

Bisonology with Various Bisonologists

Ologies Podcast

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Oh Heeey, it's your forgotten half can of LaCroix that's just cold, juuust fizzy enough to keep drinking it and not throw it away, Alie Ward, back with a very, very weird, odd episode of Ologies. If this is not your first Ologies rodeo, you know that each episode I usually talk to one Ologist, but for some reason... I don't know man, bison just threw us for a very rare loop. So this episode is kind of more like a buffalo party: 4 times the number of interviewees. Yes, that's right: 4 times! So if you are actually listening to this, it means that this episode did not kill me, and I am thankful for that.

Other things I'm thankful for; every week of course are y'all, everyone on Patreon.com/Ologies for supporting the show, everyone in Ologies merch from OlogiesMerch.com, and all the folks who tweet, or tell a friend, and are subscribed, and rate the show, and of course review, 'cause you know I creep 'em every week. And as proof I pick a fresh one, such as this week, CMM says:

Ologies is charming, informative, hilarious and consistently good. This podcast highlights the joy that comes from being curious with nothing dubbed 'too boring', because nothing is if you think about it closely enough. 5 stars, Alie.

I've actually shed at least two tears reading that. It really got me this time. Also, Hannah Christopher thanks for your review, I hope that your Tinder match who recommended this is a good one, good luck out there.

Okay, Bisonology. Bison, it's Baltic or Slavic origin, it comes from the word *wisunt*, which means 'the stinking animal' because of its musk while rutting. And the word 'bison' is distantly related to the word 'weasel', which is also stinky. Weasel and bison; one is hulking, billowing steam into the cold air, and the other is a sock with a face. Etymology, y'all.

I had every intention of just following my usual, very comfy, broken-in denim *Ologies* format - one ologist. But this episode was just, like, a pair of jeans that just kept growing more pockets. I first reached out to this well-known archeologist, who traces the history of bison across, like, tens of thousands of years in North America. But before our meetup at a Hampton Inn, naturally, in Utah, he was like, "Hey, can I bring a plus one?" He actually wrote about a colleague via email beforehand and said, "I thought having us both in the interview might be a bit more compelling since we're both working with bison, but on different ends of the Holocene: mine being the pre-contact record and Dan's research on the present population. We've been trying to find the time in our schedules to work together and discuss it over beer, and coffee - not mixed - so this may do it."

So I said "Yeah, bring him along. Let's shoot some bison shit." So we met up, we had a good chat, but I also found myself wanting the voice of someone with an indigenous perspective, aaand also perhaps someone who works day to day with bison. And I'm like, "I'm gonna need a party bus to fit all the folks I wanted to talk buffalo with."

But luckily my wonderful cousin raises bison in the snowy vistas of Browning in northern Montana, and his amazing wife is of course also a bison rancher and a member of the Blackfeet Tribe. So this past Sunday afternoon I called 'em up, got 'em on the horn, and they got on speaker, and they let me ask them all kinds of buffalo questions, including if it's okay to hug one. So rather than one, singular person's long thread becoming kind of like a crocheted blanket, this episode is just a rare Ologies

quilt of sorts. All about the world of bison, or buffalo... Fuck. I don't know - we gotta figure out the difference.

So you're going to hear from Ken Cannon who is a New Jersey-born, now Utah-based Research Professor of Anthropology at Utah State University who studies ancient bison and gives talks like: *Rolling Thunder: 10,000 years of Bison in the Greater Yellowstone Ecosystem*. He has short, cropped hair, rosy cheeks and a salt and pepper goatee. He looks like he could have been a rugby player in another life. That's Ken. He brought along Utah State University Ecologist Dan McNulty, who spent years in Yellowstone studying animal behavior. He has sandy-blond hair, he's a little more wiry than Ken, and I cannot explain why, but Dan looks like a Ken and Ken looks like a Dan, and that screwed me up editing this entire episode. But yes, Dan studies the more modern era of bison.

Lila Evans is my beloved cousin-in-law, and she served in the Montana House of Representatives, and I always just picture her in a business blazer even though she's probably more likely, like, bundled in fleece, 'cause it's January in Montana right now. And her long-time husband is my cousin Boyd Evans who's tall and gangly in Wrangler jeans. He has a handlebar mustache, and a rain-stained cowboy hat, and a great laugh.

