designated, making it eligible for a grant of $20 000/yr over five years for research and development. Furthermore, the Social Sciences and Humanities Research Council has provided $160 000 for site research.

Other heritage site presentations have at least reached the discussion stage and could possibly see research and planning completed by the decade's end. These include the interpretation of a prehistoric pit house situated within the Lytton Heritage Park in B.C. (Burley 1984), the Lockport site on the Red River north of Winnipeg (well advanced) and the development of one or more prehistoric and historic resources on the Blood Reserve in southwestern Alberta and James Smith Reserve on the Saskatchewan River.

**In situ** interpretive developments may prove the most effective method of both communicating archaeology's methods, results and goals to the public and demonstrating its indirect monetary benefits to regional economies. At present, only Alberta Culture, which can afford the risk and absorption of
some degree of failure, is venturing capital on the assumption that the opportunity costs are less than the accruing benefits of presentation. And both the Strathcona and Head-Smashed-In sites have achieved Treasury Board approval for sustained operation (O) and maintenance (M). O and M is a critical consideration when gambling long-term commitments of public funds. Capital funds are relatively easier to secure: infrastructure construction creates jobs in the traditional trades, injects small windfalls into constituencies and has political appeal. Operation and maintenance commitments are quite different in that they could be assumed as perpetual.

It has been shown that to capture over 80,000 tourists annually, heritage attractions must have operating budgets of 20 to 30% of their development costs (Derek Murray Consulting and Associates Inc. et al. 1985). When the latter costs are in the order of several millions of dollars, O and M costs rise to significant levels. This consideration has not escaped the attention of the other Western Canadian governments who have yet to allocate funds to prehistoric interpretive developments.

Some idea of the costs for developing (CAP), operating and maintaining federal historic parks and sites is provided in Table 4.27. Since these costs do not include the expenses of headquarters and regional offices or land assembly, they underestimate the actual costs. Since these costs are for historic sites themed on military (Ft. Walsh, Ft. Rodd Hill, Batoche) and fur trade (the rest) events, with differing periods of operation, infrastructure investments, locations, visititation levels and so on, they may not accurately parallel the cost of prehistoric developments. Remote sites are generally very expensive while those near or in urban areas...
Table 4.27 Average Capital, Operation and Maintenance Costs Per Visit for Select Western Canadian National Historic Parks and Sites (1969 - 1978)

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<tr>
<td><strong>Developed Sites</strong></td>
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<td>Churchill Sites</td>
<td>$11.05</td>
<td>$21.22</td>
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<td>Battleford</td>
<td>1.18</td>
<td>3.93</td>
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<td>2.35</td>
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<td>0.52</td>
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<td>Fort Rodd Hill</td>
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<td><strong>Developing Sites</strong></td>
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<td>Fort St. James</td>
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<td>6.23</td>
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<td>Lower Fort Garry</td>
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<td>2.66</td>
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<td>Prince of Wales</td>
<td>.71</td>
<td>.31</td>
<td>1.03</td>
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<td>Fort Walsh</td>
<td>14.59</td>
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(in 1978 dollars; from Parks Canada 1979a; 1979b)

straddle the median. Unfortunately, some of the most important prehistoric and historic resources of the study area do not coincide with current settlement and transportation patterns. Most of those which did either no longer exist or have been disturbed to the point development is unfeasible.

Evident in Table 4.27 data is the federal bias to commemorating and confirming Euro-Canadian events and the neglect of other heritages, especially those of the 28 or more Native ethno-linguistic groups which occupied Western Canada at contact. Granted there are problems with prehistoric site interpretation: site visibility, sensitivity and understanding difficulties (Burley 1984). Put simply, most prehistoric sites lack surficial expression, attract vandalism when presented, and
require costly and destructive field research. Since most site planners are Euro-Canadian, trained in history, architecture, or planning and lack an anthropological world-view, cultural stereotypes and a major jural-socio-economic contradiction are reinforced. Only now is the federal systems plan being corrected. Scarce fiscal resources and a deteriorating eastern Parks Canada infrastructure do not permit much optimism the federal government will soon be undertaking prehistoric site developments. Meanwhile some provincial and UNESCO programs are taking leadership roles.

The academic side of the discipline is beginning to recognize the importance of site development. Most would probably seize upon Burley's (1984) observation that site presentations introduce the public to the research disciplines upon which interpretation is founded. Displaying the labour involved in excavation and laboratory analyses will surely bolster arguments for more research. However, many public archaeologists would prefer resource presentations be regarded as nearing the closure of research, not just a means to rationalize more of the same. Until the discipline achieves broad consensus of both its fundamental goal and the partitioning of responsibility to achieve this, the public will remain untouched by Western Canadian prehistory allowing, at least in part, a propagandist past held unawares (Leone 1982a) to continue.

4.4.10 A Summary of the Participants in Western Canadian A.R.M.

There are a number of groups participating in Western Canadian archaeology, playing different roles in expending the resource base. A provincial a.r.m. agency implicitly or explicitly treats them, along with the resources base itself, as target groups which it seeks to beneficially
affect through a complex network of policy decisions, few of which are under its direct control. Balancing the interests of these groups while upholding a provincial statute can be difficult. One target group is hostile (small developers), one is frustrated (large developers), some are facilitative (other regulatory agencies) while others are politically supportive (special interest groups). As a target group, the academic community is difficult to situate or summarize. Until the early 1980s Western Canadian academic archaeology exhibited social passivity and vigorously defended its esoteric mandate. This precluded many points of interface with the decision-making processes affecting the archaeological record. Even today its place in a.r.m. is uncertain.

While Western Canadian archaeology's base of support is diverse, it directly involves small numbers of people --- probably no more than 1500 individuals in total. This being so, failure to become involved in a.r.m. by those who believe archaeology should have a future cannot really be afforded at this time. Several policy issues require sophisticated commentary and political action. Many stake-holders in archaeology are muzzled by the circumstances of their employment. Academic opinion, protected by tenure and carrying considerable authority, is urgently required on these issues (cf., Dincauze 1984; e.g., Wallace 1984). So, too, is academic involvement in applied research (e.g., Epp and Spurling 1984). Finally, there are complex scientific, economic and socio-political administrative practices which undergird the societal decision-making processes affecting archaeology --- all require analysis (cf., Barrett 1984).
4.5 HOW DECISIONS ARE MADE OVER ARCHAEOLOGY'S FUTURE

4.5.1 Introduction

More and more the interests of the foregoing groups are implicated, albeit at different times and to varying extents, in resource management policy- and decision-making. Indeed, the reader has already had an introduction to the formal, jural and administrative aspects of these processes, but from the perspective of government a.r.m. agencies. For most of the 1970s, an understanding of provincial legislation and appurtenant policies provided a reasonable basis for understanding how a.r.m. choices were made. Since the political, social and economic consequences of their decisions were comparatively small, the responsible government agencies enjoyed considerable autonomy. Global forms of resource planning and policy-making by internal and, at the time, still inchoate bureaucratic mechanisms seemed appropriate and feasible. The buoyant academic literature provided assurances that any missing techniques and methodologies needed for their implementation would follow, considering the apparent strides being made in the neoarchaeology.

However, the straitened economic and intellectual climate of the 1980s curtailed this optimism for many agencies. In most jurisdictions, formal and comprehensive policy-making via legislative mechanisms is being overshadowed by the more ad hoc, accumulative policy-making which occurs in environmental assessment procedures. In this forum the comparative costs and benefits of conserving archaeological and other amenity resources can be evaluated. That the costs and benefits are examined in the context of the economic, social and political impacts on and of specific development
projects does not always guarantee optimal decision-making. The e.i.a. process can often devolve into a protracted, overheated debate between a project's proponents and its opponents, wherein environmental choices are made on basis of shifting political considerations or short term economic effects. Exacerbating this tendency is the increased use of underdeveloped or controversial econometric methods and the endorsement of these by environmentalists anxious to maintain scientific respectability (e.g., Evernden 1985).

As regards a.r.m. specifically, decisions over resources are often made in the context of single development projects, not from the perspective of comprehensive provincial heritage resource planning. In regions sustaining high development rates, a patch-work of conservation and management strategies can eventuate. In the aggregate then, the e.i.a. process does not guarantee decisions will be made which ensure the retention of representative sample of resources in a region. Nor is it certain the cumulative impacts from future development projects and land use changes will be taken into account. These are the very weaknesses Hollick (1981a) has described, namely that an e.i.a.'s accuracy is contingent on knowing the future conditions of the region in which the sponsoring project occurs. Frequently, forward planning at the correct scale has simply not been undertaken and many regions' alternative futures are unknown.

Indications are that a trend is emerging whereby e.i.a.s are being widened into regional planning exercises (Lee 1982). This creates problems of its own. For example, as more and more issues are piggy-backed by environmental assessment processes, their original objectives of
environmental protection become diffused and subordinated. It remains that, for most of Western Canada, land use plans are not available for areas undergoing large scale development (Hirst 1984b). Nor are they likely to be in the face of recent sociopolitical hostilities to such planning exercises. Because of its entrenchment, e.i.a. has been left as one of the few recourses open for resource allocation decisions. Therefore, although it sits uncomfortably between disjointed incrementalism and mixed scanning on the planning spectrum, and despite its other flaws, the e.i.a. process in Western Canada is extremely important: it's increasingly the only game in town.

As we saw in section 4.4.1, e.i.a.s usually include heritage considerations, especially when the sponsoring development involves landsurface alterations. Because of this association, as an administrative, decision-making procedure, a.r.m.'s evolution has closely emulated that of e.i.a. Although small scale development proposals may be treated in a variety of ad hoc methods, large projects generally pass through one or more iterations of the e.i.a. process. If archaeological resource conflicts are envisioned during agency review of a proponent's proposal a h.r.i.a. may be required and often becomes part of an e.i.a.

E.i.a.s usually go through two or three phases, each having its own decision structure: 1) the acquisition and modeling of environmental, heritage and socio-economic data to forecast project impacts, 2) the analysis and review of these models by government and industry, with increasing use of economic methods and decisional criteria by the latter, and 3) public review of the results of steps 1) and 2). Following public
review, the Provincial Cabinet or a committee thereof determines whether a project should proceed and, if so, under what terms and conditions.

Below, the three phases of environmental decision-making will be explored with emphasis accorded to their implications for airm. First, the philosophy and methods of data acquisition and impact forecasting will be investigated (section 4.5.2). Secondly, the use of policy-analytic techniques in resource allocation choices will be discussed (section 4.5.3). Particular emphasis will be placed on benefit-cost analysis, a method which has already been employed to valuate heritage resources in B.C. Finally, the instruments of public and disciplinary participation in the final decision-making will be described and a synopsis of Western Canadian archaeology's involvement to date will be provided (section 4.5.3).

4.5.2. Environmental Assessment: Data Gathering, Modeling, Monitoring
4.5.2.1 Introduction

There is no question but that this is the procedural phase most familiar (if not understood) by the discipline. In fact, it is fair to say that most archaeologists consider their involvement in environmental decision-making to effectively cease at its termination (cf., Blakey 1983:8). Heritage consultants, private and institutional, are routinely engaged to carry out field studies designed to amass information on the location and significance of archaeological resources in conflict with development projects. We have witnessed the debates on the objectives of this activity in sections 3.4, i.e., whether h. r. i. a. should be primarily oriented to addressing academic research problems or predicting and ameliorating resource impacts.

This confusion of goals is no doubt attributable to the rapid
development of h.r.i.a. and, more generally, e.i.a in North America. Soon after environmental conservation was recognized as a critical policy issue, e.i.a. quickly evolved into a complex sociopolitical practice with elaborate governmental and legislative administrative structures. This accelerated evolution was not emulated by all other first world jurisdictions (e.g. the European Economic Community [Lee and Wood 1985]). E.i.a., in fact, arose as a last minute add-on to NEPA and was not preceded by extensive research into its implications (Hollick 1981a). By 1982 over 14 000 e.i.s.s had been produced in the U.S. (Canter 1982). The speed with which bureaucratic support systems were put in place outpaced the ability (and perhaps the interest) of involved scientific disciplines to develop the appropriate technical and methodological support systems (Rosenberg et al. 1981; Beanlands and Duinker 1984). Simply put, rule-making ability outstripped the requisite scientific data-gathering and interpretive capability. Since the process had relatively well defined operating principles, applied scientists and administrators involved in e.i.a. came to view the scientific quality of e.i.s.s as subordinate to their ability to satisfy sociopolitical concerns. Pure researchers in the biophysical and social sciences came to see environmental assessment scientists producing products according to low scientific standards. Inevitably the two enterprises drifted apart with criticism levelled at the latter by the former (e.g., Schindler 1976).

Environmental assessment has produced many benefits and successes (e.g., Alexander and Van Cleve 1983). Through mechanisms like public hearings the laity has gained a more sophisticated and broader awareness of issues and investigative procedures. In many cases real environmental protection has
been achieved via impact avoidance and mitigation measures. Also, various important research problems have been revealed. Basic research has been supported too: even straight-forward resource inventories and natural history observations in frontier areas add to ecological (and archaeological) knowledge (e.g., Rosenberg et al. 1981 and Hester 1984, respectively).

But there are many difficulties. The fundamental one in e.i.a. (and, for that matter, h.r.i.a) is that its origins lie not in the need for scientific advancement but in public concern for environmental quality (and the political response to this concern). While involved scientists must forecast the impacts to be caused by a project as objectively as possible, it is up to the public and its representatives to determine whether the effects are acceptable or not. The risk is always there that e.i.a. may degenerate into public relations and government lobbying campaigns (Beanlands and Duinker 1983).

Many of e.i.a.'s defects are simply institutional and procedural (e.g., Rydant 1984). Bureaucrats administering the process focus on the development of acceptable guidelines and industry compliance. Given the number of e.i.a.s under agency review at any one time, the compressed resources available to evaluate each properly, and the corporate cultures of bureaucracies (e.g., Wallace 1981), resource managers frequently must streamline and accelerate their handling of projects. Mindful of the need to process projects as expeditiously as possible, bureaucrats are unlikely to provide scientific direction to e.i.a. Industry usually considers e.i.a. as a legal hurdle and selects to conduct only those scientific activities
which will achieve project approval or liscencing while maintaining or
enhancing corporate image. Most proponents probably recognize improvements
to their environmental studies are aligned with their greater interest. Yet
no incentives exist for industry to carry assessment beyond the point
necessary for statutory approval. Then there are the legislators and senior
administrators who expect firm, unambiguous information on natural,
previously unmanaged and (at least partially) enigmatic environmental
systems to guide the making of difficult economic and political choices.
Somewhere in the midst of these competing interests are the scientists who
conduct (as consultants) or review (as agency researchers) the e.i.a., and
are "expected to practise science in a politically motivated process"
(Beanlands and Duinker 1984:269). Under these circumstances, the strict
application of scientific methods and standards would seem compromised from
the start.

These characteristics have created the perception that e.i.a. simply
represents tokenism. Credence is lent to this view when assessments result
only in mitigative proposals and evade evaluating the acceptability of
developments. Some e.i.a.'s also appear to be undertaken as justifications
for already decided upon development plans and engineering designs (Hollick
1981a). Certainly, when study recommendations have no ultimate effect on a
the form or timing of a development, the allegation of tokenism cannot be
refuted (Rosenberg et al. 1981).

E.i.a.'s most glaring deficiency is that its product is often little
practical use to decision-makers, despite the fact its main objective is to
inform decision-makers (Duinker 1983). This is in part due to the "count
and describe everything" (a.k.a. busy taxonomist) approach taken in many investigations. A consequence of science's empiricist heritage (Miller 1985), consultants too often attempt to carry out all-inclusive studies within their own realms of expertise, often in such isolation that cross-disciplinary interaction is impossible. Research, although encyclopaedic, becomes superficial. Voluminous, unintegrated and indigestable observations are made on a myriad of environmental components of a study area. Obviously much of these data will be irrelevant and unnecessary. Questions as to whether the sponsoring project will cause impacts to these components and, if so, whether the effects are significant and exactly how significant, frequently go unaddressed. Holling (1978:98) inveighs against such approaches because they "produce giant reports rather than useful predictions".

From the consultant's perspective there may be good reasons for this --- the encyclopaedic approach may fend off charges of incompleteness while fuzzy methodological description may deflect informed criticism (Lee 1982). Indeed, both tactics may mask the uncertainty inherent in many e.i.a.s. Since developers tend to reduce uncertainty wherever possible in the planning of their projects, it is not unreasonable for this tendency to be transferred to their consultants (Hirst 1984a). The ethics and educational and experential backgrounds of e.i.a. practitioners cannot but condition the quality of e.i.a. For purely financial reasons, consultants are often compelled to fit their assessments into the time-lines of sponsoring projects and, likewise, their reports must generally conform to proponent objectives.
Recognition of the need to enhance the role of science in e.i.a. has sponsored a considerable literature (e.g., Holling 1978; Rosenberg et al. 1981; Beanlands and Duinker 1983, 1984). That this is regarded as serious is evident by the joint funding (by Dalhousie University, Environment Canada, and three proponent associations) of a two year project to "determine the extent to which the science of ecology could contribute to the design and conduct of assessment studies and to recommend ways in which this could realistically be achieved" (Beanlands and Duinker 1983:1). Workshops held across Canada with environmental professionals, together with reviews of the academic literature and numerous e.i.s.s led the project leaders to conclude the state-of-the-art required considerable improvement.

Many flaws and conceptual and procedural shortcomings came to light. On a general level, e.i.a.s were judged to be marred by: unclear objectives; insufficient time frames; snap-shot rather than processual approaches; incorporation too late in project planning; decisions based on political considerations; confusion over the participants' roles; inadequate information on sponsoring projects; overabundant opportunities for confrontation; government intransigence; and too little feedback between the pure and applied research communities. Few efforts were evident to narrow the focus of e.i.a.s. Additionally, the importance, magnitude and duration of impacts were generally undefined. As well, definitions of study boundaries were seldom grounded on ecological method and theory. Furthermore, examples of in-field experimentation and statistically robust baseline studies were scarce. Moreover, post-impact monitoring investigations, when undertaken at all, were usually post hoc and did not
follow logically from baseline studies. And, finally, proposed mitigation methods were rarely innovative and, instead, were adapted to conventional engineering and construction activities. In summary, most e.i.a.s were found to be overly descriptive, missing a discernable research design and containing vague impact forecasts inconsequential for project decision-making.

To correct these deficiencies, a host of requirements and recommendations were presented by Beanlands and Duinker (1983, 1984) which have implications for the improvement of e.i.a. and h.r.i.a. These follow.

4.5.2.2 Ranking Impacts

A primary concern of the Duinker/Beanlands study was ranking the significance of potential environmental impacts stemming from a development project. First it was recognized that e.i.a. is founded on societal values expressed by political decisions and through formal, bureaucratic administrative procedures. Participating scientists are required to identify and explicate the relationship between the actions of a development and societal preferences. All conceivable impacts of a development defy study given the usual contraints of funding, time and the current state of scientific understanding. Even should complete project impact identification be feasible, it is likely some would be double-counted while others would be inconsequential (Lee 1982). Consequently, parsimony must be striven for: the spectrum of possible project impacts must be narrowed, and only major impacts should be concentrated on. To do so requires "scoping", i.e., isolating those environmental constituents of greatest concern in the context of a development. Beanlands and Duinker (1983) call these valued
ecosystem components (v.e.c.s).

Since the perceptions, aspirations, and beliefs of the public have as much influence on environmental decision-making as the results of scientific studies, researchers, they feel, should isolate and accommodate v.e.c.s early in the design of an e.i.a. Soliciting the opinions and utilities of both the general public and scientific community to identify v.e.c.s has been called "social scoping". Although v.e.c.s can be expected to change over time, today's key public concerns are worth noting: impacts to health and safety, commercial or recreational resources, endangered species and/or loss of habitat. Measuring and rendering the strengths of these preferences less subjective allows the relative importance of potential environmental impacts to be discriminated. Obviously, the earlier such concerns are designed into an e.i.a. as topics of scientific investigation, the more effective the study becomes.

Another approach to ranking impact significance, not dissimilar to those advocated in CRM, is to avoid considering the social ethos. Instead, differences in ecosystem components before and after a project are statistically measured and compared. This method, though, is flawed as it disallows ranking of impacts in terms of their social importance and, thus, disregards the raison de etre for e.i.a. A related strategy is to ground the ranking exercise in ecological (or, for h.r.i.a., archaeological) science. For instance, project actions leading to the decay of entire ecosystem components or processes would be deemed significant. But this scheme still depends on social value systems for the arbitration of significance, e.g., ranking the severity of various ecosystem component
losses and the importance of these. Still another way looking at impact significance is to concentrate on those directly influencing the planning and approval of the development project.

There seems no way to escape the subjectivity inherent in impact significance determination — in three of the above approaches we are brought full circle to the need to determine those aspects of the environment potentially affected by a development which are important to society. Clearly, the adverse consequences of studying only those impacts of immediate public concern and ignoring emerging scientific issues must be guarded against. Holling (1978) proposes using professional judgement to include some impacts which may not be fully recognized. He also urges keeping a list of issues removed from an e.i.a. should their effect on the formulation of a policy or development decision subsequently require attention.

Considering all the above problems with determining significant impacts, Beanlands and Duinker (1986:7) suggest this statement as a point of departure:

"Any exercise in judging the significance of an environmental impact should thoroughly consider (a) the importance of the environmental attribute in question to project decision makers, (b) the distribution of change in time and space, (c) the magnitude of change, and (d) the reliability with which change has been predicted or measured."

After social scoping has determined significant impacts, they suggest consulting scientists begin to study and predict modifications to the v.e.c.s which will be caused by a development.
4.5.2.3 Peer Review

To increase the scientific content and credibility of e.i.a., bridges must be built between the pure and applied scientific communities. One means of doing so is through peer review. However, this involves something of a dilemma. That is, temporal and political circumstances limit the extent to which peer review can influence the design, conduct, standards and results of impact assessments; yet without it the scientific validity of many investigations is greatly weakened. Certainly there is the question of the optimal time for peer review. External assessment at an e.i.a.'s conclusion is clearly less desirable than during the design and execution phases. For at these junctures the study approach can still be altered. Left to later stages the correction of fundamental deficiencies becomes very, if not preclusively, expensive. This is particularly true in the case of capital intensive developments which have gained such momentum that many investment and design decisions soon become immutable. Unfortunately, external scientific evaluation generally is brought into play after the production of the e.i.s. Beanlands and Duijker (1984) suggest that an e.i.a. be subject to peer review both in the design stage so that study methods can be influenced, as well as during the formal review of the e.i.s., when the interpretation and presentation of findings can be critiqued.

Peer review at a formative point in e.i.a. design is not the same as social scoping. V.e.c.s should be identified by the design stage. But now exists the need to bring together consultants, administrating bureaucrats, proponent decision-makers, technical reviewers, and possible intervenors to
discuss and set the e.i.a.'s scientific parameters. Probably the optimum process by which to do so is through serial workshops (cf., Holling 1978).

