The Archive of Place

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The Archive of Place

Unearthing the Pasts of the Chilcotin Plateau

WILLIAM J. TURKEL

FOREWORD BY GRAEME WYNN

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For Juliet, and in memory of J. Charles Wyse, 1966-98

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FOREWORD

Putting Things in Their Place

by Graeme Wynn

In the sixth book of *de Architectura*, written in the first century BC, Marcus Vitruvius Pollio wrote of the Greek philosopher Aristippus, who was shipwrecked off the island of Rhodes. Upon landing on the beach, he found some lines drawn in the sand. Recognizing their geometrical form, he urged hope upon his companions, crying out according to one translation from the Latin, "Be of good courage, I see marks of civilization," and in another, "Let us be of good cheer, for I see the traces of man."[1]

Two thousand years later, Clarence Glacken, a geographer from the University of California, Berkeley, drew the title of his magnum opus from this incident. Thirty years in gestation, *Traces on the Rhodian Shore* is a remarkably erudite study of nature and culture in Western thought from ancient times to the end of the eighteenth century.[2] Yet *Traces* has little to do with the sorts of material inscriptions on the landscape that buoyed the spirits of Aristippus. Although Glacken insisted that his interest in the relations between culture and the environment grew from personal observations of the immensely diverse entanglements of land and life in different parts of the world, observations which prompted him to ponder the circumstances that kindle human creativity, he expected readers to regard his work as "exclusively a product of the library." Indeed, *Traces* explores "man's place in nature" through an impressively wide-ranging engagement with ancient, medieval, and early-modern written sources. It says very little about material settings and the marks that humans make on the surface of the earth as it maps expressions of three interlocking

ideas: the idea of a designed earth; the idea of environmental influence; and the idea of humans as geographical agents. It is at once a work of geography and intellectual history, and it stands, in retrospect, as an early contribution to the emerging field of environmental history, marking out both the possibilities and the value of investigating the ways in which humans have thought about the world.

In the pages that follow, William Turkel follows the trail blazed by the Greek philosopher and the Berkeley geographer by proclaiming his interest in the marks and traces – the indexical signs – that humans impose on the landscape. In some sense, the Chilcotin Plateau of British Columbia is Turkel's island of Rhodes, and ideas about nature and culture lie as close to the centre of his concerns as they did to Clarence Glacken's project. But Turkel comes deliberately to the Chilcotin, as a scholar seeking to integrate and extend various perspectives on the past rather than as a shipwrecked traveller. He sees the plateau as an intellectual challenge rather than as an intelligible sanctuary and (as a scholar shaped by his turn-of-the-millennium context) he is reluctant to accept the distinction between nature and culture that Glacken recognized as a "dichotomy that has plagued the history of geographical thought" but found impossible to resolve on account of its deep involvement with other histories of ideas.

For Turkel, the Chilcotin is neither simply a stage on which humans have left their marks, nor merely a locale in which to examine the perceptions of particular individuals. It is, rather, a setting in which to examine the complicated entanglements of these two things, an exemplar of the larger point that "every place is an archive" and a vehicle for reflection upon historical practice. It is about history and memory, about the relations between historical consciousness and the materiality of place, and about doing historical research "in the field" rather than in libraries and archives. *The Archive of Place*, Turkel tells readers in his preface, "is about the ways in which people interpret material traces to reconstruct past events." It is thus both a history of a place (an environmental history, Turkel would say) and a study of the practices involved in writing about past places. It begins in the belief (derived from the phenomenologically-oriented philosopher of place Edward S. Casey) that "places gather" a vast range of things – from animate and inanimate entities, through experience, histories, languages, and thoughts, to legends and practices – and rests on the conviction (borrowed most immediately from environmental historian William Cronon) that scholars should recount how they come to understand the world as well as provide narratives about it.[3] Thus, *The Archive of Place* seeks to historicize the act of place making and place the process

of constructing the past under critical scrutiny. The result is an unusual and arresting book that reveals a good deal about the Chilcotin as it elucidates how people create, deploy, and contest evidence in the search for a usable past.[4]

To appreciate this book's contribution, it is necessary to put it in its place, to understand what it does, and does not, do because many others have sought to understand places through traces by interpreting ordinary landscapes and engaging in "archival fieldwork," although rarely from the precise standpoint adopted by Turkel.[5] Here it is well to remember, as Donald Meinig has observed so eloquently, that deciphering the material evidence of human imprints on the earth – or "reading the landscape" – is "a humane art, unrestricted to any profession, unbounded by any field, unlimited in its challenges and pleasures." In this context, the writings of American J.B. Jackson and Englishman W.G. Hoskins immediately spring to mind as superlative examples of the craft of landscape interpretation. Very different in background and temperament, engaged in understanding very different parts of the world, and endowed with "exceptionally seeing eye[s]" focused on different interpretive horizons, these two independent-minded scholars did much to advance interest in the rich historical record given material expression in the complex, ever-changing tangle of features (from hedgerows to field patterns and from farmhouses and churches to trailer parks and roadside strip malls) that set localities apart and give character to places.[6]

Both Hoskins and Jackson sought to uncover "the logic" behind landscapes that they understood as "a series of [human] compositions of varying magnitude" or as "living design[s]" adorning the face of the earth in reflection of human actions, aspirations, and beliefs. The former, a local historian, sought "truth in the details of this particular house, this lane, this hedge, by means of the most meticulous work in field and archive." The latter, a broad thinker fascinated by aerial photographs, tended to view places from more remote vantage points, and to assess them more quickly as he sought meaning in classes of things: kinds of dwellings, patterns of features, and plans of settlements. Hoskins, concluded Donald Meinig in a sympathetic and illuminating comparison of the work of these two influential figures, was "engaged in a skilled detective work of exact dating from scraps of evidence," while Jackson undertook "interpretive work" in search of "general meaning" inspired by a "keen sense of culture history." For Hoskins, landscape interpretation was a distinct form of historical practice, an approach directed to addressing fundamental historical problems. His work was necessarily conducted at the local or micro-scale

of particular localities, but he was firm in the belief that the material traces left in the landscape by humans reflected the societies and environments (the worlds of ideas, technologies, beliefs, and biophysical surroundings) in which they lived, and that they were best understood through and alongside other written and otherwise recorded remnants of human endeavour.[7]

For Jackson, by contrast, encouraging landscape appreciation was a form of activism. Much of the magazine *Landscape,* which Jackson founded in 1951 and edited and contributed to for seventeen years thereafter, was devoted to commentary on the problems facing residents of rural and smalltown America as technological and social change swept across the country. It reflected Jackson's rejection of the modernist era's "one worldism" in favour of a "less didactic" understanding of economy and society, in all their dynamic variety, at the local scale. "What we need," he wrote in a 1953 commentary on E.A. Gutkind's *Our World from the Air,*

> is not an aerial perspective of the globe but an aerial perspective of our own backyard. It is no use telling us the world is our home and that we should love it, until we have learned to love our own corner of it, until we have learned what that corner possesses in the way of beauty and potentiality for happiness. Otherwise, we can only look upon the foreign landscape as Dr. Gutkind does: not as an inhabitant, but as a kind of global social worker, bereft of all sense of wonder, but very much aware of what is wrong and how to right it.[8]

In a narrower disciplinary vein, generations of geographers have plowed somewhat parallel, although often less clearly articulated, furrows. The roots of this concern are buried deep in the mists of time. Some see the tradition of geographical fieldwork (inherent in which is a concern with the "look of the land") beginning with Odysseus; others find more recent and robust antecedents in the work of the great cosmographer Alexander von Humboldt. A third, more diffuse, precursor can be found in the common expectation, in late-nineteenth-century German geography, that graduate students would produce an initial dissertation on a local topic (involving direct engagement with the particularities of a specific locality) and a subsequent *Habilitationschrift* on a distant part of the world. Inspired in the first part by Pestalozzi's educational reforms, which valued local knowledge or *Heimatskunde*, and in the second by Goethe's celebration of the medieval *Wanderjahre* tradition as well as a commitment to self-development in German education, these impetuses undoubtedly encouraged an emphasis on field investigation and place-based studies among

twentieth-century American geographers. So too did the strong field tradition defined by the earth scientists Nathaniel Southgate Shaler and John Wesley Powell, as they surveyed and assessed the physiography and resource potential of the American west and reflected on human-environment relations in this area. Together, these influences were carried forward by the influential geomorphologist William Morris Davis, the young Carl Sauer, and others, leading to the emergence by the late 1920s of a distinctly American form of cultural geography involving "careful studies of landscapes and economy based on archives and detailed fieldwork."[9]

