

Elyse: Our next story sheds new light on the lives of some of the earliest Americans. Between 5,000 and 6,000 years ago, a little-known tribe of nomadic people struggled to survive on the edge of a barren wasteland. Crossing a forbidding landscape, known today as the Great Plains, they forage and hunt but leave little to mark their passing. Now, 5,000 years later, a man in Tulsa, Oklahoma, thinks he has found an artifact that, if authentic, may unlock some of the secrets of this mysterious culture. Amateur fossil hunter Kim Holt was searching the sandbars of the Arkansas River when he made an amazing discovery.

Kim Holt: This day, we were hunting along in the sandbars and I saw the base of a buffalo skull sticking up out of the sand. I got down and dug it up and flipped it over, and then found a point sticking out of one of the horn cores. And my first thoughts were, you know, what is the story behind this, you know? How did this point get stuck in the skull in the horn?

Elyse: I'm Elyse Luray, and I've come to Oklahoma to investigate.

Kim: Here's the skull here.

Elyse: Wow. Oh, what is that, an arrowhead?

Kim: Yeah, it's a projectile point of some type.

Elyse: Now, did you show it to any experts?

Kim: I took it over to the Oklahoma University Archaeological Survey and had those people over there to look at it. They ran some tests on it and told me it's at least 5,000 years old.

Elyse: Five thousand years old.

Kim: That's unbelievable.

Elyse: That would be really unbelievable. So what's the reaction been?

Kim: Oh, a lot of people think it's a fake. Some people really believe it's a true thing. I had one friend try to take it out.

Elyse: And what did you do?

Kim: I told him, no, don't do that, don't touch it.

Elyse: Okay, so tell me, what do you want to know?

Kim: I'd like to know if it's -- it's really, actually 5,000 years old. I'd like to know what type the point is, and if it holds any significant historical value.

Elyse: Okay, can I take it with me?

Kim: Sure, let's pack it up.

Elyse: If Kim's discovery is real, it may give insight into one of the least-understood peoples in the history of North America. Five thousand years ago, the Great Plains emerged from a 2,500-year drought that turned the

region into a barren, burning desert. When the rains finally fell, wildlife slowly returned to the land, followed by a small band of hunter-gatherers called the Calf Creek. Is this skull really 5,000 years old? And if so, what can this stone point tell us about those early plains pioneers? I'm heading to the University of Oklahoma to meet with archaeologist Margie Duncan. She was one of the first experts to look at Kim's find. She says that archaeological evidence of the Calf Creek is extremely rare.

Margie Duncan: You try to piece together the story of their lives, and it's not an easy thing to do because we don't have much. For a lot of years, no one thought anyone was here, but the Calf Creek people were on the southern plains. There are no human remains, so we have no idea who these people were or who they are today. For many years we had no idea what they hunted.

Elyse: Margie says the Calf Creek are important to historians and anthropologists because of their special ability to adapt and survive in a harsh environment. So she was excited when Kim first presented his find, but suspected it looked too good to be true.

Margie: First I thought it was a fake.

Elyse: Why?

Margie: Because this large of a spear point should have shattered when it hit that horn core. If it's found in the river, rolling around, those barbs should have broken off. You wonder, did somebody drill a hole in there and put part of a point in there? But there's no glue. If it's fake, it's a really great one, because it's quite well done.

Elyse: To determine the skull's authenticity, I'm showing it to forensic archaeologist Kent Beeler. When he first saw the artifact, Kent identified the skull as a young bison. But how long ago it died was harder to determine.

Kent Beeler: The color of the embedded sand grains suggests that this has been in a river deposit for quite some time. As far as how long, it could be 100 years, it could be 20,000 years.

Elyse: It's a young bison, but the horns are different from those of a modern bison. The straight horn suggests it belongs to a long-extinct giant bison. Comparing them to the horns of a young modern animal, Kent shows me the difference.

Kent: And you can see by the very short, very curved horn cores on that as compared to our specimen here how these are much straighter. This little guy would grow up to be modern bison, and this one would likely have grown up to be this one, bison occidentalis.

Elyse: Yeah, that makes sense. I see that. If he was correct about the species, Kent estimated the skull could be as much as 5,000 years old, but for confirmation, he needed a radiocarbon-dating analysis. With Kim's permission, a bone sample was taken from the bison's inner ear. This part of the skull contains the most dense and least degraded organic material. The team sent the sample to a lab and waited for the results. But even if the skull is 5,000 years old, it doesn't prove that the stone Point is from the same era or who put it there. So I'm taking it to Don Wyckoff, a Calf Creek expert at the Sam Noble Oklahoma Museum of Natural History.

Don Wyckoff: It's really stuck in there. I see polish on the bone and I see polish on the spear point.

Elyse: Don says the shiny finish could indicate that the maker used fire to heat the stone. Heat can change

the stone's crystal structure, making it easier to shape into a point, a well-known technique used by the Calf Creek. And though we could only see the end of the point sticking out, Don says the twin barbs suggest a possible match.

Don: We have a lot of polish here. Squared off... going in... stem's broken off on the one that -- this -- this is our baby. I think we can make the correlation that, if this is Calf Creek and this has got the barbs of Calf Creek, that this is probably Calf Creek also.

Elyse: Don's pretty sure the point is Calf Creek, but if that's the case, then it shoots a hole straight through one of Don's long-held beliefs, that these wide points were too big to be used on the head of a spear.

Don: I've been working with Calf Creek materials for about 30 years, and I've always considered these big, wide specimens to be knives, and yet here it is stuck in here as if it's a spear point. So, my question is: Is this an authentic association of what I would have considered a knife in a bison? Or have I been wrong all these years in interpreting what these kinds of things were?