4.5.2.4 Establishing the Scientific Basis of E.I.A.

Beanlands and Duinker (1983:3-4) propose other procedural and conceptual requirements to rehabilitate science within the actual conduct of e.i.a. First is the problem of imposing time and space boundaries which confer manageability and tractability to a study. Determining diachronic and spatial parameters is clearly crucial to all other strategic and tactical aspects of the study. The duration and components of the sponsoring project must be taken into account as must the extent of the political jurisdictions in which it, and its potential impacts, could occur. Put another way, there is no benefit to delimiting a study area larger or smaller than the area over which the client has responsibility (Holling 1978). Likewise, there is little point in adopting a study area so large that resources are inadequate to assess it. Administrative and project-specific variables thus contribute the greatest to bounding scientific inquiry in e.i.a. On the other hand, ecological (or, in our case, archaeological) criteria, i.e., transboundary phenomena such as time lags, migration, transhumance, and transport mechanisms also must be considered in establishing spatial and temporal limits. Finally, technical limitations likely to condition the e.i.a. have to be accommodated. These include such problems as obtaining adequate samples, contending with logistical difficulties and studying incompletely understood resources or processes.

Second are the joint issues of quantification and monitoring. For e.i.a. to truly improve, for it to generate testable and falsifiable
predictions, environmental phenomena must be subject to measurement. Simple qualitative description, while useful in the ecological characterization of an ecosystem (Hirsch 1980) or conceptual modeling (see below), is insufficient for the purposes of baseline or later monitoring investigations (Holling, 1978; Beanlands and Duinker 1984; Hecky et al. 1984). Ecological characterization is directed to gaining an understanding, usually by surveying existing evidence, of the main features of an ecosystem and their inter-relationships. This serves to form an initial idea of anticipated development impacts. Descriptive data are all that is necessary as later study phases will focus the e.i.a. and acquire specific information on effects to v.e.c.s.

Subsequent baseline studies are generally designed to describe environmental "conditions existing at a point in time against which subsequent changes can be detected through monitoring" (Hirsch 1980:86). Baselines studies are meant to yield statistically robust descriptions of v.e.c.s prior to the initiation of project actions. Yet these studies have a built-in deficiency. They are basically static, statistical snap-shots of a complex, continuously operating biophysical system. On their own, unsupported by subsequent audits, baseline studies only caricature ecosystems for a brief, arbitrary time-slice prior to perturbation. For sedentary variables such as vegetation, geological features and archaeological resources, baseline studies may prove reasonably sufficient for gross impact prediction (Hirst 1984b). But for mobile environmental variables (e.g., wildlife) it is crucial that measurement, sampling and time series analyses be undertaken so that deviations from the baseline, and
the responsible causal relationships, can be detected and explained.

Measuring and capturing the etiologies of such changes can only be realistically achieved through post-impact monitoring programs. Ideally, monitoring studies should not be restricted to the operational stage --- system state changes in variables may occur immediately subsequent to a baseline study as well as during project construction. Quantification and monitoring are inseparable. Testing the reliability of baseline studies requires adequate and practical sampling methods and statistical analyses. These data can then be used in monitoring studies to refine, solidify, or refute changes to variables predicted in the baseline study (Holling 1978; Hirst 1980; Beanlands and Duinker 1983).

The third e.i.a. requirement centres on the modeling of a development and its possible impacts (e.g., Holling 1978). Two modeling exercises are involved: conceptual and quantitative. Reliant on intuition and deep understanding among the participating scientists, the former denotes methods capable of discriminating a system's components, characterising its structure and graphically portraying its functioning. Prior to any field studies the sponsoring project is essentially superimposed on the study area and resultant bio-physical responses are conceptualized. This form of modeling confers many advantages: basic study elements are considered; conceptual errors are flagged; study requirements are isolated; hypotheses are formulated; systemic relationships are roughed out; ideas are synthesized; information is shared; and potential impacts are determined. Commonly used qualitative techniques include various iteration matrices and other models such as the Leopold matrix and its descendents, GSIM and KSIM. 

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Quantitative modeling involves constructing mathematical depictions of system components and inter-relationships via statistical analysis, simulation techniques, and other methods. In the process assumptions become explicit; hypotheses are tested; informational requirements are discriminated; system relationships are clearly defined; adverse effects are predicted; various impact scenarios are developed; and mitigation measures are suggested. Its major benefits are its low cost, the fact no environmental disturbances are entailed, and a fairly high level of verisimilitude in predicting physical impacts.

Building either type of model is most effective through phased workshops (Holling 1978). The workshop format facilitates interdisciplinary communication and concentrates attention on the central problems of the e.i.a. Holling suggests participants adopt a "looking outward" process: conceptualizing how other systemic variables affect and interact with those of concern to each disciplinary specialist. Holling also cautions against the tendency for complex model development. He warns complex models may become so complicated, so realistic, that they fail to simplify the real world and are of little assistance in decision-making (see Miller 1985a).

Beanlands and Duinker's (1983, 1984) fourth requirement is to enlarge forecasting abilities in e.i.a. Greater precision and confidence is required in predicting the magnitude, kind, duration, and time of occurrence of impacts. Whether based on conjecture, judgement calls, qualitative or numerical modeling, experimental data, group consensus methods, etc., improving predictive powers of e.i.a. is crucial (acknowledging that
absolute prophesy may not be obtainable [Holling 1978:133]). One obvious means of increasing forecasting abilities is defining suspected or known project effects as hypotheses and, consonant with the scientific method, attempting their invalidation via quantitative techniques. Even when information is insufficient to formulate questions in accordance with the null hypothesis method, the exercise of transforming a general question into a hypothesis has plenty of advantages (Beanlands and Duinker 1983).

Finally, Beanlands and Duinker (1984) advocate the careful bundling of study tactics (experiments, modeling, field surveys and inventories, etc.) into comprehensive, coherent strategies which are used to control and manage the e.i.a. They recommend 1) dividing a project into tactical components, 2) designing the study around the probability of being able to measure changes after project start-up, 3) fully employing information inherent in biophysical records and natural or anthropogenic phenomena, together with that available from similar, completed developments, and 4) expressing suppositions on impacts as numerically statable questions or hypotheses.

From these guidelines it follows that the applied scientist's role is to ascertain whether a development project's effects will alter v.e.c.s. Determining this requires further constraining an e.i.a.'s coverage. While social scoping seeks to identify v.e.c.s, those ecosystem components for which theoretical or methodological understanding has been achieved perforce have higher priority. For it is unlikely and nonsensical that little understood phenomena would have a high social value. Accepting this ranking scheme, Beanlands and Duinker suggest trading-off the requirements of decision-making against sound, applied science in the final selection of
v.e.c.s to be assessed.

Ecological scoping is put forward as a way to conceptualize a project and the environment in ecological terms. In contrast to social scoping, which relies on social values and public opinion, ecological scoping frames v.e.c.s into ecologically-based strategies for study. This exercise determines: 1) what effects a project might have on preselected v.e.c.s; 2) how direct and indirect project impacts can be investigated; and 3) whether indicators of direct or indirect effects should be studied when the effects themselves cannot be.

4.5.2.5, Implementing Changes

Several means to achieve the above improvements are advanced by Beanlands and Duinker (1983, 1984). Translating the recommendations into guidelines and policies is suggested as a means of concretizing them. Also recommended is their adoption as operating procedures by proponents, consultants, and the professional associations of environmental scientists. Another proposed step is the establishment of expert committees drawn from environmental assessment agencies, academia, industry and the consulting community. These committees would review policies; prioritize applied research needs; coordinate non-confrontational liaisons with regulators, industry, consultants and research scientists involved in the project(s) in question; stimulate educational efforts in e.i.a.; and assist in the dissemination of information. Furthermore, building-in monitoring programs as a required part of the process is strongly urged. Finally, Beanlands and Duinker (1984) encourage research institutions to facilitate staff participation in e.i.a.
The actual transformation of these recommendations into operating procedures or policies requires considerable changes. With the current political and economic climate hostile to increased regulation, coupled with efforts to roll back existing hindrances to development, adjustments even perceived as magnifying the e.i.a. process will face difficulty in introduction. As well, several recommendations would be expensive for government to implement and are unlikely to be favourably considered at the present time. Yet there is widespread agreement that improvements must be made. Enshrining the recommendations as guidelines or policies will require time and the sustained support of all parties involved in e.i.a. To gain the endorsement of what to today's governments is probably the most influential of these parties --- industry --- the financial benefits of formally adopting the recommendations will probably have to be shown.

Beanland and Duinker's remaining recommendations also face hurdles. Establishing advisory oversight committees to coordinate policy development by each provincial agency responsible for e.i.a. has considerable merit. Arms-length watchdog groups could act to maintain agency commitments to scientific rigour and objectivity in the face of countervailing political pressures. Such committees could help setting applied research needs in discussion with affected special interest groups. The opening of consultation could help reduce the adversarial nature of e.i.a. Although it is not entirely clear how such a committee would effect this, any action which brings various stakeholders together for consultation and discussion at the milestones in the e.i.a. process would be a positive one (Holling 1978; Lee 1982; Beanlands and Duinker 1984). Some provinces (e.g.,
Saskatchewan) have taken partial steps in this direction already and installed representatives of development-oriented government departments to sit on its technical review panel. At the same time some boundaries between groups must be maintained to defend against conflicts of interest or compromises of academic freedom (e.g., Suzuki 1984).

Without question, study results must be more effectively communicated. If, by the establishment of advisory committees this single objective could be met, a significant improvement to the status quo would be accomplished. One not-so-obvious benefit accruing from wider report dissemination might be a more conscientious consultant effort to improve studies. Presently, e.i.s. authorship does not have to be provided. This is partly because these statements are often considered proprietary information by developers and they may suppress their circulation, especially when study findings may compromise project approvals. Whether for this reason or the defensive comfort conferred, the professional stakes consultants have in the authority and accuracy of an e.i.a. become much reduced when authorship remains anonymous. Because anonymity does not auger for a high quality in study documentation, one means of improving e.i.a. would be agency insistence on the disclosure of all report authors and study participants. The two-phased peer review process discussed earlier would also increase the accountability of those preparing e.i.s.s and likely improve scientific content.

Another important facet of communicating the results of e.i.a. is their packaging. It must be remembered that there are more target groups than government regulators, peer reviewers, and industry specialists. The output of e.i.a. --- rationalization of the study area, baseline information, study
methods, identified impacts, alternatives and implications --- usually must also be made comprehensible to lay people. Most observers concur that more effective means of organizing and presenting e.i.s.s are required.

Rosenberg et al. (1981) endorse the format used in the scientific literature while Holling (1978) recommends using creative simplification models. Virtually all workers support extensive applications of visual information digests, e.g., simple graphs, overlays, nomograms, and slide presentations.

Beyond this is the need to have e.i.s.s and supporting documentation (i.e., transcripts of public hearings, the results of monitoring studies, project case histories, etc.) accessible to the public and scientific community. Consolidation of this information could be accomplished by the maintenance of a catalogue of reference and abstract information on all e.i.a.s done in North America. Backed up by a comprehensive bulletin-board computer service, environmental assessment information could become widely available to all with a need-to-know and the requisite hardware.

Turning to the embedment of monitoring in e.i.a., there can be no doubt this recommendation has much to commend it. Consensus exists that only through post-impact audit can the reliability of an e.i.a. be validated; only by monitoring can hypothesis testing truly be carried out; and, only by monitoring can prediction and assessment skills increase within environmental science. Another benefit is the generation of case histories for designing better e.i.a.s and regulatory policies (Rosenberg et al. 1981). This information is critical as environmental responses to massive developmental perturbations cannot always be forecast (cf., Weinberg 1972).

Despite its compelling good sense, there appears to be several factors
opposing the widespread inclusion of monitoring studies. Some are institutional, others methodological. In their survey, Rosenberg et al. (1981) cite the inertia of bureaucracies. It is possible some review agencies become more concerned with processing new projects than learning lessons from their experiences with past ones, and that existing procedures are deeply entrenched and unresponsive to change. Likewise, consultants may discourage monitoring to avoid exposing weaknesses in their study approaches. Proponents might similarly resist such studies to prevent revealing decisional and managerial errors. As well, the perceptions that monitoring studies are expensive and create project delays or extensions have to be contended with. Financial support for post-impact audits is unlikely from the development community because the results of monitoring are usually irrelevant for achieving project approval. As Hirst (1984b:212) puts it, "monitoring and audits are difficult to fit into the accepted pattern of project decision-making". Most governments are unable to extend funding for these studies given incremental budgeting and the fact that e.i.a. is founded on the "proponent pays" assumption (Hirst 1984a).

Methodological difficulties are also encountered. Deviations from baseline conditions caused by natural processes cannot always be differentiated from project induced ones. Also the prediction of an impact may reduce the likelihood of its occurrence (Hollick 1981b). Problems exist, too, with discriminating and accounting for the actual etiology of impacts. Discontinuities may exist in ecological or physical systems; therefore, past behavioral trends may not be accurate guides to future ones. Furthermore, developments employing new technologies or involving an
unprecedented magnitude of environmental perturbation may be so rare
undertaken their full effects are essentially unstudied and unknown.

While little can be done to remove the uncertainty in predicting the
effects of unprecedented projects, stable, robust and sufficiently
comprehensive sampling programs, combined with field and laborato
experimentation, can probably be employed to overcome the monitoring
problems of most development projects. Counteracting funding contraints may
require arguments to proponents based on the desirability of eliminating
uncertainties which might delay the approval of future projects. For this
to be a convincing argument, the benefits of undertaking monitoring studies
would have to be demonstrated at the margins (Hirst 1984a).

The final remaining recommendation requiring implementation is bringing
the pure and applied research communities closer together. To this point
pure researchers have tended to distance themselves from e.i.a. This is
partially understandable given the constraints placed upon the full
employment of the scientific method. Few publication opportunities and the
fact participation in e.i.a. does not assist promotion reinforces the
research community's disinclination to involvement. This must change
(cf., Thompson 1985).

The need for enlarging environmental data bases is continual. Clearly
this cannot be done solely on the backs of environmental assessments since
their primary purpose is the prediction of impacts on e.c.e.s. Much basic
research, from the development of floristic, faunal, and other resource
inventories to the modeling of complex ecological systems remain the domains
of academic science. However, a significant communication lag exists
between the applied and pure research communities. The former are consistently behind the latter in keeping abreast of recent scientific developments. For e.i.a. to gain from this research effort, and likewise for pure research to learn the limitations of and benefit from the results of e.i.a., formal communication links have to be established.

To stimulate increased academic involvement, Beanlands and Duinker (1983) suggest contributions to e.i.a. should be recognized for the purposes of career advancement, just as would be contributions to the scientific literature, university committee work, etc. In addition, it is recommended that leaves-of-absence be extended to academics wishing to participate in short term assessments.

4.5.2.6 Implications for H.R.I.A.

As is probably evident to readers familiar with a.r.m., h.r.i.a. shares many of these problems and could profit from adopting many of these recommendations. Archaeology was as unprepared as most other disciplines to cope with the sudden legal implications of e.i.a. (cf., McGimsey and Davis 1984:122). And it has been slow to supply practical technical tactics and methodological strategies demanded by h.r.i.a. --- the majority of the advances promised by the neoarchaeology proved chimerical. Many of the flaws of e.i.a. are evident. H.r.i.a.s tend to take snap shot approaches, post-impact monitoring studies are the exception rather than the rule, scoping exercises are unheard of, hypothesis testing is rare, problems abound in archaeo-sampling, impact predictions are descriptive rather than quantitative, and so on.

The controversy over the McKinley mine, discussed in section 3.4.3.4., is
a case in point. For it reveals the reluctance of many members of the
discipline to make a sincere, legally mandated commitment to hypothesis-
testing and predictive modeling. Granted, problems have been disclosed
regarding past performance in these methodological areas (e.g., Berry 1984).
But given the opportunity to have enshrined in law the development of
research designs, sampling schemes and models with the entire package
subject to peer and public review prior to any fieldwork, the discipline
balks. Approaches which may be strongly endorsed in the classroom are
opposed in real world applications and the majority of the discipline
retreats to the busy taxonomist position.

Some of archaeology's methodological and technical deficiencies are more
apparent than real. For example, since archaeological sites are stationary
and do not strongly interact with non-human biological systems, baseline
studies are more apt to produce accurate portraits of the resource base vis-
a-vis, say, mobile wildlife resources. Yet at the same time, a.r.m. is
disadvantaged. It faces obstacles to accurate sampling insofar as the
resources themselves are frequently unobtrusive. And not to be forgotten is
the fact the cultural systems of which the resources are residuals are
extinct. Hence, archaeological resources cannot recover from perturbation
--- they can only be destroyed or reduced to reports and museum collections.

Perhaps the most serious barrier to improving the scientific content of
a.r.m. is attitudinal. Most archaeologists realize archaeological concerns
are only one of the ecological factors considered in e.i.a. In fact,
archaeological resources are most appropriately viewed as a valued ecosystem
component. But archaeologists, especially those in institutional employ,
in toto, ecological considerations comprise only part of the spectrum of variables making up an e.i.a. Economics, politics, social preferences and legal procedures all condition an e.i.a.'s ultimate outcome. Consciously or unconsciously, the discipline seems to have ignored the greater milieu. Archaeologists have tended to view h.r.i.a. funding as found money for pure research. The real purpose for h.r.i.a., assisting in the making of difficult environmental decisions, has either not been recognized (cf., Epp and Spurling 1984) or depreciated (e.g., Frison 1984 among others; and see sections 3.4.2.4 and 3.4.3.3).

There is an urgent need to bring archaeological science more squarely into h.r.i.a./m. To fully effect this requires a shift away from the attitude that h.r.i.a. exists to serve relatively narrow research needs. Pure research and the generation of information useful in environmental decision-making may, in fact, have inimical objectives. Holling (1978) and others acknowledge scientists have their own biases stemming from their own and their disciplines' developmental trajectory. Much of what is considered critical research in any given field may have no bearing on environmental or preservational policy needs (cf., Dunnell 1982c, 1984a, 1984b; Miller 1985a). Thus there is not necessarily a perfect correspondence between sound scientific inquiry and the making of better decisions. A problem-oriented study directed at addressing contemporary research questions may result in useless information for the purposes of resource management. This is not to say sound research is not required to make optimum decisions. Only when research is refined through the policy mill, when it applies to the solution of socially valued problems, can its relevance be guaranteed.
4.5.3 How Governments Rationally Decide

4.5.3.1 Introduction

Needing methods to arrive at costly investment decisions, private and public enterprises have embraced a variety of methods to analyse and choose courses of action: whether a proposed project should be deferred, abandoned or given the green light; whether project design changes should be made; whether a government program should be enhanced, cut or abolished. Use of these decisional tools has greatly increased and lead to the concern that such technocratic methods may contravene democratic decision-making involving the public and special interest groups. Lacking the expertise to assess the technical assumptions and utilize the mathematical methodologies, the participatory efforts of citizen groups may be effectively neutralized by what, to them, may seem mystical micro-economic manipulations.

Yet the rise of benefit-cost and other forms of decisional analysis continues and they will be in use for the foreseeable future. Originally developed in the 1930s to assess the practicability of large water control projects (Freeman 1979), benefit-cost analyses are increasingly being applied to health and human resource programs in provincial governments. To the south, the Reagan Administration's Executive Order 12291 requires benefit-cost evaluations of environmental regulations (Burness et al. 1983; Tolchin 1984). Closer to home, the BCUC (1983a:48) was instructed to use The Province of British Columbia's Guidelines for Benefit-Cost Analysis (ELUC 1977) in its review of the Peace River Site C project. Increasing application of this technique could cause major problems for a.r.m. given that the managed entities are amenity (i.e., noncommercial) resources having

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public good qualities with no market counterparts.

Disciplines concerned with outdoor recreation, wildlife management, aesthetics, etc., facing similar problems in valuating environmental resources, have developed proxy methods for monetizing their resources' worths. Yet archaeology to this point has largely failed to do likewise. This cannot be attributed to unfamiliarity with mathematics: quantitative methods have been a hardy perennial since the onset of the neoarchaeology and, of late, microeconomic techniques have even gained some currency in the literature (e.g., Christenson 1980; Smith 1983). Granted, until now, there seemed no need to derive a calculus and data base for economically justifying archaeology's research and conservation activities. Indifference and complacency are now declining in some sectors as formal evaluative analyses for mitigation studies are being called for by decision-makers in government, Crown corporations, regulatory agencies and the private sector.

Consequently, my purpose in this section is to provide a descriptive overview of the most important analytic technique: benefit-cost analysis (BCA). Given its many complexities, examination of the method must be incomplete. Several important elements of BCA will be omitted such as economic rent, the effects of technological external economies and diseconomies, inflationary adjustments, various market imperfections, normalizing procedures for ranking projects, etc. Instead, discussion will focus on the key concepts underlying the method, drawn from McAlister's (1982:85-147) precis on the subject; the ELMC (1978) guidelines and additional sources.

While other evaluation techniques have been employed from time to time
in environmental planning, none has achieved the status and widespread application of BCA. Because of this, these alternatives will be overlooked save for a comparative presentation in Table 4.28. The interested reader is referred to McAllister (1982) for further information on them.

4.5.3.2 Benefit-Cost Analysis: A Qualitative Discussion

Benefit-cost analysis seeks to scientifically measure the impacts of large public or private projects in nontechnical terms, using estimates of the monetary value of the impacts. Presumably, government economic undertakings or projects are designed to achieve the objectives of economic growth, social well-being, environmental quality and income distribution or regional development (ELUC 1977:v). Judged against these goals, when the sum of monetized beneficial impacts surpass the sum of monetized adverse effects, a project is assumed to represent an opportunity to improve economic efficiency and usually proceeds. BCA's attractiveness for determining benefits and costs derives from its use of dollar figures, a nontechnical, relative unit of measurement which is universally understood.

