THE NORTH SLOPE

Flowing Toward the Arctic
The Birthplace of Western and Northern Rivers
The Columbia Icefield and Jasper National Park

Jasper has always seemed different and special to me. For a very long time I thought it was the many friends I had there, but then I realized there was even more to it than that. The people in Jasper, as everyone in Banff will attest, are, well, different. I have been wondering how they are so and why this came to be.

It took me twenty-five years and hundreds of journeys over Sunwapta Pass to realize that, if you concentrate hard, you can actually sense a difference in what the landscape feels like when you cross the divide from Banff to Jasper National Park. While you see the same high mountains in the area of Sunwapta Pass that you see in Banff, there is a perceptible sense that the valleys that radiate out from them will open into an immensity that is different from what you experience further south in the Rockies. It is then that one is struck by the realization that Sunwapta Pass is, in fact, a Great Divide in its own right, quite different from the one that has paralleled the road all the way from Lake Louise. From the summit of Sunwapta Pass, the continent slopes down to tidewater. But this is not an east-west divide. From the Columbia Icefield to the town of Jasper, the Icefields Parkway drops down from the north slopes of the Rockies into one of the greatest watersheds on Earth. The waters that
gather in this great basin do not flow into the Atlantic or the Pacific as they do further south. The Sunwapta, the Whirlpool, the Miette, the Snaring, the Snake Indian and the Athabasca are rivers of the north. They flow through an eternity of taiga and tundra into the polar sea.

No wonder the air smells and tastes different in Jasper. It is not surprising that the plant communities are not the same as they are in adjacent Banff. No wonder there are grizzlies here. No wonder ravens are the most obvious birds. We should not be surprised there are caribou here, and wolves. The outstretched arms of a gigantic inukshuk, the Rockies of Jasper face north. Timberline falls like a tilted curtain as it follows the cold to the pole. It is from the north that the weather comes. The people of Jasper are different than the people of Banff because Banff is part of the West and Jasper the North. Jasperites are northerners. Isolated and independent, they have been shaped by their exposure to the pole.

The two great natural heritage features in Jasper National Park, the Columbia Icefield and the Maligne Valley, are so spectacular and so geologically interesting that either could have qualified for World Heritage Site designation in its own right. These features are the essence of the amazing natural history that composes the north and northwest slopes of the Canadian Rocky Mountain Parks World Heritage Site. Both were created by water.

A SEA OF ICE AND SNOW: THE COLUMBIA ICEFIELD

By any standards, the Columbia Icefield is a substantial geographical feature. It is a high basin of accumulated snow and ice that straddles 325 square kilometres (roughly 125 square miles) of the Great Divide separating British Columbia from Alberta. Eleven of the twenty-two highest peaks in the Canadian Rockies are found in, or in close proximity to, the Columbia Icefield. The highest mountain in Alberta, Mount Columbia, 3,745 metres, sticks out of the north edge of all this ice. Much of the basin itself is over 3,000 metres in altitude. The Columbia Icefield is located just east of a major gap in the Columbia Mountains of British Columbia, making the Great Divide the first major obstacle to moisture-laden winds blowing eastward from the Pacific. At least ten metres of snow, more than thirty feet, fall on this basin every year, more snow by far than falls anywhere for hundreds of kilometres to the north or south. The snow and ice in this basin is in many places more than 300 metres, or a thousand feet deep. Steep cliffs of ice cap even the summits of the icefield mountains to a depth of as much as 100 metres, more than
300 feet. Out of this basin flow six major outlet glaciers. (An icefield is an upland area of snow accumulation that feeds two or more glaciers.) Though by no means the largest of the Columbia Icefield glaciers, the best known is the Athabasca Glacier, which presents itself each year to hundreds of thousands of travellers who choose the Icefield Parkway as the route they take from Lake Louise to Jasper.

Though the nearby but less accessible Saskatchewan Glacier is almost twice the size, the Athabasca is still a most impressive mass of ice. As of the summer of 2000, it measured five kilometres long from its upper edge to its toe. Its average width is one kilometre. Its depth, in the middle of the glacier at the turn-around point for the Snowcoaches that take tours on its surface, is 300 metres, nearly 1,000 feet. At this centre point the glacier moves twenty-five metres a year, gradually slowing to fifteen metres a year at its terminus.

Cold statistics, however, do not begin to embrace the cold fact of so much ice. Ultimately, references to a human-centred world are inappropriate in this place. Snow that fell four hundred years ago is melting at the glacier’s snout. The black peaks seem to lean over us. There is a different sense of time here. The day is the smallest unit, the season next, then the year. Beyond the year there is only the timelessness of epochs, the incomprehensibly vast passing of the geological seasons, mountains rising and falling, ice ages coming and going, and the appearance and disappearance of entire rafts of life. Confronted by eternity, we feel small here before the grumbling ice. Epiphany is possible here, a sense of aesthetic arrest.

**The Discovery of the Columbia Icefield**

A century ago, the Canadian Rockies were known only to locals. Beyond the thin steel line of the national railway, the limitless wilderness of the mountain West spread to every horizon. If anyone had seen the country’s great icefields, they had left no records. The location and heights of the country’s most spectacular mountains were still unknown.
It was a most unlikely group of people who undertook the first explorations of the great stone divide that formed the spine of the continent in Canada. For the most part, they could be considered tourists. They took the train West on their holidays and explored the country as time and money permitted. While they were competent and inspired, it was their wealth and leisure that granted them the opportunity to do what locals could not do, given the demands of a pioneer culture that insisted that the most practical things related to basic survival be done first.

The three adventurers associated with the discovery of the Columbia Icefield were Hugh Millington Stutfield, Hermann Woolley and John Norman Collie. Stutfield was a wealthy British stockbroker who through careful and considered investment was able to retire early from the London Stock Exchange and pursue his interest in travel. He was also a crack shot with a rifle and shotgun, a talent that later allowed him to save his fellow climbers from a difficult predicament in Canada with respect to supplies. It was this same talent, however, that caused him to be hunting instead of climbing when the full extent of the Columbia Icefield was discovered in 1898.

Woolley was a pharmaceutical chemist and the head of a large Manchester drug firm. He was also an amateur boxer of note and a strong climber. Collie was best known as a chemist. He also had a fine reputation as a climber. A biography of Collie¹ records that he made a total of seventy-seven first ascents in Skye, the Scottish mainland, the Lake District, the Himalaya and the Canadian Rockies.

Fortunately for us, however, Collie was as good a geographer as he was a scientist. Over four visits to the Canadian Rockies between 1897 and 1902, he mapped more than three thousand square miles (7,770 square km) of Canada’s mountain West. He was also a climber of note in the Rockies a decade before mountaineering became popular in the region. While Stutfield and Woolley deserve to be remembered for the parts they played in finding the Columbia Icefield, a hundred years after this historic discovery it is Collie we remember best.

Collie first heard about the Canadian Rockies as a result of Philip Stanley Abbot’s 1896 accident at Lake Louise. Collie participated in the Anglo-American expedition that climbed Mount Lefroy on the anniversary of Abbot’s death. Two days later Collie and Sarbach made the first ascent of Mount Victoria with Charles Fay and Arthur Michael. The climbers then went to the Bow Lake area where, on August 11,
they made the first ascent of Mount Gordon. With three new ascents to celebrate, the Americans had run out of time and had to go home.

Following the departure of part of the team, Collie, George Baker and Swiss guide Peter Sarbach planned to visit Mount Assiniboine, which had acquired the reputation of being the Matterhorn of the Rockies. Collie changed these plans, however, on the basis of some thing he had seen to the north from the summit of Mount Gordon: a fine double-headed snow peak with large glaciers pouring down its east face. They also looked upon a giant that loomed cold and sharp into the clear August skies further north. This peak, they surmised, was Mount Forbes, which they guessed to be somewhere near 14,000 feet (4,267 m) in height. The sight of this mountain triggered something in Collie that would change his plans for the remainder of the summer of 1897 and bring him back the following year.

The image of Mount Forbes brought an old legend to life in Collie’s mind. It was a legend that grew from the journals of David Douglas who, in 1827, had been the first man to climb a major mountain in North America. Douglas had told the story of two giants that guarded Athabasca Pass in what is now Jasper National Park. These stone monsters,
which Douglas had named Mount Hooker and Mount Brown, were said to be Himalayan-sized peaks that lay to the north, beyond Mount Forbes. Collie decided to find and then climb them. During the winter of 1897–98, Collie could not get the Hooker-Brown problem out of his mind. Through careful research, Collie learned that many competent explorers had already applied themselves to the mystery of the two mountains and had published excellent accounts of their findings.