Characterizing even this more narrowly defined band of work in historical/cultural geography is no easy task. In 1925, when Carl Sauer wrote "The Morphology of Landscape," which is often regarded as the basic foundational statement of American cultural geography, he had been advocating fieldwork for a decade and he was defining an approach in explicit opposition to prevailing views that the physical environment determined individual development and behaviour, and thus the cultures in which people lived. Critical of the untested presuppositions upon which environmental determinism rested, and cognizant of peoples' capacity to act willfully, Sauer reversed the equation of environmental determinism and made culture a driving force of environmental change. With the aid of a simple but powerful heuristic model, he envisaged cultural landscapes (constituted by the material traces of human endeavour, such as fences, field patterns, dwelling forms, and so on) as products of the encounter between human culture (a shared set of beliefs, attitudes, behaviours, and technologies) and the physical environment (vegetation, soils, climate, etc.) over time. In this schema, people of different cultures coming into the same physical environment would produce very different cultural landscapes as their conceptions of "the good life," their appraisals of their setting and their capacities (and desires) to alter it would differ. By the same token, people from the same culture colonizing markedly different settings would not produce identical new landscapes because they would have to adjust their practices to work with different biophysical resources.[10]

Half a century on, Sauer's conceptual framework was roundly criticized by scholars whose intellectual contexts were very different from those in which Sauer wrote. Some took him to task for his "super organic" view of culture, which he regarded (as did most of the leading anthropologists of his day) as static and "given" rather than as the ever-changing product of the ongoing dialectic between individuals and societal norms that those who studied social worlds in the latter part of the twentieth century conceived it to be.[11] Others were discomfited by what they regarded as Sauer's

rigid distinction between nature and culture and by his failure to avoid that age-old dichotomy, although a more sympathetic reading of his conceptual scheme might suggest that the cultural landscape fashioned by humans in encounter with the biophysical world was at least a hybrid creation. Be this as it may, for decades after his relocation from Chicago to Berkeley in 1925, Sauer continued to develop and extend his geographical practice, which bore few signs of intellectual constraint by his "morphology model" and engaged generations of graduate students in exploratory trips in which "interrogating landscapes was more important than either explaining them or interpreting them."[12]

Meanwhile, others embarked on different courses of geographical inquiry and carried the mainstream of the discipline away from both landscape studies and the investigation of human-environment relations. By the 1960s, much of the "fieldwork" undertaken by geographers was governed by a positivistic paradigm and directed to the systematic collection of neatly ordered data through the use of surveys, questionnaires, and enumeration schemes. The cluttered, disorderly world that confronts the senses and challenges the understanding of those who relish its everyday diversity and complexity was ultimately reduced to abstractions and even regarded as "naughty" for its failure to conform to the interpretations, designs, and models applied by scholars.[13] Some continued to "get out into ... [the world], look hard at it, ask questions about it, and grapple with the conundrums so presented," and attempted to decipher the jumbled record of human traces in the landscape by joining field observations in interrogative conversation with data from ethnographic, archival, or archeological sources to understand the "intersection of people, land and space in the past." But by the 1980s, fewer and fewer geographers were inclined to "take the world as it is."[14] Reflecting the cultural turn then coursing through the social sciences, a new generation of geographers thought of landscapes as texts but rejected the possibility of mimetic ("accurate"/"objective") representations of the world and, more generally, the realist assumptions that underlay field-based inquiry. Critical of earlier efforts to observe, describe, classify, and map material artifacts in order to identify cultural regions and trace the diffusion of cultural traits, they sought to understand landscapes through interpretive metaphors that implicated "a web of social processes and intersubjective meanings."[15] The field, reflected the English historical geographer Felix Driver in 2000, "is not just 'there'; it is produced and reproduced through both physical movement across a landscape and other sorts of cultural work in a variety of sites."[16]

In this context, it is perhaps hardly surprising that William Turkel found the task of understanding the Chilcotin unexpectedly challenging. Trained in psychology and linguistics before beginning doctoral work in history, in anthropology, and in the Science, Technology and Society Program of the Massachusetts Institute of Technology and then becoming interested in environmental history, he was relatively unfamiliar with both the fading traditions of archival fieldwork and landscape interpretation and the new cultural geography outlined above.[17] Initially, he thought, ambitiously, to write an account of the sparsely settled plateau that lay to the west of one of his childhood homes. He contemplated a deep and thorough study that would allow him to narrate the story of these acres in west central British Columbia through 300 million years. Quickly he discovered that records of and knowledge about this territory were fragmentary and uneven. Historians and anthropologists had written about the Chilcotin and its peoples, but relatively sparsely. Archival holdings about the place were tantalizingly incomplete. Archeologists had excavated a few sites and their reports threw light on facets of the past beyond the reach of written records as they helped piece together the picture of population migrations into and through the area thousands of years ago. Scientists specialized in several disciplines, from paleobotany to glaciology and geology, had deciphered the record of drifting continents, the collision and accretion of fragments of crustal materials (terranes) and the patterns of volcanic activity that produced the particular configuration of the western edge of the continent. They had traced the scouring and deposition of surficial materials by massive ice sheets, detailed the colonization of the area by various flora and fauna as climate changed over the millennia, and so on. Foresters, hydrologists, agricultural scientists, wildlife managers, and others had addressed many of the problems confronting those who lived in and utilized the area and its resources in the latter part of the twentieth century.

Yet the question remained: How to make sense of this disparate and patchy corpus of information? Perhaps the answer lay in and on the land itself. Armed with a digital camera and a GPS (Global Positioning System) receiver, Turkel took himself to the Chilcotin and travelled its highways and byways for a week, taking 3,500 pictures of "everything," from cliffs and clouds to power lines and abandoned cabins, from mining operations to log-hauling trucks, and from cows to alpacas. Precisely located through association with data from the GPS, each image could be plotted and entered in a Geographical Information System (GIS). Thus the features of the landscape were enumerated, inventoried, and catalogued. Through

the magic of technology, Turkel was able to "revisit" this remote tract of British Columbia from afar. Sitting in his offices in Cambridge, Massachusetts, and London, Ontario, he could browse in GIS map layers, click through photographs, remind himself what the Chilcotin was like, and see things that he had missed when he was there. Information accumulated, but it was hard to make sense of it. With so many disparate fragments to hand, and so many different kinds of evidence to wrestle into some kind of order, Turkel began to wonder about the value of the materials he had collected. He, like others at similar points in their inquiries, was troubled by a seemingly simple query: "So what?" At one scale, he confronted the historians' age-old challenge of finding a story against which to measure the significance of particular pieces of information. At another, he asked himself why people should care about what he might have to say about this place.

Answering these questions meant making choices. The past of the Chilcotin – represented by the archival fragments and material traces that Turkel encountered and assembled – was open to interpretation. Speculate, for a moment, about the ways in which devoted students of Hoskins, Jackson, and Sauer might have attempted to make sense of this evidence and this place. In an effort to emulate Hoskins, one might have treated the landscape of the Chilcotin as a palimpsest. Typically, this might have entailed close scrutiny of its material features, an effort to establish, as precisely as possible, the dates of and reasons for their creation (and alteration), and the development of a chronological account of the changes made to the area through time. Another, following Jackson, might have seen the Chilcotin landscape as a reflection of contemporary society and read from it a range of arresting claims about the ways in which scenes along "three hundred miles of back road to nowhere much" revealed the local peoples' efforts to "make the earth over in the image of some heaven."[18] A third, working in the spirit of Carl Sauer, might have identified the distinctive characteristics of the Chilcotin at different periods of time as expressions of different cultures, and marked the ways in which indigenous people, transient gold-seekers, ranchers, mining interests, and other groups utilized and thus shaped the landscape in markedly varied ways. Stretching the point, we might say that students embracing these distinct perspectives would treat landscape as history, as ideology, and as cultural product, respectively.

