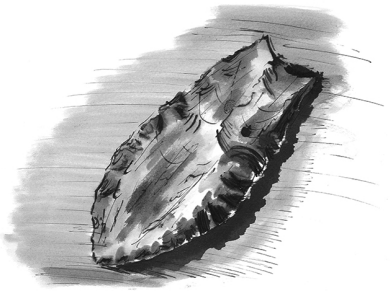
1

The Point of Clovis



I have had a weakness for grand museums ever since I was a boy. I used to catch the train up to London at least once during each school holiday and spend the day in South Kensington at either the Natural History Museum or the Science Museum. Like most boys, my favorite exhibits were always the biggest: the enormous hissing steam engine or the giant blue whale, and of course the dinosaurs. As I have grown older I appreciate these museums more for their embodiment of optimism and curiosity about the world than for the splendor of their individual exhibits. America has its fair share of grand museums, nowhere more so than the great showplaces surrounding New York's Central Park or lining the National Mall in Washington, D.C.

In London none is more celebrated than the British Museum in Bloomsbury, particularly since its lavish restoration. It houses the main national archaeological collections, and I spent many happy days there researching my earlier books. Imagine my delight, therefore, when one morning I found myself listening to the museum's director, Neil McGregor, talking about one of the hundred objects from the museum's

Clovis spear point. British Museum, London.

collection that he had chosen to illustrate his radio series on the history of the world. That day he had selected an artifact from the North American Gallery—an object that, as he explained, was evidence that people had arrived in America much earlier than anybody thought. Compared with other displays in the gallery, the magnificent feathered headdresses and the elaborately carved totem poles, this object was at first sight rather modest, but the story it had to tell was of enormous significance for the early history of America. It was a stone spear point thirteen thousand years old, found in Arizona. Dr. McGregor took it out of its case and to the nearby study room, where he described its features in minute detail.

I knew at once that I wanted to do the same and, three months later, after following a trail of connections, I was walking between the Doric columns that frame the museum's famous entrance. Turning right through two glittering galleries, I arrived at a pair of tall wooden doors that led to the back rooms. Once behind those doors, the grand architecture was the same, but the paintwork was chipped and faded. This was the academic heart of the museum, where such decorative luxuries are deemed to be unnecessary. I was met by the archaeologist and curator of the North American collections, Jill Cook, who led the way into the book-lined study room, where a plastic box was waiting for me and, without further ado, the spear point was placed, very carefully, in front of me, cushioned on a sheet of gray foam rubber.

It was about two and a half inches long and a little over an inch wide. Its shape reminded me of a broad fish knife narrowing to a sharp point at one end and with a concave surface at the other. It was a creamy beige, more the color of milk toffee than anything else, and shiny. The first thing that struck me was how very symmetrical it was, and how beautifully made. The workmanship was of an extremely high standard, each face whittled down by a series of blows that had chipped off thin flakes of flint. With the hand lens that had also been brought, I examined the edge of this remarkable stone, but only after I had run my finger along it. It was sharp, but not razor sharp. The edge had been precisely shaped

by hundreds of tiny chips, only really visible with the help of the lens. At the broad end there was a shallow groove, about half an inch long, where flint had been removed in a series of strikes that left serried rows of ripples, like a sandy beach after the tide has gone out. Jill explained that this was to help attach the stone point to a wooden shaft without the need for a sinew fastening. By splitting the end of a straight branch, the point could be pushed in along the groove with the ripples of flint acting like a ratchet to stop it from being pulled backward. The attachment was so strong that once the point was in the shaft, Jill did not have the strength to pull it back out.

The spear point I held in my hand had been found in Arizona in 1942, but its particular style derived its generic name from a small town on the border of Texas and New Mexico. That town is Clovis, and the object in my hand was a Clovis point. The site of the town was originally called Riley's Switch, but the coming of the Santa Fe railroad in 1906 created a larger settlement, and to mark its new status, the engineers were asked to suggest a new name. The stationmaster's daughter was enthralled by French early medieval history and came up with the suggestion of naming the new town after one of her heroes, the first Catholic king of France, who had been converted to Christianity in the fifth century AD. Clovis in turn gave its name to the spear points first found in a dry riverbed just south of the town called Blackwater Draw, in 1933. In this way the classic early style of stone tools in America came to have a French pedigree.