So I told you, this is a weird and wonderful episode, and a break from the usual format. And if you hear it and you're like, "I don't *like* that it's four people instead of one!" don't worry, calm down, this a rare exception. If I did one of these every week, I would never sleep, and I would be so tired I would just move to another country and have a coconut stand. I just made this one a bison bonanza because I wanted to do the animal, and the community, and the topic, justice. So hop on, hang tight, and learn how big a bison is, what their fur feels like, how many there used to be, how many there are now, how do they do a head count, and what that lumpy hump is for, what a bison's favorite treat is, and what noises they make, and the difference between raising cows and bison, and how their very existence and survival has been politicized and continues to be, and also maybe the *worst* sentence in the English language. As we talk to academics and hands-on ranchers; all four of whom, in their own way, are professional bisonologists.

[intro music]

Aside: Okay, let's get right into it. The first person I had approached was the one I interviewed: Dr...

Ken Cannon: Ken Cannon.

Alie Ward: And you're a bisonologist.

Ken: That's part of my jobs, yes.

Alie: Is this news to you, that you're a bisonologist?

Ken: Yes it is, very much so. [laughs] I never heard that term before.

Alie: Would you ever use that term, like, in a cocktail party, like, "Hi, I'm a bisonologist."?

Ken: I think so.

Alie: Yeah?

Ken: Yeah, I think so.

Alie: Well, you're welcome. [*giggles*]

Ken: Yeah, thank you.

Alie: So how long have you been studying bison?

Ken: Well, I first got interest in bison when I started working for National Park Service in 1987 when I was just a little kid. And I got interested in it because we were working in Grand Teton National Park, and there was an archeological site there that referred to itself as a 'bison kill site/bison jump site'; it was interpreted numerous different ways. At the time there weren't that many bison in Grand Teton National Park.

Aside: Grand Teton is in Wyoming, and if you're like, "I'm in New Zealand, I have no idea where your parks are. Isn't Yellowstone in Wyoming?" The answer is yes, and I'm sorry. Both are gorgeous, mountainous, grassy places in Wyoming. They're just a few miles away from each other, but they have separate entrance fees, unless you get, like, one big pass that covers both. Essentially, Yellowstone is Disneyland and Grand Teton is California Adventure. Anyway, in the late 1980s when Ken started, there were not many bison there.

Ken: And the previous archeologists that worked there always minimized the presence of bison in there. So, I just started looking at the literature and the more I looked at the literature, every time there were fallen remains - bones preserved at archeological sites - nine times out of ten they were bison bones. And it's like, "How can you minimize bison in the archeological record when all the bones that you're finding are bison bones?"

So that just got me going, and I moved up and started working in Yellowstone National Park, and got more interested in bison; this wonderful mammal that was an incredible part of our ecosystem, shaped a large part of North American ecosystem, and why we don't know a lot about it. Most of what we know about it is from small herds and anecdotal historical records. I really wanted to try and understand at least the Yellowstone bison in a little bit more detail.

Alie: How old were those kill sites and what exactly is a kill site?

Ken: A kill site, it can vary in a lot of different ways. The traditional ones we always think of for Great Plains are running bison over a cliff.

Alie: Ooh!

Ken: Hundreds of bison over a cliff and then dispatching them at the bottom of the cliff.

Alie: This is kind of a stupid question, but when you say a 'kill site', like let's say they were *pheewww* over a cliff, is that for... to then use that meat and fur, or... Was that, like, a hunting technique?

Ken: Yes, it was a hunting technique. So that was the best, the easiest, I guess, and most economically efficient way of getting a lot of bison to get you into the winter. Typically they're end of fall, that these events happen. Bison, coming into the fall and the winter, they're really fat, and fat's good. Not like today, but fat was good back then. Everybody - all hunter-gatherers - everybody wanted fat. So you hunted bison in the fall. They're at their prime, nutritionally. Their fur is at prime, so you, you get some really nice skins for making clothing, and teepees, and all kinds of stuff. So yeah, that was an official way of doing it.

Alie: Going back into some history, much more recent, tell me a little bit about how you started to love bison. You mentioned that you have a New Jersey accent?