The entire issue surrounding the legendary heights of Hooker and Brown began with the explorer and mapmaker David Thompson, who was the first European to traverse Athabasca Pass in 1811. Thompson, perhaps from an incorrect boiling-point determination, estimated the 5,735 foot (1,748 m) summit of the pass to be about 11,000 feet (3,353 m). Ross Cox and Thomas Drummond, who crossed the pass in 1814, compounded Thompson's mistake by calculating the summits of the two major peaks in the area of the pass at 16,000 to 18,000 feet (4,877 to 5,486 m). When botanist David Douglas crossed the pass in 1827, he recorded in his journal that he became desirous of climbing one of the two peaks at the crest of the pass and set out to climb the mountain on the left or west side that appeared the taller. In his journals he did not identify any peak by name or elevation. Nor did he claim that

COLUMBIA GLACIER OGINES

When viewed from the icefield above it, the Columbia Glacier looks very much like any of the other major glaciers that flow from the neve, or high snowfield, that creates them. The Columbia Glacier is unique, however, in that it falls into the neighbouring valley so steeply that the ice forms concentric pressure ridges called ogives.

Photograph by R.W. Sandford.
the peak he had climbed was the tallest in North America. Quite con-
trary to what he claimed when he got home, his journals clearly admit
that there were many other mountains in the area of the pass that were
higher than the one he climbed.

Douglas returned to England in 1828 and began the transcription
of his journal notes into an account he hoped to present before the
Royal Horticultural Society. It is at this point that the account begins to
derive from his notes and from fact. His published transcriptions argue
that, instead of climbing the mountain on the left or west side of the
pass, he climbed the one on the north side of Committee’s Punch Bowl,
the small lake at the summit of the famous trade route. He claimed the
mountain to be 17,000 feet (5,182 m) instead of his original estimate of
18,000 feet (5,486 m), and for some unknown reason claimed this peak
to be “the highest yet known in the Northern Continent of America.” He
then named the two Athabasca Pass mountains for botanist colleagues
William Hooker and Robert Brown. With a few strokes of a pen, Douglas
sent three generations of geographers and mountaineers on a wild
goose chase searching for these two fabled peaks. Though Collie prob-
ably sensed that the mystery of Hooker and Brown had already been
solved, he decided to take up the adventure.

On July 31, 1898, Collie and company left Laggan with a large pack
string organized by local outfitter Bill Peyto. The expedition decided to
follow Peyto’s 1897 suggestion of reaching the drainage of the Saskatche-
wan by way of the Pipestone and Siffleur valleys, which permitted them
to avoid the timber jams and bogs of the lower Bow Valley.

On August 17, their nineteenth day out from Laggan, the expedi-
tion was camped on the watershed that separated the Saskatchewan
and Athabasca rivers. Opposite their camp, a huge glacier-clad peak
beckoned to them. Late in the morning on August 18, 1898, Collie and
Woolley started for the summit of Mount Athabasca. Soon they were on
the east side of the peak and climbing. The ridge gave them little trouble
until it gave way to rotten, eroded rock. They then took to the glacier
and made their way up to a large basin just below the summit. Then
they cut steps for two hours along a line that was so steep they couldn’t
change places to relieve the tedium of step cutting. Finally, they arrived
at a small platform just below the summit where a chimney led them to
a very trying pitch that allowed them access to the summit ridge. The
peak itself would have been reward enough, but the view slowed their
minds. Collie later described what he saw:
The view that lay before us in the evening light was one that does not often fall to the lot of modern mountaineers. A new world was spread at our feet: to the westward stretched a vast ice-field probably never before seen by the human eye, and surrounded by entirely unknown, unnamed, and unclimbed peaks ... But it was towards the W. and N.W that the chief interest lay. From this great snow-field rose, solemnly, like 'lonely sea-stacks in mid-ocean,' two magnificent peaks, probably about 14,000 ft. high, keeping guard over those unknown western fields of ice. One of these, that in shape reminded us of the Finsteraarhorn, we have ventured to name after the Right Hon. James Bryce. A little to the north of this peak, and directly to the westward of the peak we were on (Athabasca Peak), rose probably the highest peak in the Canadian Rocky Mountains. Chisel-shaped at the head, covered with glaciers and ice, it also stood alone, and I at once recognized the great peak I was in search of; moreover, a short distance to the northeast of this peak another, almost as high, also flat-topped, but ringed round with sheer black precipices, reared its head into the sky high above all its fellows. At once I concluded these must be the two lost mountains Brown and Hooker.²

Having climbed the difficult north face, the tired climbers opted for an easier descent. Following the summit ridge to an adjacent horn, they descended what is now the classic route up this popular mountain.

On August 20, two days after the first ascent of Mount Athabasca, Collie, Woolley and Stutfield camped on the Athabasca Glacier just below the last of its three great icefalls. At 3:00 a.m. the following day they used head lamps to make their way up through the deep crevasses and jumbled seracs to become the first to stand on the icefield proper. They were heading for Mount Columbia, the chisel-headed giant Collie had seen from the summit of Mount Athabasca. As the day warmed and the snow on the surface of the icefield began to thaw, they realized that Mount Columbia was too far away to reach in a day. Instead they climbed a great arc of snow on the edge of the icefield, which they called the Dome. Back in England it would occur to Collie that, on the top of what is now called Snow Dome, they were standing on the only peak in North America where the snows, when melted, found their way into three different oceans. This peak is a triple divide, the apex between the drainages of the Columbia, which flows into the Pacific, the Saskatchewan, which flows into the Atlantic at Hudson Bay, and the Athabasca, which makes its gradual way north to empty into the Arctic Ocean.

Collie surmised correctly that the chisel-headed peak they had named Columbia, and its neighbouring flat-topped giant, which they named Alberta, could not be the legendary Hooker and Brown. Though Collie went on looking, he never found Douglas’ fabled giants. In all his adventures, which included six expeditions and more than twenty first
ascents in Canada, he never found anything that rivalled the grandeur or the geographical significance of the Columbia Icefield. Visitors today often feel the same way.

**FILLING IN THE MAP: COMPLETING THE EXPLORATION OF THE COLUMBIA ICEFIELD**

Norman Collie’s 1898 exploration of the Columbia Icefield area raised more questions than it answered. Collie and Stutfield had been greatly impressed with the size and nature of the Icefield giants and had first-ascent designs on Mounts Columbia, Bryce and Alberta. Unfortunately, the distance from any base camp in the Saskatchewan or Athabasca River valleys made these mountains simply too distant for a practical one-day attempt. The climbers acknowledged that Mount Columbia might be climbed if an easier route through the triple icefall on the Athabasca Glacier could be found. Stutfield, however, offered that the entire Columbia Icefield group of mountains might be far more accessible from the western side, where massive glaciers did not make it impossible to bring horse camps closer to the peaks they wanted to climb. So it was in 1900 that Stutfield and Collie planned a third expedition to the Rockies with the aim of exploring the remote mountains between the main ranges of the Rockies and the Columbia River. The expedition, however, proved to be a disaster. The climbers did not take into account that the forests on the wet side of the Great Divide would be dense and impenetrable. The party spent a month beating their way...
up the Bush River only to find themselves a full fifteen miles (twenty-four km) away from the Columbia Icefield.

Disappointed by their failure to climb even one decent mountain during the summer of 1900, Collie gave the Rockies a miss in 1901 and went instead to climb in the Lofoten Islands in Norway. In the meantime, however, the Canadian Pacific Railway advanced their plans to turn the Canadian Rockies into the Canadian Alps. In 1901, the railway brought Edward Whymper, the conqueror of the Matterhorn, to the Rockies to promote mountaineering in Canada. This angered Collie, who wrote to Charles Thompson to complain that Whymper was going to hog all the first ascents.

Though Whymper did not prove a threat to Collie’s first-ascent plans in the Columbia Icefield area, another British climber did. After teaming up with Edward Whymper briefly, James Outram made headlines in Canada and abroad with the first ascent of Mount Assiniboine in September of 1901. Collie resented Outram as much as he did Whymper if only because he had played no role in the exhausting early exploration of the Rockies, but was managing simply to make first ascents of mountains already found and mapped by others. When Collie returned to the Rockies in 1902, he was no longer interested in exploration. He wanted to make first ascents in the icefield he had discovered. Competition between these two climbers would lead to full exploration of the Columbia Icefield and first ascents of many of its most prominent peaks.

In the summer of 1902, Outram got into the field two weeks before Collie. Realizing he had only a short time before Collie arrived, Outram advanced immediately up the main branch of the Saskatchewan to the Alexandra Valley with the intent of stealing the first ascent of Mount Columbia, the giant of the Columbia Icefield. Near the base of Mount Alexandra, which dominates the head of the valley, Outram and his guide Christian Kaufmann ascended a high ridge to survey the surrounding peaks. There they saw before them the edge of the great icefield discovered by Collie and Woolley four years before. They saw also the narrow, three-pointed ridge of Mount Bryce and, as the clouds parted, the exquisite summit of Mount Columbia. They saw, too, that they were still a difficult and trying distance away from both.