The discovery of the Clovis points had a dramatic effect on the prevailing view among the academic community, which at the time was struggling to acknowledge an Ice Age date for the first human settlement in America. The finds at Blackwater Draw were to push the date even farther back into prehistory, but they were already edging in that direction thanks to a chance discovery by a sharp-eyed ranch foreman called George McJunkin a quarter of a century earlier near the village of Folsom, New Mexico, 150 miles north of Clovis.

McJunkin was a forty-eight-year-old African American. Having been born just before the outbreak of the Civil War, he had drifted west after the Union victory that secured his freedom. He was an acute observer of the natural world and took in the abundant signs of life, past and present, in the undulating plains that were his workplace. One day in August 1908 he was on his rounds when he rode into Wild Horse Arroyo, a small canyon still flooded from a torrential storm two days before. The rains had washed away a section of the canyon wall, and McJunkin noticed some large animal bones protruding from the newly exposed cliff. He rode over to take a closer look. They were far too large to be cattle bones and too big even for bison, at least the bison that lives in America in modern times. Though he did not know it at the time, McJunkin had come across the remains of the extinct *Bison antiquus*.

He dug out one of the bones and took it back home. The next day he showed it to his friend, Carl Schwacheim, who he knew was also interested in natural history. Schwacheim, a blacksmith in nearby Raton, tried his best to take this discovery up to a higher level when he got in touch with the director of the Colorado Museum of Natural History. The response was, let us say, less than immediate. It took another eighteen years, until 1926, for anyone from the museum to visit the site at Folsom, and that only came about because the curator, Jesse Figgins, had decided that the museum needed a complete *Bison antiquus* skeleton to put on display. While he was excavating the bison bones, Figgins made the discovery that would shift the debate about the antiquity of the first Americans to a much earlier time. There, within the collapsed rib cage of an enormous bison he found the undeniable evidence that humans had been in at the kill. A flint spear point, its edges knapped with great skill, lay among the bones, witness to a scene played out ten thousand years before.

We can imagine the scenario: The men were ready, lying in wait along the walls of the narrow canyon. They knew from years of experience that the bison would come at this time of year as they moved down from the summer grazing high up in the foothills of the Rocky Mountains

to the plains where they would spend the winter. The hunters knew the time was right because the dazzling star Sirius had just begun to rise on the eastern horizon as the sun was setting. Like a diamond in the sky, the Dog Star flashed red, yellow, and ice-hot blue as it edged farther and farther into the heavens. This was the signal for the band to assemble at the killing point, where the canyon narrowed sufficiently to force the beasts into single file. Unlike today, Wild Horse Arroyo was filled with damp vegetation, and a stream ran along the bottom, but it was still a fine place to spring a trap. So important was the bison hunt that the band could not afford to be late and so they waited, relaxing while one of them took up position on the mound half a mile away to warn of the approaching herd. Nowadays we would be bored after a few hours, but boredom was a luxury that never featured in the lives of our ancestors. I say *our* ancestors because this scene, or something very similar, was also being played out in Europe and Asia at the same time. For the members of the band, about twenty strong, were not bored, only patient. The children threw pebbles into the stream that ran along the canyon floor, parting the reeds to discover frogs that hopped back into the cover of the vegetation. Occasionally they would disturb a rattlesnake and, well aware of the danger, taunt it with sticks as it coiled and shook its scaly tail.

Waiting was a skill our ancestors had perfected, but the time was far from wasted. While the children played by the stream, the adults were making sure thay they were ready for the moment to come. The men unfolded the squares of deerskin that held their principal weapon, the glistening flint spear points that would soon be fixed to long sticks of fire-hardened cottonwood. They had been packed away six months earlier in the spring when the bison had reversed their journey on the way to their summer grazing grounds. Now the men took each of their points in turn and ran their fingers along the edges, tapping them expertly with a bone pick to remove a tiny flake here and there and renew the cutting surface. They tested the sharpness of the edge against their thumbnails. If it dug in rather than slide across the surface, the edge was sharp enough. And sharp it had to be to slice through the tough hide of a bison,

through a gap in the ribs and into the beating heart of the great beast. Once the men were satisfied, the points were wedged into notches cut into the end of hardened stakes. They were not tied with sinew; any binding would only slow the passage of the weapon through flesh. The journey was only one way, and if the spear was withdrawn for any reason, the point detached and remained where it was.