In the end, none of these approaches appealed to Turkel. Influenced by the French sociologist of science Bruno Latour and more broadly by the late-twentieth-century intellectual movement known as post-structuralism

(succinctly described as "a set of theoretical positions, which have at their core a self-reflexive discourse which is aware of the tentativeness, the slipperiness, the ambiguity and the complex interrelations of texts and meanings"), Turkel came to conclude that his attention was skewed.[19] Landscapes were important not as mirrors of history, ideology, or culture per se, but because the material traces that humans inscribed upon them endured and carried the stories that societies told about themselves through time. Places were archives of memory. Fixated on fragments and worrying about his readers, he had failed to see this. Now he recognized that the issues important to him were those framed by people who were actively engaged in reconstructing and reinterpreting the past of the Chilcotin.

Geologists, archeologists, First Nations people, anthropologist, historians, resource managers, and others, Turkel came to understand, were interested in the rocks, the human occupants, the organic life, and the other facets of this place because they were (and are) stakeholders in its future. They each sought, in different ways, to make the past usable for their particular present. As a consequence, the pasts that they produced were more or less deep, were framed and emphasized differently, and were sometimes incommensurable, as they reflected and fed into the concerns of those who constructed them. Stakeholders read the material traces of the past in the same way as Aristippus interpreted those geometrical marks on the beach – as indexical signs, things that signified "something else by virtue of a causal or physical connection between the two" (page 66 herein) – but, viewing them from different vantage points, they wove them into different stories and were often led into contention, as they asserted the primacy of their narrative over those of others. An appreciation of this provided Turkel with the basic structure of his book. Three struggles joined in the last decades of the twentieth century but rooted in the past of the Chilcotin – one over property rights, another over the creation of a heritage trail, and a third over prevailing interpretations of British Columbia history – allowed him to explore others' stories about this place, stories that lead him inexorably to the conclusion (page 227 herein) that "The different ways a place is imagined do as much to shape the understanding of what happened there in the past as any physical trace ever could."

The Archive of Place is, then, both a gathering of stories about a place in time and a study of representations, partial, contingent, and purposeful. It explores the complicated relationship between historical consciousness and the materiality of place and it reminds us that the Chilcotin is a repository of ideologies that have changed over time. Like all parts of the earth's surface, this one, Turkel tells us, is constituted by the accretion within it

of things new and old, things familiar and strange, things that are tangible and things that are not. Thoughts, memories, dreams, disappointments, penchants, and prejudices are as important parts of this landscape, this archive, as the material traces left upon it by the actions of humans, their animals, and their machines. In light of this, Turkel would urge environmental and other historians to think anew about the practice of their craft. By paying more attention to the ways in which others have constructed stories about places past, by tacking back and forth between their own reading of sources and the ways in which others have understood them, by telling "not just stories about nature but stories about stories about nature," he would suggest that they have the means to bring their work more fully into the mainstream of current concerns.[20] In this lies both the challenge and the freshness of Turkel's work. In the final analysis, *The Archive of Place* is a manifesto, encouraging scholars to find new ways of thinking about venerable concerns. To do this, it draws attention to, and tells us a good deal about, a little-known, even out-of-the-way place, but its crucial message echoes that attributed to the French novelist Marcel Proust, who observed that "The real voyage of discovery consists not in seeking new landscapes but in having new eyes."[21]

Preface

THE ARCHIVE OF PLACE is about the ways in which people interpret material traces to reconstruct past events, the conditions under which such interpretation takes place, and the role this interpretation plays in historical consciousness and social memory. The book consists of three case studies from the Chilcotin plateau in the west-central part of present-day British Columbia. In each case study, a conflict in the mid-1990s over the meaning of the past for the present provided the occasion for underlying stories to surface. As different groups struggled to control the fate of the region and its resources, they invoked very different understandings of its past to justify their actions. In many cases, their beliefs about the region's history were informed, directly or indirectly, by physical evidence found in the place itself.

Material traces of past events are commonplace. Seeing a footprint in the mud, we may infer that someone walked by after the last rainfall, when the ground was soft. We readily distinguish the tracks of a child from those of an adult, human tracks from those made by other animals, or bicycle tracks from those of motorcycles or cars. In certain settings it becomes important to be able to infer more from tracks, and some people specialize in these more intensive kinds of reading. Hunters or wildlife biologists, for example, can readily distinguish the characteristically round hoofprints and telltale dewclaw marks of a caribou from the more pointed and elongate tracks of a moose. Forensic investigators can determine the size of a shoe and its manufacturer from footprints and can make reliable predictions about the weight, height, and gait of the wearer as well.[1]

But tracks are not the only material trace of the past. In fact, every single aspect of our environment bears some physical or causal connection to past events. Every *thing* has a history, and our ability to reconstruct the past of anything is limited only by the knowledge that we bring to bear and by our ability to detect or discriminate or identify or measure the trace. Blood contaminating a shoe print may be invisible to the naked eye, but if the print is sprayed with a chemical reagent called luminol, the blood will glow in the dark. The blood itself may be matched to a particular animal by the proteins that it contains. If it is human blood, it can be matched to a group of people (according to the ABO system of blood groups) based on antigen-antibody reactions or matched to a particular individual by DNA testing. What is made of such evidence, however, is rarely straightforward. Different people may have a stake in the outcome, and this is reflected in the conclusions that they draw. In a sense, the idea that different interpreters will draw different conclusions from the same material evidence is merely a corollary of the historian's methodological dictum that one should, as E.H. Carr put it, "study the historian before you begin to study the facts."[2]

Part 1 of *The Archive of Place,* "Deep Time in the Present," focuses on a case in which contemporary stakeholders presented their interpretations of different material traces of the past while arguing over the fate of a copper-gold **porphyry** deposit and a nearby lake. In the 1990s, a mining company and other proponents of an open-pit mine found themselves in conflict with other companies over mining claims, with the government and anglers over fisheries, with environmentalists over conservation, and with First Nations over land claims. As the estimated value of the potential mine increased, each of these groups tried to determine the future of the region, in part by reconstructing its past. The only way for the mining companies to find out how much the mine might be worth was to reconstruct the geological history of the ore deposit. The postglacial history of the lake and its population of rainbow trout became important for individuals and groups who wished to preserve a natural fishery. The ecological history of the region guided environmental groups in their decisions about which areas they should fight the hardest to conserve. Archaeological studies corroborated the traditional patterns of indigenous land use, which played an important role in the legal case for Aboriginal land claims. For each of these stakeholders, the key to the Chilcotin past lay in physical evidence found in the place itself, evidence that typically had to be gathered and interpreted by specialists from many different disciplines. Since these studies cost something (and often were very expensive), they

were only undertaken by groups that expected to see some benefit in return. Much of the argument in this first part of the book focuses on the ways in which people reconstructing the past from physical evidence use that reconstruction to bolster claims about property rights, which in turn form a key element of the region's political economy.