On July 19, 1902, Outram and Kaufmann set out from their camp at 2:20 a.m., in just enough light to see the shadows of the trees in the valley. In an hour they felt the coldness of the glacial ice. At 5:00 a.m. they roped together to thread their way through the maze of crevasses and soon looked out over the eternity of ice and snow that forms the
the windswept névé of the icefield. The mountain looked no closer than it had from the valley floor. It took the climbers nearly four hours of continuous walking to reach the bergschrund out of which the peak of Mount Columbia rose into the cold, indifferent sky. They made their gradual way up the arête to a sheer and icy escarpment that was the last obstacle to the summit. At just after 2:00 p.m., Outram “planted the Union Jack on the broad, white platform that crowns the summit, the highest point in Canada from which the British flag has ever floated.”3 Then they faced the careful descent and the long slog back over the ice to camp. Just after midnight, after 22 hours of strenuous walking and climbing, they at last stumbled into their tents.

Between 1902 and 1919, there was virtually no exploration done in the area of the Columbia Icefield. During that time, the efforts of mountaineers were concentrated further south at Lake Louise and beyond. While a few expeditions made their way north from Lake Louise to Jasper, they avoided the difficult Columbia Icefield section. In time, however, civilization began to catch up with the remoteness of the West. In 1913, a survey to delineate the boundary between Alberta and British Columbia was initiated by the Office of the Surveyor General in Ottawa. During the first three years, the survey concentrated on the southern Rockies between Akamina Pass and Mount Assiniboine. By 1918, the survey had advanced past Thompson Pass to within sight of the Columbia Icefield. In July 1919, a climbing party ascended to the Columbia Icefield and began to survey a line across it to Mount Columbia. The survey was undertaken by R.W. Cautley of the Alberta Land Survey and Arthur Oliver Wheeler of the British Columbia Land Survey.

The next major expedition to the Columbia Icefield was led by the prominent American ophthalmologist James Monroe Thorington, and his friend Dr. William S. Ladd. Their guide was an Austrian named Conrad Kain, who was already famous for leading the first recognized ascent of Mount Robson.

A 1922 expedition to the Freshfields had whetted James Thorington’s appetite for the northlands. Throughout the following winter Thorington and Ladd spent hours pouring over the few available maps and photographs of the region they called the “Alexandra Angle.” This country that they considered “a land lost behind the ranges” included the peaks along the Continental Divide between Howse Pass and Mount Columbia, all of which were encompassed by the uppermost drainages at the headwaters of the North Saskatchewan River. Though some of the earliest expeditions had made brief incursions into this blank space on
only half that distance to the Thorington party, the North Twin is a full
distance of twelve miles by air (nineteen km) from the shoulder of Mount Castleguard. It took them several hours just to reach the head of the Athabasca Glacier and the base of Snow Dome. They were still only halfway to the North Twin. After circling widely to avoid crevasses at the head of the Columbia Glacier, Thorington began to see things that weren’t there: Fatigue mirages – momentary illusions – began to appear; for an instant I was convinced that the dark line of a distant crevasse was a staff planted on the summit of North Twin; and I berated Conrad for bringing us so far only to let us be cheated of a first-ascent.4

Thorington’s observations of mirages on the immense plateau give an idea of just how big the Columbia Icefield really is. It is big enough to
create its own weather and optical effects. His observations were confirmed the following year by the Field expedition and have, from time to time, been reported by climbers right up until the present. Bushes and trees constantly seem to present themselves at various places all over the icefield as climbers pitilessly observe their own slow progress over the eternal snows.

Only after the party stopped at 2:00 p.m. for lunch, after nearly eleven hours of walking across the ice, had they reached their mountain. Before them was a stunning scene. Framed by the North Twin and ice-deep summit bulges of Mount Stutfield, the climbers peered in silent awe at the unclimbed, cliff-walled summit of giant Mount Alberta. They reached the summit of the North Twin at about 4:20 p.m. But as too often happens in mountaineering, the climbers had reached the summit only to be greeted by dense cloud. Robbed of the view, they had to be satisfied with the first ascent, the last of the unclimbed 12,000 foot peaks in the Columbia Icefield area, and the first traverse of the Columbia Icefield from the Castleguard Valley to the head of Habel Creek. As any climber will tell you, the summit is only halfway to the goal. The arduous return journey from the North Twin is one of the epics of early mountaineering in Canada. Thorington described it as if it were a dream:

Someone, following in our track, may one day understand that journey back across the icefield’s vastness. For an analytical mind, it will at least afford insight of the psychology of fatigue: the half-hour in a blizzard, obscuring the trail and exhausting us; the clearing at sunset, with crimson and orange light banded against masses of lead-blue storm clouds behind The Twins; mist and snow-banners wreathed about and trailing from Columbia and catching up the light – we three mortals in the middle of the field, in all its immensity, struggling on in insufficiently crusted snow until the light failed.5

Twenty-three hours after leaving camp, the climbers fell on the grass beside the campfire and ate breakfast as the sun rose on the peaks surrounding the Castleguard meadows. This had been the longest mountaineering ordeal to date in the Canadian Rockies.

In 1923, Thorington had, in effect, dropped a gauntlet to other climbers by announcing that Kain, Ladd and he had set a “new long-distance and altitude record in Canadian mountaineering.” Their claim had been established by climbing, in five successive days, the North Twin (the first ascent and a journey of 54 kilometres, or more than 30 miles), Mount Saskatchewan (another first ascent and a journey of 27 kilometres,
Harvard glaciologist William Field came to the Rockies in 1924 due to a talk given by James Thorington to the American Alpine Club in Boston about his 1923 Columbia Icefield expedition. This group wished to make the first ascent of the South Twin.

Guide Edward Feuz led them first to the Castleguard Meadows where they camped. As the South Twin was a good 25 kilometres (about 15.5 miles) away, Feuz instructed the party to leave at 8:00 p.m. one evening and to walk across the icefield by moonlight to the base of the 11,700 foot peak (3,556-m peak). It was only lunchtime when the team of very strong climbers made their way to the summit of the South Twin. Relishing the stimulating physical exercise and the grand views, William Field proposed that the party climb the North Twin while they were in the vicinity. Feuz agreed, suggesting that since they were going to be late getting back to camp anyway, they might as well make a full day of it. Fred Field complained that he’d already had enough but was overruled. William Field and Feuz had their way.

The return trip from the North Twin was something of an exercise in masochism. As had happened to the Thorington party the year before, the climbers had to return over the icefield during the hot part of the summer day. The usual mirages began to appear, just as they had to the eyes of Thorington and his party. Lawren Harris saw bushes and trees growing out of the ice and claims to have seen groups of people watching their “piteously slow progress on that interminable march.” In just over twenty-four hours the climbers had walked 58 kilometres (about 36 miles) and climbed two of the highest peaks in the Columbia Icefield group. They were clearly worthy of an additional and most remarkable discovery they made just inside what is now the northern boundary of Banff National Park, just on the edge of the Columbia Icefield: a

**THE TRIPLE HYDROLOGICAL APEX**

A rare and very interesting hydrological feature also exists at the Columbia Icefield. Mount Snow Dome, near the Athabasca Glacier, is buried deeply in snow and ice. The mountain, however, is located such that meltwaters from its top flow to three different oceans, west to the Pacific, east to Hudson Bay and the Atlantic, and north by way of the Athabasca River to the Arctic. In this photograph Jasper Park Superintendent Ron Hooper, the author, and the Mayor of Jasper Dick Ireland send water to each of the great oceans from the summit of Snow Dome, in celebration of the United Nations International Year of Fresh Water. Photograph by Ward Cameron.
THE CASTLEGUARD CAVES
Underlying the Castleguard Meadows is the longest cave system in Canada. Beginning in 1967, Derek Ford of McMaster University led a series of winter mapping explorations, which ultimately revealed the extent and character of the 20-kilometre-long Castleguard system. Ford and his colleagues discovered that the Castleguard Caves actually terminate under the Columbia Icefield. Because of the extreme hazard, the cave system is now closed to public access.

Photograph courtesy of Dr. Derek Ford and Parks Canada.

discovery that in its own right would have later qualified the region to become a World Heritage Site.