After three days of waiting the lookout heard something. A low, intermittent rumbling, like far-distant thunder. Peering into the blazing light of the eastern sky he could just make out a faint wisp of smoke rising over the plains. But he knew better. This was neither fire nor thunder but the signal the band had been waiting for so patiently: The bison were on their way. Quickly he ran down to the canyon, spoke, and pointed in the direction of the approaching herd. Immediately the men stopped what they were doing and ran to their positions. Two women climbed to the lookout ready to give immediate reports on the herd's position. The other women ran to the stream and collected the children, moving them to safety away from the base of the canyon that would soon be trampled flat by pounding hooves.

As they waited for the ambush, adrenaline pushed up their heart rates in anticipation. And yet it was not absolutely certain that the bison would choose to come through the canyon. Five years before, after a particularly dry summer, the bison's route to their winter quarters took them three miles to the west, avoiding the ambush altogether. That winter, without the autumn harvest of bison meat dried to last, the band was continually hungry. Three elderly members, well into their forties, did not survive.

For fear that they would be seen and divert the herd, the two women lookouts lay flat and watched the dust cloud as it meandered slowly in their direction. They could not see the animals, but the low, throbbing sound was getting louder. They looked toward the fold in the hills through which the herd usually came. One hour passed, then another. The drumming came and went with the breeze, but still no bison

appeared. One of the women climbed down a few feet behind the crest of the hill so she could give a visible signal to the waiting hunters without alerting the herd.

And then they came. Led by three enormous males, the great beasts cantered forward, their black eyes looking from side to side. Across the scorched grass that led to the mouth of the canyon, they came on. The lookout whispered to the messenger words that defined the size and composition of the herd. She then stood up and, using several arm movements, transmitted this intelligence to the hunters below. Her signals indicated that the herd was about forty strong and included several young bison. Having been born in the early summer, these animals would now be about five months old and weigh three hundred pounds.

As they neared the mouth of the canyon, the lead males slowed to a walk, sniffing the air and clearly nervous about entering its narrow confines. The hunters pressed their bodies closer to the rock. A breeze coming down the canyon filled their nostrils with the heavy smell of bison, but more important still, meant that no human scent reached the sensitive noses of their intended prey. They let the big males past, then a few more, until a natural gap appeared in the following animals. Then the trap was sprung. Three young men leaped from their positions on the canyon wall right into the path of the bison, yelling and waving their arms. The forward party accelerated to a gallop and thundered down and out of the canyon. The others shuddered to a halt, fearful of running the gauntlet of screaming humans. They tried to turn and run back up the canyon, but it was too narrow, and their way was blocked by the other animals still pouring forward, unaware for the moment of the melee in front of them.

It was at this point, with the animals uncertain what to do, that the older men leaped down into their midst and thrust their spears into the chests of the panic-stricken beasts: To the low grunts of confusion were added the high-pitched bellows of pain. Two of the speared bison fell where they stood, the flints having found their target of the heart. Others appeared unaffected by the missiles, except for the stabs of pain that

panicked them into trying to push past the bodies of their fallen companions. The men had returned, each armed with a fresh spear, and continued with a second round of slaughter, this time concentrating on the young animals whose bewilderment was all too plain to see from their rolling eyes. Three of them fell instantly, the other two reversing out of the canyon with the spears snapping off as they broke against its hard walls. The young men, armed with spears, followed them back onto the flat grassland and ran after them, knowing that eventually they would be brought down by loss of blood.