There are further dimensions to the relationship between material traces and historical consciousness, however, and the idea that every place is an archive of these traces becomes progressively complicated over the course of the book. Part 2, "The Horizon of Experience," is concerned with the creation of a heritage trail to commemorate the accomplishments of the eighteenth-century explorer Alexander Mackenzie. In 1793, an expedition led by Mackenzie skirted the northern edge of the Chilcotin and ended at the Pacific Ocean. Mackenzie and some of his men became the first non-Aboriginal people to make the voyage across the continent north of Mexico. When some groups tried to celebrate and re-enact the voyage on its bicentennial, there was conflict over the role that the explorer did, or should, play in history. Canadian nationalists felt that the accomplishments of Mackenzie had been inexplicably overlooked, and those of the American explorers Meriwether Lewis and William Clark celebrated excessively; they felt it was time to rectify this historiographical oversight and relegate the American explorers to the category of "also-rans" in a race across the continent. To federalists, who feared that the Québécois might be about to split the country apart with their demands for separation, Mackenzie was a symbol of Canadian unity, one of the reasons the country stretched from sea to sea. But the Mackenzie story also contained many elements that called for revision. Two members of the expedition were Aboriginal guides from the east, and Mackenzie and his men made constant use of other Aboriginal guides and informants and followed a longstanding network of Aboriginal trails the whole way. The First Nations took a variety of positions on Mackenzie, the most extreme being that he was a harbinger of genocide. In this they were joined by some politicians on the left, who saw the opportunity to advance a program of democratic socialism.[3]

Each side in the debate about the significance of the explorer for Canadian history, identity, and unity was supported by attempts to reconstruct the route that Mackenzie followed using his surveying notes, maps and artifacts, and especially physical evidence found on the trails themselves. Federal and provincial governments, non-governmental organizations, and First Nations commissioned studies of the system of overland trails in a struggle to define a particular place and its role in history. One of the

outcomes of these studies was a new appreciation for the fact that this system of trails underlay networks of trade and exchange that made the Chilcotin "coextensive with the disk of the world" over its long period of human occupation. The accomplishments of a few centuries were thus confronted with those of nine millennia. The argument in Part 2 focuses on the ways in which historical consciousness and social memory depend on the materiality of landscape. The sheer profusion of physical evidence from the past to be found in any place makes it impossible for an individual or group to limit the stories that landscape can tell.[4]

In the historiography of British Columbia, the Chilcotin has often been portrayed as a landscape of darkness, resistance, and violence, and the Tsilhqot'in, the indigenous people who live there, as essentially truculent. Part 3, "Shadowed Ground," explores the ways in which a place becomes a repository not only of the material traces of its past, but also of particular ideologies. It begins with a discussion of reburial. When an Aboriginal cemetery was accidentally unearthed during construction in the 1970s, the human remains were unceremoniously dumped with waste from the building site. When some presumably Aboriginal bones were discovered in a similar situation in the 1990s, however, their ultimate fate became a matter of widespread dispute and negotiation for seventeen months. Reburial is one way people attempt to physically correct their historical relationship with a place and with their ancestors. It is an attempt, if you will, to rewrite the archive of place. The change in attitudes toward reburial in the late twentieth century signalled a radical revision of long-held ideas about Chilcotin history and a dismantling of retroactive historical justification for contemporary racism.

Part 3 traces the history of the region from the time of Mackenzie and the fur trade to the 1990s. In the late 1850s there was a massive influx of non-indigenous people into the interior in search of gold and attendant profits, and a British colony was created. Although the newcomers had little knowledge of the past of the place or its Aboriginal occupants, they were largely responsible for creating its archival record. One of the first challenges they faced, to the authority of their government and to their identity as colonial subjects, was a series of killings in and at the edges of the Chilcotin. This became a defining moment in subsequent historiography. The events of the Chilcotin War (as it came to be known) coloured the ways the Chilcotin was imagined for the next century, feeding into a frontier myth that portrayed the actions of Euro-Canadian settlers as having a civilizing and beneficent effect on Aboriginal people. By the 1970s, the hegemony of this colonial view was beginning to break down. The

death of a Tsilhqot'in man during an encounter with the RCMP became a flashpoint for reform of the relationship between the justice system and Aboriginal people. In the 1990s, a government commission was established to investigate how Aboriginal people had been treated by the police, Crown prosecutors, probation officers, and counsellors of the family courts. This provided a forum in which many of the cherished interpretations of British Columbia history, both popular and scholarly, could be called into question.

Together, the three parts of *The Archive of Place* trace the end, which occurred roughly between the 1970s and the 1990s, of a complex of ideas that governed relationships between Aboriginal and non-Aboriginal people. From the mid-nineteenth century to the 1970s, prevailing views of Aboriginal people denied their agency in a wide variety of social, legal, political, and economic contexts. A common assumption was that Aboriginal rights in British Columbia were extinguished by the establishment of colonial government or the subsequent regulatory activities of its successors. Where Aboriginal rights were acknowledged to exist, they were held to be usufructuary and not to include title to the land. Historically, Aboriginal people were portrayed as a part of nature, discovered by non-Aboriginal explorers and tamed by the settlers who came in their wake. In contemporary portraits they were often brutalized. By the 1990s, Aboriginal people and their supporters had disrupted the status quo. Aboriginal title was a legal fact, although its ramifications were unclear. Aboriginal people were agents in a revised history and a force to be reckoned with in contemporary politics. Although the details of the story are specific to this place, in many ways it parallels simultaneous changes elsewhere in the world.

The focus on a particular place, on the physical traces of its past, and on the different ways in which the past has been reconstructed and fought over makes it possible to build on the strengths of intersecting historiographical traditions like environmental history, the history of science, and ethnohistory. As a result, this book is both an environmental history and a historical study of the quotidian practices that are analogous to doing environmental history. It takes as its subject the ways people retrieve the past from a place and the reasons they choose to learn some things and not others. By historicizing this activity, however, it forces the recognition that the environmental sciences may provide a wealth of historical information, but they do not provide a unitary or authoritative account against which all other accounts must be judged. In this way, the narrative tries to pull the concerns of environmental history more into the mainstream of historical revision. As a history of science, the emphasis is on work in the

field, on situations in which the products of science are not judged in a rarefied world of theory but, rather, in settings where, for example, people who want to dig mines come face to face with others who would rather cut trees, graze cattle, fish, or simply admire the beauty of nature. The work also draws on the literature of ethnohistory, which has redirected attention to indigenous people and to the ways they have been excluded from narratives and representations of the past. Indigenous people do play a significant role in each of the contests described here, but ethnological concepts and categories are given no more claim to final authority than any other kind of knowledge.

One central idea in this work is that of *clues,* drawn in large part from Carlo Ginzburg's essay of the same name and reworked. This is evident in the subject matter: the ways historians and other interpreters use latent or seemingly insignificant traces to draw wide-ranging conclusions about an external and knowable (but opaque) reality. It is perhaps less obvious, but no less important, that the narrative is also shaped by the application of what Ginzburg called the "evidential paradigm," in that it focuses on individual cases precisely because they are individual, manipulates scale as an experimental technique, and uses **abduction** to infer causes from their effects.[5]

The Archive of Place explores the ways in which usable pasts are drawn from the material substance of a particular place, typically under conditions of conflict. As with any historiographical encounter, these pasts are never fixed, depending instead on the interests, biases, and abilities of their historians. Taken in conjunction, these stories about the past characterize the people living in a particular place at a particular moment, their aspirations and anxieties, their image of who they are and where they came from, their sense of being exactly where and when they are. That moment – that binding of history and memory and landscape – constitutes the present. The physical traces of the past lie all around, manifest to a greater or lesser degree, ready to be incorporated into what comes next.

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Part I

Deep Time in the Present

1

Fish Lake

As you leave Williams Lake, heading west on Highway 20, you pass the stampede grounds, the sawmill and lumber yards of Lignum, a small alpaca farm, a few trailer courts, and houses here and there. It doesn't take long to leave the outskirts of town and find yourself in the midst of land with little sign of human activity. The highway passes under power lines and swings south to parallel the Fraser River. Stands of Douglas fir and lodgepole and ponderosa pine give way at lower elevations to grassland, much of which is irrigated for hay by local cattle ranchers, particularly on the benches above the river. The highway drops to the Sheep Creek bridge and then slowly climbs the hill on the opposite side of the river via a series of switchbacks. At the end of each switchback is a steep gravel "runaway lane." These give truckers hauling logs down the hill somewhere to turn if their brakes fail. At 760 metres above sea level, you reach the top of the hill and the Chilcotin plateau opens out in front of you. The land has just enough relief that you can almost always see the shadows of clouds moving slowly over the earth.