THE DISCOVERY OF THE CASTLEGUARD CAVES

Though many other outfits had camped in the Castleguard area and observed how meltwater disappeared through cracks and fissures in the bedrock of the meadows, none had hitherto discovered where that water went. Exploring the timbered slope below their camp late one afternoon, two members of the 1924 William Field party heard a rumbling underground, then a river burst forth from the side of the mountain below them. Further exploration revealed a substantial cave mouth out of which the water was issuing in torrents. Two days later the water subsided, at least for a time, and the party was able to explore the cave for some two hundred metres until the cave floor dropped into an abyss. The mystery of the Castleguard Cave system would haunt scientists and cave explorers for more than fifty years until research initiated by McMaster University geologist and caver Derek Ford led to the realization that the twelve-kilometre-long cave system ended under the Columbia Icefield itself. It is one of the longest cave systems in Canada.

The cave system is now closed to the public for reasons of safety. Even the entrance to the cave system can only be accessed by experienced and well-equipped mountaineers. Travelling within the system itself can be extraordinarily dangerous as flooding is common and unpredictable. The Castleguard Caves remain one of these places we are happy to know exists and pleased to have protected within a World Heritage Site. It is not, however, a place that will ever be visited by many people.

With the Field expedition, the great days of pioneering mountaineering expeditions in the Columbia Icefield area came to an end. While they discovered much else as well, what the early explorers and mountaineers essentially discovered was the birthplace of western rivers. The organizing principle of this World Heritage Site is watershed. We see a century later that almost every aspect of the mountain landscape is an expression of what water does in upwardly tilted geological circumstances. All of the rest of the wonder – the shapes of the peaks, the colour of the lakes, the rich forest and alpine ecosystems – all follow from the fact
of abundant water. To see the World Heritage Site in this context is to understand its significance not just to the West but also to the world.

SNOW DOME: CRADLE OF THE WESTERN WATERSHED

The Athabasca Glacier receives its name from the Athabasca River, a major Western Canadian watercourse whose origins begin at the Columbia Glacier that flows from the northern rim of the Columbia Icefield. (By some accident of geographic place naming, the Athabasca Glacier gives birth to the Sunwapta River that joins the larger Athabasca some fifty kilometres downstream before that great river flows by the town of Jasper.) Athabasca is a Cree word that means “place where the reeds grow.” The Columbia Icefield also contributes to the great Columbia River, one of the most important early highways across this continent. The other great river that has its origins in the Columbia Icefield is the North Saskatchewan River, the great river of the northern Canadian plains. These three major rivers flow to three different oceans. The Saskatchewan flows nearly two thousand kilometres to pour into the Atlantic Ocean at Hudson Bay. The waters of the Athabasca River flow nearly three thousand kilometres northward by way of the Mackenzie River system to become part of the Arctic Ocean and, finally, the meltwater of the glaciers on the west side of the Columbia Icefield pour through the Bush and Wood rivers into the Columbia which meanders for two thousand kilometres to join the Pacific near Portland, Oregon. There is actually a hydrological apex in the Columbia Icefield that is the exact dividing point between these three great rivers. The apex of this unusual triple continental divide is the summit of Snow Dome, a 3,451 metre peak that overlooks the Athabasca Glacier from the north. Snow falling on the summit of this mountain can, depending upon where it falls, end up in any one of three major river systems each bound for a different ocean.

HOW GLACIERS FORM

Everywhere in the polar and temperate regions of the earth, and at high altitudes in the tropics, atmospheric water condenses and freezes into solid form. Sometimes the resulting water falls as hail, or as small irregular globes called graupel. But most often, frozen atmospheric water falls as snow. Every child has marvelled at the lacy elegance inherent in the radial symmetry of the snowflake. Each flake is different, each
unique, each perfect in its own way. When snow falls in the Rockies, individual flakes fall one upon the other, glistening and gradually deepening into the romantic image of the Canadian winter. As snow continues to fall and deepen, the sheer weight of accumulation changes the nature of the flakes. As pressure builds, the lovely radial arms, outstretched and intertwined, melt.

In most places in the world, the life of the snow is terminated by the hot sun of springtime. The aging snow dies back into water as it melts. But at the poles, and in the high places of the mountains, the snow that falls in winter never completely melts. The snow deepens, layer after layer, year after passing year. At a certain depth, thirty metres or so, the compressed snow becomes extremely dense ice. Under its own weight, and in response to dictates of its own crystalline nature, this ice moves. This is the ice of the eons; this is glacier ice.

**ICE AGES: THE ICE MAN COMETH**

*It is generally assumed* that as long as there has been ice in the polar regions of this continent, glaciers have likely existed in the Canadian Rockies. While local altitude and climatic conditions may have
supported glaciers in the Columbia Icefield area for as long as three million years, ice movement at the Columbia Icefield has also been linked to more widespread climatic coolings, which have resulted in major glacial advances throughout the Rockies. What appears to be the most extensive of all modern ice ages began roughly 240,000 years ago. The Illinoian or Great Glaciation covered most of the northern regions of the upper hemisphere, fashioning much of the geography as we know it today in North America. The Great Glaciation was a spectacular geological event that lasted a hundred thousand years. Though the glaciers of the Columbia Icefield would have grown dramatically during this continental cooling, the dynamics of the icefield itself would have changed little. The only difference would be that the major alpine glaciers could have been hundreds of kilometres long and as much as two kilometres deep as they left the Rockies and joined the even greater ice masses flowing southward from the direction of the pole.

Other notable but lesser glacial advances took place in the Rockies seventy-five thousand and twenty thousand years ago and did much to give these mountains the contours that make them so dramatic today. Another climatic cooling took place around eleven thousand years ago and initiated what is called the Crowfoot Advance, a smaller but still measurable glacial growth period still represented in the surface geology of the Columbia Icefield area. The last glacial advance to have taken place in the Canadian Rockies is so recent that early travellers were able to document its close. The Cavell Advance, often call the Little Ice Age likely began near the year 1200. At the peak of this advance, in about 1750, the Athabasca Glacier was two kilometres longer than it is now.

CLIMATE AND MICROCLIMATE: THE LITTLE ICE AGE

History tells us that Anthony Henday was likely the first European to look upon the Rocky Mountains in Canada, an act he is said to have performed in the summer of 1754 from a hilltop vantage near the present site of Gull Lake, Alberta. So dazzling was the panorama of the distant snow-clad peaks, that he called the Rockies the Shining Mountains. Today, from the same summer vista on the Great Plains, the Rockies would not likely appear as quite the wall of white Henday witnessed before he packed his canoes with furs and headed east again for Montreal. Henday looked upon the Rockies while they were buried deep beneath the throes of the most recent time of glacial advances,
the Little Ice Age. But since then the climate of the West has changed.
By the beginning of the twentieth century, the climate of the Rockies
had warmed considerably. Since then most of the glaciers of the Rockies
have retreated.

It is very difficult to predict what will happen next in terms of glacial
advance and retreat in the Rockies. Though much of what happens in
terms of ice dynamics at the Columbia Icefield depends upon local or
micro-climatic conditions, even this great mass of ice is not immune to
the larger influences of planetary climatic change. Due to the way glacial
ice is accumulated and endures, glaciers offer an excellent and reliable
source of information about the earth’s past climates. Glacial cores from
the ancient ice of the poles tell us that, before 1900, natural atmospheric
pollutants overwhelmingly outnumbered human-generated pollutants.
This is no longer true.

Human activity is now an important factor in the evolving climate.
One cumulative result of all of these atmospheric changes is the green-
house effect we have heard so much about, which is causing warmer
temperatures worldwide. It is clear that such warming could have a
substantial impact on the planet’s inter-connected ecosystems and on
patterns of human settlement. The ultimate effect of these atmospheric
changes on the Columbia Icefield is unclear. Even if the climate does
warm, however, it may not mean the end of the ice in these moun-
tains any time soon. The glaciers may shrink back into the icefield that
formed them. The decreased surface of the ice will likely accelerate melt.
But that may not be the end. There is something to be said for glacial patience. Shrunken but by no means defeated, protected by the cold heights of the Great Divide, the ice will simply wait and wait. Provided the warming is not too great of course, it will survive.

Current evidence suggests, however, that our glaciers are in trouble. One quarter of the glacial mass in the cordillera has disappeared in the last century. Rapid glacial recession and dramatically lower stream flows have also been recorded at the headwaters and downstream on all major rivers that have their origins in the mountain national parks.

As the mountain glaciers continue to melt, water availability will diminish on the Great Plains. As hydropower generation becomes less reliable, more coal-fired generation will be required which will likely result in greater greenhouse emissions. The kinds of life that live in the river will change as the temperature of the water rises in the wake of decreased introduction of cold water from glacial melt. If the climate continues to warm as expected and stream flows are reduced as projected then the water needs of projects like Alberta’s oil sands could reach a critical proportion of winter low flows.

