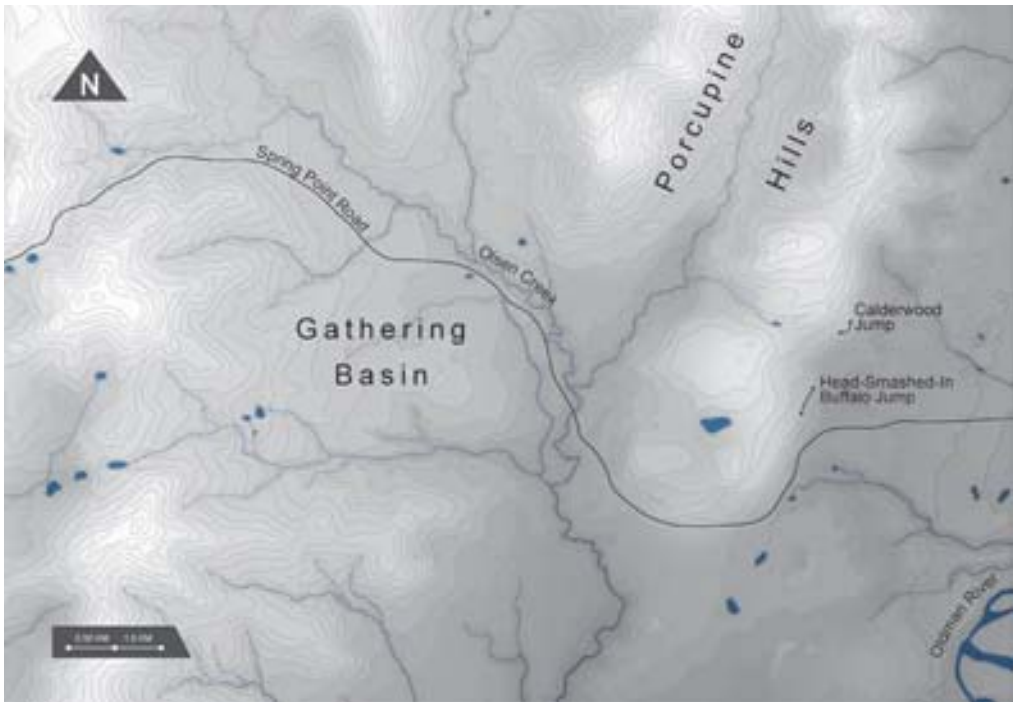
CHAPTER 4

# The Killing Field

*The Great Father of Life, who made us, and gave us these lands to live upon, made also the buffalo and other game, to afford us the means of life: his meat is our food; with his skin we clothe ourselves and build our houses; he is to us our only means of life – food, fuel, and raiment.* – Anonymous Chief to H.R. Schoolcraft, 1851

Head-Smashed-In Buffalo Jump is just one of countless places on the northern Plains where prehistoric Native Americans drove bison to their deaths. After all, the buffalo was the centre of existence for Plains people from the very first moment they arrived on the scene until the bison were nearly exterminated in the late 1800s. It stands to reason that the times and places that ancient people found to kill the largest land mammal in North America would be many and varied. But among the thousands of known buffalo kill sites, and countless others yet undiscovered, there is something special about Head-Smashed-In. Something made this particular place one of the most dependable, and hence most heavily and repeatedly used, of all the kill sites that are known. Many were used just once, some a few times, some were built for killing but never fulfilled their promise. Just a handful were used over and over for hundreds, even thousands, of years. Of these, Head-Smashed-In is arguably the greatest kill site of them all. Why?

It is not the height of the cliff that made it so lethal. Some jumps are higher; many others are much lower. It was not, presumably, that people of the region possessed greater skill or knowledge of coercing animals to plunge from a cliff, as it seems reasonable to assume that these abilities would be widespread among many Plains Aboriginal groups. Were there simply more bison in this area, more often? Probably at times there were; the Porcupine Hills, rich in rough fescue and




*The Olsen Creek valley west of Head-Smashed-In forms the main basin behind the jump, with smaller tributary basins in valleys to the north and south of the creek. (Courtesy Royal Alberta Museum)*

blue grama grass, a great attraction. But at other times there would be none anywhere in the region, possibly for extended periods.

Casual visitors who stare up at the imposing bedrock cliff and imagine hundreds of bison plunging to their deaths – the final stanza of an elaborate symphony that played out long before that final drop – see the cliff where the killing took place. It is the focus of all the drama and excitement when conjuring up a buffalo jump. It is the brink of death. It is what most visitors to the site see, and it is all they see. The magic that made Head-Smashed-In perhaps the most long-lived and successful buffalo jump of all time is not found at the cliff, but lies hidden in the grass-covered rolling hills situated behind and to the west of the buffalo jump.

Yet the cliff is just the very end of a story as immense in scope as the vastness of the country in which the story unfolded. Picture yourself at the very end of a horse race, eyes fixed straight ahead at the finish line. Horses thunder past you. You see who wins and who loses. But you don't see any of what got them there. You don't see the blast out of the gate, the jockeying for position, the brilliant moves and

the miscues, the strategies leading to success and to failure. Today, silence envelops the sandstone cliff at Head-Smashed-In, broken only by the rushing of the wind, the cries of hawks, and the piercing chirp of yellow-bellied marmots. Gazing at the sheer face of rock, steeped in silence, you are witness to the finish line. But you have missed the race. The story has already unfolded. It must have, otherwise there would be no finish; no ten-metre-deep layer of smashed bison bones lying ghost-like beneath the cliff, no UNESCO World Heritage designation. What only a few lucky visitors to Head-Smashed-In ever see is the incredibly faint evidence of an elaborate network of knowledge, work, and skill that went into making all this come to pass. This evidence lies tucked away, almost imperceptibly, in the rolling shortgrass prairie to the back of the cliff.

## Finding Bison

*The Indians who reside in the large plains, make no subdivisions of their territory; for the wealth of their country consists of buffaloes and wolves, which exist in plenty, everywhere among them.* – Daniel Harmon, 1800–19

The story of Head-Smashed-In begins many kilometres away from the jump, and many thousands of years ago, in a magnificent bowl-shaped depression that lies behind the cliff. It is a place we have come to call the gathering basin. You won't hear that term used for most buffalo jumps, for most don't have one. They have what you might call a collecting area, from which animals were rounded up and moved towards the kill. Typically these areas are flat or gently rolling prairie that happen to lead to a steep drop or sometimes an upland plateau or mesa with sheer edges. But the collecting area at Head-Smashed-In is a natural depression, a huge basin totalling some forty square kilometres in size. There is one main basin located directly behind the jump-off. It extends west toward the mountains some ten kilometres before the land finally rises and you climb out of the bowl. Then there are a number of tributary basins feeding into the main basin. These are mostly to the north side and are formed by a series of ridges and valleys, like fingers of a hand, that meet up with the main basin. These finger basins added yet more territory from which bison could be harvested to bring to the jump, and more complex topography that the hunters could use to their advantage. A small stream, Olson

Creek, drains the main basin, providing water for hunters and bison alike and, importantly, brush.

There are a few great people in the research and study of buffalo jumps. The Dean of them all is George Frison, now professor emeritus at the University of Wyoming. George not only wrote at length about excavations he conducted at numerous buffalo jumps in the American West, he was also one of the first (and still one of the only) people to give thought to how these elaborate traps worked. Much of his insight into this world came not from academia but from a personal life of hunting large game animals and from hanging around bison herds – hobbies that fostered a deep understanding of animal behaviour, the single most important ingredient to a successful buffalo jump.