However, BCA's theoretical foundations are deeply rooted in advanced microeconomic theory (specifically welfare economics) and its methodological niceties and defects can only be appreciated by trained economists. Policy-makers who rely on the technique for decisional purposes must frequently make a leap of faith when employing the results of a BCA. Most economists confess that BCA has not yet developed into a set of routine procedures which can be comprehensively and repeatedly applied. This, in part,
Table 4.28 Evaluation Methods in Environmental Planning

<table>
<thead>
<tr>
<th>Method</th>
<th>Type of Evaluation</th>
<th>Impact Estimation Method</th>
<th>Source of Rating</th>
<th>Unit of Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benefit-Cost Analysis</td>
<td>nontechnical</td>
<td>scientific</td>
<td>market prices</td>
<td>money</td>
</tr>
<tr>
<td>Planning Balance Sheet</td>
<td>nontechnical</td>
<td>scientific or judgemental</td>
<td>expert or market prices</td>
<td>money</td>
</tr>
<tr>
<td>Goals-Achievement Matrix</td>
<td>technical or non</td>
<td>nontechnical or judgemental</td>
<td>unspecified points or votes</td>
<td></td>
</tr>
<tr>
<td>Energy Analysis</td>
<td>nontechnical</td>
<td>scientific</td>
<td>physical characteristic</td>
<td>energy</td>
</tr>
<tr>
<td>Land Suitability Analysis</td>
<td>technical</td>
<td>scientific or judgemental</td>
<td>expert or judgement</td>
<td>points or votes</td>
</tr>
<tr>
<td>East Sussex Landscape</td>
<td>technical</td>
<td>scientific or judgemental</td>
<td>expert or judgement</td>
<td>points or votes</td>
</tr>
<tr>
<td>Environmental Evaluation</td>
<td>technical</td>
<td>scientific or judgemental</td>
<td>expert or judgement</td>
<td>points or votes</td>
</tr>
<tr>
<td>Judgemental Input Matrix</td>
<td>technical and non-</td>
<td>judgemental</td>
<td>expert or judgement</td>
<td>points or votes</td>
</tr>
</tbody>
</table>

(from McAllister 1980: Table 5.3)
motivated ELUC (1978) to develop guidelines to standardize assumptions and approaches for the use of BCA in public investment decision-making in B.C.

Welfare economics considers that societal welfare is predicated upon the utility or well-being of the individuals making up a society. Social welfare, then, can be seen as the sum of all individuals' utilities. Changes in social welfare generated by a public action are the weighted sums of each person's change in utility caused by a development project. Due to measurement difficulties, the idea of utility has been replaced by a ranking of individual preferences for goods/services or consumption opportunities. If individuals prefer good a over good b, then the utility of a is greater than that of b. In play here as well is the law of diminishing marginal utility which holds that the more a good or service a person has, the less an additional unit of the good or service is desired.

The equivalence of ranked preference with utility still requires that utility be indirectly or directly measurable. As well, the problem of whether want and well-being are synonymous arises. Because some groups in society cannot make preferential decisions, because many values may be imposed and manipulated by the state (e.g., Luke 1985) and because many individuals lack the expertise to evaluate the results of various actions, especially those with long-term consequences, personal priorities may not be the best approximation of personal utility.

Both direct and indirect measurement techniques have been developed. One method of direct measurement utilizes gaming theory. Gaming choices on a scale of utilities for goods and services are provided to the individual(s) whose utilities are to be estimated. After a series of
preferences have been established, a choice between the certainty (1) of obtaining one good or service and the probability ($< 1$) of obtaining another is offered. The probability is adjusted until the individual's point of indifference between the two options is arrived at. Some people may prefer the exercise of gambling itself over its purpose in this application and thus may bias their responses in favour of the second option. This, together with the method's expense, has led economists to suggest this direct utility measurement needs further development.

Indirect willingness-to-pay measurements are currently favoured in BCA. In global terms, benefits are regarded as the maximum willingness-to-pay for either an increase in a desired good/service or a reduction in something not desired; while costs are viewed as the maximum willingness-to-pay to evade forgoing opportunities for achieving a benefit or avoid gains in something not wanted. Examples of the two types of benefits include improvements in environmental quality or natural resource uses, and diminished pollution and natural hazard risks, respectively. Lost opportunities to allocate land, labour, capital, etc. to alternative uses and higher pollution levels exemplify the two kinds of costs (McAllister 1982).

Benefits are established on the basis of market data on the supply and price of goods and services. Demand curves are developed which represent the scaled value weights in monetary terms. The precision of market information is contingent upon the existence of a perfect market, defined as a properly functioning market with many producers and consumers who have complete information on all goods and services, who all pay the same prices, wherein competition is such that no one can influence prices, and the
effects of externalities (i.e., uncompensated spillover impacts between producers and consumers) are negligible. Perfect markets are an ideal and rarely encountered in the real world. For example, pollution externalities are very familiar impacts. Divergences between private and social values for goods and services are common, particularly where these cannot be apportioned and appropriated by single consumers, i.e., are public goods. These complications notwithstanding, most BCAs must proceed from the assumption that perfect market conditions prevail.

Consumer choice theory holds that a buyer's utility is maximized when the marginal utility from the last dollar spent on each consumed good is equivalent for all such goods. If this is violated and the last dollar spent on each good is different, an individual could maximize his or her total utility by lowering purchases of goods with a low marginal utility and acquiring more of those with a high marginal utility. Substituting goods thus is arrested when equality is obtained. What this means is that, for different goods, the ratio of marginal utilities will accurately reflect their respective prices. Therefore, the market price for a good represents a relative measurement of the marginal utility of the last unit of that good. Put another way, the market price is the maximum willingness-to-pay for the last increment of the good being analysed. Rightward downsloping demand curves are usually constructed to reflect the fact that the more of a good or service possessed by an individual, the less a person will be willing to pay for a further increment of that good/service (Figure 4.13).

The area under a demand curve is often called the consumer benefit which is comprised of two parts. The first, consumer expenditure, is the
component of the consumer benefit representing the payment on the consumed
good; the second, consumer surplus, is the portion of the consumer benefit
which is kept after the fiscal layout is made, or, stated differently, the
difference between the total cost and the consumer benefit. Consumer
surplus derives from the ability of individuals to purchase goods at prices
lower than they would be willing to pay for them if forced to.

In perfect markets with no price discrimination, i.e., where anyone can
purchase a good for the same price, since the ratio of prices is the same as
the ratio of marginal utilities for one person, it will also represent the
ratio of marginal utilities for everyone. Accepting this for the sake of
simplicity, a market demand curve for a good or service can be seen as the
sum of individual demand curves, i.e., the maximum willingness-to-pay for
each unit of a good by the public.

Figure 4.13 exhibits a demand curve for willingness-to-pay for a
hypothetical public project, say a hydroelectric facility. Before the
project, a quantity of electricity $e_1$ was demanded at price $p_1$. Following
project construction the addition to electrical supply lowers the price to
$p_2$ at which quantity $e_2$ is demanded. The area of the vertical-lined
rectangle indicates the market value of the increased quantity which is
consumed, calculated as $p_2$ multiplied by $e_2$ minus $p_2$ times $e_1$. The area of
the rectangle $o_{plael}$ minus the area $op2ce2$ represents the change in the
total market value of the consumption of electricity caused by its increased
supply. The consumer surplus from increased consumption becomes the area of
the darkened triangle while the area of the triangle $p2bc$ indicates the
consumer's surplus flowing from the consumption of the quantity of electricity $e_2$. This value combined with the consumer expenditure $op_2ce_2$ equal the consumer's aggregate willingness-to-pay. And the trapezoidal area $q_1acq_2$ is the value of the increased consumption $q_2q_1$ for the project (EMINC 1977:18).

In the case of a hydroelectric project which lowers electrical costs
while increasing quantity, the project's benefits are determined with reference to the difference under the demand curve between the annual benefits without the project and the annual benefits created by the project. Where indirect consumer benefits accrue from increased production opportunities, such as increments in water supply or irrigation in this example, and these changes are small, increased output of these goods and services can be valuated by their market demand.

An important concept in BCA is that of opportunity or sacrifice cost, alluded to above. Given finite productive resources (land, labour, capital, etc.) available to undertake projects, their allocation for the construction of one project means that the benefits of their employment in the construction of alternatives must be given up. This is what is known as the opportunity cost: the cost of resources consumed in a project which equals the maximum willingness-to-pay for them in other, usually the next best, use(s). Viewed from the perspective of society at large, the term social opportunity cost is often employed. When the opportunity costs are focused in a limited number of optional uses and force a significant change in the resource allocation(s), the cost of allocation(s) must be measured by the reduced area under the demand curves for alternative projects. On the other hand, when the opportunity costs are spread over numerous alternatives, and bring about only slight changes in each optional use, the forgone costs of the resource(s) are approximated by market prices. Most resources have multiple usages and so even the commitment of a large amount of a resource will usually have a relatively small effect on alternative uses. Consequently, opportunity costs can generally be measured by market
prices (e.g., for labour and materials). Where land and all appurtenant resources are dedicated to a single project use, the value of service flow from its next best optional use is used as the opportunity cost.

Optimizing the net benefits of a public investment requires that all opportunity costs be considered. Following ELUC (1977: 27) the following function is used to assess the net benefits of two resource policies (e.g., the use [1] of a river for electrical generation or fishery enhancement [2]). Where 1) \((B - C)1\) is the present value of net benefits (gross benefits - gross costs) of one resource use policy, 2) \((Ba - Ca)1\) is the opportunity costs of not investing in the next best optional project to achieve the policy goal, 3) \((B - C)2\) is the present value of net benefits of another resource use policy, 4) \((Ba - Ca)2\) is the opportunity cost of not investing in the next best optional policy and \(Y\) is the difference in net benefits between policies:

\[
Y_{1,2} = [(B - C)1 - (Ba - Ca)1] - [(B - C)2 - (Ba - Ca)2]
\]

Assuming that all practicable resource uses are similarly compared, the policy decision ensuring the greatest efficiency is that which achieves a positive value for \(Y\).

A major problem area is how equity or the distribution of income is handled. Equity concerns the distribution of costs and benefits across society. Most often dollar measurements are summed for groups, rather than on an individual basis. In computing the social welfare function, i.e., the sum of the utility of each person times the weight or importance attached to that utility, all weights are usually given a value of one. This would seem to invest equal weight to all persons but, in fact, utility changes are
measured by willingness-to-pay, a factor profoundly affected by the ability of a person to pay. Higher prices most certainly impact the poor more heavily than the rich. But, because no objective means has been developed to assess the relative worth of every individual to the social welfare, there is no way to robustly determine the weights of the utility of lower income people or groups vis-a-vis higher ones. Instead, the Pareto criterion or a version thereof is frequently employed in evaluating projects. The Pareto criterion proposes that if a project action causes nobody to be worse off and at least one member of society to be better off, an increase in social welfare has been gained. But should the condition of even one person be reduced, an increase in social welfare will not have been achieved, despite the fact that the state of all others may have improved.

However, all projects probably cause deteriorations in the lot of some individuals due to changes in income distribution, even under attempts to reduce this by project redesign, different financing methods and compensation payments to evident losers. In acknowledgement of this, the potential Pareto criterion or Compensation Principle has been developed. Essentially this says that if a project produces enough benefits such that those who gain are capable of fully compensating those who lose while maintaining their new advantage, social welfare has increased, even in the event that no notional compensation is made. The potential Pareto criterion undergirds many orthodox BCAs which aggregate dollar impacts while neglecting equity problems between income classes. This adjustment, however, does not satisfy some critics (e.g., Elkin 1984). The ELUC Guidelines (1977:95) try to get around this problem by arguing that
efficiency pricing (i.e., where the price of a good or service equals its marginal cost) results in resources being optimally allocated thereby generating surpluses for redistribution through government policies.

Both allocative rules require definition of referent groups, those who lose and gain from a project. Usually for provincial undertakings, the referent group will be the residents of the province. However, there may exist situations in which project costs and benefits experienced by smaller jurisdictions may be of interest, e.g., where the promotion of regional development is a concern (ELUC 1977:16). Thus the B.C. Guidelines also skirt the socio-economic equity problem by viewing distributional effects mainly in geographic terms.

McAllister (1982:101-2) finds fault with both the Pareto and potential Pareto criteria. He notes use of the former could discourage any improvements to social welfare, especially those involving small scale projects, the benefits of which might only be measurable over the long term experience of an individual. More positively, he recognizes the commonality between the potential Pareto criterion and points of law which do not guarantee a person's complete freedom from nuisance or inconvenience incurred due to social progress, and which provide for compensation only when the level of nuisance exceeds reasonable thresholds. However, McAllister remains concerned for those individuals and groups who consistently suffer losses due to project actions, the benefits and costs of which have been evaluated on willingness-to-pay, not ability to pay. Often the values of the advantaged (who are more able to pay) are reinforced at the expense of the poor (who are less able to pay).
Another important concept of BCA is the rate of discount. It is common for future benefits and costs of projects occurring over several years to be discounted to present values. The assumption is that people are unwilling to pay as much for a futurity than for the same good or service today. A government policy or project may increase levels of consumption per capita in any time period but only by reducing the level of consumption in another period. Accepting that per capita consumption is rising over time, it makes sense to raise contemporary levels rather than increasing future levels. Seen another way, people would rather receive more income in the present by sacrificing possible future gains so the income received by future generations can be discounted. Theoretically, then, a quantitative ratio (i.e., a rate of interest) exists between present and future improvements to which individuals are indifferent. For example, at a rate of interest of 5%, an individual's time preference would be indifferent between having $10.00 now or $10.50 next year.

However, equal values are not necessarily attached to benefits and costs taking place at different times and most analysts discount future values to present ones. Unanimity has not been achieved among economists in setting the social rate of discount. There are those who suggest the time preferences of consumers or taxpayers should be employed; alternatively, some maintain that a social time preference be used to guard against myopic consumption/saving preferences so that society invests in the benefit of future generations; while others support the use of the social cost of capital, founded on private enterprise's willingness-to-pay for monies to expand production in the future (McAllister 1982:107). The third option is
favoured in British Columbia as is a 10% discount rate (ELUC 1977:66,71), although rates between 4 and 12% may be encountered elsewhere.

The BCA of some projects are extremely sensitive to significant asynchronies between the timing of costs and benefits. For example, projects like hydroelectric dams involve high and unvarying initial capital costs. Over the project's operational life, differences as low as 2% in the discount rate may significantly affect the annual projected benefits of the project. A low rate of discount may be favourable to its construction and a higher one may strongly support its abandonment at the design stage (McAllister 1982:108). B.C. Hydro and Power Authority was recently criticized on this score for using a discount rate of 6% in support of its proposal to construct the Site C dam in northeastern B.C. Lord and Sydneysmith (1982:2) charge that by doing so Hydro overestimated project benefits by 60%.

Projects whose costs and benefits are incurred coevally are less, unaffected by the rate of discount. Given the considerable uncertainty which may surround the choice of a discount rate, many analysts carry out sensitivity evaluations using different present value estimations.

Determining the optimal discount rate is not an easy task. Clearly, low discount rates favour the construction of large-scale, long-term projects. Economists favouring low rates argue that the present generation should invest more of its resources for the benefit of future generations and that the present population should allocate a greater quantity of its resources for the protection of the environment and associated natural resources. Others, disposed to higher social discount rates, consider that by
discouraging large and lengthy projects, more funds will be available for shorter-term public and private developments which may expand the capacity to produce more private goods and services, facilitate amelioration of urgent social problems, and decrease the degradation of the natural environment and rate at which nonrenewable resources are being consumed. Thus, in the case of conserving amenity resources, proponents of higher and lower social discount rates often muster the same rationale, albeit from divergent polemics.

The concern remains that the discount rate is not an effective mechanism for meeting the goals of resource conservation and mitigating pressing societal problems (cf., Holling 1978:118). Moreover, it is most uncertain whether the social discount rate truly accommodates the interests of future generations in environmental conservation (Hollick 1981b). Most BCAs accept a cut-off point of 50 years after which impacts are disregarded. This is because even at low discount rates, once a project's impacts are discounted to present values, the magnitude of impacts, even those which are initially quite large, are reduced to insignificance.

As 50 years does not quite span two generations, second, and particularly, third generation impacts are not adequately incorporated in BCA. This has led critics to allege that the real long-term impacts of a project are not adequately considered, although first generation impacts may well be. To correct this defect, McAllister (1982:112) suggests that long-term future impacts not be discounted and that they be segregated from first generation impacts and stated separately. This solution to the intergenerational equity problem analogs that suggested by some economists
for present equity problems, i.e., that impacts on different generations (or income groups) be treated separately and not combined in any grand index.

A second method of reconciliation is to record impacts in two overlapping classes, one which measures the rate of return for monetized present and future impacts, the second stating the summed undiscounted future impacts. By using the rate of return, defined as that discount rate in which the present value of benefits is equal to the present value of costs (synonymous with the rate earned on the investment), the time stream of impacts can be used to calculate the rate of earnings.

Where impacts and their dollar values are not known with certainty due to an inability to accurately forecast future events, the concepts of risk and uncertainty come to the fore. Risk refers to the ability to estimate the probability of a future event affecting a project; uncertainty exists when a probability cannot be assigned. Whereas measures of risk can be built into BCA based on the experience gained from precedent projects, uncertainty cannot. Examples of uncertainties include unforecastable developments in technology, consumer choices, government policies, prices and how a project might perform vis-a-vis original expectations. Approaches to dealing with uncertainty include sensitivity testing using upper and lower boundaries of probabilities for project actions or estimating the worst and best case results of a project.

Risk situations are more easily treated in BCA. One approach is to err on the side of conservatism when estimating the benefits and costs of a project. Another more controversial and usually rejected method is to upwardly adjust the discount rate. For B.C., ELUC (1977:56-62) suggests two
methods to be used according to the magnitude of construction costs of public project undergoing BCA. The first involves determining expected values for physical and price inputs and outputs; the second method, for projects requiring less significant public investment, entails the generation of alternative scenarios (e.g., best, worst, and probable) outcomes.

In BCA the term risk is also used in the description of projects designed to alleviate environmental hazards. An example of this use of the concept is where water control facilities are constructed to prevent or reduce the hazards of annual flooding in a river valley. The costs of 1 in 10 year floods, 1 in 20 year floods, etc. are computed and from these the annual expected flood damage is derived for the situation without any control facility. From these figures, the monetary benefits of a control project which exclude the risk of 10 year floods can be calculated as can project designs eliminating the risks of 20 year floods, 30 year floods and so on. Seemingly straightforward, the calculation of monetary benefits from the alleviation of risks is complicated by demographic, land-use, and property value changes. Furthermore, the expected value of a risk aversion project only roughly corresponds to the aggregated willingness-to-pay, and in some situations may undervalue this.

A critical component in BCA is the organization and totalling of impacts into a structure permitting decisions to be made. Decisions are of two main types: to accept or reject a project proposal or to rank alternatives to identify the optimal single or group of project(s). In the first decisional scenario, if benefits can be shown to surpass costs then the
project should proceed; and vice versa. That is, if positive net benefits (i.e., benefits minus costs) are demonstrated, the project should be constructed.

Less agreed upon are criteria for ranking projects. Two types of scaling are implicated. The first ranks alternatives for achieving the same objectives in the same region; the second ranks nonsubstitutable projects, i.e., those designed for different goals or which have the same goals but for different areas. The net benefit criterion is usually not helpful in ranking alternatives or nonsubstitutable actions, for all options might disclose positive net benefits.

To circumvent this problem the benefit-cost ratio is frequently employed. This measures the mean benefits per unit cost. It allows projects having high capital costs as well as high positive net benefits to be compared against projects having lower capital costs and lower positive net benefits. In cases, the second type of project should be selected because of the reduced initial investment costs and despite their lower net benefits. The benefit-cost ratio can also be useful in determining which alternative should be upscaled to achieve the intended goal of the project.

One constraint of the benefit-cost ratio is the inability to disaggregate initial costs from operating ones. Consequently, a capital-outlay ratio is often used to discriminate choices when a fixed sum is available to undertake a project. This indicator factors in the initial capital cost, the annual operating cost, the annual benefit per operational year, the social discount rate, and the project life span. Since the social discount rate must be calculated in both the benefit-cost and capital-outlay
ratios, a rate-of-return factor is often computed for the purpose of scaling alternatives. Frequently used is the internal rate of return: the rate of interest which equates the present value of benefits to the present value of costs. Because the internal rate of return does not isolate initial costs, the investment rate of return, used in private sector investment decision-making, is sometimes preferred. The attractiveness of both methods is that the social rate of return need not be established.

Keeping in mind these concepts, it is important to remember there usually are multiple societal objectives behind public investment decisions, not all of which are concerned with economic efficiency: economic development, environmental enhancement, improvements in social well-being and regional economic development. Three avenues to simultaneously achieving these objectives are recognized in BCA. The first approach is to accept the existence of project outputs which cannot be monetized but some of which may be quantifiable. Technically, the adverse and beneficial impacts must be identified at the project design phase. Legislation may exist to control the levels of some adverse effects and impose constraints on the project in quantitative fashions (e.g., levels of tolerable pollution, water contamination, etc). Other constraints may require specification by administrative and political decisions. Following assembly of these constraints, their effects on the economic efficiency of a project can be determined by relaxing them, one by one, until an acceptable design is arrived at.

The second procedure is proposed for situations where no guiding legislation exists for determining the negative or positive impacts of a
project. Alternative project designs are generated to optimize each of the four objectives. Among these, the political decision-maker must make a choice.

Combining aspects of both these approaches is a method which highlights the opportunity costs of differing objectives for decision-makers. The amount a design change increases non-monetary benefits while reducing efficiency benefits becomes the lowest value which the former must surpass for a project alteration to be judged acceptable. This involves accounting the opportunity costs of providing and/or conserving non-monetary values deriving from non-efficiency objectives (e.g., environmental quality enhancement, increases in social well-being). The cost impacts of design adjustments on a project’s total income are summed and the total income reduction becomes the opportunity cost of gaining non-efficiency objectives. This analysis is then squarely placed in the policy-maker’s court for a decision. ELUC (1977:102-114) recommends use of this method and provides a thorough discussion with an example of its application.

Related, and sometimes seen as an alternative, to BCA is Cost-Effectiveness Analysis (CEA), a method which compares monetized costs to output units (kilowatts, gallons of water, recreational visitation, etc.), instead of monetized benefits. Its application is most effective in assessing alternatives having identical goals and units of output. In these situations, projects which are the most cost-effective are those which produce the maximum output for a fixed cost or yield a fixed level of output at minimum cost. However, comparability problems attend the use of CEA. If all outputs of a project are not monetized, accept-reject choices require
evaluating qualitatively different units: monetized costs versus dissimilar units of output (e.g., kilowatts, recreational visitation). CEA is best employed subsequent to the decision to proceed with a project when it can be used to determine, say, the optimum allocation possible for maximizing a service output from a fixed budget.

A somewhat similar method also deserves discussion: break-even analysis. This instrument is frequently used by private industry in situations where investment decisions must be made in the face of inadequate demand information. In BCA, break-even analysis has been employed to valuate nonmonetizable impacts. Break-even analysis seeks to compute the minimum value of an output unit required to justify the acceptance of a project. An accurate estimation of the level of service requires the calculation of only one break-even figure. For example, if a reservoir improvement project costing $20 million resulted in a demand by boaters of 10 million user days, and if a user day is valuated at at least $2.00, then the break-even value has been achieved and project benefits exceed project costs. As McAllister (1982:122) comments, an attractive feature of break-even analysis is its intuitiveness. Decision-makers can determine whether in their experience the break-even point is reasonable. To date, this instrument has not been widely utilized in valuating intangibles in environmental policy-making.

