

## The Buffalo

*The American bison, or ... buffalo ... seems to have been spread over the plains of this vast country, by the Great Spirit, for the use and subsistence of the redmen, who live almost exclusively on their flesh, and clothe themselves with their skins.* – George Catlin, 1832–39

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If you had to pick an animal that was going to be the soul of your existence, the one thing that made life possible, you would be hard pressed to choose better than the North American Plains bison (*Bison bison bison*). From the earliest evidence that people inhabited the Great Plains, about twelve thousand years ago, the bison has been the pivot around which all else revolved. In an old and somewhat overworked cliché, the bison has been called a walking supermarket for the people of the Plains. Like most clichés, this one contains an element of truth. Seldom in prehistory, if ever, have a people relied so heavily on one resource to provide such an overwhelming part of life's necessities (the reliance of some Arctic people on caribou is a fitting rival). Bison provided the bulk of food year-round, durable hides for making lodge covers and blankets, and strong bones for making a wide variety of tools. The great scholar of the Blackfoot, John Ewers, counted eighty-seven different tools and implements made of bison parts, adding that a more exhaustive search would probably bring the list to over one hundred items. To be sure, other resources were needed: wild plant foods to supplement the diet, other animal meat and fat when bison were not available (and to provide a little variety in life), hides from smaller game to make soft, pliable clothing (something for which the tough hides of bison were unsuited). But bison was the kingpin, the backbone of life, and in a very real sense it was the centre of the universe.

There has been a great deal written about bison. After all, they are the largest land mammal in North America. Bison have a fascinating

## Imagining Head-Smashed-In

*The supreme importance of the buffalo is reflected in these images of the animal carved and chipped out of stone. (Courtesy Royal Alberta Museum)*



and complex evolutionary history spanning millions of years and several continents. Most of this is not relevant to our story. Bison have been in North America for hundreds of thousands of years, long before there were people here to hunt them. They have changed considerably in this time; most notably, they have gotten smaller. Bison have especially diminished in size since the last Ice Age, and continue to do so today, although the change is imperceptible in our lifetime. At the end of the last great Ice Age, about twelve thousand years ago, bison were about 25 per cent larger than their modern counterparts. These were formidable beasts indeed, made all the more so by the fact that their horns were huge. The distance from tip to tip on the horns of a modern adult male bison averages about a three-quarters of a metre. You can drop into museums in Idaho, Nevada, and Utah and see horns with a spread of more than *two metres*. While these monsters had died out by the time humans appeared on the scene, it is certainly true that Aboriginal hunters stalked and ran up next to wild, enraged beasts of nearly their size, and killed them with simple wooden spears tipped with stone points.

If you ever get a chance to see a live bison, please do so. It's not that hard these days, because bison have enjoyed an explosion in popularity in recent years, thanks in part to the superior nutrition they offer compared with beef and the ease of managing a herd. There are ever-increasing numbers of public and private herds throughout North America, thousands in all, containing more than half a million head. I haven't met a private bison rancher yet who doesn't love owning these animals and who will proudly take a few minutes to show them off. Take a long and studied look, but from a safe distance.

## The Buffalo



*One of the giant bison that lived during the Pleistocene Era (the last Ice Age) – was Bison latifrons. These monsters stood two and a half metres tall but died out in favour of smaller bison before the first hunters appeared on the scene. Painting by Ludo Bogaert. (Courtesy Royal Alberta Museum)*

*Next page: With or without horses, bison hunting under any conditions was dangerous business. Painting by Albert Bierstadt (Courtesy Buffalo Bill Historical Center, Cody, Wyoming; Gertrude Vanderbilt Whitney Trust Fund Purchase)*

Remember that, unlike cattle, bison have not been domesticated. They are wild animals, and the illusion of domestication is created by the fact that we can lean on a fence and watch them, much like we do cattle and horses. They are magnificent beasts. It is little wonder that their visage has appeared on everything from clothing, beverages, food brands, shipping companies, and the American nickel. The bison is the epitome of power, emblematic of individualism and freedom, an icon of a continent.