I once brought George to Head-Smashed-In. Of course we walked around the cliff and the kill site below where the great slaughters took place. But then we walked up above the cliff, heading west, following the land uphill for the first few hundred metres until we reached the crest where you can see down into the enormous expanse of the basin, where the swell of the land ripples out before you like a churning ocean. I was young, green, and standing next to my idol. Desperate for pearls of wisdom, you can imagine that I haven't forgotten his words. Toothpick in mouth, pocket-protector stuffed full of pens in his snap-buttoned western shirt, with crow's feet–wrinkled eyes that had seen more buffalo jumps than any person on earth, George surveyed the scene unfolded in front of him. Now *that*, he said, is a gathering basin. George was never long on words. In truth, what George probably loved most about Head-Smashed-In was the ten-metre-deep bonebed chock full of artifacts and bones, for this is where archaeologists traditionally get their hands dirty and grub out the evidence they then use to weave their intricate stories of the past. But he had seen enough to know that the rich bonebed only existed because of the pure beauty of the land stretched out before him, a land almost fashioned by the Creator to bring bison to their deaths.

What George Frison and I saw that day was the backbone of what is probably the most successful buffalo jump on the continent. The gathering basin is the substance and structure that held it all together and made everything work. To be sure, there is much more that must fall into place for the drama to unfold, but without the magnificent landscape that lies behind the jump the story would be much more pedestrian in nature. It perhaps would be just a typical kill site where

animals met their deaths but a few times. However, the sheer size of the basin at Head-Smashed-In would mean that there was always a good chance of finding bison in this country. The great variety of topography would give the hunters a formidable edge in making sure that at least some of the animals could be led to the brink of the cliff.

## Drive Lanes

*From this entrance [of the pound] small sticks are laid on each side like a fence, in form of an angle extending from the pound; beyond these to about 1 1/2 mile distant. Buffalo dung, or old roots are laid in heaps, in the same direction as the fence.* – Mathew Cocking, 1772, cited in *Ewers,* 1968

I have often been asked by young students doing an assignment what it's like to be an archaeologist, and especially, what were some of the most important discoveries I have made. The expected answer, I suppose, is to recount the discovery of some spectacular artifact or truly significant site that knocked my socks off, changed our thinking about the past, and perhaps made headlines. I suspect I disappointed the interviewers. I haven't found the Holy Grail, or Atlantis, though I'm not averse to the prospect. Carefully I try to explain what makes a eureka moment for me, and the one I often cite happened one clear, warm summer day at Head-Smashed-In.

*When you look southwest into the basin, cattle grazing across the main channel leading toward the kill provide an idea of how bison might have looked when approaching the jump. (Courtesy Royal Alberta Museum)*

It was early in my career at Head-Smashed-In, about 1984. I had finished up with some of the required work I had to do in the areas where we were going to build the new interpretive centre (more about this later). You can appreciate that a lot of archaeological testing had to be done in the areas that were going to be disturbed by construction of the building, the parking lot, roads, and so on. How would it look if a UNESCO World Heritage site was partially disturbed by construction of the very facility that was going to interpret it? So with some of this work out of the way, I thought I would take a break and head off for a peaceful walk into the back country behind the jump. This is where I had one of my epiphany moments, the one I relate to inquisitive students researching their first term paper.

I knew there existed an extensive system of drive lanes at Head-Smashed-In, that fabulously complex network of small piles of stone that stretch for many kilometres into the wide basin behind the jump. I had read about them and even briefly seen them from one place in the basin where you can drive a car close. But I had never explored them and, more importantly, never thought about them. On that day, I headed off into the country where the real story of Head-Smashed-In took place, where the race to the finish line was held.

It was a beautiful summer day. The sky was absolutely cloudless, a cobalt blue across the horizon. The wind was strong, as almost always, but not overpowering. You don't sweat on windy days, no matter the temperature, but you do get dirt packed into every corner of your body. And grasshoppers. As you walk into the wind you flush the grasshoppers from the grass in front of you and they are blown back, slamming into your body. It freaks you out at first, but you get used to it. After years of experience, you are only bothered by the ones that drop down your shirt or hit you in the face – especially an open mouth or eye. I've had many of both, and have sat in a doctor's office having body parts of grasshopper picked from a bloodshot eyeball. Then there was the time that a grasshopper, defying all laws of physics, managed to drop into the tiny opening in my can of beer while my crew and I headed for the local swimming hole, but I'll spare you the gruesome details of what happened next.

On that blue-skied day I walked in a gentle zigzag pattern from the top of the cliff, thinking I would soon intersect the small rock piles, called *cairns,* that surely must lead directly to the jumping off point. But I found nothing. The land behind the jump rises gradually

for maybe half a kilometre and then crests, on the spot where George Frison and I had stood. From this point you get a spectacular view: west into the rolling Porcupine Hills with the peaks of the front range of the Rockies poking up from behind them, east towards the cliff and the seemingly endless prairie beyond. South lies a ribbon of green where the Oldman River waters this desiccated land, and to the north you follow the crest of the Porcupines like an enormous backbone of the land itself. I reached this crest having seen nothing of the lines of rock and wondered if I was not properly attuned to seeing them. Perhaps I had walked right by them. After all, the few that I had seen had been notable for their nearly inconspicuous nature. These are not true piles of rocks, as sometimes shown in antiquated museum displays or in old encyclopedias. They are more like small circular platforms of rocks, gathered together but not piled up, and now half buried by the dirt that has drifted over them in the centuries of disuse. As I began the descent down the other side into the basin I searched the ground, thinking I must have missed the drive cairns.

Ranchers who run cattle throughout the basin alternate them into different pastures so as to stagger the demand on any one section of prairie. How high the grass is in any one place is pretty much a result of how recently cattle have been in there grazing – that and the annual rainfall. Because grass directly affects the visibility of the ground surface, cairns will show up best in areas recently grazed. My descent into the basin was taking me into parts of the prairie where cattle were grazing. They hurried around in front of me, giving me plenty of walking space and themselves greater social comfort. The grass was cropped very short. I could see almost every rock that poked even a little bit above the sod. Archaeologists train their eyes to look for something out of the ordinary, a pattern where there shouldn't be one. Nature occasionally makes patterns, sorting rocks, sand, and soil according to processes that are understood and predictable. People do the unpredictable, like gathering large, melon-sized stones and putting them in small circular clusters, one after another. Nature doesn't do this.

Walking down the slope into the persistent wind, grasshoppers smacking into me, I began to see small circular arrangements of rocks. Fist-sized rocks, melon-sized, occasionally a little larger, five to ten of them pushed into a tight group. The clusters were not here and there, one to my right, another to my left. They were in a line stretching out

*When the grass is heavily grazed, the small rock clusters of the drive lanes show up as a line of faint hummocks on the land, as seen here just to the left of the person standing. (Courtesy Royal Alberta Museum)*

in front of me. With the high sun I could just make out slightly raised tufts of grass in the distance, heading west down into the basin, until I lost them in the endless stretch of prairie. The small rock clusters catch and hold a tiny bit more moisture and offer slight protection from the wind, so grass tends to grow a little thicker around them. I walked up to each one in turn, counting the paces between each. I stood over each cluster and looked down at the seemingly insignificant little gathering of rocks. Then I walked to the next, looked ahead to the others in front of me and back to the ones I had just passed, making a line out of them in my mind or, rather, realizing that someone else had made a line out of them long before my leisurely stroll on that warm afternoon.