According to Dr. David Schindler of the University of Alberta, both Alberta and Saskatchewan have already recorded a warming trend of 1 °C to 4 °C, mostly after 1970. Regional climate models predict that the average temperature could further increase by as much as 4.8 °C to 8 °C by 2100. This range is outside our society’s current willingness or capacity to adapt.

Reduced river flows, reduced glacial melt contributions, and other climate-related changes in precipitation patterns and timing are converging to create a new hydrological regime on the eastern slopes and on the prairies. And yet we continue to develop heavily in our headwater regions. We are writing cheques our landscapes may not be able to cash. One does not think of such things, however, when heading down-valley from the Columbia Icefield toward Jasper. One thinks about water because it is everywhere, falling from the mountains surrounding the valleys and, in the case of the Maligne Valley, flowing invisibly beneath our feet.

**NORTH SLOPE WONDER: THE MALIGNE VALLEY**

Legends have always existed of sacred places deep in the mountains where nature is said to exist in the most extravagantly pristine state. For hundreds of years, Native peoples in the mountain West knew...
about a remarkable lake in a stunning valley enclosed by the most beautiful of mountains. Even though few actually visited the lake, for it was remote and difficult to reach, word slowly found its way to the outside. In order that the secret not fall into uncaring hands, stories of this almost mythical place were told only to the most inquiring of early European explorers. These adventurers longed to search out this magical valley, but few had the time or the resources for an extended expedition. The wilderness through which they would have to travel was trackless and wild, and the only maps that existed were images lodged in the fading memories of Native elders.

It was the lower reaches of this fabled valley that Europeans found first. As if to protect the upper reaches of this sacred place from vandals, the river that roared from this valley proved difficult and dangerous to cross. Naming the river Maligne for the curse they uttered on its banks, the Europeans carried on westward across the mountains, to the Columbia, to the sea. Only as the map of the West filled was the legend of the primeval valley heard again. There was a remarkable lake deep in the wilderness, back of beyond.

The first European to stumble on the lake at the head of the magical valley was not looking for it. Henry McLeod was looking for something else – a way out perhaps – and did not see what he was looking at. Walled inside himself by private misery, he named the lake for his sore feet and wandered on. The noisy rustling that passes for silence in the wilderness descended again. More than thirty years went by. In summer, water lapped on ancient shores. Ice groaned on the peaks. Loons called. In winter, the lake froze deep and hard. Then only wolf-howl could be heard above the hiss of the falling snow.

**BACKCOUNTRY SOPHISTICATES**

In the Rockies, rail tracks were laid through Lake Louise in the south and, later, through Jasper in the north. Tough, hard-cussing bush-whackers made their summer living by cutting crude trails through the burnt forests and muskeg in order to take American pilgrims into the wilderness along the Great Divide. The trips often took weeks. Climbers and adventurers had the time to leave the city behind. As long days passed beneath the sparkling glaciers, travellers slowed to the pace of the land. Even the most single-minded were then visited by a sense of well-being that often changed their lives. Captured by the unutterable beauty of the Rockies, some never went home. One such traveller, Mary
The Columbia Icefield and Jasper National Park

American wildflowers. Taken by the notion of the Wild West, in her mid teens Sharples realized the dream of travelling by train to see the Indians of the American southwest.

A second trip west also included a steamer voyage up the West Coast to Alaska where her desire to acquaint herself with aboriginal cultures seemed to be satisfied. What wasn’t satisfied, however, was what was to become an abiding interest in travel, an obsession that further expressed itself in an extended rail journey from Montreal to Vancouver in the summer of 1889. This journey was inspired by the encouragement of family friend Mary Vaux, who had become interested in the glaciers and deeply carved valleys of the Selkirk Mountains when her family first visited Rogers Pass two summers before. The Vaux family was, in fact, so taken by the Selkirk landscapes they began formal studies of the movement of both the Illecillewaet and Asulkan Glaciers and continued this research on an annual basis after 1894. The enthusiasm of the Vaux family toward Canadian mountains was to infect Mary Sharples, too.

Schäffer, (see Chapter 10) spoke eloquently but softly of a “wonder trail,” a difficult but rewarding path through the primeval peaks from Lake Louise to Jasper that possessed an extraordinary charm. Before this “wonder trail” became “the wonder road” and, later, the Icefields Parkway, she marked this relatively blank space on the map as one of the most remarkable places on Earth.

Mary Townsend Sharples (pronounced Sharp-less) was born into no small amount of Quaker family wealth in West Chester, Pennsylvania on October 4, 1861. Though thoroughly educated in all the usual skills and graces appropriate to a young lady of her station, Sharples also inherited an intense interest in natural history bequeathed to her by her father, whose passionate interest in mineralogy was cultivated through regular contact with some of the most prominent scientists of the day. Sharples’ interests led to a study of botany that, combined with natural talent in art, later permitted her to contribute significantly to the field identification of North American wildflowers. Photograph by R.W. Sandford.

**ALPINE FORGET-ME-NOT**

In terms of climatic conditions, the mountains of the Canadian West act as a southward extension of arctic ecosystems. Many arctic plant species find their way southward along the spine of the Rockies. Alpine Forget-me-not (*Myosotis alpestris*) is one of the most colourful alpine flower species. Photograph by R.W. Sandford.
The mere proximity to these mountains was soon to change the course of her life.

At Glacier House in the summer of 1889, Mary Sharples was introduced to Dr. Charles Schäffer, a physician who had an abiding dedication to botany, which he pursued in the field every summer. Though the good doctor was considerably older than young Mary Sharples, their mutual appreciation for botany made them inseparable companions and led to their marriage and a planned return to the mountains of Canada in the summer of 1891. Their botanical studies of the Rockies and Selkirks continued, with Mary making elegant drawings of the specimens her husband collected, until his death in 1903. Anxious to fill in the void created by his death, Mary decided to continue his botanical work. In exchange for his taking credit for any publications, she was able to convince Stewardson Brown, Curator of the Herbarium of the Academy of Natural Sciences in Philadelphia, of the legitimacy of continued fieldwork in the Rockies. Determined to overcome deeply rooted fears of bears and horses, Schäffer arrived in Banff in the summer of 1904 looking for a way to get comfortably into the backcountry. She asked outfitter Tom Wilson if he could supply someone who could toughen her up for the demanding kind of travel that would be necessary to get her where the important botanical work needed to be done. Wilson assigned to her service one William “Billy” Warren, whom Schäffer would soon affectionately name “Chief.”

In the summer of 1905, Mary Schäffer and Billy Warren extended the range of their collecting on a journey with three of Schäffer’s friends northward from Lake Louise to the North Saskatchewan River. One of these women, a geology teacher from Columbia College in New York named Mary “Mollie” Adams, seemed as taken by the Rockies as Schäffer herself. The two became inseparable travellers on some of the most significant exploratory journeys taken along the Great Divide in the next decade. The collecting season of 1905 rendered enough specimens for Stewardson Brown to begin his identification and descriptions of the plants that were later published with Schäffer’s fine watercolour drawings in *Alpine Flora of the Canadian Rocky Mountains* two years later. But even with her husband’s work now complete, Schäffer could not get the Canadian wilderness out of her heart. Having once listened to Sir James Hector describe the wilderness of the north country, she was captured. In the summer of 1906, she and Mollie Adams were back in Banff, this time with far more ambitious plans that included a journey to Wilcox Pass and the fabled Columbia Icefield, exploration of
the Alexandra River, and a trip to Pinto Lake. During this expedition, they named many of the features travellers enjoy today on the Icefields Parkway. Their journey of 1907 was even more ambitious, for that summer they aimed to explore the headwaters of the North Saskatchewan and Athabasca rivers and to look for a big lake known to the Stoney tribe as Chaba Imne. The Stoney’s “Beaver Lake” was reputedly located north of the Brazeau River. Though they did not find the lake, their four-month expedition with Billy Warren and Sid Unwin covered a lot of country. They were now ready for the major “discovery” that would endear them to the living history of Canadian mountains.

Plans for the 1908 expedition included a larger support party and specific plans to find Chaba Imne. The attitude of the travellers were, however, very different than what we might today expect from explorers on the verge of new and unmapped terrain. Schäffer and Adams looked at the journey more as a pleasure trip than an expedition. Both were quite willing to let their paid trail hands receive all the credit for the hard work they committed to making their way through the tough country. They appeared to simply want to enjoy the experience to the fullest. Each fully acknowledged that the fabled lake had been visited often by Native peoples. But when they finally reached the shores of the lake they realized that railway surveyor Henry McLeod had named it “Sorefoot Lake” in response only to his own discomfort, which obviously distracted him completely from the beauty of the scenery.