The bison was certainly a worthy foe for early hunters, who were armed only with simple weapons such as spears and bows and arrows. The general resemblance of bison to cattle, and our impression of cattle as slow and stupid – an attribute gained from generations of inbreeding for meat production – might lead the casual observer to think bison are plodding and cumbersome beasts. Nothing could be further from the truth. The preeminent naturalist John J. Audubon was astonished by the agility of Plains bison. Though we associate bison with the flat prairies, they possessed remarkable climbing ability. “The activity of Buffaloes is almost beyond belief,” Audubon observed; “they can climb the steep defiles of the Mauvaises Terres [Bad Lands] in hundreds of places where men cannot follow them.” His companion, Lewis Squires, expressed amazement that bison exhibited “most surprising speed, for an animal apparently so clumsy and awkward ... I could hardly imagine that these enormous animals could move so quickly, or realize that their speed was as great as it proved to be.”





The Earl of Southesk, like other Europeans, vastly underestimated the speed and agility of the bison, a consequence, he said, of the perceived “lumbering awkwardness of his action, and the grotesque wildness of his appearance.”

In every sense but one, bison must be credited with having the upper hand in any encounter. Considering their massive size, they are incredibly fast animals. Over short distances they can run with a race horse, reaching speeds of fifty kilometres per hour. And over the long haul they have amazing endurance, being able to run at somewhat slower speeds for extended periods of time, long after their predators have tired and faded. Their squat, stocky, heavy-bodied appearance belies a remarkable quickness. Ask anyone who works regularly with bison. They can turn on a dime, twirling with their heads down and horns out. Many a coyote, wolf, and human hunter have been gored and flung through the air by a buffalo that just a moment before had been standing still. Audubon again provides witness:

*When wounded and mad they turn suddenly round upon the hunter, and rush upon him in such a quick and furious manner that if horse and rider are not both on the alert, the former is overtaken, hooked and overthrown, the hunter pitched off, trampled and gored to death. Although the Buffalo is such a large animal, and to all appearance a clumsy one, it can turn with the quickness of thought, and when once enraged, will rarely give up the chase until avenged for the wound it has received.*

Hunters, who were on foot for twelve thousand years before the horse was returned to this continent, standing in the open, often featureless landscape, were at a decided disadvantage. There was only one way humans had the upper hand – their intellect, their cunning, their ability to observe and to learn.

## Is it Bison or Buffalo?

There certainly is a great deal of confusion over the two competing names for the same animal. The source of the problem is as follows: there is the name given by the scientists whose job it is to provide order and classification to the animals of the earth, and then there is the popular, colloquial name that is technically wrong but is deeply entrenched in public parlance. How did we end up with two names for the same animal? You can blame that on the early European

visitors to this continent. They sailed the Atlantic from places like France, Spain, and England and were familiar with other members of the Bovidae family – the Asian (*Bubalus*) and African (*Syncerus*) buffalo. These look roughly similar to the great beast of the Plains. When they first saw the bison of North America they noted the general similarity and erroneously proclaimed them “buffalo.” (In fact, many of the early historic accounts talked about the “cattle” of the prairies.) But since it was European explorers, not Aboriginal people, who wrote books and letters, made sketches of the animal, and communicated these around the world, the name given by the Europeans came into common usage. While their correct name is bison, the word buffalo is in such common use that it is pointless to fight. Just as the animal most people call gophers are really ground squirrels, the name gopher will live on.

What did Native people call bison? Obviously they used their own languages, of which there were many in use in western North America at the time of first European contact. Each group had their own word for bison or, actually, many words. You can imagine that an animal so critical to their existence was not referred to by a single term. Many cultures had distinct words for important aspects of their lives, say, for male and female bison, old and young ones, fat and lean. The Omaha had separate words in their vocabulary for a single family hunt, a hunt by a single man or few men, for men who go out and stay with game, for groups to go out and drive game. In a very real sense, the survival of the Plains hunters depended on knowing and recognizing the differences in bison and how best to hunt them. When your life depends on food from one main source, not all bison are created equal.