The Chilcotin is a long way from the part of British Columbia where most people live, the metropolitan region around Vancouver and Victoria. It's a long way from the leisure-centred urban society that has given BC a reputation throughout Canada as "lotus land." Newcomers to the Chilcotin have often written about the journey west on Highway 20 as if it were possible to travel back in time by following the road. The landmarks that most North Americans have come to take for granted, like supermarkets and fast-food restaurants, are simply not there. Most of the Chilcotin

plateau is out of the range of cellphone service. The only stores to be found are few and far between. In those general stores you can buy kerosene lamps, horseshoes, washboards, nails, deer- and moose-hide moccasins made by Aboriginal people, coils of rope, haywire, saddles, and chaps. Caught up in the novelty of the wares, it is easy for a traveller to overlook the electricity and refrigeration.[1]

If you follow Highway 20 across the plateau and through the Coast Mountains to Bella Coola on the Pacific Ocean, you will travel along what local historian Diana French called "three hundred miles of back road to nowhere much." You will pass the occasional logging truck or recreational vehicle and, less frequently, the kind of battered pickup truck favoured by locals. About halfway along the road, the pavement ends; most of the rest is gravel. If you make it to the far edge of the plateau, you face "The Hill." For ten kilometres the road drops through a series of hairpin curves at an 18 percent grade, often narrowing to one lane. People who make regular trips down The Hill advocate travelling with doors unlocked and seatbelts off so you can jump clear if the vehicle starts to go over the edge. It sounds like hyperbole, but even in the dark you can see the cars that have gone over. Not everyone makes it to The Hill. Flat tires and blowouts are common as you negotiate "mudbogs," "fun rollers," "washboard road," and "loonshit." Paul St. Pierre, ex-MP and local humorist, wrote that "loonshit was a gumbo; it was undetectable when dry but when thoroughly soaked in water a patch of it took on the character of molasses mixed with glue. All men encountered loonshit sooner or later in that country and all but the strongest wept when they did."[2]

Behind the obviously untrue claim that a trip into the Chilcotin is a trip into the past lies a deeper truth. The sense that people have of occupying a particular place in time is supported by their lived experience in a world of familiar artifacts and landmarks. Things that you find in Williams Lake, like a Tim Hortons doughnut shop or a working cellphone, are traces of the recent past. If time travel were possible, you could use the existence of a Tim Hortons in your vicinity to figure out *when* you were – sometime after the franchise was established in the mid-1960s. Other landmarks and artifacts could be used to refine your estimate. Are people smoking cigarettes? Eating burgers out of Styrofoam cartons? Listening to Anne Murray or the Tragically Hip? Wearing mullet haircuts? Driving hybrid electric cars? Of course, most people don't need to see a hybrid car to know that Y2K has come and gone. But the very substance of a place is composed of stuff from the past and legible traces of past events. These constantly cue memory and provide a sense of history.

Without these obvious connections between a place and the present moment, history and memory cease to be grounded, and it becomes possible to imagine or pretend that this is some other time.[3]

The tourist returns home after a few weeks in the Chilcotin, but what about the people who live there? They have a stake in its future. Many of them depend for their livelihoods on grazing cattle, logging, mining, or guiding and outfitting rich foreigners who want to take home a moose. More frequently now, they cater to ecotourists and advertise their lodges with words like "harmony" and "healing." Despite the outsider's perception that these people are living in the past, they are not. But the landscape is familiar to them and reflects a distant time. Each bend in the road takes on the shading of memory, of stories heard or half-remembered. That's the place where the truck broke down a few winters ago; they're clear-cutting the hill on the other side of that lake; isn't that the place where that Indian guy got killed in the seventies? To the people who live in the Chilcotin, as for people anywhere, the landscape holds much of their past, and they have a stake in that too.

A Division of Interpretive Labour

To say that a place is full of traces of its past is not to say that those traces are obvious or easily read. Much of the physical evidence of the past is muddled, latent, difficult to decipher. Often it requires experience or special training or expensive equipment. As a consequence, in cases where it is important to reconstruct the past from its material traces, the interpretive labour is divided. Zoogeographers specialize in figuring out the origins of animal populations and their geographic distributions. They can tell you, for example, that moose entered what is now British Columbia about ten thousand years ago from the north, after the ice sheets of the last ice age melted, and that they competed successfully against the slightly larger stag-moose for habitat. The latter are now extinct. The records of the fur trade show that moose were hunted by indigenous people in the Chilcotin in the 1830s. Then, for some reason, the moose may have disappeared in the central interior of the province until the 1900s. They began to reappear in numbers in the early twentieth century.[4]

At this point, the reconstruction of the history of past distributions of moose becomes entangled with the threads of memory, oral tradition, and folklore. One account suggests that moose first appeared around Charlotte Lake, at the edge of the Coast Mountains, in 1914 and soon became

so bold and numerous that ranchers had to arm themselves for protection during the rutting and calving seasons. In *Three against the Wilderness,* Eric Collier provided another, more fanciful version of "how the moose first came to the Chilcotin." He said that an Aboriginal man hunting around Riske Creek on the eastern edge of the plateau in 1916 saw an animal that he had never seen before and shot it. The oldest member of his group, "reckoned to be 106 years old," couldn't identify the animal, and the riddle was finally solved by an Englishman at the trading post, who had seen moose in northeastern British Columbia at the turn of the century. In 1931, the zoologist Ian McTaggart Cowan was told that moose had only arrived in the Chilcotin in the mid-1920s and that there was no word for the animal in the Tsilhqot'in language. Other evidence, however, suggests that the animals may have been present in the Chilcotin the whole time, but that their numbers were much lower. By the 1950s they were so plentiful in the area that groups of them spent the winters at local ranches, feeding with the cattle and becoming tame enough to pet. As with any kind of history, this story about what happened in the past emerges from conflicting accounts and evidence that can be read in more than one way. There is no univocal story about how moose came to be in the Chilcotin.[5]

The work of zoogeographers depends on the work of other interpretive specialists who reconstruct the history of different aspects of the environment. Paleobotanists, for example, can tell us about the past vegetation of the region. Around fifteen thousand years ago, plant life began to return to recently deglaciated land in the wake of the melting ice sheets (see Appendix A). The coastal lowlands were free of ice relatively early. They were initially vegetated by willow and soapberry, and later by lodgepole pine. Over the course of the next two millennia, alder, true fir, spruce, and ferns moved into the area. The interior remained dry and cold and was covered with ice in many places. Cattails, sedges, and bulrushes from the south moved rapidly into moist deglaciated land, to be replaced gradually by aspens and pines. The uplands were more sparsely covered with sage and perennial herbs. Since different plants thrive or decline in different climates, vegetation is one clue to the prevailing conditions at a given time. Paleoclimatologists thus have much to learn from paleobotanists, and vice versa.[6]

Between nine and ten thousand years ago, summer solar radiation peaked at levels 8 to 15 percent greater than today's, while winter solar radiation was about 10 percent less than today's. This heated the centre of the North American continent and increased the contrast between land and ocean temperatures in the summer, which in turn affected the way atmospheric and oceanic circulation redistributed heat from the equator (which

always receives more solar energy) to the poles. The East Pacific subtropical high-pressure system expanded, resulting in summer drought in what is now British Columbia. In the interior, vast areas of steppe grassland developed, spreading as far north as Pantage Lake near the Blackwater River and extending to elevations over fifteen hundred metres. These grasslands were zoned by altitude, with sage in the valleys and on the lower slopes and grasses and forbs at higher elevations. Plants from the prairies and the Great Basin (in what is now eastern Oregon and southern Idaho) were able to spread as far north as central Yukon. By about four thousand years ago, the climate was again becoming cooler and wetter. Interior grasslands retreated, replaced by forests of pine and alder. Today, grasses give way to trees at elevations around seven hundred to a thousand metres, and the northernmost edge of the grasslands ends right where you cross the Sheep Creek bridge on your way into the Chilcotin.[7]