4.5.3.3 Valuating Quasi-intangibles

While some may agree with the contention "everything of worth has an economic value which is measurable at least conceptually" (ELUC 1977:9, emphasis theirs; also see Hollick 1981b), there exist types of environmental impacts without direct market prices. Willingness-to-pay for some
environmental values simply cannot be derived from private market information with extant methodologies. This problem is particularly acute for monetizing the benefits of archaeological resource management and conservation. Except in the illicit antiquities market, price information is not available for artifacts, and no direct technique exists for monetizing unstudied archaeological sites. There are, however, methods for indirectly valuating recreational resources and these may be extendable to archaeological resources which have the potential to be developed for touristic end-uses. Certainly, recreational valuation methods can be used in valuating sites already interpreted and developed for public visitation (e.g., Chaco Canyon, Ft. Steele, Strathcona) and there seems to be no reason why these techniques cannot be applied more generally. To do so, assumptions must be made that an unstudied site is 1) capable of sustaining in situ development as a park or 2) by its excavation and content analysis, could enhance the interpretation and visitor attraction of one or more nearby sites better suited to touristic development and/or positively affect attendance at proximate museum facilities which display information recovered from the site. Obviously, imputing the values of undeveloped sites from developed ones must be considered to produce rough proxies at best.

To see how this valuation method might work, we now turn to a discussion of recreational impact assessment. In BCA, the impact of public projects which would create or eliminate recreation opportunities is measured by valuating the resultant impact(s). This is usually done for the region sustaining the project impact(s). Although most recreational opportunities
(e.g., provincial and regional parks) are provided free of charge, visitors
en route must make expenditures on recreational equipment, transportation,
food and lodging, and these incurred expenses reflect willingness-to-pay for
recreational sites. To valuate a site the demand curve for recreationists'
willingness-to-pay for various future time periods is estimated, the area
under the curves is computed for the willingness-to-pay for each time
period, future values are discounted and the result totalled to derive a
present value sum. If a recreation resource is provided by the construction
of a project the present value total is seen as a project benefit;
alternatively if a site is precluded, the total becomes a project cost.

The most frequently used approach to imputing demand curves for
recreational opportunities is the Clawson travel-cost method (McAllister
1982:125-130). It involves the following procedure. The demand curve
displays the quantity of a good or service that individuals would be willing
to purchase at points on a range of different prices. The area under the
curve, often called the exchange value, is the value flowing from the
direct user consumption of the recreational service. Recreationists,
travelling varying distances to visit a site, experience covarying expenses.
Thus, the quantity of the recreational opportunity demanded can be compared
with the cost incurred. From this, differential demand curves can be
developed based on the willingness of visitors to pay tolls. That is, an
admission fee is imputed from the travel cost.

In practice, hard data on the number of visits from different points of
origin is acquired through visitor surveys. The population of the points of
origin, round trip kilometerage between the points and the site, and the
travel cost per kilometer are acquired and stratified. To construct the demand curve, the number of trips per unit of population (often per 1000 people) is displayed on the abscissa and round trip kilometers are presented on the ordinate. The line fitted between the point intersections of the number of trips and the round trip distances exhibits the relationship between trips and the cost of travel. Assuming that recreational visitors are indifferent as regards a dollar spent on travel and a dollar spent on admittance, the resultant curve shows the relationship between trips, total costs, travel and gate fees. With this information in hand, the number of trips from each zone can be estimated for a range of entrance payments. Then the number of trips at each entrance fee can be totalled and plotted and, from this, the estimated demand curve can be constructed (see Germann [1982] for a hypothetical application of this method to an archaeological site and Freeman [1979:195-233] for a more general treatment).

Another method for valuating recreational experiences is to employ on-site questionnaire surveys which ask visitors how much they would be willing to pay for improved facilities, decreased site pollution, etc., or the maximum they would be willing to pay for or, alternatively, be willing to accept to give up, specific services or facilities. Hypothetical questions, though, can engender hypothetical answers. Penetrating and biasing these efforts is the supposition that respondents might strategically overvalue their willingness-to-pay if they believe the costs of the enhancements will not be borne by them or if they consider the recreational resource may be jeopardized. Conversely, respondents may become "free riders" (Hollick 1981b) and understate their preference if they
expect 1) they will receive the enhancements regardless or 2) their aggregated responses will be used to justify (higher) tolls or taxes for continued use or site improvements (see Freeman 1979:85-107). Other accounting problems stem from the facts of seasonal use and the existence of substitutable recreational facilities. Additional difficulties with visitor evaluations are discussed by Pearce and Moscardo (1985).

Situations also commonly arise where the above technique simply cannot be applied. Visitor surveys are impossible where provision of a new park as a result of a public project is being considered. Predicting future demands for site use are difficult since numerous variables influence recreational activity such as changes in population, income, and age distribution of potential users, competition from other recreational sites, distance, and the characteristics of the site itself. The Clawson approach itself has problems, notably difficulties in forecasting future travel costs, whether transportation operating costs or fixed costs such as insurance and vehicle depreciation costs should be considered, whether utility is gained from travel to and from the site which would cause the visitation experience itself to be overstated, and whether the value of travel time should be included.

Additionally, the travel-cost method ignores the benefits property owners adjacent to a recreational site derive from this proximity, particularly insofar as property values may increase. Furthermore, not all park sites are created solely for recreational uses. Wilderness preservation and ecological research frequently motivate the creation of parks and these purposes are not usually factored into visitor willingness-to-pay.
statistics. Some wilderness areas attract visitors from great distances but have low use levels and thus could be under- or wrongly-valued by the Clawson method or its derivatives. Indeed, visitation above a site's carrying capacity may cause congestion, compromising visitor experience and deprecating their valuation of a site. Still, in B.C., the travel-cost approach is generally recommended for recreation evaluation (ELUC 1977:37-8).

Other problems in valuating recreational resources are found in measuring option value, the amount risk averse people who are not users of a resource are hypothetically willing to pay to have the option of consumption in the future. Warranting attention too is existence value which is often seen as a variant of option value: the amount individuals who never plan to use a resource are willing-to-pay for its retention for the comfort of knowing either it still exists or that it will be left for future generations, "even though they might be appalled by the prospect of being exposed to it" (Krutilla and Fisher 1975:15). Finally, bequest value should be considered: the sense of duty to preserve a resource for future generations experienced by present consumers (Cummings et al. 1983:522).

How option value should be dealt with in BCA remains controversial. Resources with high option value generally have an uncertain demand, are nonsubstitutable, and not easily reproduced if destroyed. Some researchers have suggested that the effects of uncertainty on option value be deliberated in decisions on large development projects with irreversible impacts on the environment. Over time, information may be gained on the benefits of alternative uses of a resource (e.g., a river valley). But as
developments are irreversible, a decision to proceed cannot be influenced by the acquisition of more information which might indicate the decision is in error. Thus there exists an option value in deferring development, particularly when uncertainty surrounds the demand supporting a development (Fisher and Peterson 1976).

Neither option nor existence value can be appropriated and measured by market transactions, e.g., those who do not directly pay to retain an amenity resource (e.g., by subscribing to conservation funds) cannot be denied consumption of the resource by visitation or other forms of non-extractive consumption. So far, the only method of determining the resource values which nonusers may have is to carry out surveys. Some surveys have shown nonuser values may exceed user ones by several orders of magnitude. However, since survey results may be prey to the strategic biases in responses just discussed, the accuracy of such data is problematic.

It is generally agreed that the irreversibility of some project effects on recreational and other environmental resources, together with future uncertainties concerning their supply and the availability of new assessment and valuation information, militate against project development in some cases. But since option value cannot be quantified it is subordinated in (some would argue, obviated by) BCA calculations. McAllister (1982), for instance, considers the long term future availability of recreation opportunities is given inadequate consideration in BCA because computing the present value of a recreational site discounts, eventually to the point of disregarding, the value to future (i.e., third generation and beyond) users.

The valuation methods used for other types of amenity resources
will likely be incompatible with archaeological resource applications. In the case of aesthetic resources, for example, residential property values can often be employed to estimate the value of a scenic vista or other landscape feature. The reasoning behind this is that sites enjoying visual access to such characteristics often have higher market prices than other lands of comparable size. Where a property contains an archaeological site, and legislation or a covenant exists to restrict the activities which can be undertaken on that site, real property values may be diminished. Thus, this method of valuating landscape amenities would seem inappropriate for archaeological resources.

One innovative but precocious approach to valuating unique amenity resources consistent with BCA theory has been developed by Krutilla Fisher (1975; and see Kidder & Associates 1982). Citing the nonsubstitutable qualities of some natural areas and features, they argued that as population and income increase, recreation benefits derivable from these areas will steeply accelerate since no production technology exists to augment their supply. Paralleling these trends, they continued, would be technological developments capable of augmenting and making feasible alternative, cheaper ways of producing the goods and services of conventional projects (e.g., hydroelectric and other extractive developments) which generate benefits by precluding the use of, or irresponsibly impacting, unique amenity resources. Thus, they concluded, the net benefits of conserving natural areas would soon surpass, in cases by an order of magnitude, the benefits flowing from their elimination or degradation by development projects. From this follows that, "since their
conversion is for all practical purposes irreversible, present provision of unspoiled environments and the wildlife and other resources associated with them will be less than what the future would desire --- even if present provision were statically optimal, which it probably is not" (Fisher and Peterson 1976:3).

Flawing their argument is the uncertainty of the future. OPEC oil shocks, the recent recession, higher interest rates, lower growth rates in personal income, and so on have either made less likely or retarded the development of alternative energy supply technologies, and postponed the point at which the conservation of some amenity resources would yield net positive benefits vis-a-vis their degradation by commodity resource extraction.

Seen in this very abbreviated form, the Krutilla-Fisher argument resembles the significance assessment problem in CRM discussed in section 3.4. Recall that several prominent American specialists have forcefully suggested the real value of an archaeological resource cannot be measured using current criteria because future advancements in archaeological science may radically increase the resource's significance. While the essence of this position is unassailable, it is irrelevant in practice when irreversible mitigation decisions must be made in the present.

4.5.3.4 Some Final Considerations of BCA

Emerging from the above, discussion is that not all impacts of a development project can be satisfactorily monetized at present. Although progress has been made in valuating some difficult areas such as recreation amenities, this often requires extensive research and, even so,
monetization efforts may carry substantial margins of error and be unable to accommodate some pretty basic intangibles. Nonetheless, BCA remains a very comprehensive method of environmental and investment evaluation which takes into account the social welfare implications of large-scale projects. A grand index is calculated by ratings based on willingness-to-pay values available from market information. Likewise, market data are relied upon for estimating costs. Its strengths are found in its long theoretical development and ongoing ability to adapt to technical difficulties; its aspiration to incorporate the values of all individuals, not just a select few; its employment of some categories of impact and measurement which are familiar to decision-makers and the informed public; and its large body of precedent applications which cover a wide number of situations which can be drawn upon by economists and environmental assessors.

BCA does have its limitations, however, some of which have already been mentioned. Willingness-to-pay measurements are extremely sensitive to individuals' abilities to pay. Problems do not usually arise where different socio-economic groups are not in competition or in cases where public projects are devoted to ameliorating social inequities. But in other situations, equity concerns may be totally overridden and the interests of the economically disadvantaged may be cramped. Also, as should by now be clear, BCA's methodology is complicated meaning that most decision-makers, who are at best naive regarding its techniques, must accept its findings as given (although there are exceptions, e.g., Caccia [1985]). This fact leaves the decisional door open to errors committed through carelessness or hidden agendas, biased valuations, and deceptive mis-estimates. Another
already recognized problem is that many environmental effects cannot be monetized or quantified and their exclusion from BCAs may lead to their often important consequences being ignored by decision-makers. Related to this concern are attempts to ascribe dollar values to impacts which are not normally viewed in this fashion because they implicate quality of life or other political and social values having no relationship to market goods or services (Chiselin 1982; and see Power 1985:43). In McAllister's (1982:143) words: "many societal concerns are long-term collective issues for which the uncoordinated willingness-to-pay of individuals cannot be considered an accurate or an appropriate guide". Furthermore, discounting future benefits and costs causes intergenerational equity problems, and disregards the mid- to long-range effects of environmental profligacy or resource loss (cf., Holling 1978). Moreover, BCA is generally too expensive to employ on all projects and must be limited to those involving large-scale investment and/or environmental impact decisions. And, finally, since BCAs are carried out by economists more familiar with tangible, monetizable commodities than intangible amenities, the very strong possibility that a disciplinary bias penetrates many analyses must be kept in mind.

 Appropriately enough, ELUC (1977:vi) recognizes that many of these problems are properly referable to the political arena where judgements must be made on the whether projects should proceed, what alternative among others should be selected, what the equity effects will be, and what mitigatory and compensatory expenditures should be made. We have seen abundant reasons for the belief that political decisions are concerned mostly with balancing pressures from various groups in society, not with the
merits of an issue, even when such appear fairly black and white (Hollick 1981b). The political level is incapable of properly managing intergenerational equity issues. Politicians are not voted in by (and are not responsible to) future electorates, they cannot predict what future generations will want, and, like the rest of us, they can't forecast what is best for future generations.

4.5.3.5 What Does This Mean For A.R.M.?

Willingness-to-pay includes two components: want and ability-to-pay. Austere economic conditions prevail in the 1980s and the ability-to-pay for regulatory programs, environmental impact mitigations, and many public goods has declined. Whereas the 1970s saw many articulate and emotional expressions of the want component, the focus during the present decade is on the costs borne, through higher taxes or product prices, to preserve or provide amenity resources. This supersession of concern is starkly seen in current governmental efforts to provide private and public developers with relief from the regulatory legacy of the previous decade (Cummings et al. 1983; section 4.4.2).

Remember, the environment within which decisions affecting non-efficiency benefits are being made is synergistically comprised of law, politics, and economics, the last of which has gained considerable prominence in regulatory decision-making (Tolchin 1984). Missing to this point has been presentation of a practical method of assisting economic policy-making, the critical third dimension which now increasingly impinges on a.r.m. As stated earlier, until recently little effort has been made in developing BCA in archaeological resource conservation. More diligent scholarship might
uncover other examples, but so far as I can tell the only attempt thus far arose as a result of pressure indirectly levied on the B.C. Heritage Conservation Branch by B.C. Hydro and Power Authority (see Charlton 1984: section 4.5.4.3).

Facing the upcoming public hearing into the construction of the Site C dam in the northeastern part of the province, and the knowledge that several hundred archaeological sites would be adversely affected, B.C. Hydro took a hard-line, no-mitigation position regarding the heritage losses. Hydro reasoned that since no methods were available to determine the benefits of archaeological resources it would impact, it could not condone expending funds on a mitigation program. The Heritage Conservation Branch responded by engaging an economist to prepare an economic analysis of the social values derivable from the heritage resources at stake (Kidder & Associates 1982).

Kidder & Associates proceeded to estimate public willingness-to-pay for the heritage resources in a developed state, i.e., interpreted and displayed in a regional tourism facility. Three levels of initial user demand for both prehistoric and historic sites were calculated on the basis of visitor user days recorded for already developed historic sites (Barkerville, Fort Steele, Hazelton/Ksan, Fort Rodd Hill, and Fort Langley) and a prehistoric site (Strathcona site). As well, three willingness-to-pay data sets were estimated from visitor responses to surveys at Fort Steele, Barkerville, Strathcona and the Provincial Museum of British Columbia. Imputed values ranged from $2.50 to $10.00 for prehistoric sites and $5.00 to $15.00 for historic resources. Four percent, 5% and 6% per annum rates of increase in
willingness-to-pay values were calculated for a 30 year period. Discount rates of 3%, 6% and 10% were also employed. Excavation, interpretation, and site development costs were taken from a number of museum studies and figures supplied by the Heritage Conservation Branch. Finally, a model was developed which allowed the growth in user-days to reach 35,000 days, the estimated capacity for an interpretive development. Twenty-seven estimates of willingness-to-pay were eventually computed, discounted to present values, and totalled to produced total present values. The costs of excavation, interpretation and display ($4 million), inclusive of operating costs, were also computed for a 30 year period and discounted. Using the three rates of discount, the present value of costs was subtracted from the present values of summed willingness-to-pay.

This exercise resulted in net present values of from $0.25 million to $19.9 million at the upper levels of willingness-to-pay and between -1.9 million and $2.8 million at the lowest levels. These figures were considered undervalues of the resources since option and existence values were not included in the analyses and neither were the scientific, ethnic and historic attributes of the resources. Kidder & Associates (1982:10) contend that should these sum to $1.9 million, even under the worst case scenario, heritage resource excavation, interpretation, and display is a break-even proposition. In summary, the analysis concluded that an archaeological mitigation program leading to an interpretive development would return positive social values.

Obvious problems attend Kidder & Associate's results. The willingness-to-pay figures were derived from tourism studies at resources with different
and perhaps more attractive characteristics than a display facility in northeastern B.C. would have. Furthermore, the survey data employed are presumably susceptible to the problems of respondent bias discussed above. Because calculation of net present benefits is hypersensitive to the imputed initial willingness-to-pay values (and discount rates), the generated values could be severely distorted. Moreover, the study could not be entered into testimony at the Site C hearing, and it remained sheltered from the scrutiny of disinterested or hostile (e.g., B.C. Hydro) economists. Thus its robustness is untested and any of its more subtle defects remain undisclosed.

Nonetheless, this study, however approximate, is a valiant attempt at monetizing what to now has remained an intangible amenity resource. And it points the way for further research in valuating archaeological resources. That archaeologists have avoided compulsion to impute the monetary benefits of their resource to this time is nothing short of remarkable. Certainly, determining the unit costs of mitigating resource impacts by excavation are an almost routine procedure in a.r.m. (Fitting 1981b). Resource managers must negotiate the costs of data recovery, resource avoidance or protection daily. Yet the quantified benefits accruing from such mitigation actions receives virtually no attention. Perhaps archaeology has been able to coast on the assumption that the public, development proponents and politicians considered archaeological resources to have such extremely high option, existence or bequest values that monetization attempts would merely be confirmatory. If so, the environment of scarcity has collapsed this smug view.
Society probably maintains a reasonably high willingness-to-pay for archaeological research and conservation. Hopefully, the preceding discussion of BCA has shown that the discipline need not fear calls for microeconomic justification of its activities from a methodological standpoint. BCA techniques can be developed and improved upon. However, as economic conditions continue to collapse the ability-to-pay component of consumer demand, the discipline has not responded by reinforcing the want component. The legacy of the neoarchaeology continues to provide a mostly impenetrable literature and efforts at public involvement and interpretation are shunned by most non-governmental practitioners. Unless public education and the development of tourism and public participation opportunities become major foci in the 1980s, society's willingness-to-pay for basic research and resource conservation alike could erode to the vanishing point.

4.5.4 Public Policy-making: Principles of Access and Participation

4.5.4.1 Introduction

Over the 1980s Western Canada must cope with a political environment characterized by austerity. Governments seeking to effectively allocate limited fiscal and human resources to mediate or mitigate existing (and emerging) social and economic problems are increasingly turning to "policy analytic techniques" founded on theories of rational choice. These methods, explored in the previous section, will probably grow in importance as resources diminish and become more closely contested for, and the need to eliminate wastage of any kind becomes paramount. Such techniques will be required to rationalize, defend and justify projects and programs to executives and legislators with budgetary authority (Kweit and Kweit 1984).
Although the use of PPBS and the like have declined, BCAs are being selectively employed on controversial and low priority programs. As well, policy analytic techniques are now coming to the fore in evaluating major public investments, particularly those in the energy field subject to regulation. Predictably, BCA and sometimes other methods, will be applied to programs and projects which previously escaped such scrutiny.

The reasons for the projected increase of these methods are obvious. Policy analytic techniques offer an internal logic, quantification, and the aura (or sophistry) of inviolability. These advantages also reinforce the centralization of power and expert knowledge in public and private sector bureaucracies. Policies purportedly founded on demonstrable gains in economic efficiency may conceal substantial benefits for special interests. Thus, wider use of such techniques may well be diametrically opposed to citizen participation in policy-making. Afterall, the laity has little technical expertise, often has emotional and nonobjective stakes in issues, does not understand bureaucratic procedures, and is difficult to control. Citizen intervention thus interferes with rational decision-making processes by introducing conflict and lengthening the time necessary to arrive at a policy choice. Some have even suggested that emotional, inexpert citizen meddling in complex problem areas is one cause of many of society's current social and economic crises (see Adie and Thomas 1982:33; Huntington 1975 in Amy 1983:346).

Yet at the same time as dependancy on technical expertise deepens, the contradictory tendency of increased public participation in technical decisions is gaining (Krimsky 1984). Democratic decision-making is basic to
the generally held concept of our political system. (A useful historical and philosophical survey of the democratic pedigree of citizen involvement in environmental evaluation is provided by McAllister [1980:12-64]). To allow it to hold sway, however, causes inefficiencies and irrationalities because of the assumption that all who are affected by a policy have a right to take part in its making and sanctioning. And this assumption is at odds with the need for sophisticated knowledge in policy choices. Still, it remains that accessibility to the decision-making process and the expectation of responsiveness of a policy to those affected by it are deeply and properly embedded in democratic theory (Krimsky 1984; Kweit and Kweit 1984; Torgerson 1985a).

Undeniably, conventional democratic decision mechanisms, particularly those applied to social issues, have been strained by scientific and technological developments (Goslin 1985). In fact, some commentators suggest that technocracy, i.e., "the application of technical knowledge, expertise, techniques and methods to problem solving" (DeSario and Langton 1984:224), and democracy stand in contradiction to one another. DeSario and Langton believe that as technological advances grow in social and economic pervasiveness, legislative evaluation and control of such innovations decrease. The large, expert bureaucracies established over the past three decades in both the public and private sectors to provide technical information and political acuity now operate largely without direct accountability to the public and, some argue, are virtually independent of democratic processes (e.g., Luke 1985). This autonomy has often shut citizens out of decision-making processes (Adie and Thomas 1982:341-54).
However, benefits of citizen participation in policy formulation are plainly evident (Richardson and Jordon 1983), especially where social vis-a-vis technical concerns are at issue. Bureaucracies develop narrow perspectives on policy areas due to recruitment and training procedures, the constraints of established routines and selectivity of information sources. This rigidity has led to many difficulties, both real and academic. As more and more technical fixes for social issues which involved value or mixed (i.e., value and technical) decisions failed; as the measurement, valuation and equity problems of benefit-cost analyses started were appreciated; as the potential skewing of decisions due to the expert's own normative preferences was realized, skepticism of technology and the scientific community accelerated. One consequence has been the "megatrend" of citizen demands for more participatory opportunities in decisions over often very complex technological issues (Naisbett 1982:159-88). The extent to which such interventionary tendencies will grow is controversial, as are its possible effects (DeSario and Langton 1984:229; Van Til 1984; Polsby 1985).