Elyse: Before Don abandons his position, he needs to be certain. As an archaeologist, he's seen lots of fakes, and this skull looks very suspicious.

Don: So as I look at it, I'm trying to see how somebody could take a prehistoric artifact that they found somewhere else and jam it into a bison skull to create an association that is not archaeologically valid.

Elyse: Did a modern-day forger hammer the stone point into the skull? Or, one day 5,000 years ago, did a hungry hunter take careful aim and launch it at the end of a spear into a living bison? To determine if the artifact is a fake, the archaeologists needed to look inside the skull without destroying it, so they sent it to the high-resolution C.T. Facility at the University of Texas at Austin. Research scientist Rich Ketchum used high-intensity x-rays to image cross sections of the skull, one millimeter at a time. A second pass at a higher resolution concentrated on the stone point. The scan revealed that the point broke apart as it entered the skull. Once the point was mapped, rich used a 3-D printer to reproduce an exact replica.

Elyse: That's incredible. So this is what is inside of here. Back in Oklahoma, archaeologist Leland Bement says the reconstructed point does resemble other Calf Creek finds. How do you know that someone just didn't take a hammer and hammer this point into an old skull?

Leland Bement: For that we're going to have to look at another one of the C.A.T. scan images. This image slices through the horn and through the projectile point right through here.

Elyse: Right.

Leland: So this barb is the red barb sticking out back here. I want you to pay attention to this continuous arc of bone. There's no breaks in this.

Elyse: No, it's solid.

Leland: For a point to be inserted into a skull and not produce any damage to it at all, it had to be living tissue.

Elyse: Why?

Leland: There has to be the moisture and oils within that bone that keeps it elastic, so that basically what happens is, the point comes in, the skull flexes, the point is inserted, and that clamps back down.

Elyse: Okay.

Leland: And this is only possible with a living animal.

Elyse: The images clearly show that the spear point struck the bison with tremendous force, penetrating the skull and shattering into five pieces. But they also left us with another question: how could a Stone Age hunter throw a spear point that large with enough force to penetrate a bison skull? Leland says the hunter needed more force than unassisted human strength could provide. His spear throw was almost certainly aided by ancient technology.

Leland: What I believe they used was the technology of the spear thrower, or atlatl. And what the spear thrower does is it extends the arm of the hunter so that when he goes to throw that spear, his arm goes through a much greater arc and that exponentially increases the amount of force given to that spear.

Elyse: Prove it to me. That was powerful.

Leland: You want to try?

Elyse: Hands in?

Leland: Put the hook on the end of the spear. Now you're going to pull it back and you're going to throw it like it's a football. Very good, very good.

Elyse: Throwing with this device takes some practice, but Lee convinced me that armed with a spear thrower, a skilled hunter could generate the necessary force to bring down a bison. But for confirmation of when the animal was killed, we need the results of the radiocarbon analysis. Okay.

Leland: And I happen to have that right here.

Elyse: The envelope, please.

Elyse: Okay, so...

Leland: 5,120 plus or minus 25 years old.

Elyse: So this is over 5,000 years old. It's real. Kim's discovery is not a hoax. It is a witness to a moment 5,000 years ago when a Native American killed a young bison. But can the archaeologists be certain it's a rare Calf Creek point? Searching the University's collections, Don and Leland try to match our stone point with stone from known Calf Creek sites.

Don: That spear point didn't come from Texas. This is getting pretty close.

Leland: That one looks real close.

Don: If you heat-treat that, I think it sometimes... more like a point.

Elyse: Okay, so what did you find?

Don: Well, Elyse, we've been trying to track it down, looking at different kinds of cherts that are the same color.

Elyse: Mm-hmm.

Don: And we think this is our best candidate.

Elyse: What Don and Lee told me next filled out our story. I took the skull and test results back to Kim, and the first thing I told him was that the skull was, in fact, 5,000 years old.

Kim: That is amazing.

Elyse: Then I told him what Don and Lee had figured out.

Don: Elyse, we think the best comparison is with the Keokuk chert out of the Ozarks. The nearest source is about 70 miles east of where the skull and the spear point were found.

Elyse: The spear point is made from the same stone that the Calf Creek used in their Ozark mountain territory, and it's thrilling evidence of how changing climate once tempted these early Native Americans into the Great Plains.

Leland: And what we are seeing is an adaptation of people coming back onto the Plains after 1,000 years of bad drought conditions that drove not only the bison but the people off of the plains.

Elyse: And Kim's find proves that the Calf Creeks were advanced hunters, using spears and atlantes to bring down big game.

Leland: This is the most dramatic evidence where we can definitely say that point, embedded in that skull, shows Calf Creek undoubtedly hunted bison.

Don: It's the -- it's the best direct evidence we've seen.

Elyse: Finally, Kim has been able to reconstruct the story behind his artifact. Coming out of the Ozark Mountains, the Calf Creek followed small herds of bison as they returned to the Great Plains. Armed with a spear thrower, the hunter launches his spear directly at the animal. The wide point strikes the young bison head-on, piercing its skull with tremendous force. The animal's remains eventually wash into a riverbed where, 5,100 years later, Kim Holt makes his incredible find.

Kim: Okay.

Elyse: In the history of the Americas, the Calf Creek have always been a mystery. Very little has been known about them, and this piece elevates our understanding about these ancient people and brings it to a whole new level.

Kim: I never dreamed I would find anything like that.

Elyse: When Kim first heard his find was genuine, he decided to donate it to a museum where everyone could



**Episode 8 ,2005: Calf Creek Arrow  
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see it. It is now on display at the Sam Noble Oklahoma Museum of Natural History in Norman, Oklahoma.

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