The landscape that we are most familiar with – the built environment of highways and houses and fences and irrigated fields – is the most recent addition to any place. Often, more seemingly natural features of the landscape, like rivers and forests, are also relatively recent. Beneath the surface of this familiar environment are layers or strata that are older, often much older, and glaciologists and geologists reconstruct their history (see Appendix B). In British Columbia, much of the lay of the land is the result of the events of the last ice age, known as the Wisconsin, which began with a cooling of the yearly average climate about twenty-five to thirty thousand years ago. Ice sheets spread across as much as a third of the world's surface, including what is now Canada and the northern United States and much of northern Europe. At first the ice accumulated as small glaciers on mountains and in alpine valleys. Each of these ice streams flowed separately, sculpting characteristic landforms by erosion.[8]

In the Chilcotin, many of these glacial landforms can be seen around the Fraser River in the area east of Taseko Lake. The Churn Creek valley near Gang Ranch, for example, is U-shaped in cross-section, which shows that it is a glacial trough created by the action of moving ice and not by flowing water, which creates valleys that are V-shaped. The amphitheatre-shaped depressions on Yalakom and Hogback mountains, known as cirques, are also characteristic of early stage glaciation and were formed as slowly moving glacial ice carried away the rock broken by the action of frost. In places in the Coast Mountains to the west, the steep walls of three or more cirques intersect to form a horn, a high pyramidal peak. The newly formed ice in alpine valleys blocked drainage, allowing proglacial lakes to form. In the Camelsfoot Range, what is now the Fraser River was dammed, and a

glacial lake formed in the valleys of the river and its major tributaries. The ice continued to accumulate, overriding glacial lakes and rising to the point where individual glaciers coalesced and the thickness of the ice exceeded the local relief. As the ice accumulated, the movement of the sheet was governed less by the topography of the land and more by variations in climate. The lower mountains east of Taseko Lake have typically rounded and domed summits where they were overridden by the ice sheet. Higher serrate peaks in a few places emerged from the ice as so-called nunataks, surrounded but not overridden. For a few hardy species, these nunataks served as refuges, where they could live through the glaciation. Everywhere else, life was swept away by the advancing ice. At their maximum, the ice sheets of the last glaciation were massive, so huge that they spread under their own weight and depressed the surface of the land relative to sea level. Thousands of years after the ice melted, the land was still rebounding. The ice sheets were also dynamic, fed by snow that fell over their interiors and reduced by melting along their margins. Over the ocean, blocks of ice would occasionally calve from the sheet. As the climate warmed, the peripheries of the ice sheets melted. Areas in the centre of the ice downwasted, that is, melted on top, allowing the uplands to emerge first and again dividing the sheet into separate glaciers in valleys. Proglacial lakes formed as stagnant ice blocked drainage and meltwater accumulated. Life returned from the nunataks and from refuges beyond the edges of the ice sheets.[9]

The Mosaic of Suspect Terranes

On a geologist's time scale, the events of the past ten or twenty thousand years are very recent. Below the built environment, and below the trees, grass, soil, and glacial till, lie rock strata that are really old. Often, the deeper you go, the older the strata you will find, and people sometimes speak in terms of "time depth" or "deep time." As there are for other parts of the Chilcotin landscape, there are specialists to reconstruct the events of the very long-term past, and they have written accounts of how the Chilcotin itself was created. These are no more certain or uncontested than any other stories about the past of this place, but much of the controversy can be glossed over in the interests of getting a thumbnail sketch of the events of deep time to serve as a background for the case study that follows.

At the end of the Permian period, 250 million years ago, this place did not yet exist (see Appendix B). At the time, almost all of the world's

continental crust was clumped in a single mass, known as Pangaea. The portion of the ancestral continent that would become North America did not extend as far west as it does today. Instead, somewhere east of where the Rocky Mountains now are, it gradually sloped into a continental shelf under the sea. For more than a billion years, long periods of erosion had led to the slow downwasting of the continent, depositing layer after layer of sediment on the shelf and exposing the "basement" rocks of the continental shield. Marine life was abundant, particularly in the warm, shallow waters over the continental shelf. By this time, plants had been living on land for 150 million years, drawing carbon dioxide out of the atmosphere and building some of the carbon into their tissues. In the atmosphere, carbon dioxide absorbed some of the sun's energy that was reflected from the earth and thus contributed to global warming. As the plants died, however, plant debris accumulated, forming peats and eventually coal, which trapped carbon. This slow buildup of organic material eventually reduced the overall amount of atmospheric carbon dioxide. This, in turn, initiated a shift in global temperature from generally hot and humid conditions to generally cold and arid ones. As the Permian period drew to a close, massive ice sheets accumulated around Pangaea's south pole, drawing down the global sea level and exposing the continental shelf. This put an end to most marine life. Corals, foraminifera, trilobites, brachiopods, bryozoans, crinoids, ammonoids – all were eradicated, or nearly so, by the most severe extinction event of the past 570 million years. Somewhere between 90 and 95 percent of marine invertebrates, and half of the vascular plants, perished.[10]

By the late Triassic, 230 million years ago, the eastern margin of the Pacific Ocean had become a subduction zone. According to the theory of plate tectonics, the framework that is now used to envision the dynamics of the earth's crustal structure, rigid plates float on fluid rock known as the mantle, sliding alongside one another and deforming when they collide. The oceans, like the continents, sit on plates, but oceanic plates are stronger and denser than continental plates. When the two converge, the oceanic plate bends, sliding beneath the continental plate, which crumples above it. This process is known as subduction and is accompanied by two characteristic assemblages of rock. At the point where the oceanic plate meets the continental crust, pieces of the ocean floor are scraped off into what is known as the subduction complex. One to two hundred kilometres away from this point on the overriding plate, magma (molten rock) rises through the continental crust to form another assemblage, a volcanic arc.[11]

Starting in the middle of the Jurassic, about 180 million years ago, Pangaea began to break up. The North American continental fragment moved northwest, the oceanic plate subducting beneath it. During subduction, the continental mainland slid into island arcs on the oceanic plate, and these pieces of crust accreted to the mainland. The western edge of North America became a vast mosaic of accumulated pieces of crust, known as terranes, each with a geological history that was different from that of the continental core. The subduction of the oceanic plate under North America also built the Cordillera, the massive collection of mountain ranges that run along the western edge of the continent. On a regional scale, the crust folded and faulted. In what is now central British Columbia, a subduction complex called the Cache Creek terrane was uplifted as this mountain building took place, bringing pieces of oceanic crust and fossils of extinct foraminifera to the surface. The identification of these marine protozoa provided geologists with the first evidence that the mountains of western Canada were composed of "exotic" or "suspect" terranes. Stikinia, another terrane that was once a volcanic island arc, accreted to the west of the Cache Creek terrane. The central portion of British Columbia continued to be uplifted as more terranes, the Alexander and Wrangellia, docked to the west. Since that time, the western edge of the Americas has been one of the most tectonically active places in the world. Accretion of terranes and mountain building was accompanied by strong metamorphism as changes in temperature and pressure caused the rocks to recrystallize. It was also accompanied by granitic intrusion when massive flows of magma cooled beneath the surface to form enormous bodies of granite. The overall result was a broad, plateau-like region in the central part of what is now British Columbia, bounded on the west by rugged Coast Mountains rising in a sharply defined front, and on the east by high ranges rising into the Rocky Mountains.[12]