## In Numbers, Numberless

*Mr. Kipp told me that while travelling from Lake Travers to the Mandans ... he rode in a heavily laden cart for six successive days through masses of Buffaloes, which divided for the cart, allowing it to pass without opposition. He has seen the immense prairie ... look black to the tops of the hills, though the ground was covered with snow, so crowded was it with these animals.*  
– John Audubon, 1843

For many millennia bison roamed the Great Plains in vast numbers. Just how vast no one knows, but there has been much speculation.

*Imagining Head-Smashed-In*



*As shown in this sketch from 1853, the Great Plains of North America once teemed with buffalo. Sketch by John Mix Stanley. (Courtesy Glenbow Archives/NA 1274-2)*

Some have said seventy-five million bison were on the Plains at the time of first European contact. Some put the figure as low as fifteen million. Many think thirty million is a reasonable compromise. It almost doesn't matter. The point is that there were maybe tens of thousands of Native people on the Plains before European arrival, and there were tens of millions of buffalo, which means there was plenty to go around, especially for hunters on foot and armed with simple hunting weapons. There is no evidence that Aboriginal hunting of bison, over at least twelve thousand years, was making any serious dent in the population. On the contrary, evidence from the bones at many different sites of differing ages suggests that bison were certainly holding their own in terms of numbers, if not actually becoming more numerous through time.

There can be no doubt that Native hunters did their best to kill these mighty beasts. They devised an astonishing array of ingenious traps to deprive bison of their natural advantages – speed, mobility, strength, endurance, sense of smell – and to turn the tables so that the

hunters at least had a modicum of a chance. But despite the hunters' best efforts, bison flourished. One has only to read some of the statements by early European observers on the Plains, who saw before them a breathtaking virtual sea of brown fur covering the land as far as the eye could reach. On ascending a small hill, Lewis and Clark remarked that bison were so numerous "that from an eminence we discovered more than we had ever seen before ... and if it be not impossible to calculate the moving multitude, which darkened the whole plains, we are convinced that twenty thousand would be no exaggerated number." The great explorer Peter Fidler, in southern Alberta in 1792-93, was convinced that he witnessed a much greater number: "The Buffalo are very numerous on the NE side the Red Deers river & near ... the ground is entirely covered by them & appears quite black. I never saw such amazing numbers together before. I am sure there was some millions in sight as no ground could be seen for them in that complete semicircle & extending at least 10 miles."

Alexander Henry was an experienced fur trader and hunter. He spent fifteen years in the Canadian and U.S. northwest. Few Europeans had more experience than Henry when it came to life on the Great Plains and living off the buffalo. Thus, when he rose on the morning of 14 January 1801 and expressed his astonishment, it must be taken seriously:

*At daybreak I was awakened by the bellowing of buffaloes. I got up, and was astonished when I climbed into the S.W. bastion. On my right the plains were black, and appeared as if in motion, S. to N. Opposite the fort the ice was covered [with buffalo]; and on my left, to the utmost extent of the reach below us, the river was covered with buffalo moving northward ... I had seen almost incredible numbers of buffalo in the fall, but nothing in comparison to what I now beheld. The ground was covered at every point of the compass, as far as the eye could reach, and every animal was in motion.*

Many found themselves at a loss for words when faced with the teeming herds. Zebulon Pike (the namesake of Pike's Peak) stated, "I will not attempt to describe the droves of animals we now saw on our route; suffice it to say, that the face of the prairie was covered with them ... their numbers exceeded imagination." The emphasis in the following statement by Audubon is his own: "*it is impossible to describe or even conceive the vast multitudes of these animals that exist even now, and feed on these ocean-like prairies.*" Others doubted that readers

† How did Native people count bison? For the most part they didn't. Counting systems were rudimentary, often limited to numbers in the tens. Indians assessed the size of bison herds, as David Thompson records, more by "the space they stand on; for numbers is to them an abstract idea, but space of ground to a certain extent they readily comprehend and the animals it may contain."

would believe their accounts of enormous herds. Robert Rundle, near Rocky Mountain House, observed, "The immense quantity we saw would scarce be credited by an inhabitant of old England." Travelling up the Missouri in 1811, H.M. Brackenridge reported this thought:

*I am conscious that with many, I run the risk of being thought to indulge in romance, in consequence of this account: but with those who are informed of the astonishing number of the buffaloe, it will not be considered incredible ... On the hills in every direction they appeared by thousands. Late in the evening we saw an immense herd in motion along the sides of the hill, at full speed: their appearance had something in it, which, without incurring ridicule, I might call sublime – the sound of their footsteps, even at the distance of two miles, resembled the rumbling of distant thunder.*

Even when they were not seen, the presence of the teeming prairie herds had other ways of making their presence known. John Bradbury, on the Missouri in 1811, tells of distant, massive herds that he could not see but whose location was known "by the vapour which arose from their bodies." The Earl of Southesk in 1860 noted the presence of immense herds by the "deep rolling voice of the mighty multitude [that] came grandly on the air like the booming of a distant ocean." Of course there was the ubiquitous buffalo chip; the round patties of dung must have dotted the prairies like an immense checkerboard. John Audubon said that chips were so abundant on the Plains that the traveller could not step more than a few feet without coming across one. In 1820, Edwin James provided the most harrowing account when, struck by a torrential thunderstorm on the Plains, the river rose and "was soon covered with such a quantity of bison's dung, suddenly washed in from the declivities of the mountains and the plains at its base, that the water could scarcely be seen." Dinner that night, made with brown river water, tasted like a "cow-yard" and was thrown away.

Attempts to quantify the size of bison herds in the eighteenth and nineteenth centuries must be seen for what they were – subjective, often intentionally exorbitant, and mostly useless at providing reliable documentation.† It's a matter best left to the imaginative realm of poetry. Robert Rundle, travelling through western Alberta in 1840, perhaps said it best. Remarking on the immense herds that stretched out before him, he stole a line from the poet Milton and wrote: "They were in numbers – numberless."

## Tricks of the Trade

*Every spring as the river is breaking up ... the buffalo [are] tempted to cross ... on their way they are often insulated on a large cake or mass of ice, which floats down the river: the Indians now select the most favourable points for attack, and as the buffalo approaches dart with astonishing agility across the trembling ice, sometimes pressing lightly a cake of not more than two feet square: the animal is of course unsteady, and his footsteps insecure on this new element, so that he can make but little resistance, and the hunter, who has given him his death wound, paddles his icy boat to the shore and secures his prey. – Lewis and Clark, 1805*

Aboriginal bison hunters of the Plains had to somehow take away the natural advantage of the swift and powerful bison and turn the tables in their favour. Clearly they could not do this with speed, strength, endurance, or formidable weapons (like a gun that in the right hands can kill an unsuspecting animal a kilometre away). They had to do it by outsmarting the animals. Almost every type of mass communal bison kill archaeologists have discovered, and those recounted by Native elders, involved some kind of trick, one that was played in a deadly game of survival.

Here's just a sample of many tricks employed. Plains hunters donned the dressed hides of many other animals – deer, wolves, coyotes, pronghorn – and so disguised were able to approach a herd close enough to loose several arrows. Bison are excellent swimmers, crossing major rivers and lakes easily.<sup>†</sup> But hunters knew bison were slow and vulnerable in the water and so waited at known crossing locations to kill them from the shore, or sometimes even shipped out in small boats to kill them as they swam. Adding insult to injury, these boats were made of the hides of bison from previous kills, stretched over a simple wooden frame. In winter bison crossed frozen lakes and rivers, but their footing on ice was poor. Hunters exploited this limitation by ambushing herds at winter crossing points, sending the beleaguered herds scattering on icy surfaces. In December 1857, the Palliser Expedition witnessed just such an event:

*The slipperiness of the ice, which gave us so much trouble in crossing the lake, was turned to good account the other day by the Indians, as they drove a band of buffalo cows so that they had to go out on the ice of the lake, when of course they fell and stumbled, and could make no progress, while their pursuers, approaching them on foot, with ease killed the whole, to the number of 14.*

<sup>†</sup> Yet they were occasionally caught on thin ice. Maximilian, Prince of Wied, who traversed the Great Plains between 1832 and 1834, reported an event in which eighteen hundred bison drowned at one place on the Missouri, where their bodies temporarily dammed this great river.