Despite some notable deficiencies in the instruments of participation, most policy researchers consider the benefits of public involvement in policy decision-making outweigh the disbenefits. Commonly cited in support are observations like the following. Citizen inputs from outside an organization's perceptual boundaries may provide more comprehensive information on issues. For example, the scope of a BCA or e.i.a. can be narrowed or widened through citizen participation. Likewise, willingness-to-pay data, discount rate choices, and selection of rules of choice are all conceivable contributions from a socially responsible laity. Afterall, it
is the public who, in a democracy, supposedly set social goals while only the means to approach these are technical and bureaucratic in nature (although some argue preferences and goals are manipulated and prescribed by social elites [e.g., Luke 1985]).

Citizens can have nontrivial impacts on technical areas. Krimsky (1984) sees important inputs from personal knowledge founded on historical associations of events, intuition, experience and trial and error. Likening a community to a sensitive ecological system, Krimsky argues that local folk wisdom has much to offer the technical expert. He cites multiple instances where environmental damages were first noticed and explained by laymen, where the elite values of planners and social engineers have run roughshod over the interests of the end-users of their projects and resulted in dysfunctional urban designs, and where the particularist knowledge of citizens has appreciably augmented scientific data (also see Rosenberg et al. 1981). Important, too, is that information provided by some groups is more trusted by legislators, the general public and activist groups than that provided by technical experts (Pierce and Lovrich 1983). Thus, the incorporation of the laity's views on both the policy and technical sides of decision-making has much to recommend it.

To facilitate nonexpert involvement, efficient and effective mechanisms are necessary. Public meetings and surveys have the advantage of being inclusive but the former can devolve into poorly attended forums dominated by small, unrepresentative dissident groups (although see Gundry and Hebertein 1984), while the latter are expensive and can produce misleading results. (For a thorough discussion of opinion polling see the Annals of
the American Academy of Political and Social Science 1984). Advisory boards and commissions more closely conform to bureaucratic procedures, allow members to develop expertise in policy areas and conduces to enhanced communication between citizens and experts. However, these mechanisms are time consuming, expensive from the perspective of supporting bureaucratic agencies and tend to attract members from affluent and already influential socioeconomic groups. Alternative instruments have emerged including various group solving methods such as Delbecq's Nominal Group Technique and the Delphi Technique (e.g., Kweit and Kweit 1984:241-2; Richey et al. 1985a,b; and see McAllister 1980: 235-57) as well as synectic and more explicitly ad hoc forms of mediation to negotiate the settlement of specific environmental disputes (e.g., Amy 1983).

Obviously, broad participation in policy formulation and decision-making has its advantages and costs. The bureaucrat is all too aware of the impediments and problems of citizen involvement, especially the time necessary to learn and define the public’s perspective and the possibility of fostering conflict among groups suddenly divided by an increase in their knowledge of how a policy could differentially effect them (Chandler and Chandler 1979:20; Kweit and Kweit 1984). Yet the bureaucrat is sensitive to the fact that the enhancement, perhaps survival, of his or her agency may be dependant upon a supportative, involved and knowledgeable clientele.

Frequently, stable and symbiotic patron-client relationships develop between interest groups and a bureaucratic structure. And where these groups do not exist for an emerging policy field, bureaucrats will often create them (Brown-John 1981:198). From this relationship the pressure
group acquires special influence, access and status while the government agency which comes to represent the group gains support, expertise and a monopoly on information for forging viable political options (Chandler and Chandler 1979:72, 112-3). The effectiveness of such a group depends not so much on its size than on its access to policy-making forums. Historically, groups enjoying this access generally represented elite professional or business interests. However, more and more, bureaucracies are developing client relationships with powerful consumer organizations, ethnic groups and environmental lobbies. The sophistication of these organizations has increased greatly. No longer do they fade away after achieving a favoured piece of legislation. The existence of activist groups is now extended to monitor how forcefully policy is implemented and administered (Colby 1983).

Not surprisingly, many environmental researchers, consultants and policy-makers currently see the significant disciplinary problems of the 1980s not, as in the past, engineering and technical "how to" questions but rather as political, legal and social ones (Thompson 1983; also see Wildesen 1984b; Miller 1985a). Indeed, the complexity of decision-making processes is just beginning to receive scholarly attention in e.i.a. (e.g., Hirst 1984a). This is reflected in Dunker and Beanlands (1982) call for greater emphasis on "social scoping" in environmental impact assessment. Recognizing that decisions affecting the environment and economy are often based as much on public aspirations and perceptions as upon the results of scientific research, Dunker and Beanlands suggest social scoping be carried out to identify those concerns arising out of a development proposal important to both the involved professions and the general public.
Attention is now being directed to studying and evaluating decision-making processes in confirmation of the fact that one of the decade's preeminent concerns is, and will continue to be, adjusting decision-making processes to complex social and technocratic contexts (DeSario and Langton 1984). This recognition, however, has not yet struck most Western Canadian archaeologists, although many have begun to experience the effects of adverse decisions made in the political environment of increasing scarcity. Already one significant set-back has been experienced (see below) and more are forecast unless the discipline's political acumen and involvement in policy making processes are dramatically improved.

4.5.4.2 The Instruments of Participation

Effecting such an improvement requires an understanding of Canadian policy-making mechanisms which permit involvement. In the following pages, an overview of various points of access and means of influence will be discussed, and two recent examples of the discipline's handling of participatory opportunities will be examined. As argued elsewhere, considerable authority has shifted from the federal and provincial legislatures to their cabinets, and from the cabinets to the bureaucracy. To compensate for this and assure the continuance of participatory democracy, the Canadian political system has evolved alternatives for policy inputs. As enumerated by Smith (1982), these include lobbying, public inquiries, task forces, advisory bodies and green papers.

Lobbying, sensu stricto, can be defined as interest group activity directed to influencing policy making by persuasion and persistence (Adie and Thomas 1982:128-9). In Canada it is generally accomplished by informal
meetings of pressure group representatives with senior bureaucrats or cabinet ministers, meetings often followed up with the submission of briefs. Contrary to U.S. methods, most lobbying is targeted at the bureaucracy, notably special and executive assistants to ministers.

Public interest groups are usually at a considerable disadvantage compared to elite, corporate lobbies. Often the former are naive regarding the policy process and mistakenly direct their energies to backbenchers or use ineffectual campaign tactics (cf. Chandler and Chandler 1979:74). Also, they frequently are transitory, lack funds and political assets (such as past party contributions and significant vote delivery abilities), approach issues negatively (e.g., using opposition party advocacy, media protest events, etc.), and fail to offer practical and face-saving policy alternatives. Corporate efforts, on the other hand, often are prosecuted by professional lobbying firms, or minimally are carried out by individuals in the legal professions or business, or who were once in political life themselves. Corporate lobbyists enjoy numerous points of access, have coherent positions, are more sophisticated in their methods, and possess other financial and social advantages over citizen groups. That hundreds of businesses, professions, social and cultural associations operate in Ottawa as full time lobbys (Adie and Thomas 1982:12) supports Smith's (1982) pessimism about the effectiveness of public interest efforts vis-a-vis the abilities and impact of elite lobbies.

Another mode of involvement is the public inquiry (a.k.a. Royal Commission and Commission of Inquiry). Relatively infrequent actors in the policy field due to their costliness and extended time frames, public
inquires are very significant and influential means of input to policy-making at both the federal and provincial levels of government. Inquiries are established to inform, advise and recommend on legislative policy regarding areas of social concern. Through their use large and complex issues can be researched, made visible and apprehendable to the public, and public attitudes can be made known. At the same time, inquiries can serve to demonstrate the complicated nature of many issues and legitimize governmental deferral of action.

Public inquiries are becoming common in resource management policy generation, the Berger (1977) and Lysyk (1977) inquiries being the most outstanding examples to date. The merit of these hearings was that small, local minority groups were permitted to be heard and have their views considered. The Berger inquiry, in fact, introduced major innovations to the hearing process (see Wallace 1984). First, three formats were used: 1) preliminary hearings to establish the rules of subsequent hearings, 2) formal, legalistic hearings where technical issues were debated, and 3) informal community hearings which encouraged the participation of local interest groups and concerned individuals. Second, funds were provided for interventions by public interest groups to ensure a balance of concerns could be heard. Third, information presented at the inquiry was widely available. And, finally, the Commission had its own legal counsel cross-examining witnesses. One unforeseen result of the Berger Inquiry was the production of a very readable report (which made number one on the Canadian non-fiction best seller list [Sewell 1983]). These innovations have been adopted in a few regulatory inquiries into resource management issues (e.g.,
The public inquiry is not without its flaws. Often cited is a commission's confusion over its mandate. Also, its terms of reference may be overly or insufficiently constraining. As well, the personalities and normative views of the commissioners themselves may heavily influence the handling, direction and recommendations of an inquiry (e.g., for members who are career civil servants, whether they are on their way up or on their way out can bear heavily on their views and loyalties [Brown-John 1981:77]). Furthermore, an inquiry's success is partly dependant upon the stage to which the issue or policy itself has evolved in the contexts of public awareness and concern. Useful levels of participation are unlikely for inquiries on issues or policy choices which have yet to be coherently formulated or for which concern has dissipated (cf., Downs 1972).

A third mechanism is the task force. Of two major kinds, interagency and extramural, this device is used by government to gather facts and information. Since the results of neither necessarily enter the public domain, it is the latter which is of importance here. Task forces offer government several advantages: a reduction of the executive's reliance on the bureaucracy for policy initiatives and, compared to public inquiries, an unencumbered mix of intra- and extra-govermental inputs; less costs; quicker results; and, given their potential for secrecy, reduced opportunities for conflict, and hence, more control over the policy-making process. That task forces are often comprised of politically compliant, or overtly loyal appointees frequently invalidates their utility as
facilitators of public involvement. Moreover, where a task force tends findings dissonant to dominant political directions or philosophies it can be easily ignored. Thus, task forces may really be inadequate means of bringing the laity into decision-making.

Yet another policy vehicle is the advisory body, often called commissions, councils or committees. Similarly designed to acquire, analyse, and assess information to inform decision-makers, advisory bodies differ from the preceding types in they are arms-length, their membership has citizen representation, and their findings are public. Insofar as they exist to advise a minister, they can be used as an input to cabinet which circumvents the bureaucracy. This route of access, however, is a two-way street in that the executive can use advisory bodies to explain policy rather than invite participation in its formulation, thereby attenuating opposition to unpopular initiatives.

At both the federal and provincial levels these bodies have been prominent actors in the area of environmental policy. The initial effectiveness of some advisory bodies can be a mixed blessing as a few studies have shown. Some committees, e.g., the former Environmental Conservation Authority of Alberta, were created by government as a result of public pressure, perhaps as much for the purposes of co-opting or deflecting criticism of the government in power than due to any deep-seated commitment to developing sincere policy responses. Subsequently, some bodies adopt ombudsman roles, taking anticipatory stances towards environmental issues, advocating positions difficult for government to adopt, and causing interagency conflict and embarrassment. Governments may respond through
legislative amendments and changes in member appointments and reduce the 
credibility of some committees so that their eventual abolishment 
attracts little attention (Smith 1982). Averting such an evolutionary cycle 
requires that an advisory body assert its objectivity and independence, 
protect its legislative mandate and maintain a reciprocal relationship with 
its client(s). Because of its ongoing function and the directness of its 
relationship with the public and cabinet, the advisory body is an extremely 
important instrument of participation in policy-making. Familiar examples 
are the various provincial heritage advisory boards (now limited to Alberta, 
Saskatchewan and Manitoba). Their use nowadays as policy generators and 
means to short-circuit the a.r.m. bureaucracies is rare; however. Arguably, 
if the remaining provincial heritage advisory boards do not take a more 
proactive stance, they could suffer the same fate as the B.C. Provincial 
Heritage Advisory Board which was abolished in 1983.

The last vehicle recognized by Smith by which the public can influence 
the policy-making process is the use of Green Papers. Originating from a 
departmental review of an issue or policy question, and containing 
background information, analyses and alternative solutions to social or 
economic problems, Green Papers are disseminated early in the policy process 
to permit discussion, reaction and input before a policy is actually 
formulated. They largely have replaced White Papers through which 
governments announced preferred policies just before their introduction 
as legislation. White Papers tended to impede meaningful involvement 
because of their release so close to the termination of the policy process, 
after choices and alternatives had already been made or discarded by the
According to Smith (1982), the early appearance of well-written, widely distributed, and properly promoted Green Papers, together with viable means of discussion, would make Green Papers an useful, constructive and educational tool for policy making, both for decision-makers and the citizenry.

A sixth access node to policy-making not explicitly identified by Smith are regulatory procedures. Government intervention in the economy, transportation, communications, agriculture, etc. through regulatory agencies is a widely discussed subject in Canadian public administration. Generally, regulatory functions are prosecuted by one of three methods: 1) bureaus of line departments, 2) professional groups like medicine, law, and architecture which have been delegated the authority to regulate themselves, and 3) independantly established agencies, normally appointed by the Lieutenant-Governor-in-Council, which are formally accountable to the cabinet or legislature. Familiar archaeological examples of the first type are agencies like the ASA and, although it never held a public hearing, the former ASAB of British Columbia might be considered an example of the third kind insofar as it granted permits. Like boards of inquiry, advisory bodies and, less so, task forces, regulatory agencies are meant to fill the gaps many ministers and legislatures acknowledge exist in their (departmental) armamentarium of resources, skills or interests so that the myriad technical, economic and social issues over which they have responsibility can be adequately studied. Historically, some regulatory agencies came into being to "fill a need for policy innovation and flexibility in new and technical fields of government activity that could not be met by normal
legislative enactments and within the confines of existing departmental structures" (Adie and Thomas 1982:276). For example, witness in B.C. the establishment of ASAB well in advance of the Provincial Archaeologist's Office. Another asset of appointed regulatory bodies to recommend or make policy is that, by doing so, difficult decisions over the activities of firms or individuals can be depoliticized, at least perceptually. By definition, regulatory agencies are statutory bodies charged with administering, fixing, establishing or regulating a market or economic activity both in the public interest and in conformity with governmental policy through systematized means and negative inducements (Brown-John 1981:35).

Despite conventional wisdom and the often vociferous calls from the private sector for less government intervention, a comfortable relationship often develops between industries and regulatory agencies. The presence of an agency can inhibit new firms trying to enter a market thus providing benefits to those companies already operating and ensuring market stability. As well, regulatory judgements can be used to legitimize unpopular rate increases or developments (Chandler and Chandler 1979:10). This has caused a major problem for some industries trying to sustain visible opposition to intervention while simultaneously maintaining its advantages. However, with the rise of environmentalism over the 1970s, hitherto straight-forward regulatory issues founded on economic considerations were augmented by concerns for resource management and environmental impacts, coupled with demands for greater public involvement. It is in these policy areas the regulated are now arguing that compliance costs surpass the benefits. And
it is in these areas that deregulation, regulatory reform, or regulatory relief is increasingly being considered or prosecuted by ideologically conservative governments.

Opportunities for input come in several forms. An individual may write an agency expressing a view or concern. Or, as a shareholder of a regulated company, a person may influence that firm's behavior in the policy area subject to regulation. Aggregated as a pressure group, citizens can apply leverage to amend or repeal a regulatory agency's enabling legislation, provide specialized information to the agency, communicate specific concerns, and by the very act of participation, confer legitimacy on the agency (Brown-John 1981:63). Furthermore, individuals and interest groups can indirectly bring pressure on the government to which a regulatory agency is ultimately answerable through persuasive interaction with the political party itself. This is especially effective during election campaigns.

The most direct and critical interventionary opening is the hearing which "institutionalizes one of the few occasions when all parties interested in a specific area of regulatory policy or its application can introduce input into the process" (Brown-John 1981:199). But during the hearing process individual and interest group interventions may be at a considerable disadvantage to industry. Because of the frequent need to protect industry secrets and insure competition, the analyses and reports undertaken by agency staff may remain internal documents. For similar reasons, some parts of hearings may be held in camera. Financial disincentives exist to discourage interventions, as well. Unlike a regulated industry which can pass on the expenses of hearings (e.g., travel,
legal, transcription, and consultant costs) through rate increases or tax write-offs, these must generally be borne out-of-pocket by citizen groups. Regulated industries also have greater experience in hearings than most intervenors and the more formal and legalistic the hearing, the more proponents tend to benefit.

Studies on regulation like that of Brown-John (1981) identify three types of intervenors: those who represent a demarcated economic interest; those who hold specific personal interests; and those who are concerned with the general welfare. Intervenors of the first kind tend to oppose, assist or monitor an applicant who is a competitor in order to maintain or improve their own market position. Intervenors with direct personal concerns often have local, intensely felt positions on property rights or more non-economic issues. Often they haven't the time or resources to properly prepare formal briefs and are inexperienced in procedural rules, particularly those of a judicial or quasi-judicial nature. Consequently, considerable frustration can result for commissioners, applicants and intervenors alike during a hearing. The third type, public interest interventions, are theoretically motivated by the recognition that some regulatory decisions have a wide impact upon the provision of services and allocation of resources in a pluralistic society.

Third party interventions in the public good, however, appear to contradict the role of the regulatory agency which is, after all, supposed to represent this in the first place. If this is not the case, it follows that the public welfare can only really be protected or served in the adversarial environment of the hearing itself. Credence is thus lent to the
argument that public interest interventions should be provided with sufficient time and financial resources to engage legal counsel and technical assistance, develop evidence, prepare testimony, and so on. For government, the costs which must be shouldered along with the lengthy lags in arriving at decisions may outweigh the benefits of support.

In general profile, most intervenors are disadvantaged in the regulatory process in comparison to a regulated industry. They have less experience, less informal and less continuous contact with regulatory agencies. Often they are not fully aware of their role in regulatory proceedings. Their point of entry to the regulatory process is generally much later than an applicant who must have a reasonable case prepared before a regulatory hearing will be set. The weight and complexity of evidence entered by an applicant often exceed the expertise of intervenors to fully evaluate or refute. Not surprisingly, intervenors express more disenchantment with the regulatory experience than do proponents, especially as regards the end result of the process.

Intervenors expect that their opinions and facts to be heard and given as much consideration as the evidence tendered by a regulated industry in support of its application to develop a project or be granted a rate increase. Brown-Johns (1981:182-8) does not find such an expectation all that realistic. He asserts that public interest groups are excluded from process of establishing regulatory procedures and bodies. As such, regulatory bodies are essentially bureaucratic creations, whose members become secure in the notion that they are the arbiters of social welfare, despite the lack of inputs from the pluralistic interests beyond the hearing
process. By default a narrow view of the public will develops, aligned most closely with their own perceptions and those of the regulated.

This tendency is extended by the methods of agency recruitment which frequently involves overt patronage. The executive appoints members drawn from the party faithful, retired or defeated Members of the Legislature or House of Commons, career civil servants, pressure and interest groups, and individuals with special skills and experience. Many regulatory agency members, then, will have direct and indirect lines of accountability to the government in power. Thus, the use of regulatory bodies can be cynically viewed as a means for a minister to delegate a policy problem to a symbolically independant body. Agency decisions which just happen to be preferred by the minister or Cabinet then become perceptually depoliticized. Since any agency decisions in conflict with preferred policy direction can generally be overridden by the executive, political control is ultimately assured. The possibility of abuse, though, must be balanced against the need to retain accountability to government, which itself is answerable to the electorate in a way the regulatory agency clearly is not. Another cogent criticism of agencies is that they can be "captured" by regulated industries (Doern 1979:181). This situation stems from a dependency the agency develops on an industry under its jurisdiction for data, expertise, and personnel (see also Chandler and Chandler 1979:134; Adie and Thomas. 1982:274-5).

To correct these defects, Brown-John recommends expanded opportunities for public involvement. To achieve this, he believes that hearings should be made less judicial in their rules of procedure (but see Doern 1979:179).
He suggests that greater effort is required to notify affected groups of upcoming hearings. He feels, too, that local hearings should be held in the communities most affected by a decision. As well, he argues that special interest groups (e.g., consumer advocate groups, environmental law associations, public interest law firms, etc.) receive more financial resources and be given sufficient lead times to take part in hearings in a more continuous fashion. Importantly, Brown-John (1981:207) contends that 'reasonable intervenor costs should be borne by proponents. The appointment of independent counsels by regulatory agencies is another suggested innovation. Furthermore, the use of surveys and polls of those directly affected by regulatory decisions is recommended.

Obviously, the subject of participation in regulation is complex. Given the similarities between regulatory agencies and the more ad hoc instruments like advisory boards and inquiries, many strengths and weaknesses are shared as well. It is difficult to imagine the importance of any of these mechanisms declining. Yet government must strive to limit the proliferation of regulations. Given the ability of regulatory agencies to impede economic development, and, in cases, make policies which have broad fiscal or social consequences, combined with their limited accountability to elected authority, a number of checks are being imposed. These include the issuance of binding policy directions from the executive, calls for impact assessments for proposed regulations and reviews of existing regulations to purge the superceded, needless or unenforceable. "Sunset" reviews of the regulatory agencies and programs themselves have also gained currency (Adie and Thomas 1982:174-6).
Evident from the preceding discussion is the large literature on public participations and regulatory procedures. A related area of study is emerging on the nature and outcomes of citizen group impingements on the style of policy-making. The rise of single-issue groups and their record of media management have had a considerable impact on the formulation of policy positions by political parties. Their influence has led to considerable concern and attention on the part of political scientists (Oberstar 1984). Another area of research has been on the level of reliability accorded technical information provided by interest groups by legislatures, the public, the experts and activists. For example, Pierce and Lovrich (1983) recently found that information supplied by interest groups on technical issues is not trusted as much as other sources of data.

4.5.4.3 Unaware or Apathetic: Western Canadian Archaeology's Record of Participation

It cannot be overstressed that citizen participation is a vital element in the decision-making process in Canada today. And it is a sad comment on the state of Western Canadian archaeology that this truism has yet to be fully recognized and used. To be sure, not all opportunities have been passed by. The recent Federal Cultural Policy Review Committee (FCPRC) heard and received briefs from a number of archaeological advocacy groups (despite the fact that archaeological concerns were omitted from the Committee's Discussion Guide, distributed prior to the hearings, outlining its major areas of concern [FCPRC 1982:ii]). Both the CAA and CCA made representations as did Parks Canada and the National Museum of Man. The effect of these briefs, however, may have been attenuated by the fact the first two organizations have obvious, professional stakes in any favourable
enhancements to national archaeological programs. Neither exert a continuous influence on federal cultural policy. Their submissions could easily be perceived as evanescent and having essentially self-serving motivations. So too could the participation of Parks Canada, a line department, and the NMC, an arms-length corporation. Arguably, the highest impact would have been derived from public organizations, such as avocational societies, whose derived benefits from improved federal research, management and interpretive policies would have been more diffuse and more closely identifiable with those accruing to Canadian society at large. However, only the SAS actually presented a brief, although written ones were submitted by the ASBC and the Ontario Archaeological Society (FCPRC 1982). Considering the variety and sophistication of the 514 competing briefs, the short shrift given archaeological concerns by the Committee is understandable.