That was enough. The spearmen climbed silently back up onto the canyon walls. The panic subsided, and the twenty or so animals left alive managed to get past the bodies of the fallen and out of the canyon. It was never the band's intention to kill the entire herd. They knew very well that they needed to leave a majority to replenish the herd for the future. Another of the young men followed a wounded female as she stumbled down the canyon. It would not be long before she, too, collapsed. All told the band had killed eight bison: Two adult males were killed instantly; of the five young, three were killed in the ambush and two others mortally wounded and followed to their deaths a few miles distant; and the wounded female who fell to her knees soon after reaching the canyon's mouth. As the sun went down behind the mountains in the west, the campfires were burning and the air was filled with the mouthwatering smell of roasting meat. Their faces lit by the flickering light of the fire, the hunters bade farewell to their quarry as their spirits floated upward into the sky.

The bones of the slaughtered bison lay where they were. The hunters moved on down to the river valley for the winter. A sudden rainstorm collapsed the canyon wall onto the bones and there they stayed, undisturbed for millennia, until another flood washed them out of their resting place. Though the details of the ambush thousands of years ago are imagined, there is no invention in recounting what happened next. Sifting through the bones, Jesse Figgins brushed the congealed yellow dust from a dark shape, and within five minutes held in his hand the

same flint spear point that had been thrust into the rib cage of the living, snorting beast so many years before.

The effect of finding the Folsom spear point in Wild Horse Arroyo in the summer of 1926 was explosive, but the fuse was slow to burn. At first the find was dismissed by the experts at the Smithsonian Institution in Washington because the excavation had not been performed by an experienced archaeologist. In their opinion this meant that it was not certain that the bison bones and the spear point were in exactly the same layer, and therefore absolutely contemporaneous. To his credit Figgins, who acknowledged his lack of proper training, took notice of the objections and returned to the arroyo. The following year he found what he was looking for, another point embedded in the rib cage of an extinct bison. This time he left it where it was and sent a telegram to the Smithsonian and other leading museums. The Smithsonian immediately dispatched its own archaeologists, who soon arrived to see the evidence for themselves. Naturally eager to discover their own artifacts, within a few weeks they had unearthed an additional seventeen spear points alongside the bones of a total of twenty-three bison in and around the canyon. There was no longer any room for doubt. The first Americans had been there a very long time indeed and were not, as the weight of scientific opinion believed at the time, far more recent arrivals.

Seven years later the time line had been pushed farther back when the excavations at Blackwater Draw, still in New Mexico but almost two hundred miles south of Wild Horse Arroyo, got under way in 1933. The scorching winds that today scour the area had uncovered the gravel bed of an ancient river, long since gone, and among the bison bones the archaeologists discovered an array of Folsom-style spear points. However, beneath the Folsom layer there was another, containing the bones not just of bison but of mammoths too. Here, lying next to the ribs of one of these huge creatures, was another spear point, larger and heavier than its Folsom successor, but equally finely manufactured. This was the Clovis point, just like the one I held in my hand. And since mammoths

had disappeared from America by the time the Folsom points were being made, the Clovis point must be from an even earlier time.

In the succeeding decades Clovis points have been found all over North America. There are several examples in the collection that belonged to that inveterate antiquarian Thomas Jefferson, though he had no idea how very old they really were. The widespread distribution of Clovis-style points shows that the hunters, or at the very least their technology, had spread rapidly across the whole continent, and into South America as well. Effective spear points can only be made from stone with the right properties of fracture and hardness, usually flint or chert. Clovis points are often found hundreds of miles from the closest sources of tool stone, and in some parts of the eastern United States more than a thousand miles separate archaeological sites where spear points have been found from the nearest location of the stone from which they were made[1]. All this goes to show that, as in Stone Age Europe, long journeys, maybe along established trade networks, were also commonplace in early America. If this comes as a surprise, it is only because we constantly underestimate the capabilities of our ancestors.

Accurate dating of the bones in which the Clovis points were embedded to about 11,500 years BP (Before Present) unsurprisingly raised the question of whether this date marked the time when the first Americans arrived. Equally unsurprising was the animosity of the exchanges between those archaeologists who believed in "Clovis First" and their opposite numbers, who considered the manufacturers of these elegant weapons to be latecomers, and that America was settled much earlier. Two archeological sites have come to epitomize the evidence in favor of the latter school of thought, the Meadowcroft Rockshelter in Washington County, Pennsylvania, and Monte Verde in Chile. There are several other sites for which claims of pre-Clovis occupation have been made, but it is strongest in these two.