In the Cretaceous period, beginning about 135 million years ago, climates became more seasonal and varied than they had been earlier. Fossil plants from the time are more clearly distinguishable as variants from low and high latitudes, suggesting a sharper temperature gradient. Angiosperms (flowering plants) appeared for the first time in the form of broad-leaved trees and shrubs, and they spread rapidly. Within about 50 million years they dominated many of the floras of the world; today, angiosperms make up most of the world's vegetation. Sediments formed during the Cretaceous show evidence of **Milankovitch cycles**, probably indicating short-term fluctuations of climate. The Cretaceous was also a time when many different forms of life, both terrestrial and marine, progressively disappeared,

for reasons that are still debated. Some combination of factors including climate change, cosmic radiation, extensive volcanic activity, and the impact of a massive asteroid was responsible for another mass extinction event, the best-known victims being, of course, the dinosaurs that vanished about 65 million years ago.[13]

The extinction of the dinosaurs left new ecological niches in North America, and these were rapidly colonized by diversifying mammals, birds, fish, insects, and flowering plants. It took about half a million years for the placental animals to begin to diversify, but after that the process took off. The most spectacular spread of organisms into new habitats occurred among the ancient hoofed mammals, which developed fifty new genera every million years, filling the continent with a diverse collection of animals. In what is now British Columbia, coastal mammals included small whales and a large, four-footed amphibian, the desmostylid, which probably occupied much the same niche that walruses and seals do now. A creature the size of an otter, but which was more closely related to bears, lived along the shore eating molluscs. In the interior, huge herbivores known as titanotheres lived in herds. About two metres at the shoulder, they had humped backs and a pair of bladelike horns at the ends of their snouts. Smaller mammals included rodents, rabbits, rabbit-sized deerlike animals, and marsupials.[14]

During the Eocene, beginning 53 million years ago, the oceanic and continental plates along the edge of what is now British Columbia ceased to converge with subduction and began to slide past one another in a transform fault. This ended the collision of terranes. Tectonic forces continued to pull the continental crust northwards, and the crust relaxed now that it was no longer being compressed. This led to extensive volcanic activity in the interior. Lava flowed into low-lying areas, damming rivers and creating plateaus where lakes formed. Assemblages of fish, insects, and plants were preserved in the sediments of these lakes, which allowed their ecology to be reconstructed in some detail. The dawn redwood, a broad-leaved, deciduous conifer, grew in low, wet areas. Bundles of its needles and leafy twigs often fell into the shallow waters at the edge of Eocene lakes. Soft-shelled turtles, juvenile suckers, trout-perches, and salmonids swam among water lilies, loosestrife, and water plantain, pursued by predatory bowfins. Larger fish, like trout and adult suckers, lived in deeper waters. In some fossil deposits, the fish bones are partially dissolved, as if they had passed through the digestive system of a bird or other predator. The plants in the interior thrived in a temperate climate, suggesting that the area was cooler than the warm temperate to subtropical conditions that prevailed

at the time in what is now the western United States. Conditions in the interior also became distinct from those in the Coast Mountains to the west, which were gradually being uplifted. This was, in part, a consequence of the relaxation of the crust, which allowed it to become hotter and more buoyant.[15]

By about 23 million years ago, at the beginning of the Miocene, the central part of what is now British Columbia had a moderate relief of 500 to 650 metres, with lower-lying areas filled in by flat or gently dipping lavas and sediments. In places, erosion had cut channels of up to a few hundred metres in depth, and these had been gradually filling with sediment. Lava erupting from vents and fissures during the middle and late Miocene covered the interior with more than 25,000 square kilometres of flat-lying basalts, creating the vast interior plateau of which the Chilcotin is a part. These lava flows formed the characteristic landform of the Chilcotin today – a gently rolling plateau bounded on one side by a steep, rocky cliff and on the other by a deeply incised valley. In the same period, the continental crust moved slowly westwards over a particularly hot plume rising from the mantle. Lava flowing out onto the surface above this "hot spot" built up a broad, round volcano. As the crust moved, the volcano was carried to the west, and a newer one was built up to the east. In this way, a series of volcanic ranges formed a trail across the Chilcotin – first the Rainbow Range, then the Ilgachuz and Itcha ranges, and finally some recent volcanoes near Nazko. The Miocene climate of the Chilcotin was cool and temperate, closer to the modern climate than Eocene climates had been, but still warmer and wetter than it is today. Overall, the flora was similar to the oak-hickory-beech-elm forests that are now found east of the Mississippi River. Conifers grew in the uplands. The warmer, wetter conditions in the interior suggest that the Coast Mountains did not yet form the extensive rain shadow they do today. This is confirmed by studies that show the land surface of the Coast Mountains has risen more than two kilometres in the past 10 million years.[16]

In the last 1.6 million years, known as the Quaternary period, human beings evolved in Africa. This period has been a time of major climatic alterations and ice ages. During successive episodes of glaciation, the upper half of North America was repeatedly buried by massive ice sheets, each scouring away most of the evidence left by the landforms, flora, and fauna of the preceding period. Each time, plants and animals recolonized the area after the ice retreated. The Wisconsin glaciation that ended about ten thousand years ago was only the latest in a series of more than twenty such shifts in climate that have occurred in the last 2.5 million years. It was

different from the preceding glaciations in one respect, however. When the plants and animals returned to North America, human beings were among the colonists for the first time.[17]

Airborne Surveys

The reason the geological history of the Chilcotin is known in such detail is that people have found it worth their while to reconstruct it. The Chilcotin economy depends primarily on resource extraction, and this invariably leads to a struggle among contemporary stakeholders because the choice to exploit one kind of resource often precludes the development of others. There is usually a lot of money at stake, and efficient exploitation of the resource, be it a mineral deposit, forest, fishery, grassland, or potential hydroelectric dam, depends on having as complete a knowledge as possible of its attributes. This is where the division of interpretive labour comes in. Geologists, zoogeographers, and other kinds of specialists are needed to determine whether or not a given resource has the attributes that will make it lucrative and cost-effective to extract. Exploitation and exploration go hand in hand. This interpretive labour often involves the reconstruction of the history of the resource: in order to determine what something is or what attributes it has, it is useful to know where it came from. Underlying stories thus emerge in the contest over the fate of the land and its resources as stakeholders search for a usable past, one that will justify their actions. This can be seen in the case study that follows, which examines the role of the division of interpretive labour in the political economy of resource extraction at a particular moment in the ever-changing relationship between the Chilcotin landscape, its stakeholders, and the stories they tell about its past.

One day in the Indian summer of 1993, a small twin-prop plane flew over Redstone heading due west. An observer on the ground might have first noticed the long stinger attached to the plane's fuselage. Even more unusual, perhaps, was the way the plane was flying: low, but always the same distance from the ground. In the days that followed there were more flights, always east to west, always at the same, precise altitude. Successive flight paths were shifted north or south by exactly eight hundred metres. If you were there in Redstone when the drone of the airplane overrode the snapping of grasshoppers, the rustle of wind in the grass, the rumble of big rigs on Highway 20, you might have concluded that someone was systematically scanning the Chilcotin plateau. You would have been right.[18]

The flights were funded by the Geological Survey of Canada, the BC Geological Survey, and some interests in the private sector as part of an effort to assess mineral potential in the region. Much of the plateau is covered by forests, glacial drift, and lava flows that obstruct prospecting. By taking to the air with extremely sensitive magnetic detectors, the surveyors were able to map the boundaries of obscured geological features, to see through, as it were, the trees, glacial deposits, and lava to the subsurface below. They were taking advantage of the fact that the earth's magnetic field varies in a measurable way from place to place. After measuring the total magnetic field and subtracting the components generated inside the earth (i.e., in the molten core), they were left with what are called magnetic anomalies at the surface (or crust), deviations from the background. These anomalies depended in part on the presence of magnetic minerals in the rock below.[19]