The goals of the FCPRC hearings were to gather information and advise the Secretary of State and Minister of Communications on broad policy directions concerning Canadian culture. The committee was not under any compelling deadline to arrive at a decision profoundly impacting the national cultural fabric. In fact, if the FCPRC had any immediate result it was to expose the complexity and multiplicity of cultural issues and rationalize governmental delay or deferral of policy initiatives. Given the review's relaxed mandate, intervening groups were provided with ample lead time to write briefs and otherwise prepare. Also aiding wide involvement was the accessibility of the hearings --- they were held in 18 major centres across Canada.
With these facilitations of participation, the Canadian archaeological community was able to organize its disparate vantages and present briefs. However, the archaeological community missed a critical opportunity to take part in a recent regulatory hearing which, if its recommendations are adopted, may have serious implications for archaeological resource management in Western Canada.

Between July, 1981 and November, 1982, the British Columbia Utilities Commission reviewed B.C. Hydro and Power's application for an Energy Project Certificate to construct the Peace River Site C project in northeastern British Columbia. Pursuant to its mandate, the BCUC (1983a, b; Henry 1983) ordered a series of hearings including: informal meetings in the local area; a formal prehearing conference at which submissions were heard, procedures were established, and intervenors were registered; formal, judicial hearings in Ft. St. John and Vancouver; formal community hearings in smaller, local towns near the project area; and special hearings at nearby Indian reserves. During their course 70 panels of witnesses and 100 individuals made presentations.

Most of Brown-John's (1981:207) suggestions for improved access were followed. The BCUC engaged its own legal counsel and technical advisory group which included an independant archaeological consultant. It required B.C. Hydro to provide notice of the hearings throughout B.C. and adjacent Alberta. And, as mentioned above, informal community hearings were held. Most importantly, applications for costs were accepted, to be awarded to intervenors on the adjudged degree to which they contributed to understanding the issues raised by B.C. Hydro's application. These expenses
were viewed as a legitimate part of the overall project costs and B.C. Hydro was to bear them. Indications are that the BCUC's style of hearing may become precedential (Sewell 1983). And several specialists consider the Site C review to have been an important advance in water policy development (e.g., Bocking 1983).

Impacts to heritage resources caused by the Peace Site C project were recognized early by B.C. Hydro and a prolonged and an extensive h.r.i.a. had been commissioned (Spurling 1980a, 1980b; Alexander 1982). Thus, B.C. Hydro's heritage consultant (myself) appeared as a witness and was cross-examined by the BCUC counsel, intervenors, and the panel itself. Since the BCUC had requested concerned government ministries to intervene, the B.C. Heritage Conservation Branch submitted a "Blue Paper" (BCMPGS 1981) outlining its positions and staff members also appeared before the panel. All issues were therefore professionally represented from three quarters: the BCUC, B.C. Hydro, and the B.C. Government.

As the hearings neared B.C. Hydro became increasingly unsympathetic regarding mitigatory work. In its e.i.s. and Energy Project Certificate application B.C. Hydro (1980a&b) expressed concern that no guidelines existed for the amount of public funding which should be spent on archaeological studies or to quantify the value of archaeological resources. When apprised that the costs of the work recommended by the BCMPSGS ranged from $3.5 to $6.6 million 1981 dollars, B.C. Hydro (1982a:9) stated "in consideration of the extensive work done to date and the lack of any yardstick to evaluate benefits from further expenditures, Hydro cannot recommend further funding." They further argued that some constraint had to
be imposed on further studies and that determining the marginal benefits of more work was difficult in the absence of BCA criteria. Hydro also alleged that the HCB would not have undertaken any studies in the absence of the Site C project. Hydro (1982b:84) summarized "the $600,000 spent to date clearly represents a rather large benefit to the rather small group of academics and professionals and a rather limited benefit to the public in general". Thus it could not recommend further funding and argued that any consideration of mitigation or compensation expenditures should be justified by the HCB in terms of the accruing benefits. This position was maintained throughout the hearings.

The BCUC tendered its report in May, 1983 and it was released by Cabinet 7 months later. In short the Commission recommended deferral of an Energy Project Certificate until an improved justification was forthcoming (BCUC 1983a:234). Recommendations were also made on project design, land use and environmental impacts, economic and social impacts, and other matters. Of especial significance was its only major heritage resource finding:

"48. Hydro match funds raised by the Heritage Conservation Branch up to a limit of $500,000 for the extra capital costs for an accelerated excavation program" (BCUC 1983a:29).

To date the government has denied a project certificate and neither endorsed nor rejected the BCUC's recommendations.

The Commission's findings on the mitigation of archaeological losses are important. For the BCUC's conclusions are completely at variance to the HCB recommendations, those of B.C. Hydro's heritage consultant, and the way heritage resource impacts have been traditionally ameliorated by developers.
in B.C., other Canadian provinces and the U.S.

What then, went wrong? Why did the BCUC basically endorse B.C. Hydro's position? Was the h.r.i.a. deficient? Were its results insufficiently robust or not contributory to archaeological science? To the contrary, the BCUC determined the h.r.i.a. was sufficient for its decision-making purposes and elicited their recognition of the unique scientific, historic and cultural values of the heritage resources at risk. The BCMPSGS (1981:1) stated the h.r.i.a. represented "the most comprehensive heritage impact study by any developer in the province, to date". In fact the h.r.i.a. earned several kudos (e.g., Reeves correspondence to Thompson, April 6, 1981), influenced the design of several subsequent heritage projects (Ball 1980; Conaty 1979; Heitzmann et al. 1981; Burley and Meyer 1981) and produced a number of refereed papers. Appreciating the effort and energy devoted to making such contributions, the disturbing question arises: if more attention had been paid to the economic and political aspects of the regulatory process and less to scientific and disciplinary concerns would the conservation of the Site C archaeological resource base have been better served?

Perhaps. Acknowledging the difficulty in monetizing the resources, the BCUC (1983a:213) concluded "that the heritage resource value can only be determined by subjective judgement of the historical and intangible values of the resource". Given the difficulty of measuring heritage resource value, and because the possibility of site excavations prior to construction was not precluded, the BCUC found that B.C. Hydro need not compensate for the predicted losses.
A benefit-cost rationale was not the only archaeological defence missing from the hearings. Critically lacking too were effective and organized interventions by the discipline and other special interest groups. The Heritage Society of B.C. appeared and made a representation. As well, the ASBC was present at a prehearing meeting and indicated it would appear during the formal hearings. However, neither a brief nor a formal intervention was made. The interventions of one local citizen and the Peace River Environmental Association mentioned the heritage resource issue but only as part of more global oppositions. Upon learning of B.C. Hydro's disinclination to fund mitigation or compensation for heritage resource losses, the CAA wrote a letter of concern to the BCUC which was entered as an exhibit (although it is unclear if it was recognized as an intervention). In retrospect, these minimal initiatives are shown to have been too late and far too little. While unproven, it is virtually certain the CAA's and ASBC's failure to get seriously involved by submitting well written and documented briefs and appear before the panel greatly weakened the significance of heritage resource values in the eyes of the BCUC. The absence of forcefully expressed and well organized public and professional concern resulted in the BCUC recommending untenable and minor mitigatory measures.

There are some important lessons here. Public inquiries and regulatory hearings dealing with archaeological resource conservation decisions cannot be taken lightly. All the skills, information and influence which can be assembled by the archaeological community must be employed. Archaeologists must gain experience as expert witnesses and intervenors.
(e.g., Rosen 1977; Waggoner 1981). The methods and procedures of participation must be examined. Alliances with supportative special interest groups must be forged and the tactics of groups opposed to archaeological interests have to be carefully analysed. Indeed, the discipline must be prepared to acknowledge that "persuasion, exchange, engagement, and sometimes even pressure and threat" (Kaufman 1978:183; e.g., Niquette 1984) will be used against archaeological interventions. For archaeologists drawn into public affairs, it simply makes good sense to acknowledge these tactics and employ them defensively or offensively when it is advantageous to do so.

Archaeology has much to learn regarding the factors contributing to social and political decision-making (Ghiselin 1982; Lee 1982). Passivity must be shed and all opportunities for public involvement must be seized. Public hearings are taken very seriously by the companies whose developments are under review, by panel members, by intervenors, by the general public and by government. One hundred and fifteen interventions were received by the BCUC --- no more than three dealt specifically with archaeological issues. Just past their mid-point the cost of the hearings was estimated at $5 million (Sewell 1983) --- the Canadian Archaeological Association had sent a letter with a 32 cent stamp! Is it any wonder that a.r.m. was considered such a minor issue and dealt such a potentially devastating setback?

What the Site C experience shows is that technically sound, scientific studies are not enough to safeguard the archaeological heritage. Mastering econometric methods and effective participation in public decision-making
processes are, today, equally, if not more, important. Heeding this lesson may may assist archaeologists to regain control over their discipline's praxis and development.

For if we feel as citizens and professionals we are both capable of, and (even more importantly) entitled to, make decisions concerning archaeology's future, we must use the instruments described above. Those looking to the prospects of public decision-making see two possible extremes eventuating: the hard-luck scenario of decline leading to apathy and authoritarianism; or the good luck transformation characterised by expanding involvement based on greater access to information, increased opportunities for making political choices and a renewed interest in the common weal (Van Til 1983; Polsby 1985). Presently, the archaeological community seems to be drifting towards the hard-luck scenario while other, more organized, sophisticated and mature interest groups (see Sadler [editor] 1979), often competing for the same fiscal resources, are faring much better in the environment of scarcity. The choice would still seem to be ours whether to lose more ground or make full use of the processes of participatory democracy sketched above.
We shall not cease from exploration
And at the end of all our exploring
Will be to arrive where we started
And know the place for the first time.

From "Little Gidding", Four Quartets by T.S. Eliot (1941)
5.1 INTRODUCTION

Western Canadian archaeological resource management has come a long way since the salvage projects of Borden, Wettlaufer and Mayer-Oakes in the 1950s. Significant progress is apparent since the spate of legislation development in the 1960s --- Manitoba now has, in theory, greatly improved heritage legislation and the already powerful Alberta and Saskatchewan acts remain intact. To be sure, advances on novel policy fronts continue in some jurisdictions, especially in the areas of site interpretive development (Alberta, Saskatchewan), public education (Alberta), and the few projects coproduced with Indian bands (B.C., Alberta and Saskatchewan).

There are many gaps and problems remaining. For example, academic archaeologists can still argue that a.r.m. studies make few theoretical or methodological contributions to the discipline. Avocational archaeologists, tourists and the interested public remain mostly excluded from meaningful involvement in field studies. The wider public is still basically unaware of the results of and need for archaeological activity, be it directed to research or conservation objectives. Public and private sector decision-makers can continue to probe the need for government involvement in and enforcement of a.r.m. And the resource base is still being lost at uncontrolled and unknown rates.

This dissertation has presented evidence for the existence of some serious problems in Western Canadian a.r.m. The history of accelerating landscape changes has been charted as has the halting emergence of legislative and technical responses to ameliorate these. Several lines of argument have been developed which can be used to strengthen and defend the
case for a.r.m. In this regard, the nature, principles and methodologies of public policy-making, economic valuation, and access to political decision-making have been discussed. This information is provided to help consultants, academics, students and governmental colleagues and others in the heritage professions who are or, by the circumstance of their employment, will be involved in a.r.m. It is also hoped that archaeology's special interest groups can use this thesis for those of their objectives which further conservation and responsible use.

The next generation of Western Canadian archaeologists, some of whom may already be undergraduates, could be the last to have access to a reasonably intact archaeological record (in Patrik's [1985] physical sense). To them will be the responsibility of maximizing returns from the remaining archaeological resource base. They will have the privilege of studying the few drainage systems not yet impounded for export, energy or irrigation. And they will exercise considerable influence over choices to excavate or preserve the rare, intact, multi-component sites not yet destroyed by urban and rural developments, transportation systems, or coastal erosion.

Let us now extend discussion beyond the topics covered so far to situate Western Canadian a.r.m. in the national and international contexts. Following this we will return to the third core problem mentioned in the Introduction: the erosion of the new archaeology. For it is in the megatrend (sensu Naisbitt 1982) symptomized by the unsettled theoretical and methodological milieu characterising not only archaeology, but most social sciences, art and architecture, and the philosophy of science that optimism for better times ahead can be found.
5.2 A BRIEF REVIEW OF INTERNATIONAL AND NATIONAL HERITAGE LEGISLATION

If it is possible to conceive of a meta-provincial style, Western Canadian a.r.m. compares favourably with some jurisdictions and surpasses most, including that of Canada. What sets the study area apart is that heritage objects are vested in the Crown in three provinces and that the four responsible ministers have such sweeping regulatory powers over such a large area. Over 30 politically diverse national jurisdictions claim "state ownership of undiscovered relics" (O'Keefe and Pratte 1984:191). France, its colonies and several Common Law countries (e.g., Great Britain [Cleere 1984:57]) remain exceptions. Resource decision-making processes are only well studied in the U.S. and comparisons have already been drawn in chapter 3. From published accounts (e.g., Meiszner 1982) and discussions with some American experts (e.g., Gummerman, pers. comm., 1984; H. Davis, pers. comm., 1985), CRM decision-making processes should not be emulated.

National government is involved in a.r.m. in most countries. In the U.S.S.R. the state and archaeology share a major sociological paradigm (Klejn 1977; Bulkin et al. 1982; Soffer 1983). This and culturgenic continuity may account for the Soviets', Japan's (Tanaka 1984) and, say, Mexico's (Lorenzo 1984) concern for the national heritage. The depth of the some nations' interests are exhibited in Mexico's tariff on foreign based projects (Lorenzo 1984:85) and, more extremely, in Ethiopia's halt of prehistoric research (Levin 1983a). In the face of closing borders to research (cf. Prewitt 1984) it is encouraging that two New World conferences on Rescue Archaeology have been held already this decade (e.g., Wilson and Loyola 1981). Major drainage developments are occurring or proposed in
Meso- and South America (e.g. Keatinge 1980; Wilkerson and Hiser 1985) and elsewhere in the third world which, without international cooperation, could result in internationally significant losses.

Among the countries of the first world Canada can claim a unique standing insofar as it has virtually no national heritage legislation. To an extent the argument that federal policy-making is limited by the fact the majority of southern Canada's heritage resources are provincial concerns has merit. Even so, a significant land area is under federal jurisdiction containing an unknown but large number of resources requiring conservation management. And the argument's validity totally evaporates upon consideration that the one third of the nation north of the 60th parallel is under federal jurisdiction. Archaeological and historic sites in this area are being afforded protection, but only under the constrained regulatory abilities of the territories (Janes and Arnold 1983).

There are other gaps, too. Developments proceeding under federal legislation, authority or financing (e.g., national railway projects; interprovincial impoundments; etc.) in theory may be capable of evading provincial a.m.r. requirements. Although this has not been tested, it is possible that in circumstances of political or economic expediency, heritage resource conflicts could be ignored. Canada's offshore underwater heritage requires protection and management, as well. Finally, there are the limitations of provincial statutes (section 4.2.2.) which can only be comprehensively addressed by federal law.

The absence of a federal presence in a.m.r. has less obvious consequences, perhaps the most serious of which is the uneveness with which
the national partimony is being managed and preserved. Most of the "have provinces" such as B.C., Alberta and Ontario have taken legislative and administrative actions to conserve their archaeological resources. Their traditionally strong economic performances and natural resource revenues have allowed for the establishment of bureaucratic units to carry out comparatively effective management of provincial heritage properties. This, however, is demonstrably not the case for the Maritime provinces which are reliant on federal transfer payments to deliver public services at the Canadian average (ECC 1982). Health, post-secondary education, and other social programs take budgetary priority over heritage conservation. Consequently, a.r.m. efforts in the Maritimes range from minimal to non-existent.

The long-term implications of varying levels of interprovincial a.r.m. activity are worrisome. For Canadians are currently permitting their heritage to be destroyed due to regional economic differences, without consideration of resource representivity or significance. Unchecked, a "sherds and patches" approach to resource management will eventuate, ultimately conducing to very distorted Canadian identity. There seems to me a clear federal role to ensure that the prehistory of, say, New Brunswick is at least as well managed and known as that of Alberta. This and the other gaps at the national level of government could be filled by the establishment of national heritage legislation, a regulatory agency to administer it, and a provincial grants-in-aid program modeled after other federally mediated equalization payments (Spurling 1984).

Canada's poor performance in heritage conservation is thrown into stark
relief when compared to Australia's. Comprised of state jurisdictions (with their own policy-making abilities) as is the case in Canada, the Australian government has promulgated The Australian Heritage Commission Act (1975), The National Parks and Wildlife Conservation Act (1975), The Historic Shipwrecks Act (1976) and The World Heritage Properties Conservation Act (1983). While state powers constrain comprehensive federal heritage planning and conservation (O'Keefe and Pott 1984:88,108-9), the Australian government has enacted strong laws where constitutionally able, i.e., its protection of offshore shipwrecks and World Heritage Sites.

Of great interest are the recent actions taken by the Australian federal government to protect internationally significant sites in Tasmanian which, via a favourable Australian High Court decision, concomitantly widened its powers over heritage, aboriginal matters and public utilities and, at the same time, confirmed its authority over external affairs (Boccabella and Mills 1983). The events leading up to this decision exemplify how politically sensitive heritage issues can become when nations take them seriously.

The Gordon-below-Franklin project proposed by the Tasmania government would have flooded a series of rockshelters dating to c. 20 000 B.P. (Lewin 1982; Blain et al. 1983). In 1981 the federal government nominated the area containing the sites to the UNESCO World Heritage list; the sites were listed in late 1982. Attempts to prevent hydro-electric development generated considerable attention in the popular and scientific media (e.g., Lewin 1983b; Paterson 1983; Mulvaney 1983), prompted strenuous protests by environmental groups (e.g., a blockade by 4000 people culminating in almost
1300 arrests [Hall 1984], marches involving 15000 people [The Mercury 1983:10] and astute single-issue management tactics [Mills 1983; Harris 1983]) and became a major political issue in state and national elections. When the Labour Party, which as part of its campaign platform opposed the project, came to power, federal intervention became a fact and was ultimately supported by the courts. While the potential heritage losses were probably only one item on the Australian government's agenda for opposing the Gordon-below-Franklin project, a heritage conservation victory nonetheless occurred (Lewin 1983b; Hall 1984).

From a contemporary Canadian perspective, the level of Australian federal involvement in a heritage issue is almost inconceivable. The evolution of the Gordon-below-Franklin issue also stands as a signal example of how activism in a democratic society can accomplish heritage conservation objectives.
5.3 *STURM UND DRANG: THEORY IN ARCHAEOLOGYLAND*

Beginning around 1977 dissatisfaction with the new, neo-, processual, or *explanatory* archaeology was renewed and became sustained (e.g., Binford 1977; Meltzer 1979; Raab 1981; Renfrew 1983; Dunnell 1984b; Hodder 1985). Once welcomed as a new, revolutionary perspective which challenged normal archaeological science (i.e., culture history), it is now seems certain Kuhn's (1970) theory of scientific revolutions, which was appealed to to validate the new archaeology, never really applied (Meltzer 1979; Dunnell 1982:14; Barrett 1984; Feyerabend 1981; Laudan 1981; Shapere 1981). In retrospect it is ironic the new archaeology seized Kuhn's "image of science" to support adoption of the extreme Hempelian model (e.g., Watson et al. 1971). For logical positivism was under considerable criticism when *The Structure of Scientific Revolutions* was first published; in fact, Kuhn wrote it in partial reaction to positivism as well as the refutationist ideas of Sir Karl Popper (Kuhn 1970, 1977; Putnam 1981).

Currently, no paradigm appears dominant in the philosophy of science. On the one hand are the realists, who maintain that "scientific change is on balance, progressive and that science makes possible knowledge of the world beyond its accessible, empirical manifestations" (Leplin 1984a:2). This seems to be the majority position, and one which is at odds with positivism insofar as, while a pretheoretical ontological realm is affirmed, there is no requirement that theoretical statements necessarily be reducible to observations (McMullin 1984; Layder 1985).

Alternatively, there is the antirealist or constructivist position, exemplified by Kuhn, Feyerabend, Laudan, etc. They maintain a variety of
positions, ranging from a denial of ontological status to "any theoretical entity whose existence is warranted only by the success of the theory in which it occurs" (McMullin 1984:25) to an acceptance of a limited independant and objective material world. Kuhn's rejection of coherent ontological development in science and demonstration of the lack of theoretical cummulation is pivotal. To the anti-realist, that one theory increases predictive accuracy, fertility and scope over another theory does not mean the first theory is better or more closely approaches the truth than the second (Leplin 1984b). For the history of science is one of theory replacement through revolution rather than assimilation.

My point in this brief survey of a current debate in the philosphy of science is to illustrate its unsettled nature. Whether scientific theories are approximately true or referential, or whether science evidences progress towards closure with a true account of the world are topics beyond the scope of this essay (see various papers in Leplin 1984 [editor]; Layder 1985; Brown 1985). What is interesting and important about this debate is that archaeology evinces a similar, though less articulated, indecisiveness. Today, the whole notion of progress in archaeology is in question. In her synthesis of lowland Maya archaeology, Marcus (1983) hit upon the circularity epitomizing the growth of archaeology in the region. Dunnell (1984b) has suggested an absence of lineal advancement may distinguish the discipline as a whole. And Barrett (1984) contends anthropology theory in general has exhibited a repetitive cyclicity and non-cumulative character. Leaving aside the issue of whether archaeology is in a pre-, pseudo- or fully paradigmatic state, we find, instead of a cohesive research program or
unified dogma, that archaeology now comprises a variety of critical and methodological vectors. Discussion of some of the major trends follows.

5.3.1 Critique: The Maintenance of Colonial Attitudes

The new archaeology had few positive consequences for contemporary Indians and Inuit. Trigger (1980a), for one, finds little improvement in the discipline's attitude towards America's first peoples in the new archaeology's research portfolio (cf., Willey and Sabloff 1980; Trigger 1981, 1984b). He perceives in the ahistorical and detached perspective of processual archaeology a sophisticated rationalization for a continued disregard for Native American problems and self-image; and disparages the "display of idiosyncratic intellectual virtuosity ... [and lack of] ... more long term substantive goals" (Trigger 1980a:672). Elsewhere, he (1980b:182) inveighs that the ahistoricism of the new archaeology renders much of it socially and intellectually inconsequential. Miller (1980) makes similar charges regarding neoarcheological studies carried out in emergent nations.

5.3.2 Critique: Narrow and Destructive Research Designs

Trigger (1980a) also faults the straitened, deductive approach to data recovery wherein evidence is amassed only in relation to the testing of a small or single number of hypotheses, often at the expense of culture historical or other advances to knowledge (cf., Fladmark 1981:14; Flannery 1982:275).