Even after the railway was completed through the heart of the nearby Athabasca Valley, Maligne Lake could hardly be said to be easily accessible. With Mary Shaffer’s visit in 1911, it became clear to outfitters, horse packers and guides that they could make a seasonal living taking intrepid easterners into the backcountry of the newly created Jasper Forest Reserve. One of the destinations for the truly discerning visitor might be the upper reaches of the Maligne Valley.

The construction of a tote road to Medicine Lake from Jasper was the first step in making Maligne Lake accessible. Adventurous travellers would then travel by boat across Medicine Lake, where they were provided with horses for the final leg of the journey to Maligne Lake. It did not matter that the trip could not be done quickly. It was a slower age then, and visitors were not in such a hurry.

In the century or so since Jasper became a national park, visitation to the Maligne Lake area has increased from a handful of visitors a year to more than 200,000. Fortunately, better understanding of natural processes has accompanied increases in visitation.
When Jasper National Park came into existence, it was thought that simply protecting landscapes from logging and mining would permit natural processes to sustain the wilderness. It is now realized that the park is part of a much larger ecosystem that extends far beyond Jasper’s boundaries – and that distant events can have profound impacts on natural ecological processes inside the park. Within this context, the natural character of the Maligne Valley has been recognized for its true uniqueness. We now know that of all the spectacular places in Canada’s mountain national parks, this is one of the most remarkable. The variety of its amazing natural features, its exotic wildlife, the healthy nature of its intact ecosystems and the long history of human presence in the Maligne Valley could qualify it, in its own right, as a United Nations World Heritage Site. Early travellers were right to marvel about this valley.

It is now the challenge of our generation to give value to the experiences we have in this remarkable place. Though we cannot be the first to visit the valley, we can still feel a measure of the awe and wonder early visitors felt in this most sacred of natural places. We are not pioneers, as James Monroe Thorington noted, but we can journey over old trails that are new to us, with hearts open.

THE TONQUIN VALLEY
It would take a lifetime to explore all the glory of the Jasper part of the Canadian Rocky Mountain Parks World Heritage Site. The Tonquin Valley is accessible only by trail. Its stunning beauty, however, makes it one of the most popular backpacking destinations in the Canadian Rockies.

Photograph by R.W. Sandford.
THE AGE OF ADVENTURE TOURISM

Even as it was being created, the Canadian National Park system embraced a new notion of wilderness. Mountains became summer sanctuaries to which pilgrims would return again and again for the solace of so much open and often unmapped space. Grand railway hotels offered elegant living in the midst of the staggering beauty of Canada’s suddenly accessible peaks. Edwardian adventurers took full advantage of this unique opportunity to make history while drawing spiritual and physical refreshment from the wilderness. The world was new and bright to them. The winter of misunderstanding mountains was over. The demons and alpine dragons that had populated the evil peaks were gone, leaving only trails bright with wildflowers.

But even in the twentieth century, that most urban of human epochs, there was still a place in the Canadian Rockies for explorers. Though physical toughness and unstinting commitment to the task at hand were useful attributes, you didn’t have to be a mountaineer to open up the remaining blank spaces on the map of mountain Canada.

Among the climbers and explorers of the early twentieth century, the last giants were very much a mixed lot. Pampered socialites, rugged cowboys, Austrian peasants, ambitious clergymen, fur trappers and a diverse host of other unlikely heroes and heroines left deep marks on the then impressionable history of Canadian mountains. Though some major work was to be done in the Purcells, the bulk of the exploration would be done north of the main line of the Canadian Pacific Railway. Through their photographs and, later, their writings they were able to contribute to the unique sense of place that characterized the Canadian alpine as possessing high aesthetic and adventure appeal. Some of these were packers and horse guides like Sid Unwin, Billy Warren and Curly Phillips. Others were often clients of these horsemen who were so deeply affected by the experiences they had in the Canadian West that their lives were changed for good by what they saw and did. Some of the most important of this latter group were young women from prominent families who used the privilege of their family wealth to fashion highly individual lifestyles in a time when women were not expected to rise out of the stations into which they were placed by their families and husbands.
Rails and Roads

One important difference between Jasper National Park and the mountain parks further south is the length of time that passed before the railway began to influence visitor use and appreciation of these natural landscapes. Perhaps due to this there appears at the moment at least to be a better balance between what has been built and what has been saved in Jasper than there is in Banff. Distance from major centres obviously makes a difference, but so do local attitudes toward place.

In the south-central Rockies, the creation of the national parks occurred as a direct and immediate result of the construction of the main line of the Canadian Pacific Railway through the Bow Valley and over Kicking Horse Pass to Rogers Pass. Nearly twenty-five years would pass before a railway would disturb the silence of the Athabasca Valley. During that time, adventurers from all over the world would be attracted to the relative remoteness of Jasper.

Because it was not the first railway in the West, the role the Grand Trunk Pacific played in the creation of Jasper National Park is not as well known as the role the CPR played in creating the tourism image of Banff. The fact remains, however, that what the Grand Trunk Pacific did in the northern Rockies is of considerable national importance. The history of the Grand Trunk Pacific and the birth of Canadian National Railways define history in Jasper.

The histories of the Canadian Pacific and Canadian National Railways are linked. One became the reason for the other. Canadian Pacific Railway only served the southern part of the country closest to the American border. Problems associated with the avalanche-prone route through Rogers Pass, and a desire to provide rail service to the rich agricultural lands north of the Canadian Pacific’s main line, soon prompted consideration of a second transcontinental line. In 1903, the National Transcontinental Railway Act was passed awarding the second national rail route to the Grand Trunk Railway. The tracks would follow the Yellowhead route west from Edmonton up the Athabasca Valley past old Jasper House, and cross the spine of the Rockies at Yellowhead Pass.

With the successful creation of Banff, Yoho and Glacier National Parks as a precedent, the Grand Trunk realized early in its development that it would have to rely on tourism to make ends meet. When the railway began to lay tracks westward, it, too, pressed for the creation of national parks in the stunning scenery of the Rockies. This wish was granted in 1907 when an immense area of five thousand square miles (12,950 square km) bordering on the rail route along the Athabasca
In 1913, the railway pursued developable properties in the small town named Fitzhugh that had come into existence further up the valley during railway construction. Originally named after a railway executive, the town changed its name to Jasper, after the famous fur trader Jasper Hawes for whom Jasper House had been named.

By the end of 1914, the railway was in financial trouble. The Canadian Northern Railway had appeared in the valley and laid down tracks that in places paralleled those of the Grand Trunk Pacific. Perhaps realizing that both railways wouldn’t succeed, the government suddenly encouraged development of hotels on the Miette River and two townsite properties. The troubled railway had no resources with which to build them. When they failed to build on the land they were granted, the Grand Trunk hotel proposals were shelved.

The huge cost of laying track across the entire continent slowed development of tourist facilities associated with the Grand Trunk Pacific. It was not until March 1911 that railway’s president, Charles M. Hays, requested necessary land for the construction of hotels, restaurants, stables and roads in the park.

In 1910, arrangements were made to begin to buy out settlers who held property in the new park. Among the last to stay on in the valley was an American homesteader, Lewis Swift, who, with his Métis wife Suzette, lived at what is now called the Palisades. When the park was formed, Swift became one of the park’s first wardens. The area of Jasper Forest Park was reduced by four-fifths in 1911 but increased again through public pressure in 1914.

New River and Yellowhead Pass was set aside as a federal reserve.

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The failure of the Grand Trunk Railway to act upon their grand hotel proposals exacerbated the accommodation shortage already in existence in the new national park. Local railway agents and a few informed businessmen saw the potential to capitalize on increased regional tourism spin-offs brought about by the World’s Fair scheduled to open in San Francisco in the summer of 1915. To be able to capitalize on this one-time event, they were forced to consider alternate forms of accommodation. In the fall of 1914, Robert Kenneth, President of the Edmonton Tent and Mattress Company, pressed railway officials in Edmonton to start looking for the site of a possible tourist tent camp to be located somewhere in Jasper Park. The railway sent H.R. Tilley to Jasper to meet with pioneer outfitters Fred and Jack Brewster and find a site. The Brewsters were long-time residents and experienced mountain men. They took Tilley to their favourite spot on Lac Beauvert, which at that time they called Horseshoe Lake due to its shape. In partnership with the Brewsters, Kenneth set up ten large sleeping tents and a cook tent on the shores of Lac Beauvert. When “Tent City” opened on June 15, 1915, its all-inclusive rates ranged from $2.50 per day to $18 a week. Though it was a huge success, the camp closed at the end of the season and did not open again after World War I, when Jack and Major Fred Brewster purchased Tent City.