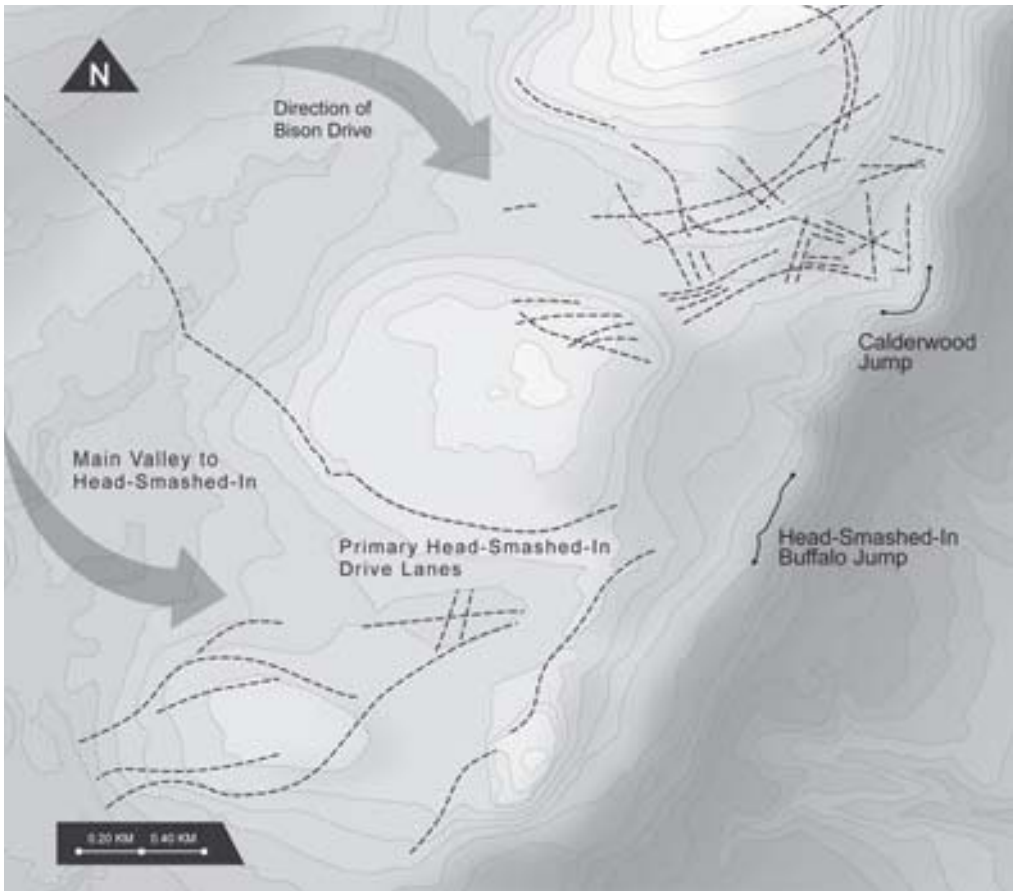
At first I was just relieved I had found them, that I wasn't somehow deficient to colleagues who had come before me. But as I continued to walk up to each cairn in turn, a powerful feeling came over me. It was a strange blend of exhilaration and yet a creepy tingling. It was not caused by the sudden mind explosion that occurs when you think that you have discovered something. It was just the opposite. I realized that I didn't have a clue what was going on.

My epiphany didn't come from finally intersecting a series of rock piles; any rookie eventually would have stumbled on to them. It came from realizing that I was walking along a line of stone piles laid out thousands of years ago by groups of people who had a plan in mind

as to where each pile would go and why. I had no idea what these people were thinking when they did this. Many years later I thought about an often-cited comment on my profession, that investigating the past isn't a search for answers, it's a search for questions. Never was this more true than walking alone on that sun-drenched day in the basin behind Head-Smashed-In.

As I surveyed the land in front of and behind me, watching the line of rock cairns swerve ever so slightly up on a low hillside, then down just a bit into a minor valley, levelling out on a straight plain, I realized that those who manufactured this arrangement were not simple buffalo hunters trying to coax crazed bison to the edge of a cliff. They were ancient architects of the landscape. It was as if, impossibly, they were able to levitate above this immense country and view it from above, detecting every little nuance of change in the roll and sway of the land, figuring out where each rock pile would have to go in order to control the animals. The people who orchestrated this slaughter had laid out maps on the landscape that had at their core some great plan for directing the movement of wild beasts far more massive and powerful than themselves. The evidence of their engineering, a reflection of an enormous knowledge of bison, was lying

*As you look west into the gathering basin, you can see the rock cairns spaced about every five metres. (Courtesy Royal Alberta Museum)*




*Brian Reeves and Maureen Rollans mapped the drive lanes behind Head-Smashed-In and the Calderwood jump. The true magnitude and complexity of the lanes can only be appreciated when seen like this from above. (Courtesy Royal Alberta Museum)*

right there at my feet. The humbling thought came to me that this system, for that's truly what it was, is something that was virtually unknown to us.

The reason this day was so memorable for me was precisely because I knew I was looking at evidence for which the archaeological community had no explanation. It was a book written long ago that we couldn't read. I remember smiling broadly as I surveyed the small rounded mounds disappearing into the distance of the Plain. I had walked off in search of answers and instead had found a barrage of questions: Why is this little group of cairns much closer together than others? Why does this line seem to veer uphill, while the one over there angles downhill? Why is there a broad, gentle sweep to the north in this lane? Why do some of the cairns have many more rocks than

others? Was all of this built at one time, or over a long period of trial and error? It was truly exhilarating to discover that I didn't have the answers to any of these questions. Why? Ask any scientist and I think you'll get the same answer. It is the thrill of the unknown, a puzzle that has you stumped, a challenge to explain the unexplained. Picture a chemist or physicist in a lab conducting an experiment. Suddenly things don't go as planned. A result appears that was completely unexpected. I'll bet you most of these scientists step back, smile broadly, and whisper in a low voice, "Well, how about that!"†

† The great science writer Isaac Asimov once said, "The most exciting phrase to hear in science, the one that heralds new discoveries, is not 'Eureka!' (I found it) but 'That's funny …'"

Alone in the basin that day, I knew that I stood among the remains of a huge construction project involving the collection and careful placement of thousands of individual rocks. Each one was selected for certain size and weight and placed in a spot deemed just right by a team of people who must have discussed and debated how the map was to be made. What started off as simple clusters of stone had morphed into a mental blueprint of complex, group-based decision-making on a scale and for a purpose that had mostly eluded consideration by archaeologists, anthropologists, animal ecologists, and pretty much everyone else. I knew that day that there was much to be learned from careful scrutiny of these lines of stone, and I resolved that I would dedicate some of my efforts to trying to tease out the mental maps that ancient people had made and, thankfully, left behind.

Buffalo jumps had been studied by archaeologists for more than fifty years before my first visit to Head-Smashed-In. It was well known that drive lanes of some kind existed to guide the bison toward the impending trap. We knew they were there but knew almost nothing about how or why they worked. Why was precious little known about these ingenious lanes of rocks that made the great kills possible? The answer has much to do with what archaeologists have traditionally considered important evidence of the past.