## Imagining Head-Smashed-In



*Although winter hunting was difficult, deep snow could become a kind of trap into which hunters on snowshoes could force the animals, then kill them easily. Painting by George Catlin. (Courtesy Bruce Peel Special Collections Library, University of Alberta)*

Hunters knew that bison avoided deep snow (it greatly reduced their mobility) and would seek out for their winter trails the crests and side slopes of ridges, which are blown clear of snow. Lying in wait in the lee (downwind) of a ridge (to hide their smell), hunters would storm up one side of the ridge and drive the bison down the other side into deep snow banks where they could be killed easily. They tricked bison into entering the mouths of box canyons leading only to steep-walled dead ends, where they could be picked off by hunters clinging to the canyon walls. Often such tricks were combined, as George Bird Grinnell reports for the Cheyenne, who used snow and gullies to deadly effect: “they followed them [buffalo] in winter on snowshoes and chased them into snowdrifts in ravines. When they had driven buffalo into such drifts, they set the dogs free to worry them, and ran up and killed them with the lance.”

The list goes on. Each bison kill site that archaeologists excavate forces us into a protracted scouring of the surrounding landscape, searching for clues as to how the kill was executed. Inevitably there was a trick or trap of some kind; there practically had to be, for the bison in its prairie home was the master of the house. People took them when their intellect had given them the ingredients to strip the bison of its natural advantage and when it was the will of the spirit world.

The skill, planning, and requisite knowledge that went into tricking buffalo to plunge over a cliff may not have been any greater than

what went into the other forms of communal killing. But the outcome was certainly more spectacular. In subsequent pages we will examine the details of what made a buffalo jump work. But first we need to know more about the animal itself. Everything about a buffalo jump was rooted in Aboriginal knowledge of the behaviour and biology of bison. It is impossible to understand the operation of a jump without knowing much (though certainly not all) of what Native people knew about the animal they sought. I have studied this topic for some twenty-five years, and I continue to learn new things about bison. Often I learn them first from the scientific literature on wildlife. And as I think about what I have read, I come to realize that these very facts were played out over and over again in the Aboriginal stories and the archaeological traces left behind. It is a humbling experience.

## The Fats of Life

*To us who had so long desired a healthful portion of bodily exercise in that quarter, it [fat] was the very marrow and life-blood of whatsoever is good and wholesome for famished carnivorous animals like ourselves ... it loosed our tongues and warmed our hearts towards one another ... it made our faces to shine with grease and gladness.*— Thomas Farnham, 1839

As far as Aboriginal hunters were concerned, what makes one bison a better catch than another is the amount of fat different animals have. In our modern world, it is difficult to imagine fat being a good thing, let alone being critical for survival. We have been indoctrinated on the evils of fat – causing everything from clogged arteries to obesity. We carefully trim and discard fat from the steaks we grill, and *bacon* has become a dirty word. Most of this carefulness is appropriate, because we get fat from almost every food we eat; every slice of bread, cheese, pie, cake, and donut. We don't need extra fats in our diet, and it is detrimental to our health. But such is not the case for people who don't have the great variety of foods that we have, who live on a diet dominated by meat, and who must survive out on the land, coping with the extremes of the elements. Living such a life burns up body fat much faster than our lifestyle, and it must be replenished. Native hunters of the West craved and sought out fat. They didn't just like it (there's no denying fat tastes good), they perished without it.

If you are not getting fat in your diet from other sources, you must have adequate fat from your main food source – in this case bison.

† John Audubon, during his bison hunting days in the 1800s, observed that wolves also chose the fattest animals to attack.

A lean animal was almost useless to Native hunters, unless they already had some fat stored from a previous kill that they could add to the lean meat. Captain John Palliser, in his famous trek across western Canada from 1857 to 1860, frequently found himself in the position of having to eat lean meat: “we could not get any fat or grease to trade from the Indians, which was a bad look out, as it is nearly as hard to live on the dried meat of a lean animal alone without grease, as it is to starve altogether.” It seems improbable, but despite eating kilograms of meat a day, people died because it was lean meat. In such cases, the body craves but does not get the fat it needs to provide energy and maintain normal body function. On another occasion, when he and his men had only a lean moose for food, Palliser vividly conveys the frustration of trying to satisfy one’s appetite on a fat-free meal: “Our appetite was tremendous, so that, although the flesh of the animal was so lean that at other times we would not have eaten it, we continued cooking, eating, and sleeping the remainder of that day, and the whole of the next.”