Even the earliest visitors to the area realized that the best way to see and appreciate the glories of the upper valley was to take a boat up Maligne Lake. Though access to the lake remained a challenge until a road was completed in 1970, commercial boat tours began operating on Maligne Lake nearly fifty years before. But as more travellers made their way to the lake, the Maligne Valley became famous for other reasons besides just the lake. Because we saved all the pieces, we keep discovering new things about this valley. By exploring Maligne Canyon we have discovered that there is an underground hydrological system beneath the Maligne Valley, of dimensions we do not fully comprehend even today.

**FURTHER DISCOVERIES: THE GRAND CANYON OF THE MALIGNE**

When Father De Smet travelled through what is now Jasper National Park, the only access to the canyon on the Maligne River would have begun where the Maligne and Athabasca rivers meet. If there were a trail at all, then, it would have been a rugged one. It might have taken the better part of a day to bushwhack from the valley floor up to the most spectacular part of the canyon. Now the most popular way to
explore the canyon is to drive right to the deepest part at what is called First Bridge and to walk down-valley to the Sixth Bridge near where the Maligne flows into the Athabasca. Let us now take that journey.

It is a beautiful July morning, clear and warm. We arrive at the canyon just as the sun is cresting the pines at the First Bridge. The coolness from the night still lingers. We are above the main valley of the Athabasca some ten kilometres east of the town of Jasper. There is robin song and the occasional single haunting note of Townsend’s solitaire. Amid the fragrant pines, we smell wet limestone and hear the thunder of cascading water. The rock here is old. It is Devonian in age, meaning that it was laid down as marine sediments somewhere around 400 million years ago. These sediments were uplifted during a surge of western mountain building that created the Continental Divide about 85 million years ago. The mountains were already old when the Maligne River began to widen an already existing fault to begin forming the canyon as the glaciers of the last ice age left the Jasper region about ten thousand years ago.

From the area adjacent to the Maligne Canyon Teahouse, the Maligne River appears to be no larger than a brook. If you look you will notice
that the limestone bedrock dips gently westward and that the stream follows the dip. As it does so, it creates a gentle bank on one side and a steep and deeply undercut bank on the other. Then it disappears. Though you can hear it, you have to look a long way down to find the water. At fifty-five metres, this is the deepest part of the canyon. The spray is lit by the occasional ray of morning light that falls at just the right angle to penetrate the dark chasm of the narrow canyon.

We see a huge waterfall that drops twenty-three metres to the base of the slit. Here we see that the upper layers of the rock that compose the canyon walls are thicker, harder and more resistant to the force of the cascade than those below. The narrow canyon suddenly widens at the falls and its walls expand into a huge stone amphitheatre out of which wells the canyon’s ceaseless song.

Wind-blown dust and fine debris from frost shattering have combined to create isolated pockets of soil on ledges in the walls of the deepening canyon. Here in the shade and the spray, mosses grow in lush carpets out of which spring species of ferns that have likely occupied such places for a quarter of the age of the earth. On the canyon’s lip, wild roses grow, adding their delicate fragrance to that of the pines and the scent of dusty spray wafting up from the booming water below.

The big rocks on the far side of the bridge are as worn by people climbing on them as the steps of some old European cathedrals. Yet, while I am standing on the bridge in the warm light, two large tour groups come and go, pausing only long enough to peer into the abyss and wander aimlessly on. I wonder what they are experiencing. It occurs to me that in their hurry they are missing something. Our shadows are
like those the clouds cast on the canyon walls. A place like this canyon needs time to speak to you. How long do you have to spend in nature to begin to hear it? A minute? An hour? A week? Nature speaks in long sentences. We appear before the stage in the midst of a soliloquy a million years long. Even in a lifetime we hear only a few words and are gone.

As the trail nears the Third Bridge, it approaches the canyon again. We discover that the canyon has widened and is less deep. The canyon narrows again just as it approaches the bridge. The Parks Canada sign indicates that the canyon is only ten metres deep at this point. But the river is still roaring below as it cascades down a spray-alive falls and disappears again into a gloom of moss and stunted trees that cling to the crumbling walls of the canyon. The Maligne is intent on making its relentless way down to the valley floor and its union with the Athabasca River just upstream from Jasper Park Lodge.

At the Fourth Bridge the canyon is twelve metres deep and narrow. Here the river makes a sensuous green and white right turn through a knot of birch trees and is joined by a small stream nearly hidden by the moss and the bleached skeletons of fallen pines.

Below the Fourth Bridge there is no one. Here the canyon has only one wall and the trail drops to near the river’s edge. The green water froths around rocks and down stone spillways toward the Fifth Bridge. En route I come upon the first evidence of the underground river that makes the Maligne Valley so remarkable. A stream of water issues from a grotto on the far side of the river. A sign explains that this is one of the larger seepages from Medicine Lake, which is located fifteen kilometres upvalley.

Over time, cracks in the limestone bottom of Medicine Lake have been dissolved and have opened and expanded to create an underground drainage system. Water takes seventy hours to flow through the fifteen-kilometre underground channel from Medicine Lake to where it joins the Maligne just below the Fourth Bridge on the canyon. Water from this same underground network also surfaces at Lac Beauvert and Lake Annette near Jasper Park Lodge. Though this system carries a great deal of water, it is not likely big enough for a man to walk through.

For most visitors to Jasper National Park, Maligne Canyon is all they see of the Maligne Valley. Spectacular as it is, the canyon is only part of a larger wonder that is the seventy-kilometre-long, sixteen-kilometre-wide valley.
The Disappearing Waters of the Maligne Valley

One of the most amazing features in the valley, indeed in the whole park, is Medicine Lake. Early visitors to the Maligne Valley noticed that Medicine Lake filled up in the summer and then emptied in the fall and winter. It soon became apparent that the waters in the lake were draining off through an immense undiscovered underground outlet. The Native peoples were impressed enough by the phenomenon to suggest supernatural causes. Many people believe that this is the origin of the lake’s name.

Later residents were also baffled by the disappearing waters. Throughout the 1930s, a park warden named Micky McGuire experimented with ways to determine the location of the outlet. He began by dumping two truckloads of *Saturday Evening Post* into the sinkholes to determine if they could be blocked. Later he experimented with a truckload of mattresses. Nothing seemed to work. Park officials, concerned with the impact of the disappearing waters on potential fish stocks, went so far as to propose the construction of a dam on the lake. The idea foundered, however, when it was realized that the sinkholes were immense and that a huge amount of fill would be necessary to stop the water from disappearing.

It was not until 1956 that the true extent of the underground river system that drained Medicine Lake began to be understood. In that year a French scientist named Jean Corbel concluded that a sinking river system had probably been created in the Maligne Valley before the last ice age. Corbel’s hypothesis was confirmed in 1965 by research teams from McMaster University. They emptied special dyes into the lake and traced the water from Medicine Lake to the outlet stream that surfaces in Maligne Canyon and to Lac Beauvert and Lake Annette. During high water, the lake drains at a rate of fifteen to forty-two cubic metres per second. The water disappearing from the north end of the lake takes nearly three days to surface again sixteen kilometres away in Maligne Canyon.

The Maligne River has been proclaimed one of the largest known sinking river systems in the western hemisphere. Some scientists have gone so far as to suggest that the valley may contain one of the largest inaccessible cave systems on the planet. But nobody knows for sure. No one has found the entrance.

Though unsuccessful to date, the intensive search for the outlet system on Medicine Lake has led to the discovery of other cave systems in the Maligne Valley. Mouse Hole Cave and Log Hole were discovered...
by Mike Goodchild in 1967. Maligne Canyon cave, 373 metres in length, was discovered by Chris Smart of McMaster University in 1974. Located close to the Third Bridge in Maligne Canyon, this “tight and unpleasant cave” features a spring at its entrance in the summer and a thick layer of icicles in winter.

In his classic book on Rocky Mountain caving, caver Jon Rollins also notes how fragile the underground drainage systems can be and how difficult it can be to predict human impacts on these subterranean resources. A recent attempt to drill a well for the Maligne Canyon Tea House resulted in the mixing of sulphur-laden underground waters with the spring waters of the Maligne Valley. Hydrological accidents of this kind can have unpredictable effects on entire underground systems, making it very difficult to predict the impacts of development in areas where the bedrock is water-soluble limestone.