## Points in Time

Our knowledge of virtually every buffalo jump that has been professionally studied comes from excavations at what is known as the bonebed – the thick, tangled, and often deep layers of discarded and broken buffalo bones found at the base of a cliff or steep drop. This is what archaeologists refer to as the rich part of the site, where artifacts are in abundance. In particular, this is where great quantities of the

points used to tip lethal weapons are typically recovered. Stone points, including those used on arrows, long darts, and spears, are much prized by archaeologists, especially those working on the Great Plains. The reason for this obsession is that, as I mentioned earlier, points are one of the few artifacts that seem to change with time and with different cultural groups. The great majority of artifacts that people made over the past millennia – stone knives, drills, scrapers, hammer stones, bone beads, and awls – often exhibit very little difference over great periods of time. Thus, finding a stone scraper at a site may tell you very little about when the site was occupied and by what people. Points are a more sensitive, or as we say, a more diagnostic artifact.

Finding a certain style of small arrowhead may indicate that a site was occupied about twelve hundred years ago by the probable ancestors of the Blackfoot people. A different shape of arrowhead may suggest it was made by Assiniboine people some five hundred years later. Few other artifacts have this diagnostic ability, so you can imagine archaeologists love finding them, especially in great numbers. Points are made by human beings, not machines, and are thus subject to idiosyncratic characteristics of skill, taste, history, and, of course, the nature of the stone itself. Each point is unique. Therefore if you only find one point, you don't know if you are looking at the normal or typical point produced by a particular culture. What if you find two and each is somewhat different? Is one of them more typical of what most of the people in that group produced, and, if so, how would you know which one? But if you find ten points and six or seven are roughly similar and a couple differ from the majority, then you may have pretty good grounds for saying that the six or seven points are in fact representative of what a certain group produced at a certain time. You then have a style of point, an artifact distinctive of a people who lived and worked together, who shared ideas about how tools should look. Once the style is dated, we know when these people lived. This is how archaeologists build knowledge about the past.

You can see why archaeologists like to recover lots of points. Where better to do this than at a site where the primary activity was killing animals? The fall or drop at most buffalo jumps was probably not in itself fatal for most of the herd. Many would have suffered broken bones, shock, and concussion. For some animals, their wounds would have been debilitating, allowing the hunters to approach safely and dispatch the wounded ones. But many, in a state of panic, would


soon be on their feet and either running or in a mood to fight with their huge heads and dangerous horns. The hunters needed great skill, daring, extreme care, and a lot of weapons to kill off those that came over the drop relatively unscathed. And since points are associated with weapons, lots of them tend to be found at buffalo jumps.† Some, like Head-Smashed-In, have yielded literally tens of thousands, so you can appreciate that archaeologists have been attracted to the bonebed portion of jumps, excavating large samples of points which in turn permit a great deal of analysis about when the site was used and who used it. While these excavations have been critical in building up our basic knowledge of the ancient people of the Plains, it has come at a cost.

That cost has been a relative avoidance of other parts of a buffalo jump site. You can pretty well bet that you aren't going to recover many (if any) points spending days following, mapping, and studying the lanes of rocks leading to the jump. In fact, it's quite likely you won't find a single artifact of any kind. People didn't live, work, and leave remains behind in the back country that led to the jumps – to do so would leave the refuse and smell of humans in precisely the area where you don't want the herd to detect them. This detritus could ruin future bison drive attempts.

There is a stereotype that archaeologists are associated with stuff. We dig things up, collect things, analyze things, and cause things to be put in museums. These activities have been a long tradition in our discipline. Not too long ago, to design a research project that didn't involve the recovery of stuff (artifacts), and to seek funding for it, was

*Finding a single arrowhead at Head-Smashed-In is exciting but tells us little about the people who used the jump. Finding a number of similar points suggests that a distinct style is represented, possibly indicating a specific group of people. (Courtesy Royal Alberta Museum)*

† There are suggestions that hunters stationed along the drive lanes may have fired arrows into the stampeding animals, not intending to kill them, but to keep them panicked and running toward the trap. At two buffalo jumps in Idaho, arrowheads were found between the drive-lane cairns, supporting this contention. The practice, however, is not well documented and seems to have been rare.

*Sometimes artifacts tell remarkable stories. This front leg bone of a bison has an arrowhead still embedded in the bone; which means that the animal was killed by hunters waiting at the kill site. (Courtesy Royal Alberta Museum)*

to risk rejection of your project and funding. Thankfully, this attitude has changed considerably in the past decades. But the history of this tradition helps explain why even as late as the 1980s we still knew very little about how a buffalo jump worked. For decades, the rich bonebeds of buffalo jumps have attracted archaeologists, like metal filings to a magnet, while the pieces of the story that made these bone piles possible lay untouched in the windswept prairie slowly gathering dust. It seemed time to rectify this situation.

My quest to know more about how ancient hunters managed to move bison from their grazing areas to the edge of a deadly cliff cast me into one of the most rewarding and fascinating journeys of my career. It sent me in search of information about bison, their behaviour, biology, and ecology. The more I learned about these amazing animals, the more I realized early hunters had known all this and more long before me. The great respect I now hold for the knowledge and skill that Aboriginal people had in pulling off a buffalo jump didn't come from excavating the bones and tools left at the kill site – these are merely the detritus of people's knowledge. Rather, my respect deepened as I began to comprehend the complete understanding and manipulation of bison that Native people displayed in their laying out of an ingenious trap.

## Ancient Knowledge

*It may truly be said that they exist on the buffalo, and their knowledge of the habits of this animal is consequently essential to their preservation.* – Henry Youle Hind, 1856–57

It is terribly hard for us to even begin to try and imagine what it must have been like to be born into and raised all your life in a society that existed on the Great Plains, say one thousand years ago. We have no experience we can draw upon that would help place us in this world. In the abstract, however, we can consider for a moment a life in a small tribal hunting society. You were born and raised in a small camp made up of perhaps ten related families (roughly eighty people) who travelled and worked together and occasionally met with other related family groups. From the first thing you can remember as a child until now, the world you know revolves around hunting wild animals. The first words you remember are those of your family discussing the hunting events of the day and the plan for tomorrow. As a toddler, a tiny bow and arrow is placed in your hand and you are encouraged to chase after the squirrels that scurry around camp. From the first solid meal you ever taste until the final food brought to your deathbed, the flesh of wild game is the basis of your diet. Imagine times of desperate hardship when your family group has nothing to eat until another animal is killed. Take that one child and repeat the same upbringing about twenty years later, then again in another twenty years, and so on for hundreds of generations.

Although we can't really imagine this world, we can perhaps in the abstract appreciate what thousands of years of continuous reliance on hunting wild animals would produce in the way of accumulated knowledge about the nature and behaviour of the animals upon which these people's lives depended. There are many things that ancient people had to know to survive – where to get stone for tools, how to make fire, how to build shelters – but these pale in comparison to one single absolute: in a land where no plants were ever domesticated, people had to be successful hunters, and to do this they had to have a total understanding of the animals they pursued.

The remarkable thing is not how much Aboriginal hunters understood about the game that they hunted. What else would you expect after thousands of years of having the life of your family and of your people depend on acquiring, remembering, and passing on

*The close quarters of Native camp life offered ideal opportunities for young people to learn the traditional ways of the culture. (Courtesy Head-Smashed-In Buffalo Jump)*

this knowledge? The remarkable thing is how long it has taken the rest of us to appreciate the depth of Aboriginal knowledge about game animals. Scientists researching wild animals today are still discovering things about animal behaviour that Native hunters knew and manipulated thousands of years ago. Let me give an example.