The sandstone shelter at Meadowcroft is located forty feet up on a south-facing slope of the densely wooded valley of Cross Creek, a tributary of the Ohio River. It is forty-five feet wide and equally high, but only

twenty feet deep, thus meriting its description as a rock shelter rather than a cave. It was when, as a young archaeology lecturer at the University of Pittsburgh, John Adovasio was looking for a largely untouched site to demonstrate excavation techniques to his classes that he heard about the rock shelter on the nearby Meadowcroft property. Checking on its suitability for his purpose, and before he began any excavations, he found the floor littered with distinctly modern artifacts: beer cans, syringes, and a hash pipe. Clearly Meadowcroft had lost none of its appeal as a temporary shelter or hideout of a sort.

That was in 1973. Adovasio and his colleagues spent the next six seasons working on Meadowcroft, logging an impressive 417 excavation days of twelve to fourteen hours each. Ever since, he has been defending himself and his findings against the school of "Clovis First." Excavating the successive layers of the rock shelter floor, he and his students came across an array of familiar and unsurprising objects down to a level of about ten thousand years, at which point the floor was littered with rocks from a major roof collapse. The feature that made Meadowcroft special was the collection of artifacts that Adovasio found *beneath* the layer of fallen rocks. The first object he and his students came across under the rocks was a spear point. It was about three inches long, and its cutting edges had been repeatedly sharpened by retouching, the process of knocking off small chips of stone with a bone or wood hammer to reveal a new sharp edge. However, it was not of the familiar Clovis design. For one thing, it lacked the fluting that served to anchor the Clovis point so firmly to the split wooden spear shaft. Adovasio named this new spear point the Miller point, after the owner of the Meadowcroft property, Albert Miller, who had encouraged the excavation of the rock shelter. Continuing the excavation into deeper levels, Adovasio found other tools, of presumably older date, made of both bone and stone. The deepest layer contained a two-inch-long stone knife, far more crudely made than the Miller point, but an effective cutting tool nonetheless. This he named the Mungai knife, after a farm a few miles to the east.

Although Adovasio believed from the style of the tools he had found

that he was excavating much older layers than the eleven-thousand-year-old Clovis points, he needed an independent method of dating the finds. Fortunately he also came across the remains of campfires that, unlike the stones themselves, could be carbon dated. Briefly, carbon exists in nature in two forms, a stable form with atomic weight 12 (or C^{12}), and a mildly radioactive form with atomic weight of 14 (or C^{14}). All living things, be they bacteria, plants, or humans, contain a lot of carbon. While alive, we and all the rest are literally radioactive, but as soon as we die the unstoppable process of radioactive decay slowly reduces the amount of C^{14} in our remains while the amount of C^{12} stays the same. By comparing the level of these two forms of carbon in the remains, archaeologists can estimate how long ago any organism died. At Meadowcroft as elsewhere, the campfires contain charcoal, the carbonized remains of burned wood cut down at, or shortly before, the time the fire was lit. The oldest carbon date, at the level where Adovasio found the Mungai knife, was sixteen thousand years BP.

No sooner had the Meadowcroft findings been published, in the prestigious British scientific journal *Nature*, than the attacks began.[2] Briefly, there were three separate charges: First, the carbon dates could have been severe overestimates because, so critics argued, flecks of coal might have contaminated the charcoal. As coal, a fossil fuel, is at least 100 million years old and thus completely devoid of radioactive C^{14} which has long since decayed, even a small amount of contamination would have pushed back the carbon dates for the charcoal. Second, and this is a familiar criticism of any excavation, the layers might have been disturbed by burrowing animals or plant roots, thereby burying the stone points at a deeper "older" layer. Third was the climatic argument that sixteen thousand years ago Meadowcroft was only a few miles south of the Laurentide ice sheet that covered most of North America, and thus the area was too cold for human survival. Adovasio answered his critics on all these points. Experts on the analysis of sediments found no trace of coal, the layer of rock from the roof collapse effectively sealed off the lower layers and would have prevented any vertical movement, and,

lastly, Adovasio argued that living near the ice sheet was perfectly possible, just as many people live close to glaciers today.