There are countless examples in the historic literature of hunters even refusing to kill lean animals, as they knew they were worthless as food. Hunting buffalo in February, Lewis and Clark spied many animals but rejected them as “too poor to be worth hunting” (the term *poor* was used by many Europeans to denote lean animals, as *good* or *fine* were used for fat ones). Or once killed, many lean animals were rejected unless the hunter was in dire straits. Edwin James, on the Plains from 1819 to 1820, killed a bison “so extremely lean ... that nothing but the most urgent necessity could have induced us to taste it.”

This is why Native hunters exclaimed with joy when a fat animal was obtained and bemoaned the killing of a lean one. With few exceptions, such as when animals were hunted for needs other than food, finding and killing fat animals was the objective of every hunt. Traversing the southern Plains in the 1830s, Josiah Gregg noted, “In the chase, the experienced hunter singles out the fattest buffalo as his victim.” John McDougall, buffalo hunting in Alberta in the 1860s, confessed to the purpose of the quest: “of course every one of us secretly in his own mind wanted to kill the very fattest.” Life (and good tasting food) depended on it.

This discernment wasn’t just a characteristic of early bison hunters; it is true of any person put in the same environmental situation.† Europeans, originating as they did from heated homes and diverse diets, often arrived on the Plains without an appreciation of the importance



of fat. But it didn't take them long to come to the same understanding as Aboriginal hunters. The literature is full of statements of Europeans craving fat after only a few months living on the Plains. They couldn't help but notice this sudden change in their own diet. Travelling with Native groups through Alberta in 1872, Donald Graham said, "I think that in cold countries where the diet is practically all meat, the human system requires a good deal of fat. Personally, I used to detest it, but on occasions I could take a large chunk of wolf fat and not only eat it, but enjoy it." Edwin James reported that his men got sick from eating currants. Nothing wrong with the currants, he concluded, "but that the stomach, by long disuse, had in a great measure lost the power of digesting vegetable matter."

Some of my friends and I, lucky enough to have the opportunity to do archaeological field work in the Canadian Arctic, likewise found our diet undergo transformation. Camped in the middle of a barren, demanding landscape, living on a restricted diet and with limited source of heat, we found that in a matter of a few weeks we experienced a craving for fat – devouring chocolate bars, peanut butter, oily sardines, and even eating spoonfuls of margarine right out of the tub. Though I shudder at the thought now, at the time there was nothing I wanted more than fat.

Knowing that only fat bison were useful to the hunters, the next step is to know which animals will be fat at any given time of year. It should come as no surprise that Native people were acutely aware of the facts governing different bison conditions. Through experience gained over millennia, they knew precisely which bison could be counted on to supply a nutritious meal: male, female, young, old, spring, summer, fall, and winter. They knew the patterns (though not

*By observing subtle differences in body contour and coat characteristics, Native hunters could pick out the fattest animals in a herd. (Courtesy Clarence Tillenius)*

the scientific explanations) that governed the gain and loss of fat, and they planned every kill with these patterns in mind. Failure to do so could spell starvation. Not only did the hunters know the natural patterns the bison followed, they also learned how to spot fat animals in a herd. An experienced hunter would pick out the pronounced curves of the body and eye the sheen of the coat that indicated a fat animal. To appreciate the detailed knowledge Aboriginal people had of when bison were fat, witness the statement Buffalo Bird Woman gave to Gilbert Wilson early in the twentieth century:

*At this time of the year the fat ones have a patch of black hair over the eyes for the fat under the skin makes the animal shed earlier and the new-grown hair is very black. Also, there is a black stripe on the highest point of the spine over the shoulders and there is a little black hair around the horns.*

To understand Aboriginal planning and execution of buffalo jumps, we need to know at least a little of what they knew about patterns of fat in bison and about seasonal changes in buffalo behaviour, habitat, and biology. This information is instrumental in answering how, when, and why the great hunts took place.