5.3.3 Critique: Borrowing Into Science

Like many disciplines which fed on one another during the last two decades, the neoarchaeology has a history of borrowing methods and using them on archaeological problems (Gummerman and Phillips 1978; Moore and
Keene 1983). These borrowings, together with the importation of abstractions from the philosophy of science (having few applicative consequences but some inspirational value [Wylie 1983a]), are almost definitive characteristics of explanatory archaeology. Quantitative procedures were taken from plant ecology, general ecology and geography, to cite the major lending disciplines. De rigueur are optimal foraging theory (o.f.t.) from animal ecology (e.g., Christianson 1980; Winterhalder 1981; Smith 1983) and price, market, consumer choice and other paradigms from microeconomics (e.g., Earle 1980 and see Christenson 1982).

Uncritical use of these methods have occasioned several cautionary papers (Moore and Keene, editors, 1983; and see Bernstein 1981). Relevant here is Keene's (1983) caveat that the fact such models as o.f.t. are grounded in capitalist economics imparts a hidden agenda. This not only jeopardizes the etic perspective but, by its acceptance and application, endorses, and so contributes to, the maintenance of contemporary social inequalities. Indeed, archaeology's interest in rational choice theoretics may just instantiate what Boulding (1969) has referred to as "economics imperialism" --- the discipline of economics takeover of the social sciences. And the new archaeology's use of microeconomic theory may be nothing more than salvage (sensu Barrett 1984:84-5), an attempt to prop up a body of discredited theory with a novel and initially convincing derivative.

5.3.4 Critique: Logical Positivism Is Inadequate and Manipulative

The two philosophical underpinnings of the new archaeology --- logical positivism and nomothetic inquiry --- have produced disappointing results and, for some, disturbing implications. The former seems increasingly
viewed as inadequate to penetrate prehistoric cultural behavior from static archaeological evidence. Indeed, the social realm is so complex that positivist approaches used in contemporary anthropology are only warranted when grossly simplifying assumptions are made. It has been suggested that, due to its necessary simplification of social relations and obscuring of contradictions, positivism supports the maintenance of power elites (Barrett 1984:6).

Likewise, the new archaeology's concern for discovering law-like regularities has been suggested as ideologically linked with the state's use of science for command and control purposes (e.g., Hodder 1985; and see Luke 1985). Trigger (1984b:366) contends that the major goal of new archaeology "was not to understand prehistory but to use archaeological data to establish universal generalizations about human behavior". Thus researches into American Indian prehistory or that of other ethnic or national traditions were simply means to nomothetic ends. The new archaeology's diminishment of multi-cultural diversity, Trigger concludes, was congruent with America's economic expansionism and military imperialism in the third world which required negation of other national identities and their replacement by a homogenous, univalent internationalism. Similar allegations have been heard in art and architecture, vis-a-vis abstract expressionism and modernism (a.k.a. the International Style), respectively (Trigger 1984b; Portoghesi 1983; Jencks 1984). As a corollary, the role of people in actively creating, sustaining and reproducing social relations was disregarded. Economic and social systems replaced individuals as the focus of study.
Some European, historical and public archaeologists now appreciate that ideology infuses the social and even the hard physical sciences. Also, many now have come to appreciate that rigorous standards of proof (via falsification of competing hypotheses) may not be possible and that objectivity may be more elusive than real. The disabusement of deductivism's efficacy is partially attributable to the recognition of trans-science problems (Weinberg 1972). Epistemological (and ontological) problems have weakened the assumption that complete objectivity is obtainable. This is being acknowledged in other fields, especially in the social sciences and humanities (e.g., Hetherington 1983; Brittain 1985; Healey 1985; Fuhrman 1985; Guba 1985; Huff 1985; Miller 1985a). It also appears that theory acceptance may have, in practice, more to do with negotiation and consensus achievement than the satisfaction of standards of proof (Pinch 1985). Data are being viewed as discipline- and value-neutral (Barrett 1984) which are injected with normative relevance by the social and biophysical sciences and their ruling ideologies. Consequently, commentators from diverse perspectives are concerned that isolating the practice of science from reinforcing contradictory social relations and outright state prescription grows more and more difficult (Carey 1985; Goslin 1985; Gastil 1970). To those of the Frankfurt School (e.g., Habermas 1970; Marcuse 1964) science and the contemporary state are closely enmeshed as evidenced in their mutual language, values and principles. Others aware of the strong relationship between government ends and scientific means maintain optimism that science can maintain an objective distance, however (e.g., Boulding 1980).
5.3.5 Response: Retreat From Anthropology

In response to such uncertainties some archaeologists have moved closer to the harder sciences, disciplines like geology, malacology, zoology, taphonomy, climatology, ecology, not so much to build models of past human behaviour but to reconstruct ancient biophysical environments. Schoenwetter's (1981) call for a contextual archaeology exemplifies a justification for research more informative to, than informed by the earth and biological sciences. Falling short of subordinating archaeological concerns completely to biophysical ones and exceeding Butzer's (1982) notion of the approach; Schoenwetter's argument for a reconstruction of methodologies which admit a more prominent role to environmental variables nonetheless challenges many of the new archaeology's tenets. This view is supported by those whose training emphasized the earth sciences and others trying to confirm archaeology's societal relevance (e.g., King 1981). In Western Canada, this tendency to the natural sciences is longstanding. Although concentrated initially at the University of Calgary, it is increasingly seen in the theses and dissertations produced at what, formerly, were forward posts of the neoarchaeology.

Although the deepening specialization in the direction of the biophysical sciences has bolstered the discipline's analytical armamentarium, the danger exists that it will fragment the field into nonsynergistic sub-disciplines. Another concern is for an "obsessive emphasis on quantified detail without context, on progressively finer and finer measurement of smaller and smaller problems ... [which will leave] ... us knowing more and more about less and less" (Toffler 1981:30).
5.3.6 **Response: Archaeological Historiography.**

A number of historical treatments of archaeological topics have recently appeared. For example, Grayson (1983) and Meltzer (1983) have written on the extra- and intra-disciplinary impacts the establishment of a respectable antiquity for humanity had, and three monographs have been published on V. Gordon Childe (Tringham 1983). Likewise, *World Archaeology* and *American Antiquity* have recently produced major retrospects. This interest in archaeology's past achievements and personages is healthy, especially since the discipline's contributions to changing our species' image of itself have been recognized. Every discipline needs its quota of (re)evaluation and celebration and this should be especially so for ours. The purpose and promise of the discipline -- our corporate myths -- have been reconfirmed. But if this becomes excessive, a deflection of scholarship from probing frontiers to self-congratulatory nostalgia may be indicated.

5.3.7 **Response: Structuralism, neoMarxism and critical theory**

The most policy oriented challenges to the new archaeology have come from European, Central Asian and Africanist prehistorians (e.g., Hodder 1982a, 1985; Kohl 1981; and see Schmidt 1983) and a few American historical archaeologists (e.g., Leone 1982a, 1982b, 1984; Wylie 1985b). Some, using structuralist methods (which assume a deep, pretheoretical "grammatical" structure to the human mind unchanged for millennia), are investigating cognitive patterns which seem retrievable from high resolution data sets dating from the neolithic onwards. Others are exploring neoMarxism and critical theory which, contra Harris (1979), do not necessarily accept the techno-economy as controlling cultural phenomena. Instead, an active and
Directive role is ceded to ideology and inter-subjective communication in mediating and mobilizing economic activities and, in turn, social relations. These research programs have definite policy implications since both accept that contemporary relations of power and ideology condition both the construction of the past and the uses of these constructs.

Anthropology recognizes difficulties with structuralism and Marxism (Harris 1979; Barrett 1984), two of which are appropriate cautions to archaeologists. Structuralism is methodologically loose, probably best pertains to belief systems and, for many archaeological purposes, too unphenomenological. Marxism, too, suffers from the last problem which contributes to its unhelpfulness in dealing with prehistoric cultural change by hunter/gatherers. Recent clarifications of culture complexity among mid-latitude hunter/gatherers (Price and Brown 1985, editors), though, have opened opportunities for neo-Marxist inquiries (e.g., Bender 1985a, 1985b).

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These disciplinary vectors signal considerable unrest in archaeology. It now seems certain processual archaeology is in decline. Some regard it as unexciting and either tautological or trivial (Renfrew 1982a, 1983; Flannery 1982). Others express uncertainty about the whole of archaeology's praxis, relevance or future (Trigger 1981, 1984a,b; Schiffer 1981; Moore and Keene 1983). This is partly due to the disappointing results forthcoming from the neoarchaeology research programs, which some attribute to its reliance on an exaggerated Hempelian rigour (see Salmon 1982), a philosophical perspective critiqued, in archaeology, by Morgan, Wylie and others. Contributing, as well, was archaeology's acceptance of a
superceded form of naturalism (positivism); as commented upon above. For, while it may be that the methodology of the natural sciences can be applied to those archaeological problems which fall into the realm of social science, the methodology selected was flawed (see Keat 1971; Benton 1981; Manicas and Rosenberg 1985). As we have seen, recognition of the ideological content and control of archaeology and other sciences, both social and natural, has also raised considerable concern.

The ascendancy of restraint and even disillusionment following more than a decade of heady optimism for great disciplinary progress is not unique to archaeology (e.g., compare the comments of Horowitz, 1978; Raymond 1978; and Webber 1978 regarding the experience of the planning profession). The insecurity of archaeology in these regards need not conduce to a nihilism, however. Recent socio-political analyses (e.g., Gero et al. 1983) point to a possibility for the discipline's revivification given recognition of its ideological content and the commitment to explore alternative research strategies.

Intuitively, there seems to be a good link between the rise of neo-positivism in the social sciences generally and post-WWII demographic changes. Certainly economic prosperity combined with a large university aged cohort stimulated great interest and enrolments in the social sciences and humanities. Implications of archaeology's expansion in a war-time macroeconomy with foreign and domestic policy contradictions have been discussed by Schiffer (1979), Kohl (1981), Rowlands (1982) and Trigger (1984b). And there are also the hedonics to consider. The increased enrolment and interest in archaeology generally during the late 1960s and
early 1970s was strongly demographically conditioned (Schiffer 1979). I can personally attest to the attractiveness of an engaging, challenging and outdoors vocation, the same characteristics which motivated hundreds of middle class kids in Western Canada to camp in the woods, dig holes or survey, get paid, analyse remains, read local sources and, at least in B.C., meet Indians. Facing the political turmoil of the times, archaeology offered a peaceful, al fresco career wrapped with the social engineering possibilities of using archaeological data to effect a more equitable society. And to be sure, the exuberant scientism of such early converts as Martin (1971), Fritz and Plog (1970), Watson et al. (1971) and Martin and Plog (1973) was directed towards laudable objectives. Today, to some, effecting social change remains possible (e.g., Dunnell 1982:21) while others seem to be uncertain of archaeology's ability to do so (cf., Wylie 1982).

There is no doubt the strong suites of the new archaeology are still very relevant. Binford and Ho's (1985) and Schiffer's (1985) use of the best middle-range theory continue to challenge and complicate the physical record. But even these scholars on the cutting edge of archaeological science have done little to widen appreciation of pre-contact Indian and Inuit life except to show that detailed infrastructural reconstruction may be beyond the discipline's current interpretive abilities. Alternatively, structuralist and neo-Marxist modes of analysis offer great possibilities for enriching understanding of social relations and ideology in prehistory. Their adoption will also dispel the neo-archaeology's mechanistic concept of people as homo economicus, as minor parts of a rational, simplistic and
egalitarian system, which lacked ideological or social complexity, and whose teleology was optimizing food-getting strategies.

Appearing as a promising research program is the use of some of processual archaeology's primary tools, e.g., quantitative methods, in combination with structuralist and neoMarxist conceptualizations of data (e.g., Shanks and Tilley 1982; Tilley 1984). Such theoretical pluralism or relativism, only now emerging, has been propounded by such philosophers of science as Feyerabend (1975), Laudan (1981) and Miller (1982). Harris (1979:21-3) has charged the relativist position(s) with "epistemological anarchy" and moral indifference. Yet this loses much of its force considering Feyerabend's (1975:27-8) explicit promotion of theoretical anarchism for humanitarian reasons. The plausibility and desirability of what Feyerabend (1980) calls democratic relativism has been criticized by philosophers (e.g., Yates 1984, 1985; Alford 1985). But relativism has some compelling polemical support (see Hollis and Lukes 1982). There are advantages to employing eurythematic research programs: principles operating at one organization of social phenomena may not apply at others. Put another way, observation of law-like regularities "at one level of analysis does not preclude distinct causal regularities operating at other levels" (Masters 1982:277). For instance, positivist inspired programs may be suited to studying behavior while structuralism may better reveal belief systems (Barrett 1984). Adopting a flexible menu of research programs, methodologies or theories may provide archaeology with more realistic and badly needed operational and participatory strategies for the first world's transition into postindustrial, postmodern society.
5.4 POSTMODERNISM: COMPASSING THE VECTORS OF THE EIGHTIES?

Many social theorists involved in futures studies anticipate significant changes in the way North American society is structured, changes which are inchoate today as it confronts postindustrialism. Postindustrialism is signalled by the decline of labour investment in traditional "smokestack" industries like resource extraction, refining and manufacturing and the shift of employment to information production and processing industries. These reallocations are having profound changes on first world societies. Observers like Toffler (1980), Naisbett (1982), Van Til (1984) and others foresee synergistic transformations in communications, economics, lifestyles and political activity. While some are fervently optimist as to how these changes will be manifested, others are more cautious or pessimistic (e.g., Lamm 1985). Acknowledging that predictions of major societal trends contain serious uncertainties, alternative futures can be identified. Van Til (1984), for example, projects four scenarios, ranging from 1) radical improvements, 2) incremental but beneficial changes, 3) continuity of the status quo to 4) social deterioration. Appreciating the reality of these differing possibilities has considerable value since conscionable citizens can use their participatory decision-making powers and work towards the scenario most likely to establish greater social equity, collective well-being, and self actualization.

Since V. Gordon Childe, the social transformational abilities inherent in the archaeological enterprise have remained largely dormant, almost as if the discipline was affected by amnesia. The rise of what Hodder (1985) had dubbed post-processual archaeology has begun to reconstitute the discipline,
especially as regards its role in constructing the past and, by doing so, validating the present. Above, how other social sciences are undergoing such self-rejection has been discussed. But is this philosophical trend evident in popular and elite culture, in the production of contemporary material cultural, in the artifacts, structures and arts which pervade our lives, work and communicate? As might be expected, since people participate in and continually reproduce an environment which is intensively (if not truly) communicative, theoreticians in the design and cultural industries are fairly introspective. A megatrend evident in these fields is postmodernism, characteristics of which are shared with contemporary archaeology. And, as will now be seen, there are additional parallels which archaeology could deliberately establish and thus effect, much the way art and architecture are attempting to, positive social change.

The term postmodern originally derives from literary criticism, architecture and art, although it has now been extended to applications in philosophy, sociological critique and other fields. Mayer-Oakes (1982a) has used the term in an archaeological context, to loosely signify a synthetic period, just begun, following the modern era. The modern era includes all the attributes of the explanatory period plus the professionalization and growth of public archaeology. Exactly what post-modern archaeology is, Mayer-Oakes leaves open. While the discipline does not need another neologism, a term for the tendential currents just discussed is required. Postmodern is available and, given its definition in art, architecture and the social sciences, suitable.

In art postmodernism is recognized as a paradigm shift hallmarked by a
mix of past and contemporary artistic conventions and expressions (viz. historical eclecticism); a restoration of humanism; a celebration of symbolism, metaphor and narrative; the use of popular artifacts and concepts as subjects codifying cultural myths; exploration of the self-conscious relationship between spectator and object; an interest in anthropology, especially structuralism; and the production of works from a point of departure outside art (Roberts 1982).

Postmodern architecture, which influenced its artistic namesake, rose in reaction to the International Style (a.k.a. modern architecture). The latter style originated in post WWI Europe, infused with socialist tenets, an explicitly antibourgeois attitude and a conviction that the world could be remade through architecture by starting from zero. The practitioners of modernism consciously broke away from tradition, reducing ornament, the vernacular and available space to a minimum to eliminate, as far as possible, the bourgeois values of individualism and privacy. Structures were functionally designed within tight, repetitious guidelines, e.g., shape: boxlike; materials: concrete, steel, glass). The processes of industrialization and technological change were celebrated in such design strictures. Underlying the modern movement was the creation of a neutral built environment, lacking, in many cases by intentionally annihilating, local codes, historical associations and context and cultural differences --- in short, the communication system which explained the differences among people and their collective identity. From this negation and forced amnesia, modernists contended a mythic, universal, technocratic, modern person would emerge (Wolfe 1982; Portoghesi 1983; Jencks 1984).
Interestingly, the social tasks the early modern architects accepted --- the erection of a social utopia, the transformation of society from a membership bent on personal acquisitiveness to one concerned with realizing collective aspirations.--- were transformed themselves. Insofar as many modern buildings were capable of communicating power, control and awe they became appropriated as symbols for the commercial and bureaucratic elites who build and run cities. Even so, as clients these elites exercised little explicit influence on the outcome of their commissions. The everyday users and vicarious consumers had virtually no role in the design process and were mostly confounded and alienated by the incommunicativeness of the modern urban environment, which quickly replaced the historically cumulative, familiar, vernacular built neighbourhoods. Among the architectural cognoscente the modern enterprise was defended and defined in a highly developed, abstract set of polemics, impenetrable to all but the initiated (Wolfe 1982; Jencks 1984).

Modernism, seen as the merger of positivist science and applied technology, also accelerated the domination and control of nature. In industrialized society, nature, rather than being adapted to, was objectified and adapted for social uses; constituents of the biophysical environment became natural resources, things capable of management and exploitation. While the size of structures was pushed to limits of technological ability, form was reduced to a simplified, unnatural geometry of straight lines and rectilineal space; symmetry, curves, and other organic shapes and arrangements were excluded from design. References to the natural world were purged. The morphology and non-human scale of modern
structures held the natural environment at a great distance from the urban environment and, in doing so, diminished even more the human/nature relationship (D. Miller 1984). A homocentric world was created in which technology, economic and bureaucratic routinization and the concept of a mechanized cosmos came to mirror and mutually reinforce one another (Torgerson 1985b:27).

For a reflective archaeology, modernism has more than a ring of familiarity. While not suggesting an exact isomorphism between modern architecture and the neoarchaeology, there are some undeniable similarities: the programmatic formalism, functionalism (see Hodder 1982b), deep seriousness, antihistoricism, internationalism, rationalism, elitism, abstraction of purpose, faith in technique and methodology and the loss of perspective on and the relevance of the original reasons for the movement. Trigger's (1984b) critique of the neoarchaeology's nomothetics and its close fit with neocolonialism and cultural imperialism together with recent socio-political critiques of archaeological practice (e.g., Gero et al. 1983) constitute additional evidence for modernism's presence in the neoarchaeology.

This recognition need not necessarily represent another loading on to the pessimism prevalent in many areas of the discipline. Instead of providing a cause for further concern, acknowledgement of the socio-political forces which archaeology much work through and for provides a case for optimism. For with the advent of postindustrial society, many sociologists and critics of urban design welcome the supersession of modernism by its radical antithesis: postmodernism. And, as will now be
argued, by critically engaging the spirit of postmodernism, archaeology may find a renewed social relevance.

Best, since most visibly seen in its expression in the built environment, postmodernism in architecture stems from an interest in the very culture-historical precedents ignored by the modern movement. Although opinion varies as to what the postmodernism precisely incorporates (Affleck et al. 1983; and see Portoghesi 1983; Jencks 1984), there is general agreement on its salient characteristics. Postmodern architecture designates "a plurality of tendencies directed toward an escape from the crisis of the Modern Movement with a radical refusal of its logic of development" (Portoghesi 1983:10). The breadth of its plurality is shown in its inclusivity: design elements of modernism may be freely appropriated.

Put in point form, postmodernism: 1) tolerates eclecticism, 2) is concerned with regional and site-specific context, 3) allows whimsical expression (e.g., decoration, ornamentation, self-conscious cleverness), 4) elevates the role of the client and encourages participatory design, 5) strives to be relevant to the needs of people and their sense of place, 6) anticipates and seeks to address the problems of the post-industrial revolution, 7) acknowledges both the diminished role of the architect in creating the urban environment and the increased importance of others' involvement (e.g., planners, developers, citizen coalition groups, bureaucrats), 8) recognizes that successful architecture involves two levels of communication, one technical, specialized code for the discipline and one generalized code, suffused with tradition and accessibility, for the public, and, finally, 9) has as practitioners social interventionists seeking to
instill their values through articulation and democratic debate (Portoghesi
1983; Jencks 1984). It too has its baggage of theory. Like postmodern art
there exists an interest in structuralism, especially semiotics, and a
search for the deep structure of design. But postmodern architecture's
demeanor is far less solemn that that of the modern movement.

The term postmodern has been criticized because it implies the departure
from one episode or period without a commitment to a destination (Wolfe
1982:116). Yet its use in denoting an interregnum is perhaps the strongest
reason for applying it to archaeology in the 1980s. There are also
justifications to be found in the coincidences between postmodern
architecture, art and archaeology: their investigation of structuralism,
concern for relevance, greater public access and input, and historicism.

Recognizing the appearance of a mix of research programs in contemporary
research as signalling an inchoate postmodern archaeology has considerable
cause. Hodder (1985) would affix the label post-processual to some of these
currents but this seems terminologically too narrow. More has happened to
archaeology than the discovery of its ideological role, structuralism,
neoMarxism and a need to critique its connection with those aspects of
neoarchaeology which contradict these research programs. Archaeology's new,
broadened public responsibilities and ceding of control to various societal
sectors must also be encompassed. The term postmodern is already
established in a number of disciplines and has achieved relatively broad
societal acceptance and understanding. And, because art and architecture
have declared themselves to be in postmodern eras and the impact of these
two fields on contemporary culture is far greater than archaeology's, there
may be an inevitable adoption of postmodern values.

Rather than attribute archaeology's movement towards research into cognitive processes and ideology and interest in relativist philosophy, strictly to endogenous factors (e.g., disappointment with the outcomes of neoarchaeological agenda), is more likely these interests were as much imposed through the discipline's interaction with outside sociocultural forces. Many social sciences in discourse with contemporary archaeology, disciplines such as anthropology, history, linguistics, philosophy, planning, psychology and sociology, transmitted their disaffection with and criticism of positivism, nomothetics and rational choice theory. Pardisciplinary incredulity also coincided with the appearance of social movements concerned with the deterioration of the cultural and natural environments. Spokespersons for such movements attributed the root causes of this degradation to the unrestrained use of science and technology by big government and big business. Citizens individually and in coalitions urged government to provide greater opportunities to affect development and design decisions, protect consumers and pass environmental and heritage conservation legislation. This widespread reaction to modern, technocratic society resulted in postmodernism. And one of its hallmarks --- the reconnection of the past with the present through the accommodation of historical symbols and information in contemporary social relations and structures --- is manifest in the heritage conservation movement.