The buffalo pound was an Aboriginal method of killing large numbers of bison similar to a jump in nearly every respect except one: the final kill location. Jumps ended at a steep drop, and pounds (an archaic English term for an enclosure) ended in a circular wooden corral. Pounds tended to be located in the lightly wooded areas that surround portions of the Great Plains, where ample wood was available for construction and where the sharply broken country needed for a jump off was absent. The method of rounding up and moving bison along drive lanes was essentially the same for both.

Stop and think for a moment how a wooden corral built one thousand years ago actually served to contain a charging, panic-stricken herd of animals weighing five hundred to nine hundred kilograms each. In days long before posthole augers, pile-drivers, pressure-treated timber posts, how did Native hunters manage to build an enclosure that could contain stampeding herds of bison? And not just a few animals; eyewitness accounts mention hundreds of bison being driven into a corral at a single time.† The answer is simple: by tricking the herds into believing there was no escape. The best they could do was to gather up fallen timber, chop down a few moderate-sized trees, pile and lean logs up against each other, and in the end create a circle of wood that any self-respecting bison could demolish

† Henry Youle Hind reported two hundred and forty bison killed in a pound over several days. Father De Smet is said to have witnessed six hundred brought in. Peter Fidler wrote, "The Pound being quite full laying 5 or 6 deep one upon the other, all thro which in the whole was above 250 Buffalo." But the most astonishing account is Robert Rundle's, in 1841: "Passed near an old buffalo pond, shaped 3 circles, at which my guide 'Friday' was present at the capture of 2450 & left; the Indians still killing them."

*With over thousands of years of observing buffalo, it is little wonder that Native hunters knew everything about that animal that sustained them. Painting by Alfred J. Miller. (Courtesy: Library and Archives Canada/Acc. No. 1946-109-1, Gift of Mrs. J.B. Jardine)*

with a single thrust of the head. So how is it that we know (again from wonderfully descriptive historic accounts) that Native people routinely slaughtered countless bison while they milled around inside these rickety pounds, seemingly unable to escape?†

Switch time and place to Elk Island National Park (EINP) in central Alberta. A lovely park more famous for bison than its namesake, EINP has been managing bison for decades. The staff are among the finest authorities on this animal in North America, and the park routinely supplies seed herds of wild bison to reintroduction ventures all over the world. For a number of years I sat on a science advisory committee for EINP and so got to see first hand some of the workings of bison herd management. For the most part, a hands-off approach is taken with respect to the herds, letting nature take its course. An exception is inoculation for disease, and this requires rounding the animals up and containing them. Of course enclosures are built today of massive materials totally unavailable to ancient hunters, but you still have to get up alongside each animal to deliver the shots. For this you need chutes, or squeezes, where the animal can be held almost motionless for a few minutes, constraining them in a very tight, small space. It will come as no big surprise that bison don't much like this. Panicked, they buck and kick and twist their horns into the wooden or wire fence chutes and with their awesome strength can sometimes

† It is difficult to know just how strong ancient wooden corrals were, but one archaeological site in southern Alberta illustrates how pounds were sometimes strengthened. The Ramillies site, situated in the treeless prairie, used a small natural depression as a pound with the opposite wall as the entrance fortified with piled boulders.

tear them apart and often injure themselves. Through good old trial and error, EINP herd managers discovered that if you made these spaces solid the bison were far more settled. If you take away the visibility of looking through the slats of the chutes to freedom beyond, the animals did not perceive a means of escape and they were far more manageable. Replacing page wire and rail fences with solid walls of fencing at Elk Island National Park served to create this illusion.

Illusion is the key. Returning to the question of how bison pounds of a thousand years ago managed to restrain an angry herd, a few citations from Euro-Canadians who actually saw these pounds in operation, and those who interviewed traditional Aboriginal people, illuminate the ancient knowledge.

Grinnell reported on the Cheyenne:

*In the olden time, before they had horses, the Cheyennes … also drove them [buffalo] into pens. Such enclosures were usually built under a cutbank or bluff, which formed one or more walls of the pen; the other sides were merely bushes or branches stuck in the ground … Though the animals might readily break through the walls of bushes, they seldom did so, for they were afraid of them, and merely ran round and round within the enclosure until exhausted.*

John Palliser described a buffalo pound as being "on a slope, and the upper part of the fencing was increased in height by skins stretched on poles, for the purpose of frightening the buffalo from jumping out. This is not needed at the lower part of the enclosure, as the animals always endeavour to jump up-hill." From interviews with Blackfoot at the turn of the twentieth century, Grinnell reports that the pound "might be only a fence of brush, but even here the buffalo did not break it down, for they did not push against it, but ran round and round within, looking for a clear space through which they might pass."†

In one of the most detailed descriptions of the workings of a pound, Grinnell again provides compelling testimony of Aboriginal knowledge of the habits of the buffalo:

*When it [the pound] was full, or all had entered, Indians, who had lain hidden near by, ran upon the bridge, and placed poles, prepared beforehand, across the opening through which the animals had entered, and over these poles hung robes, so as entirely to close the opening. The buffalo will not dash themselves against a barrier which is entirely closed, even though it be very frail; but if they can see through it to the outside, they will rush against it,*

† Victims of their own success, buffalo pounds did occasionally collapse under the strain of their bounty. John Audubon reported that "so full does [the pound] become occasionally that the animals touch each other, and as they cannot move, the very weight against the fence of the pen is quite enough to break it through; the smallest aperture is sufficient, for in a few minutes it becomes wide, and all the beasts are seen scampering over the prairies, leaving the poor Indians starving and discomfited."

*and their great weight and strength make it easy for them to break down any but a heavy wall… Sometimes, if the walls of the pis'kun [pound] were not high, the buffalo tried to jump or climb over them, and, in doing this, might break them down, and some or all escape. As soon, however, as the animals were in the corral, the people – women and children included – ran up and showed themselves all about the walls, and by their cries kept the buffalo from pressing against the walls.*

Eyewitness to a Cree buffalo pound in the 1850s, Henry Youle Hind likewise recorded the role of women and children in helping to confine the frantic animals in the pen, but this time using hides to block themselves from view: "with the utmost silence women and children on the outside hold their robes before every orifice until the whole herd is brought in." Hind also provides gripping testimony as to the consequences of failing to make the walls of the pound look solid. He recounts an event where some two hundred buffalo were being driven into a pound when a "wary old bull" suddenly spied "a narrow crevice which had not been closed by the robes of those on the outside, whose duty it was to conceal every orifice." The bull made a dash for the tiny opening, smashed through the pound wall, and the entire herd "ran helter skelter through the gap, and [disappeared] among the sand dunes."

You can see the pattern. Ancient wooden corral structures were draped with bison hides, probably with the darker hair side facing in, creating the appearance of a solid surrounding wall. The illusion is complete. Animals thundering into the corral saw only solid darkness surrounding them, no visible escape, and historic records show that they simply circled around in the confines of a structure that they could easily have destroyed.† Managers of modern bison herds have rediscovered aspects of the animal's nature that were known and manipulated for thousands of years by Native hunters.