The minerals to be found in rock bear many traces of the conditions of their origin. For example, both igneous and metamorphic rocks can be created in great heat, the former as molten rock cools, the latter when some pre-existing rock is subject to heat or pressure or both. As the temperature of hot rock falls below a certain point, molecules of ferromagnetic materials such as magnetite (Fe_3O_4) and **hematite** (Fe_2O_3) align with the earth's magnetic field, preserving a record of the field's direction in the substance of the mineral. This is known as remanent magnetization. The principle is similar to that used in an ordinary audiotape: the magnetic record persists in the rocks and can be read with the right instrumentation. The "playback" is more complicated than a tape recorder, however, especially if you want to read the magnetic record from about three hundred metres above. To detect the minute magnetic fluctuations of rock from a low-flying airplane, the geological surveyors used an instrument known as an optically pumped magnetometer. In this device, polarized light from a cesium vapour lamp is passed through a low-pressure cell of cesium vapour and measured with a photocell. The system is exquisitely sensitive to magnetic fields.[20]

Aeromagnetic surveying provided a rapid means of mapping features of geological interest across the Chilcotin plateau, which was one of the last blank spots on the 1992 magnetic anomaly map of Canada. Two faults lying to the southwest of Redstone, the Yalakom and Tchaikazan, showed up clearly as magnetic anomalies in the new survey. Faults are fractures in the earth's crust, places where the energy generated by the movement of the massive plates that comprise the surface of the earth displaces the edges of the crust with respect to one another. When you stand on one

side of the Yalakom fault system, corresponding rocks on the other side have been displaced to the right by more than one hundred kilometres. In fact, the existence of the Yalakom fault was well-known before the aeromagnetic survey took place. Topographical features in the area are aligned along the fault, and the **lineament** can be seen in aerial photographs.[21]

Radiometric dating from another 1993 survey also corroborated the presence of the Yalakom fault. Southwest of the fracture, the rocks are igneous and can be dated to the late Triassic period; they originated a little over 200 million years before present (212-208 **Ma BP**). To the northeast, the rocks are metamorphic and date from the middle to late Jurassic at the earliest, perhaps 160 Ma BP. The sides of the fault were sliding with respect to each other even more recently, for a period of about 37 million years (83.5-46.5 Ma BP), cutting all rock units older than about 65 million years. In order to date the rocks in the area of the Yalakom fault, survey geologists took samples of a mineral called zircon. When zircon is created, it does not contain any lead but it does contain the unstable uranium isotope ^{238}U. As zircon ages, the unstable uranium isotopes decay into stable lead isotopes (^{206}Pb). Since the rate of radioactive decay is accurately known, the geologists used the concentrations of uranium and lead isotopes in zircon samples to date the rocks containing the mineral.[22]

Magnetic and radioactive properties of particular minerals are just two of the non-obvious ways that any place stores a record of past events. They are unwritten sources that can be used to reconstruct a history of rocks, including their creation and perturbation by subsequent geological processes. Geological exploration is done for many reasons, of course, one of the most common being the potential for profit. For example, in 1949, the fledgling aeromagnetic program of the Geological Survey of Canada discovered a massive magnetite body in an area of Ontario that had previously been thought not to contain valuable minerals. Profits from the resulting mine "more than covered the cost of the entire aeromagnetic program" to 1993. There are always costs associated with learning something, but there are often benefits, too. It is simply not possible to know in advance whether there will be a net gain or loss.[23]

To an expert in magnetometry, the fact that the Chilcotin survey was flown at an altitude of 305 metres would immediately suggest that the motivation for the flights was primarily commercial. Flights around this altitude are ideal for detecting magnetic fluctuations caused by mineral or ore deposits. Presentation of the 1993 survey data emphasized geological features that might be of economic significance. South of Redstone near the Yalakom fault, for example, geologists found a "significant gold anomaly"

in the glacial drift lying along the edge of an aeromagnetic anomaly, one of a number of "mapped and possibly unmapped features which [might] be important loci for mineral deposits." Four kilometres north of Yalakom fault, also lying on the flank of a magnetic anomaly, was Fish Lake, a **porphyry** copper-gold deposit that the surveyors and the general public were already well aware of.[24]

In fact, another airborne survey of 1993 centred on the region around Fish Lake. An environmental consulting company was contracted to do a "helicopter-mounted reconnaissance-level survey." Over the space of three days in May, the survey crew flew the helicopter along the lines of a grid measuring about thirty by fifty kilometres. Every 2.5 kilometres, the helicopter dipped down and the person doing the sampling – securely attached to the hovering helicopter by a couple of safety lines – leaned out to snip off one of the pine tree tops. These samples were passed on to the Geological Survey of Canada in Ottawa. There, biogeochemists first dried the plant tissues, then burned them and tested the ash for concentrations of various metals, including copper and gold. Finally, these concentrations were plotted on a map showing where each sample was obtained. The logic of the study was to use the trees to amplify the geochemical signature of the substrate they were growing on. As the pines grew, they extended their roots deep into the soil, the glacial drift, and, in places, the bedrock. Drawing water and nutrients up through this root system, the trees also extracted materials that they didn't need for growth, such as copper and gold, and these became concentrated in the tree tops, twig ends, and bark. Concentrations of metal in the trees could thus serve as a sign of concentrations of metal in the ground below.[25]

The Fish Lake Porphyry Deposit

It is not possible to completely know the three-dimensional structure of the earth's crust, so geologists have to infer the structure from surface characteristics; outcrops; core samples; measurements of gravity, radioactivity, and magnetism; and whatever else is known or surmised about the geological history of the region. Specimens of porphyry taken from the Fish Lake area were readily identified because they consisted of a fine-grained groundmass speckled with large, distinct crystals. Most of the crystals were copper and gold; some were molybdenum, silver, and zinc. Each of the metals was an important commodity, and if there were enough copper and gold in the Fish Lake deposit, it might be profitable to mine it. Preliminary

exploration suggested that the deposit was a large ovaloid. By 1992, it had been measured to be almost a cubic kilometre: 853 metres north-south by 1,310 metres east-west by 823 metres deep. The full extent of the deposit is still not known. There is a possibility that it extends farther north, west, or southwest.[26]

Companies that wish to extract the commodities in porphyry deposits must first make an effort to reconstruct the history of those deposits. In general, porphyry deposits are created in places where two of the earth's tectonic plates are colliding, and a slab of dense oceanic crust is subducted. As the subducted slab descends, the temperature and pressure increase, causing it to melt. The surface crust of the oceanic slab contains water, which is released into the overlying crust. This released water lowers the melting temperature of the overlying material, and magma is formed and rises. Sometimes the magma makes it to the surface and is erupted as lava from a volcano. If the magma cools and crystallizes before reaching the surface, however, the resulting body of igneous rock is known as a pluton.

Porphyries are closely associated with plutons and are thought to occur under the following conditions. When the magma created by the subduction of oceanic crust begins to rise, the pressure drops. This reduction in pressure causes the dissolved water in the magma to separate. At the same time, the magma begins to form the crystals that will later be found in the porphyry. The separation of the water further cools the magma, which speeds crystallization and forces more water from the magma. Since the outer surface of the body cools more rapidly than the interior, a carapace is created around the magma. Pressure builds up in this carapace and eventually shatters it, allowing hot fluids to be released upwards to circulate around the solidified porphyry and surrounding host rock. The process continues cyclically until the entire body has solidified. As the magma crystallizes, trace metals are forced out along with the water and become concentrated in it. They are typically found in a zone around the intrusive body. The Fish Lake porphyry was created in the late Cretaceous (around 80 Ma BP), when the terranes that make up central British Columbia had already docked, and the accretion of Wrangellia and the Alexander terrane farther west caused uplift, faulting, metamorphism, and granitic intrusion in the Coast Range. Near Fish Lake, movement at the Yalakom fault was accompanied by volcanism and the emplacement of plutonic bodies into older marine sedimentary rocks and non-marine volcanic rocks. Subsequently covered by Miocene lava flows (23-5.3 Ma BP), the Fish Lake deposit was exposed as those lavas eroded.[27]

In the second half of the twentieth century, porphyry deposits were an