The other archaeological site that seriously challenges the "Clovis First" school lies some five thousand miles distant from Meadowcroft, on the banks of a small creek in Chile. While John Adovasio was excavating in Ohio, another American archaeologist, Tom Dillehay, was teaching in the Universidad Austral de Chile in Valdivia, about five hundred miles south of the capital, Santiago. One day a student brought him the tooth of a mastodon, an extinct smaller relative of the mammoth. Along with the tooth he also brought in a collection of other bones on which Dillehay noticed some cut marks that were consistent with deliberate butchering. Dillehay traveled to the site at Monte Verde, which lies on the banks of the Chinchihuapi Creek about ten miles from the coast of a marine inlet near the town of Maulin. Resting in the sandy terraces on the banks of the creek, he found more animal bones with apparent cut marks as well as stone tools and the always helpful remains of campfires. Imagining these to be no more than ten thousand years old, he was very surprised when the carbon dates from the charcoal and the bones came back at around 13,800 years. Older than Clovis certainly, but still in the same ballpark.

Working their way through earlier levels, Dillehay and his colleagues discovered more stone tools. Most of them were not reworked and looked as though they might have been found and selected as usefully sharp objects. But a few did show clear signs of improvement, in particular a piece of fine-grained basalt about four inches by two and with unmistakable signs of deliberate flaking. This was far less sophisticated than a Clovis point, being worked only on one side and lacking its beautiful symmetry and fluting. Of course, the key question was, as usual, how old was it? Once again it was the ashes from two hearths lying close to where the stones were found that gave the answer, and it was completely stunning. Flecks of charcoal from one hearth came back from the radiocarbon lab at 33,730 years old, and a small pieced of burned wood

from the other gave a carbon date of between 33,020 and 40,000 years. In other words, three times as ancient as the Clovis points.

The effect was dramatic, and, just as at Meadowcroft, the critics were ready with a barrage of alternative explanations that undermined what appeared to me to be the careful and understated conclusions of Dillehay's original *Nature* article.[3] As I write, more than twenty years after the paper was first published, the 13,800 years BP dates for Monte Verde have been supported by additional finds, most recently in 2008, and are now widely acknowledged as being correct.[4] However, the significance of the older lower levels at Monte Verde and at Meadowcroft is still extremely controversial. This is despite years of active and often pugnacious defense of their positions by both John Adovasio and Tom Dillehay that has clearly exhausted them both. At various times the debate crossed the boundary from appropriate academic intensity to outright viciousness, with accusations ranging from professional incompetence to downright forgery. Dillehay even went so far as to say that if he had to do it all again, he would not. "It hasn't been worth the agony," he is quoted as saying.[5]

And there, more or less, the matter rests. From time to time other fragments of evidence emerge that suggest that there were people in North America before Clovis. Other archaeological sites, but always lacking actual human remains, surface from time to time. Most recently, in 2008, a site at Paisley Caves in south-central Oregon yielded a few stone tools, butchered animal bones, and human coprolites, the euphemism for fossilized feces.[6] The organic remains, including the coprolites, gave carbon dates of up to 12,300 years BP, slightly older than Clovis but not by much. In another study published in *Science* in 2007, careful redating of material from Clovis and other sites showed that unambiguously identified Clovis artifacts were confined to a very narrow range of only two hundred years or so.[7] The authors were persuaded that this was far too short a time for people to have colonized the vast areas between the scattered sites across America where Clovis points have been found and that therefore America must already have been inhabited and it

was the technology that spread. But even that conclusion was fiercely challenged in a strongly worded response to *Science* a few months later, which argued that the new data were completely irrelevant.[8]

The whole debate about the timing and origin of the first Americans has the familiar feel of a stagnant intellectual circus, still balanced between entrenched academic foes who will never agree. This, I have realized over the years, is the natural equilibrium that sets in when a field has reached an impasse and where the rigid stance of personalities and their fiefdoms, rather than evidence, has become the deciding factor in an argument. Although this state of affairs is the antipathy of science as a branch of philosophy, where evidence alone is king, it is surprisingly widespread. When a field stagnates like this, the cycle can be broken only by a completely independent kind of evidence. Which is where genetics comes in.