I sometimes wonder how Aboriginal hunters learned such a fact about bison. Since people were without the horse for at least twelve thousand years, stalking and killing animals far larger, much faster, and immensely more powerful than themselves, where do you get an opportunity to work up close to a herd and discover this behavioural quirk? I can only imagine that it came through long periods of observation followed by trial and error. As people first began attempting to drive bison, they must have used certain landscapes as natural traps, cornering them in narrow canyons and valleys. They may have

† Weasel Tail, a Blood Indian, told John Ewers of an additional incentive to keep bison from trying to break through the pound walls: "All around the corral stakes of cottonwood or birch were laid over the lowest crosspoles. Their butt ends were firmly braced in the ground outside the corral. Their other ends projected about 3 feet or more inside the corral at an angle so that the ends were about the height of a buffalo's body. These ends were sharpened to points, so that if the buffalo tried to break through the corral, after they had been driven into it, they would be impaled on the stakes."

*This model of a buffalo pound shows hides draped over the edge of the wooden corral to make it look solid. (Courtesy Royal Alberta Museum)*

noted that trees or brush in the valleys helped contain the herds and began adding cut brush to the natural vegetation, laying cut branches between existing trees, eventually giving way to the full construction of crescent-shaped wooden enclosures. Presumably it became apparent that herds were tearing their way out through gaps in the walls. Perhaps people piled more wood in places and noticed that where the pound looked more solid the bison tended not to attempt an escape. After using increasingly greater amounts of wood, one day someone, whose name is long lost, had the idea that you could substitute hides for wood to create the same solid appearance. With a few tries, it became clear that hanging hides all the way around the corral had the desired effect.

## Back to the Drive Lanes

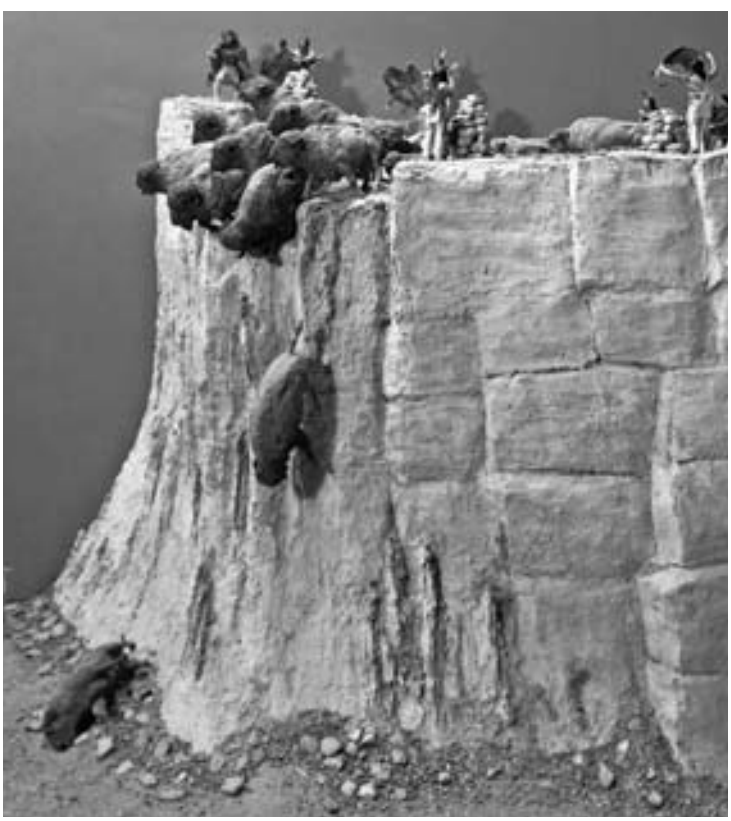
*On each side of [the pound] entrance commences a thick range of fascines [bundles of sticks], the two ranges spreading asunder as they extend, to the distance of 100 yards … but the fascines soon become more thinly planted, and continue to spread apart to the right and left, until each range has been extended about 300 yards from the pound. The labor is then diminished by only placing at intervals three or four cross-sticks … these extend on the plain for about two miles, and double rows of them are planted in several other directions to a still greater distance.* – Alexander Henry, 1809

I remember when I was young seeing antiquated museum displays and entries in kids' encyclopedias that showed the final moment of a buffalo jump – animals stampeding toward the edge of the cliff, hunters lined up on both sides of the herd. The hunters were always depicted waving buffalo hides, firing arrows, and standing alongside and behind big piles of rocks. These were towers of rock, often coming up to the chests of the hunters, built with huge boulders. I gave these images no particular thought at the time. But I did when I was out walking in the Head-Smashed-In gathering basin, looking at the small clusters of rocks that didn't rise any higher than the tops of my shoes. Something was wrong. What happened to the towers of rock?

I started bringing my crew back into the drive lanes. We began a search of these rock lines, walking parallel to the small piles, scouring the ground for more rocks. It seemed logical to assume that the piles we see today must have been higher in the past, that the ravages of time, years of neglect, and disturbance by grazing cattle have knocked them down to their current height. If this were true, then we should find a scattering of rocks located near each of the cairns. What we found was just the opposite. The immediate area surrounding most of the rock piles was relatively free of other rocks. We only started seeing the expected amount of surface cobbles as we moved five to ten metres away from each cairn. I should note that surface rocks are common here, as they are over most of Alberta.

The rolling hills of the Porcupines were overrun by mighty glaciers during the Ice Age. These massive sheets of ice brought with them all kinds of debris, including huge amounts of rock picked up by the ice as it ground its way across central and western Canada. The rocks were dropped all over the landscape, often forming a blanket of stone on and just below the topsoil that covers much of Alberta.

As a result, it is perfectly normal to see the tops of rounded cobbles sticking out of the sod everywhere as you walk the hills and plains around Head-Smashed-In. There was no shortage of rocks to choose from when going about building stone cairns. Most of the time, you would only have to scour an area of a few metres to find enough rocks to make a decent pile. Our discovery of an area relatively clear of other rocks surrounding each of the drive-lane cairns started to make sense. Ancient Aboriginal people had scoured the area just as we had, gathering the rocks that lay closest to the place where they wanted to build a cairn. After all, why haul heavy rocks any farther than you have to? They left behind a pattern we can still see today – a zone parallel to the lanes that has been relatively cleared of rocks. But this realization came with a further conclusion: there was no scattering of displaced rocks around the piles that would confirm that they had once been much taller. Where were the rock towers of my youth?



*This portrayal of a buffalo jump shows huge rock cairns at the end of the drive, unlike what we find today. (Courtesy American Museum of Natural History)*

*Crew member Bob Dawe examines excavations along the drive lane where only low platforms of rocks were found. Rocks are concentrated in the cairns and are relatively rare within several metres of each stone pile. (Courtesy Royal Alberta Museum)*

If the rock piles hadn't been scattered over time, perhaps they were gradually covered up by drifting soil and we were just seeing the tops of once higher cairns. Investigating this scenario required us to dig, which we did in the mid 1980s. Before this period, I don't think any archaeologist had ever excavated a drive-lane cairn at a buffalo jump. I'm sure the general reaction of my colleagues would be, why waste your time digging around a simple pile of rocks? But I wanted to know what had happened to the other rocks, and I was running

out of ideas. So we hauled some excavation gear into the gathering basin and selected a short section of a drive lane, about five cairns in a row, to dig. I didn't want to disturb the existing rock piles if I didn't have to (archaeologists are always conscious of the fact that they can never undo their work, putting things back exactly as they were; nor can we imagine the kinds of analyses that might appear in the decades to come). We left all the existing rocks in place but stripped the soil away from between them and from the sides of the cairns. In a sense we isolated each cairn on a little pedestal of sod as we dug away the surrounding earth. If the small clusters of rock visible today were merely the tops of larger piles, we should have found layers of more rock underneath the surface stones. We didn't.