Consequently, a.r.m. appears much a postmodern enterprise in its genesis and, increasingly, in its practice.

Support for the latter half of this argument is found in the greater
participation of the public, its elected and bureaucratic representatives and special interest groups in the conduct of archaeology. Greater outside influence and intervention was inevitable as archaeology was drawn into public policy fields as a consequence of its expanding regulatory activities and its conversion from a small, closed research science with modest funding requirements to a big science with significant funding needs. Not only did the large sums of public funds appropriated for projects demand greater accountability, but the number of agencies, business interests and societal groups with which archaeologists interacted grew. No longer were archaeologists simply dealing with members of their own, and other academic disciplines, as well as the interested public. Over the 1970s and early 1980s archaeology became fractionated and its practice increasingly engaged combinations of the groups defined in sections 4.3 and 4.4. Each of these had a stake in archaeological affairs and exercised what power they had over its practice. Barrett's (1984:234) observation for anthropology is relevant here: "what has happened is that we have lost our anonymity. No longer can we assume that our books and reports will not be read by the 'natives'". Because of these factors, the neoarchaeology, with its heavy investment in intradisciplinary advancement through methodological development and inattention to social values and substantive knowledge, came very close to societal irrelevance.

As a consequence, about 1980 some academics and public archaeologists unconsciously began to change the discipline's course towards postmodernism and reconstitute archaeology's role: vis-a-vis maintaining the prevailing ideology and relations of power, advocating environmental ethics and
facilitating anthropological understanding.

Discussion of post-modernism would be incomplete without a brief excursion into the recent criticism directed at it. For the acceptance of postmodernism as a dominant movement, if it can be viewed as such, is not universal. Jurgen Habermas, perhaps the pre-eminent contemporary sociological theorist, defends modernity, in art (Jay 1985), in architecture (Habermas 1982) and in more general terms (Rorty 1985). In Habermas's (1985) view, such phenomena as the protection and expanded use of civil rights, as well as democratic self-determination, are founded on modernity. Consequently, he finds post-modernism's roots in neoconservatism since it denies "universalistic principles of morality" (Habermas 1985:90) and offers no theoretical basis to choose one social direction over another. This deactivates the liberal critical program of accessing through theory an undistorted reality.

Habermas's vindication of modernism in architecture is carried through his overall defence of modernity. He considers the Modern Movement responded correctly to design possibilities and requirements but that it was overburdened in attaining its socialist objectives by market and bureaucratic pressures. In wider terms, modernity, as a project stemming from and continuous with Enlightenment thought, remains viable but incomplete (Bernstein 1985). Habermas's argument is still formative and, like other aspects of his work, has its critics (Lyotard 1985; Rorty 1985). Demonstration of its strength and cogency will have to await publication of his forthcoming book on the subject.
5.5 POSTMODERNISM AND A.R.M.

The practical consequences of these social and scientific debates and trends require grounding. For, as Meehan (1985:309) observes: "From the policymaker's perspective, philosophy generally appears to be almost completely divorced from real world affairs and many philosophers continue to serve as herdsmen to flocks of literary pieces of dubious relevance to the conduct of real world affairs" (Meehan 1985). The question must be asked: what are the possibilities and implications of practicing a.r.m. and, indeed, archaeology itself, in an increasingly postindustrial, postmodern world? Four major areas where the discipline is being transformed can be identified.

5.5.1 Striving For The Preservation of An Unbiased Sample

The first major implication for resource managers is the need to develop strategies to contend with the state of flux found in theory and method. Whether, as Marcus (1983) and Dunnell (1984b) have suggested, archaeology is showing circular rather than linear development or, as preferred here, a eurythematic postmodernism, decision-making processes concerning significance and resource conservation are rendered even more complex than previously thought.

The effect of disciplinary context on ranking resources has been commented upon extensively in CRM (section 3.4). A resource significant under today's criteria may be rendered more, or alternatively, less significant by future research problems and needs. A case of where this has occurred has already been discussed (Lynott 1980). In coming to terms with the shifting concept of significance, Dunnell (1982c, 1984a) has recommended
that resources not be conserved on the basis of how their investigation will contribute to contemporary research problems since this biases the remaining archaeological record. Rather, he suggests resource conservation decisions be based on areal sampling, without regard to the resources contained in the sampling universe, so to reduce research biases as much as possible.

This approach has much to recommend it. Preservation by sampling property rather than resources is mostly congruent with Tainter and Lucas' (1983) critique on the effects problem orientation had on CRM decision-making. It also offers economies since many regional sampling programs are based on such a tactic. This preservational strategy, by deflecting interest from demonstrating significance through field research, may actually increase the discipline's efforts in resource conservation and avoidance.

However, its adoption, at least in Western Canada, could countervail public participation in resource conservation. Recall that the provincial heritage statutes provide for the designation of heritage sites at the provincial or municipal level, depending on their importance (section 4.3.9). Attempts by heritage agencies to control either type of designation in the interests of achieving resource representivity not only would countervene democratic decision-making in principle, but likely the fact of legislation. Attempts by bureaucrats to totally govern designation procedures may compromise the development of a needed public commitment to archaeological resource conservation. One of the significant characteristics of postmodernism in architecture is the celebration and preservation of the local built environment. This is accomplished either
through the preservation of older structures, their integration into new buildings, or the design of historical attributes into new structures. Such efforts as these enhance the appreciation by communities of their history, uniqueness and sense of place. That the designation, preservation and development of archaeological sites likewise contributes to these same humanistic objectives is apparent in the emergence of local archaeological societies together with a new role for historical particularism in archaeology (section 4.4.9). In making resource conservation decisions, the archaeological resource manager today must strive for double coding, for a balance between achieving representivity for future researchers and satisfying public preferences for the conservation of locally significant resources.

5.5.2 Creating And Presenting A Self-Reflective Past

A second implication of postmodernism affects resource managers, exhibitors, park planners and interpreters and consultants involved in museum and site interpretations. Recognition that "groups and societies use images of the past to justify present activities and to socialize new recruits" (Mandelbaum 1985:185) places a considerable ethical burden on specialists engaged in exhibiting "the presence of the past in the present" (Leone 1981:13; and see Leone 1982a, 1982b, 1984; Meltzer 1981; Schuyler 1976; Wylie 1985b). Museums and heritage parks provide the public with the most accessible experience of the past. How the lifeways, behaviors and beliefs of prehistoric peoples, Indians, fur traders, Metis, military figures, homesteaders, government administrators, ethnic minorities, and early capitalists are displayed and given meaning can either validate or
challenge the existence of current social inequalities. Through physically
detailed site reconstructions, visually exciting dioramas, vignettes of
daily activities by costumed performers, computer assisted audiovisual
displays, and so on, the past seems, at one level, demystified and
tractable. Yet at another, deeper level a past inexorably leading to,
legitimizing and deeply mystifying current social relations can be
constructed.

Acknowledging the power of historical reconstructions does not make for
an easy definition of the responsibilities of the resource manager and other
specialists involved in such developments. The exact range of vulgar or
secular messages the public receives from visiting Parks Canada's Fort Rod
Hill, Fort St. James, Fort Walsh, Lower Fort Garry or such provincial site
developments as Barkerville, Rutherford House, Cannington Manor, etc. is
essentially unstudied. What is evident, however, is the underrepresentation
of Indian society except insofar as its seemingly passive role in fur trade
economics is portrayed. To be sure there are a number of pragmatic
constraints (see section 4.4.9) which account for why attention has only
recently turned to interpreting and presenting Indian prehistory and history
in Western Canada. But counterpoising the predominance of early Euro-
Canadian historic sites and their heroic messages of exploration,
mercantilism and militarism against the virtual absence of prehistoric
interpretations, the sanctioning of colonialism and a reification of
contemporary asymmetries in relations of power between White and Indian
society are revealed. In one way it may be beneficial that Indian history
has not been constructed via site developments since specific historical
stereotypes not being entrenched via these media. By the same token, however, existing stereotypes remain unchallenged. More neutral benefits flow from the facts that site interpretations can now be advantaged by 1) a greatly expanded archaeological information base, 2) consultations with Indian groups and incorporation of their concepts of the sites, themes and events being interpreted and 3) the deliberate development of a critical self-reflection by public archaeologists as to the uses of the past (e.g., Leone 1982a). By acknowledging, and intervening through, their roles as managers and constructors of history, archaeologists have the potential to effect changes in normative attitudes of Western Canadian society towards visible minorities, which, in the case of its first peoples, is frequently overt racism. By doing so, archaeology can contribute to real social change.

5.5.3 Developing An Archaeological Policy Science

For several reasons it now timely for archaeology to develop a deeper interest and broader understanding of policy science. A number of arguments can be made for this. These range from Weaver's (1985b:197) concern that "the development of a policy science in anthropology ... is now an urgent task because of the need to provide employment for our students and to prevent the obsolescence and disappearance of anthropology as a viable academic discipline" to the more radical one that modern bureaucracies and decision-making processes merit study so that they can be used to reduce social inequalities (e.g., Barrett 1984).

Barrett develops a compelling moral argument for anthropology's greater involvement in policy science, which, in the main, is applicable to
archaeology. He (1984:233) maintains anthropology's role is "to unravel the factors that create, conceal and perpetuate inequality." Citing Nader (1972) Barrett encourages 'studying up', i.e., a switch in research "from the powerless to the powerful, from the poor to the rich, from the colonized to the colonizers". By analysing contemporary bureaucracies a reflective, effective, relevant and socially responsible discipline committed to significant social change may eventuate. Charges that activism compromises the necessary neutrality of scholarship are countered by the revelation that such neutrality is chimerical: non-participation in policy-making and debates amounts to support for the status quo (Barrett 1984:228-29).

Whatever reasons appeal, it is clear that some quota of policy science knowledge is required for non-academic archaeologists. For government employed professionals a wide understanding of public policy-making is essential. To achieve comprehension of and a position in the policy sciences, curriculum changes are required so that graduate students, who will continue to be streamed toward non-academic employment, can acquire the skills needed in the real world. While core courses in archaeological theory, methodology and research techniques will continue in importance, offerings in public administration, law, resource management, situational ethics, applied research, political science and decision science should augment the standard menu. As part of their preparation for professional careers, students must also have opportunities to participate in group problem-solving, and practica and apprenticeships in government and business (Weaver 1985b). Needed as well is instilling in students a balanced view of
the roles of technical and psychosocial methods of problem-solving in management, planning and policy-making (e.g., Christensen 1985; A. Miller 1984, 1985). Such skills and values are necessary if applied archaeologists are to shed their image with some decision-makers as naive advocates, and thereby gain access to and affect the administration of public policy.

The extent to which a policy science approach is developed from university to university will probably depend, as it does in environmental management (Francis 1984), on how highly applied work and social commitment are valued at the institution in question. If recent trends in anthropology, history, planning and environmental management are any guide, the worth of policy science research in archaeology can only be expected to increase.

This dissertation has been directed to this objective. In it a fairly comprehensive study of archaeological resource management as a form of public policy has been undertaken. The problem of resource loss in Western Canada has been circumscribed insofar as available data permit. The slow evolution of public policies, both in the study area and the U.S., to reduce resource loss was then charted. Following this a detailed comparison and analyses of the public laws undergirding a.r.m. were presented. The culture, processes and effects of provincial bureaucracies, specifically those established to carry out archaeological policy, were exposed and critiqued. And this was followed by discussion of how bureaucratic, economic, professional, academic and other societal groups are affected and engaged by these policies. Finally, the methods by which policy can be democratically influenced and changed have been provided. Thus this
dissertation has been a preliminary, self-conscious exercise in policy science. The data, recommendations and conclusions contained herein will hopefully lead to further analyses and, perhaps, a discipline more effective in intervening in its own interests, which I believe, coincide with those of an improved society.

5.5.4 Thinking With Archaeology

The very term resource management reveals it as a field whose roots are squarely neoarchaeological and modern. Members of the "deep" ecology movement (Devall 1980) would judge its goals to be congruent with resourcism. As Livingston (1985:4) describes it, resourcism is the commodification of all components of the biophysical world, including landscapes and landforms and the "process of which these phenomena are both the agents and the creations". Such resources may then be viewed as merely raw materials or assets appropriable for human purposes. Conceptually, resourcism is aligned with the industrial development imperative and the concept of management euphemizes control and the ability to engineer away problems affecting them (Livingstone 1985; Torgerson 1985b).

A.r.m. cannot be defended against such allegations. More or less situated in governmental bureaucratic structures with limited influence from continuously active, concerned and committed special interest groups, a.r.m. can at best be reformist. Without increases in academic and public participation and intervention, archaeological conservation problems will continue to be satisficed by incremental (or decremental) social engineering methods, the effectiveness of which may continue unknown.

Continuance of the status quo is not inevitable. There are strong,
demographically and technologically driven trends evident to some social scientists (e.g., Toffler 1980; Naisbett 1982; Polsby 1985) which conduce to optimism for significant improvements in social relations for the near future. Citizens already enjoy an increased capacity for diversity in lifestyles and political involvement. Expansions of personal wealth and leisure time, more selective control of the information explosion, more geographic mobility, liberation from diurnal and seasonal constraints on activities, fluid kinship and residence relationships and the devolution of traditional gender roles all contribute to wider choices for individuals. Evident, as argued above, in the rise of postmodernism, postindustrialism, or, in Toffler's (1980) terms the appearance of a third wave society, are growing tendencies to political plurality, social diversity, decentralized and expanded decision-making apparatus, deeper concern for environmental ethics and demands for wider opportunities for participation in all sorts of personal and political activities.

Sustained, the implications these megatrends hold for archaeology are profound. As the well educated cohort of baby boomers moves into senior governmental and business positions, and later as it enters retirement, concern for environmental quality and collective well being could become even higher societal priorities. Likewise, its search for self actualization and quality forms of recreation may offer archaeology a highly motivated, well educated and astute clientele for coproducing beneficial political activities as well as traditional field and laboratory projects. Properly encouraged, the rise of such a volunteer sector could fortuitously coincide, at the turn of the century, with the last major opportunity for
preserving or recovering significant portions of the archaeological record.

Yet these tendencies, like democracy itself, are inchoate and fragile. As Van Til (1984) warns, a hard-luck scenario of increased authoritarianism, economic decline, and personal acquisitiveness may prevail. To counter this, archaeologists, no matter what their affiliation and employment, must seek to install the discipline in popular culture, to use democratic decision-making processes when appropriate and to self-critically use archaeological data to positively effect social change in the direction of social equity. In short, archaeologists must become public, as educators, advocates and interventionists. To accomplish this a transformation of the discipline is required. A new vision of its purpose and direction must be conceptualized. An ultimate objective, to paraphrase Portoghesi (1983:24), should be to encourage people to think with archaeology, not just about it.

It is my hope this dissertation, in the arguments developed and data presented, has shown the effect a.r.m. has had on the development of Western Canadian archaeology, as well as its potential for bringing about further change, change which need not be restricted to the discipline. I also hope this essay will encourage greater disciplinary attention to and participation in archaeology's transformation. There is no denying our primary subject matter will always be the past. This being so, the numerous uncertainties characterising our constructs will not disappear; nor do the solution of problems simply introduces new ones. Archaeological resource management provides the chief means for continuing and extending our explorations. And because of its explicit public role, it also reinforces their relevance.
**APPENDIX: GLOSSARY OF ABBREVIATIONS AND ACRONYMS**

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<thead>
<tr>
<th>Abbreviation</th>
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<tbody>
<tr>
<td>ACA</td>
<td>Association of Consulting Archaeologists</td>
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<tr>
<td>ACHP</td>
<td>Advisory Council on Historic Preservation</td>
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<td>AD</td>
<td>Archaeology Division (B.C.)</td>
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<tr>
<td>ADM</td>
<td>Assistant Deputy Minister</td>
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<td>AHPA</td>
<td>Archaeological and Historic Preservation Act</td>
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<td>AHSPA</td>
<td>Archaeological and Historic Sites Protection Act</td>
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<td>AMA</td>
<td>Association of Manitoba Archaeologists</td>
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<tr>
<td>a.r.m.</td>
<td>archaeological resource management</td>
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<td>ARMS'</td>
<td>Archaeological Resource Management Section (Sk.)</td>
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<td>ARPA</td>
<td>Archaeological Resources Protection Act</td>
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<td>ASA</td>
<td>Archaeological Survey of Alberta</td>
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<td>ASAB</td>
<td>Archaeological Sites Advisory Board</td>
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<td>ASBC</td>
<td>Archaeological Society of British Columbia</td>
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<td>ASC</td>
<td>Archaeological Survey of Canada</td>
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<td>ASCA</td>
<td>American Society for Conservation Archaeology</td>
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<td>ASSWM</td>
<td>Archaeological Society of South Western Manitoba</td>
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<td>ASocA</td>
<td>Archaeological Society of Alberta</td>
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<td>BCA</td>
<td>Benefit-Cost Analysis</td>
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<td>BCMPSGS</td>
<td>British Columbia Ministry of Provincial Secretary and Government Services</td>
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<td>BCPM</td>
<td>British Columbia Provincial Museum</td>
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<td>British Columbia Utilities Commission</td>
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<td>CAA</td>
<td>Canadian Archaeological Association</td>
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<td>CAP</td>
<td>Capital Costs</td>
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<td>CAPA</td>
<td>Canadian Association for Physical Anthropology</td>
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<tr>
<td>CDAP</td>
<td>Churchill Diversion Archaeological Project</td>
</tr>
<tr>
<td>CEA</td>
<td>Cost-Effectiveness Analysis</td>
</tr>
<tr>
<td>CRAR</td>
<td>Committee for the Recovery of Archaeological Remains</td>
</tr>
<tr>
<td>CRM</td>
<td>Cultural Resource Management</td>
</tr>
<tr>
<td>CWA</td>
<td>Civil Works Administration</td>
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<tr>
<td>DCCAEC</td>
<td>Department of Consumer and Corporate Affairs and the Environment (Man.)</td>
</tr>
<tr>
<td>DM</td>
<td>Deputy Minister</td>
</tr>
<tr>
<td>DOE</td>
<td>Department of Environment</td>
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<tr>
<td>ECC</td>
<td>Economic Council of Canada</td>
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<tr>
<td>e.i.a.</td>
<td>environmental impact assessment</td>
</tr>
<tr>
<td>e.i.s.</td>
<td>environmental impact statement</td>
</tr>
<tr>
<td>ELUC</td>
<td>Environmental Land Use Committee (B.C.)</td>
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<td>Energy Project Coordinating Committee (B.C.)</td>
</tr>
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<td>Energy Resources Conservation Board (Al.)</td>
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<td>Federal Cultural Policy Review Committee</td>
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<tr>
<td>GAO</td>
<td>General Accounting Office</td>
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<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
</tr>
<tr>
<td>GSCo</td>
<td>Guidelines Steering Committee</td>
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<td>HBC</td>
<td>Hudson Bay Company</td>
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<td>h.i.s.</td>
<td>heritage impact statement</td>
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<tr>
<td>HMP</td>
<td>Historic Management Plan</td>
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<tr>
<td>HPA</td>
<td>Heritage Property Act</td>
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<tr>
<td>Abbreviation</td>
<td>Description</td>
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<td>h.r.i.a.</td>
<td>heritage resource impact assessment</td>
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<tr>
<td>h.r.i.a./m.</td>
<td>heritage resource impact assessment or mitigation</td>
</tr>
<tr>
<td>IAS</td>
<td>Interagency Salvage Program</td>
</tr>
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<td>kW</td>
<td>kilovolt</td>
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<td>M</td>
<td>Maintenance Costs</td>
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<tr>
<td>MAS</td>
<td>Manitoba Archaeological Society</td>
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<td>MBO</td>
<td>Management by Objectives</td>
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<tr>
<td>MEARA</td>
<td>Manitoba Environmental Assessment and Review Agency</td>
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<tr>
<td>MBA</td>
<td>Master of Business Administration</td>
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<tr>
<td>MOE</td>
<td>Ministry of Environment (B.C.)</td>
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<tr>
<td>MMMN</td>
<td>Manitoba Museum of Man and Nature</td>
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<tr>
<td>MPA</td>
<td>Master of Public Administration</td>
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<tr>
<td>NEPA</td>
<td>National Environmental Policy Act</td>
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<tr>
<td>NHPA</td>
<td>National Historic Preservation Act</td>
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<tr>
<td>NPS</td>
<td>National Parks Service</td>
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<td>NWCo</td>
<td>North West Company</td>
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<td>O</td>
<td>Operating Costs</td>
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<td>OAHP</td>
<td>Office of Archaeology and Historic Preservation</td>
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<td>o.f.t.</td>
<td>optimal foraging theory</td>
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<td>Office of Management and Budget</td>
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<td>OSM</td>
<td>Office of Surface Mining</td>
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<tr>
<td>OSMPMOA</td>
<td>OSM Programmatic Memorandum of Agreement</td>
</tr>
<tr>
<td>PEA</td>
<td>Preliminary Environmental Assessment</td>
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<tr>
<td>PMA</td>
<td>Programmatic Memorandum of Agreement</td>
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<tr>
<td>Abbreviation</td>
<td>Full Form</td>
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<td>--------------</td>
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<tr>
<td>PMIS</td>
<td>Program Management Information System</td>
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<tr>
<td>PPBS</td>
<td>Planning, Programming, Budgeting Systems</td>
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<tr>
<td>PPPARSA</td>
<td>Provinical Parks, Protected Areas, Recreation Sites and Antiquities Act</td>
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<td>Resource Management Division</td>
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<tr>
<td>r.o.w.</td>
<td>right-of-way</td>
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<td>SAA</td>
<td>Society for American Archaeology</td>
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<td>Saskatchewan Archaeological Society</td>
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<td>SCR</td>
<td>Saskatchewan Culture and Recreation</td>
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<td>Saskatchewan Heritage Advisory Board</td>
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<tr>
<td>SHPO</td>
<td>State Historic Preservation Officer</td>
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<td>SMNH</td>
<td>Saskatchewan Museum of Natural History</td>
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<td>SOPA</td>
<td>Society of Professional Archaeologists</td>
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<tr>
<td>SPAG</td>
<td>Saskatchewan Professional Archaeologists' Group</td>
</tr>
<tr>
<td>SPC</td>
<td>Saskatchewan Power Corporation</td>
</tr>
<tr>
<td>TVA</td>
<td>Tennessee Valley Authority</td>
</tr>
<tr>
<td>UNESCO</td>
<td>United Nations Educational, Scientific and Cultural Organization</td>
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<tr>
<td>USFS</td>
<td>United States Forest Service</td>
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<tr>
<td>v.e.c.</td>
<td>valued ecosystem component</td>
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<td>Western Canadian Archaeological Council</td>
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<td>Works Progress Administration</td>
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<td>ZBB</td>
<td>Zero Based Budgeting</td>
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