Ken: Yeah. *[laughs]*

Alie: Okay, so you grew up in New Jersey, but what brought you out to Yellowstone and the National Park Service? At what point did you want to start working in nature?

Ken: Well, I've always wanted to work in nature. I grew up on the Jersey Shore, and I actually started out as wanting to be a marine biologist. My undergraduate work was as a biologist, like Jacques Cousteau, 'cause I used to scuba dive and hang out on the beach. I swore when I was seventeen that I would never live more than half a mile from the ocean.

Alie: And here we are in Utah!

Ken: Yes, and here we are in Utah *[both laugh]* Be careful about those things that you say and put out there to the gods.

Aside: Okay no, you're not losing your mind. Last week's guest, Futurologist Rose Eveleth *also* wanted to follow in the flipper steps of Jacques Cousteau before finding her own path. Weird! Cute, right?

Ken: Anyway, I went there, and I got a little bit frustrated with the biology program there. It was largely geared towards pre-med students. But then I started taking anthropology courses. It was a small program, really good professors, treated you like a human being and not just a number. And I learned that I could do biology as an archeologist.

Alie: Oohhh!

Aside: So Ken graduated from the University of Florida, and did grad school in Tennessee, and then got his PhD from the University of Nebraska at Lincoln, studying the biogeography of prehistoric bison isotopes. So how did this Jersey dude wind up so far from the sea?

Ken: I wanted to get out of town, essentially, and see something different. And as a fluke I just applied for a job with the National Park Service, and got hired by the Midwest Archeological Center, and the first job was to go and work in Grand Teton National Park. It's just those weird things that happen in life and you've just got to go, "Okay, let's go!" *["Let's go! Let's go!"]* So, yeah, it wasn't a plan. *[laughs]*

Alie: But it seems like it served you well.

Ken: Yeah. I'm very glad that it all happened. I remember when I got hired and drove out, I had this... of course I had a nice little VW bug that I drove all the way out to Grand Teton from Tennessee. And when I got there my boss told me, like, "You were the last person we picked." *[laughs]*

Alie: *[gasps!]* Ouch! *[laughing]*

Ken: It was mostly because I didn't have any experience out there. But it was a slam and it's like, "Okay, I'll take this as a challenge."

Alie: Did you live up to it then?

Ken: I don't know. I'm still trying. *[laughs]* It's an ongoing process.

Alie: Is there something about bison themselves that intrigued you? I feel like, as an American, I think there's so much lore and history, and even a dark history to them as well. Is that something that grabbed you as an archeologist?

Ken: It grabbed me as an archeologist because in the mountains they were never seen as being an important part of the subsistence economy of Native American groups, and that was intriguing to me. But also, I think you're right, there's an iconic history to bison. It is a deep, dark history, but it's also a very exciting, positive history because we brought them back from extinction. And it was the efforts by a small group of people that said, "This is crazy. We go from 30 million to down to nineteen..." Or a hundred, or whatever the number was at the turn of the last century. I think that's a big part of it, just that, you know, that resurrection story is there too. But they're cool animals. I mean, you just go out and they're just... They're just cool to sit and watch.

Alie: They're majestic!

Ken: They are majestic, yes.

Aside: Now Ken's colleague, Dr. Dan McNulty - no relation to squid expert Sarah McAnulty - got his Bachelor's in Environmental Studies at the University of Colorado, and got a Master's in Wildlife Conservation *and* a PhD in Ecology Evolution and Behavior from the University of Minnesota. So how did he get lured into the bison life?

Alie: And now, are you from Utah?

Dan McNulty: No, born in Illinois, grew up in California, went to school in Colorado.

Alie: So one might say you've been roaming around, as well.

Dan: I have been a bit nomadic.

Alie: Right.

Dan: Although not lately.

Alie: And so you are a bisonologist. You study bison as part of your job, whether you would call yourself that or not.

Dan: I would say that bisonology is part of my program, yeah.

Alie: Okay.

Dan: Yup.

Alie: And so how long have you been into science, and field work, and animals? What was it that drew you to this?