Under the surface layer of rocks was nothing but dirt. Now I had to wrestle with the looming reality that the small platforms of rock, thousands of them spread across the Head-Smashed-In gathering basin, were never any bigger than what we could see sitting on the surface. It just didn't seem to make any sense. From even a short distance away we had enough trouble seeing them ourselves. How could these innocuous little rock clusters have played any role in directing the movement of such a massive and powerful force as a stampeding herd of bison? I didn't know a lot about buffalo at the time, but I thought I knew enough to realize that these rock piles were insufficient to accomplish the task with which they have been credited. Clearly, I was missing something. Finally I did what I should have done long before. I started reading a great deal from the one source that might hold crucial clues – the literature written by those lucky few who actually saw the last of the bison drives in operation.

It's no wonder that Stephen Ambrose's book and the subsequent television series about the Lewis and Clark expedition were hugely popular. It is quite simply a great story. But read the original; it's even better. There is nothing quite like the day-by-day accounts of people forging a new country, especially an already inhabited one. There is no long-term plot in these early journals, no central storyline, only a matter-of-fact retelling of the day's events. Many days are mundane, others are incredible, and neither you nor the author has any idea what the next day will bring. The journals of the earliest explorers to cross the Great Plains make for compelling reading, and they are especially pertinent here because some of these travellers encountered buffalo-hunting cultures still practising traditional methods of rounding up

and moving bison. When it comes to opening windows into the past, it is hard to beat these sources.

Of course contemporary Native people can be an invaluable source of information about traditional bison hunting. But knowledgeable elders freely admit that much has been forgotten, as can be expected given that it has been a century and a half since most of this knowledge was last put to use. Vivid memories persist of the uses of the buffalo, of the importance of the great hunts to the people, and especially of the ceremonies associated with these dramatic events.† In contrast, technical matters tend to be most quickly forgotten: how stone tools were made, or how and why drive-lane cairns were constructed.

† I have attended a number of Blackfoot ceremonies where the prayers and songs used to call the buffalo to the great traps, or to thank the spirits for the gifts of the buffalo, are perfectly remembered and recited.

Although bison were hunted by whites and Natives alike until there were virtually none left, about 1880, the final decades of Aboriginal hunting were almost exclusively with horses and guns. These two supremely important imports from Europeans put a rapid end to the old labour-intensive and time-consuming ways of hunting buffalo. Not until very recent times have Aboriginal authors put stories of their traditional cultural ways in writing. For first-hand eyewitness accounts of traditional bison drives, then, we turn to the journals and accounts of European explorers, fur traders, missionaries, and others who probed the western frontier.

In a sense, those of us interested in Aboriginal cultures of the western Plains are very fortunate. Europeans generally worked their way from east to west, with Native people being settled in the wake of this push. This means that cultures in the West continued many traditional cultural practices for much longer than those in the east. I can still sit down for coffee with a Blackfoot elder raised by grandparents who hunted buffalo. This is an extraordinarily close connection to the past, one that other anthropologists can only envy. It is a direct result of the very recent settlement of the West, and it is the reason why we have a number of wonderfully colourful and descriptive written accounts that we can draw on for help in interpreting the past.

A number of early European visitors to the western Plains were fortunate enough to witness the Native inhabitants attempting to drive bison to a mass kill, most often into the wooden corral of a pound. There are precious few eyewitness accounts to drives leading to a jump, but the process of rounding up the animals and moving them toward a kill is the same. Only the final kill location differed. It was during

my search of early historic eyewitness accounts of bison driving that I discovered the clues that held the secret to the operation of drive lanes. Once I had this information, the small rock cairns at Head-Smashed-In started to make a whole lot more sense. But there was a curious twist to this secret, one that took me a while to figure out.

Some of the great names in the European exploration of the West are David Thompson, Peter Fidler, Anthony Henday, Lewis and Clark, Alexander Henry (the older and the younger), Henry Youle Hind, John Audubon, John Palliser, The Earl of Southesk, Edwin James, and George Catlin. I read the accounts of these men, and others, and I started to see a pattern in how bison kills were orchestrated. Drive lanes figure in almost every description of luring bison towards a kill. But here's the twist – the accounts of those who were on the Plains during the last years of buffalo hunting almost never mention drive lanes made of rocks.† Rather, individual cairns are said to be made of branches from trees, twigs of brush, clumps of sod piled up, stacks of buffalo chips, and various combinations of these.

In 1772 Mathew Cocking noted that the wings of the drive lane were made of small sticks and that buffalo dung or old roots were laid in heaps in the same direction as the piles of sticks. John Palliser, traversing the Plains between 1857 and 1860, recorded, "To this entrance converge lines of little heaps of buffalo dung or brush from several miles into the prairies which surround the clump of wood in which the pound is concealed. These lines serve to lead the buffalo in the required direction when they have been driven into the neighbourhood." Daniel Harmon likewise observed, "From each side of this opening, they fix two ranges of stakes, at about an angle of ninety degrees from each other, extending about two miles into the plains. These stakes rise about four feet above the ground, and are about forty feet apart."

So where are the rock piles that exist in the thousands at Head-Smashed-In and at most other buffalo jumps that I had seen or read about? Why are these so conspicuously absent from historical accounts of driving bison towards a kill? The literature (an abundance of it, so that it could hardly be dismissed as anomalous) all pointed to cairns made of organic materials, yet a dedicated search of the gathering basin yielded only cairns made of rocks. Something was seriously amiss.

This discrepancy led me to consider the difference between what early European explorers saw and what I could see on the ground

† I know of only one account from an actual eyewitness to communal bison kills who mentions rocks being part of the drive lanes. Maximilian, Prince of Wied, wrote, "A tract is surrounded with scarecrows, made of stones, branches of trees, &c., and the terrified animals are driven into a narrow gorge, in which the hunters lie concealed ... On such occasions the Indians sometimes kill 700 or 800 buffaloes."

today. I could understand why there was no longer any brush, sod, dung, or twigs to be seen along the drive lanes at Head-Smashed-In. In the more than one hundred years since Europeans observed these organic materials, they had decayed long ago. But why didn't the early explorers mention the piles of rocks present at most communal buffalo drives?

## Deadmen

*[The kill] was formed in a pretty dell between sand hills, about half a mile from the first, and leading from it in two diverging rows, the bushes they designate "dead men," and which serve to guide the buffalo when at full speed, were arranged. The "dead men" extended a distance of four miles into the prairie, west of and beyond the Sand Hills.* – Henry Youle Hind, 1857–58

The cairns at Head-Smashed-In are low platforms of stone. Our digging had confirmed that they were never tall piles. In and of themselves, I could not imagine that the cairns would help direct the course of stampeding herds of buffalo, but they could have served as the base on which to construct the organic structures noted by European eyewitnesses. If covered with sod, dung, twigs, and brush, the small basal rock clusters may have been completely invisible during the time the drives were in operation. Early eyewitnesses saw the taller organic cairns and missed the bottom layer of rocks.† Clearly this begs the question of why anyone would bother with the small rock piles at all. Why not just stack up chunks of sod and bison chips and brush on the ground and forego all the work that went into gathering thousands of small cobbles?