As has already been noted, the jewel of the Maligne Valley is the lake at its head. Maligne Lake is the largest glacier-fed lake in the Canadian Rockies and one of the most impressively beautiful places in all of Canada. Famous for its unique geological features which include the largest icefield in the Front Ranges of the Rockies, the largest known

MALIGNE LAKE
Because of their widespread use in tourism promotion, Spirit Island and Maligne Lake are icons of how the rest of the world views Canada. Places like these are the reason Canadians are seen by others as living in one of the most desirable places on the planet.
Photograph by R.W. Sandford.
active karst drainage system in the western hemisphere, the largest glacier-fed lake in the Rockies and one of the largest gorges in the cordillera, the Maligne Valley meets the criteria for World Heritage Site designation on its own merit. The Maligne Valley and Maligne Lake are natural wonders of global significance. While one could dwell for a lifetime on the hydrological anomalies of the Maligne Valley system, another element of wonder is the natural systems that overlay the geology of the basin.

MALIGNE LAKE AND THE BIODIVERSITY OF THE MALIGNE VALLEY

The ecological systems found on the surface of the Maligne Valley are just as complex as the subterranean systems below. The biodiversity of the Maligne Valley can be broken down into four distinct regimes. The first is the aquatic ecosystem of Maligne Lake itself. Even to this day, not much is known about the natural systems that support life in the lake. We know that Maligne Lake can be found at an altitude of 1,676 metres. We also know that, at twenty-two kilometres, it is the longest lake in the Canadian Rockies. We know that the lake lies in a glacially carved sedimentary rock basin and that the length and depth of the lake have been extended by a natural rockslide dam at its northern end. We also know that at its deepest point, Maligne Lake is ninety-seven metres deep, making it the third deepest lake in the Canadian Rockies. There is not a great deal more we know about it. Cold and deep, this lake has historically been inhospitable to life.

Although it is the largest body of water in the Canadian Rockies, fish are not native to Maligne Lake. The towering waterfalls and turbulent waters of Maligne Canyon proved too great an obstacle for fish that re-colonized the rivers of the Rockies at the end of the last ice age. Fish did not become a part of the aquatic ecosystem of Maligne Lake until the lake was stocked with brook trout in 1928. The idea at the time was to have only one species of fish in the fragile Maligne watershed. Later rainbow trout were introduced without authorization. These more aggressive trout have come to dominate the aquatic ecosystems of both the lake and the river. Though Maligne Lake has become famous for its fishing, stocking no longer occurs and the populations of trout in both the lake and the river are stabilizing around natural conditions and food supply.

Some sixty-seven species of resident or breeding birds and more than fifty species of migrants and accidentals can be found in the Maligne Valley. Many of these, including the stunningly beautiful Harlequin
duck, can be found in the shoreline ecosystem that surrounds the lake and along the banks of the Maligne River. The moist shoreline of the lake and river banks provide habitat for shrubs and plants that harbour a huge range of insect species which are the preferred food of wading birds and ducks like the goldeneye, bufflehead and mallard. Loons are also found on the lake, as are bald eagles and ospreys.

Spirit Island is part of this shoreline ecosystem. Formerly known simply as Sampson Narrows or The Narrows, Spirit Island was named by renowned Jasper photographer Harry Rowed. During the 1960s, Rowed canoed frequently to the Narrows where his spirit was moved by the islet and the grand backdrop of peaks that rose up around it. He named the tiny islet after that spirit. His stunning photographs of the islet were soon used to promote Maligne Lake in Canada and abroad, and the islet is now known as Spirit Island.

The valley ecosystem of the Maligne area is composed mainly of forests of lodgepole pine, Engelmann Spruce and subalpine fir. This ecosystem is similar to forest ecosystems everywhere in this region of the Rockies with the exception of one key inhabitant. These forests, and the meadows of the alpine ecosystem above it, are the home of one of the most rare and most spectacular of all the creatures that exist in the Canadian West, the mountain caribou.

THE MOUNTAIN CARIBOU

Elk, deer and moose are common in Jasper National Park and are often seen in the Maligne Valley. Caribou, however, are rare. Creatures of the arctic tundra, the mountain caribou that exist in the Maligne Valley and in the neighbouring White Goat Wilderness are a remnant of what must have been large herds of caribou that moved into this area of the Rockies as the glaciers retreated twelve thousand years ago. At that time, treeline was much lower and much of the Canadian Rockies would have resembled habitat caribou occupied in the arctic.

You can often see mountain caribou on the alluvial fan at the head of Medicine Lake in the spring. Later in the summer they are up high in the alpine meadows along the Skyline Trail and in the area surrounding Maligne Pass. Mountain caribou are about the size of a mule deer but are more heavily built. Adult bulls weigh up to 120 kilograms. They are distinguishable from deer by way of a number of interesting features. Caribou are the only members of the deer family in which females have antlers. The antlers of the male are like nothing else on the planet.
If you look at a Canadian twenty-five-cent piece, you can see that the male caribou has a “shovel” that extends forward from the main rack. Another distinguishing feature of the caribou is its colour. Caribou are a dingy brown in summer with uneven patches of white on the rump, belly, backs of the legs and the tip of the nose. They generally become lighter in colour in winter.

Perhaps the most remarkable feature of the caribou is its feet. The hooves are not sharp like those of a deer. They are splayed and huge. The dinner plate-sized hooves of the adult caribou allow it to travel over deep snow and to travel into regions of the mountains that its main predator, the wolf, will not go.

The mountain caribou is under threat in the Rocky Mountains. As they are creatures of the tundra, they do not compete well with elk, deer and moose. They may well have become extinct in the Maligne area were it not for the fact that they specialize in eating lichens. Lichens are crusty combinations of algae and fungi that live on bare rock and on the dead branches of trees. Caribou are the only animals that can eat and survive on tree lichens. Lichens, however, are most common in old-growth forests. In much of the Rockies, fires and logging are gradually destroying old-growth habitat. Caribou populations even inside Jasper National Park have been declining since the early 1960s. Only 175 to 200 caribou were estimated to be in the Jasper National Park / White Goat Wilderness area in 1988, less than half of the total of 450 that were estimated to be in the region between 1961 and 1973. Even the
most ambitious studies have not determined clearly the reasons for this decline. The study indicated that the major cause of caribou mortality was wolf predation. But caribou have always been hunted by wolves. The amount of predation did not explain the overall mortality rates.

It is likely that the decline of the caribou is being caused by a combination of environmental factors. Deep snow cover and the physical condition of the caribou themselves may be contributing to higher mortality. Diminishing natural habitat and climate change have also been cited as contributing causes. So has the caribou’s intolerance of human development and presence, and expanding recreational snowmobile use outside of the park. Natural population cycles undoubtedly play a role. We think we know why they are disappearing. We know that the light is going out on this species in the Rockies, but at the moment at least, we appear helpless to do anything about it. The forces that are responsible for the diminishment in population and the potential loss of this species operate largely outside the boundaries of Jasper National Park. While the local culture inside Jasper is closely connected to and highly respectful of the landscapes and ecosystems that make this northern community so worth visiting, we are learning that even a big park like Jasper may not be large enough to perpetuate all the interactions required to sustain a species like the mountain caribou.

Over time and through considerable effort, we have been able to save a great number of species and species interactions in the Canadian Rocky Mountain Parks World Heritage Site. Hopefully we will be able to stop and reverse the diminishment of loss of species and habitats that has been the hallmark of human presence on this planet since the Pleistocene, and that the reversal will take place in Jasper National Park.

The reasons for this are apparent if you have time to travel in Jasper’s remote backcountry. The Maligne Valley also offers access to one of the three great backcountry trails that make Jasper one of the most famous wildernesses in North America. It is possible to walk from the Maligne Lake road to Nigel Pass trailhead below Parker Ridge in Banff National Park. The distance is 165 kilometres. It is possible to walk from Maligne Lake back to the town of Jasper over the stunning Skyline Trail. Some twenty-five of the forty-four kilometres of this trail are at or above timberline, making it the highest trail in Jasper National Park. From the Skyline one can see in the distance the high peaks that ring the Tonquin Valley, one of the most beautiful places in all of Canada’s national park system.
All of Jasper National Park is amazing; including many of the day hikes, it offers the grand prize in wilderness travel in Jasper in the North Boundary Trail. This 179-kilometre trail begins at Celestine Lake, thirty-six kilometres north of Jasper, and ends in Mount Robson Provincial Park. The hiking options on this trail are endless. Blue Creek is one of the most interesting side trips that hikers can take on the North Boundary Trail. It allows access into the adjacent Willmore Wilderness in Alberta. Created in 1959, Willmore Wilderness Park protects 4,600 square kilometres of stunning foothill and mountain terrain. It also protects traditional packtrails that were used by Aboriginal peoples, trappers, guides and outfitters. The Wilmore is unique in that long-standing hunting and guiding traditions are still sustainably maintained within protected area boundaries. The management of the Willmore is informed by a strong local culture that holds that people should never consider themselves separate from place, a view that is changing the way we manage protected areas elsewhere in the Rockies.