First, the rock piles would serve as a permanent marker of the correct route for the drive. If the jump was not returned to for several years, the organic materials might be all gone and there would be no trace on the land of where the previous cairns were located. We can be certain that a great deal of thought, planning, and trial and error went into discovering the only suitable places that drive lanes would successfully control the movement of bison. Mistakes were no doubt made, lanes placed in wrong locations, and herds escaped from the trap. Reassessment would have been made, cairns shifted to create slightly different lane direction (or perhaps more cairns added to strengthen a particularly vulnerable spot), and the whole

† In contrast, many interviews with Native elders in the years after the end of buffalo hunting make specific mention of the rocks used in building drive lanes, lending support to the likelihood that European eyewitnesses to the hunts simply didn't see the rocks under organic materials.

effort repeated. With such a great amount of effort going into each attempted drive, and considering the importance of success, it is not surprising people designed a method to mark the proper route of the drive in a way that would last for generations to come. Small rock piles accomplished this goal.

Second, rock piles almost certainly played an active role in the actual function of the cairns when they were in use. While sod and dung could be stacked anywhere, brush, if it is to stand up straight, needs to be anchored. Poking the ends of slender sticks into the hard baked earth would be nearly impossible. Furthermore, they would simply blow over in the first strong wind. The low platforms of rock that we see today at Head-Smashed-In are perfectly suited to serve as a base for wedging in the ends of sticks and brush. In almost every instance the rocks are gathered together into a tight group that offers space between individual rocks where the shaft of a branch could be inserted. I am reminded of the little wire mesh grids that are found in the bottoms of some flower vases: the openings in the grid offer places to stick the stalk of the flower so that it stands in just the manner you wish. The purpose of the rocks, in addition to marking the permanent drive lane, is to support the brush so that it can stand

*Small rock piles may have served as permanent markers of where successful drives took place. (Courtesy: Royal Alberta Museum)*

*Preparing the drive lanes at buffalo kills might have looked something like this: fixing branches with rocks and stacking bison dung. (Courtesy Head-Smashed-In Buffalo Jump)*

up in the wind, and, by doing so, these seemingly innocuous little stands of brush provide a key element that made the buffalo drive work, that is, motion.

European explorers commonly used one word to describe the drive lane markers that they observed: "deadmen." I think this may be a very insightful use of a term. When buffalo chips, chunks of sod, brush, and twigs were piled on top of rock piles, they may have looked, from a distance, very much like human beings – hence the term deadmen. Perhaps the European observers were recognizing the fact that once these cairns were made in the proper form, they served as, and took the place of, Native hunters. Witnessing traditional buffalo drives in the early 1800s, Daniel Harmon seemed to appreciate that cairns were intended to extend the range and numbers of people. He described long lines of stakes extending into the prairies, topped with some dried grass to give a sense of motion, and perceptively noted the human-like quality of the cairns: "Indians are stationed by the side of some of these stakes, to keep them in motion, so that the buffaloes suppose them *all* to be human beings" (my emphasis).

We know that hunters, sometimes including women and children, staged themselves along the path of the drive lanes to help control the bison, ensuring that they did not escape the trap. This was especially true at the end of the drive where the lanes converged (funnel-like) to their narrowest point, where the herd was compressed into a tight mass and where the danger of escape was greatest. There are graphic accounts of Native people standing alongside the cairns, shouting, waving their arms, and flapping bison hides, as a means of keeping the animals contained within the funnel.† Yet clearly there were never enough people to spread themselves along the kilometres of lanes that extend back from the edge of Head-Smashed-In.

† Grinnell wrote, "Finally, when the buffalo were fairly within the chute, the people began to rise up from behind the rock piles which the herd had passed, and to shout and wave their robes. This frightened the hinder-most buffalo, which pushed forward on the others, and before long the whole herd was running at headlong speed toward the precipice."

To extend the ranks of human figures way beyond the limits of the small population, cairns were built in the likeness of the people. And what better way to imitate a human being (as opposed to having the cairns simply resemble small trees or bushes) than to have the cairns move as if they too were alive.

Fresh-cut brush would accomplish this movement. Branches stripped from trees and sections of small bushes would wave in the wind, especially if they still had leaves on them. When the season was such that the leaves had fallen, small strips of bison hide and hair were tied to the twigs so as to catch the wind. What is the big advantage of having the cairns impart a sense of motion? Once again we look to Aboriginal knowledge of bison behaviour for the answer. Perhaps because they are not very keen of sight, bison are remarkably sensitive to any unusual movement in their environment. People who work with buffalo will tell you that as long as you are positioned downwind you can get quite close to a grazing herd by simply not moving whenever the animals are looking at you. As long you stand perfectly still, they will gaze at you for a long time, trying to identify the object. Finally, they will turn away or return to grazing and you can continue to approach, freezing once again when they look up. If you want to be noticed by a bison herd, and cause a sense of consternation, simply move around. This is what stone cairns embellished with brush did.

What a great ruse the Plains people had pulled off. They managed to gather together small piles of rocks, wedge some branches between the stones, and maybe pile up a few bison chips or some sod around the base of the brush. In so doing they created a deflective shield, a barrier that existed only in the mind's eye of the buffalo. It was a barrier that could easily be crossed or trashed a moment's notice by any self-respecting bison herd, but it was one that on most days was not. The people who built it understood that bison would shy away from an unusual object waving in the wind. As the herds stood in the bottom of the basin looking along a lane of cairns, they would experience the famous telephone pole effect, the visual illusion that the fluttering stacks of brush appeared to be closely spaced, especially when viewed from one end ... just like telephone poles parallel to the road we are travelling seem to merge closer together as we view them in the distance. Recall how wooden pounds worked to contain panicked bison because they looked solid. So too, drive lanes worked

extraordinarily well to keep the bison contained in a specified area because, by their movement, the stacks of brush gave the appearance of something to be feared – a strange object moving in the distance.

## In Small Things Forgotten

I didn't really learn anything new on the first day I walked into the gathering basin. On the contrary, I realized how much I didn't know about how and why ancient hunters constructed this bewildering labyrinth of stone lines. But I knew that these simple, inconspicuous lines must have played a central role in the bison drive. Why else move tens of thousands of stones into carefully crafted positions? My ignorance set me on a course of discovery, determined to understand the same truths that the ancient map-makers understood. My ignorance opened up wonderful doors to new worlds in the gripping accounts of the first explorers and the beauty of the natural world as revealed in the literature on bison behaviour.

A thin but beautifully written introduction to archaeology by James Deetz is titled *In Small Things Forgotten*. How appropriate.

*The final configuration of drive lanes at a buffalo jump might have looked like this: V-shaped lines of rocks, brush, and other material leading to the cliff. (Courtesy Shayne Tolman)*

For, indeed, the small, innocuous stone cairns of the long-abandoned buffalo jumps of the northern Plains have been very much forgotten. They have been left to gather dust and slowly disappear into the prairie sod. There is an important lesson here. Sometimes the small, forgotten things of the past tell a powerful story. But the stones won't speak to us. The archaeological record is as static and silent as are the voices of the vanished people who produced it. Only when secrets from the past are pondered, probed, wrestled with, debated, is it occasionally the case, and only occasionally, that we stumble through a window into another world.