Dan: Well, I lived in Hong Kong for three years when I was in junior high, and so that was, obviously, a very urban environment. When I got back to California I was in, like, eighth or seventh grade. And we lived on the edge of a big open space; lots of live oaks, and hills, and it kinda just sucked me in [*"Sucked me right in!"*] soon after we got back. And I've been kind of at it since then. And actually even before that, I grew up, you know, riding horses with my dad in that country, and just got really into it when I got back from that little stay in Hong Kong. A lot of time spent camping, hiking...

Aside: Dan said, growing up he always loved animals and being out in nature observing them.

Dan: But I never really thought I'd actually make a career of it. I was an undergraduate at Boulder, Colorado and then went up to Yellowstone. And actually, it was in... That was kind of when it was sort of the 'aha' moment, that, "Yeah, I think I can make science into a career," was when I arrived in Yellowstone. This was '95. I just got to see wildlife biologists in action. The folks I worked with up there had made it their career, had met other people that had been at it for a very long time, and it sort of dawned on me that, "Wow, if you work hard and you focus, it's possible to make this a career." So that's kind of where I really got started.

Alie: And now, how did you end up in the bison arena, sort of?

Dan: Following wolves.

Alie: Okay!

Dan: Yeah, the wolves brought me to the bison.

Aside: So the wolves brought him to the buffalo. But before we go much further, let's clear this up: *buffalo*, or *bison*? So, buffalo - etymologically - comes from the word for an African antelope, and then expanded to mean a wild European ox, and then French fur trappers saw bison, and called them *boeuf*, meaning 'oxen' or 'beefs'. So they were like, "boeuffalo." But currently, *is* there a difference when referring to the woolly, hook-horned, beautiful beasts of the North American Plains? I called my cousin Boyd and his long-time love and wife Lila up in Browning Montana, which is a small town of just a few thousand people. And with the Blackfeet Reservation, over 90% of the town are indigenous folks. Lila is a member of the Blackfeet Tribe, and I've been lucky to learn about her heritage and their family's tribal involvement over the years. And about buffalo... bison?

Alie: You, you don't mind if I have buffalo questions?

Lila Evans: No, we absolutely do not.

Alie: [*Alie giggles*] I'm so excited to talk to you about this because it's like, "Oh, I know people who actually get to see buffalo and bison every day." This is so exciting! My first question is: the difference between a buffalo and a bison. Stupid question.

Lila: There is none.

Alie: No such thing as a difference?

Lila: Nooo difference.

Boyd Evans: Yeah, I mean, just whatever.

Alie: Okay. So it's either/or.

Boyd: Yeah.

Alie: Yeah. Po-TAY-toe; po-TAH-toe: to-MAY-toe; to-MAH-toe.

Boyd: [*laughs*] Yeah.

Lila: That's kind of what it is.

Alie: How long have you had buffalo?

Boyd: Twenty years.

Alie: Twenty years?!

Boyd: Yeah.

Lila: Yeah.

Aside: Boyd and Lila started with *just six* a few decades ago.

Alie: What made you go get the buffalo?

Boyd: Just thought we'd try that.

Alie: [*giggling*] Just give it a shot.

Boyd: Yeah.

Lila: You know, you have to take those chances.

Aside: Once again, the life lesson is: get a buffalo, or six. Cut bangs, text your crush, because we're all gonna die. So they took a chance... they now have 52 bison. Also, I felt very stupid because I've read and heard both *Blackfeet* or *Blackfoot*, and the name comes from the dark soles of these bison hunters' moccasins. I didn't want to say it wrong, so I asked a very smart person a stupid question.

Alie: And correct me, is it Blackfoot Indian, Blackfoot Confederacy, Blackfeet Nation? I want to make sure I say it right.

Lila: Okay. There *is* a Blackfoot Confederacy, which is: our Blackfeet Tribe, the Blood Tribe in Canada, and the Blackfoot Tribe in Canada, and the Sarcee Tribe, and one other tribe, but I don't remember what it is. They're all connected. That's the Blackfoot Confederacy. But we are actually the Blackfeet Tribe in Montana, and we're the only ones on this side of the line.

Alie: And traditionally and historically, what has the Blackfeet relation to bison and buffalo been like?

Lila: Historically that's what they lived on. They followed the buffalo. And then when they became big things back east, like when their hides became really valuable back east for hats, and overseas, then everybody went to killing buffalo, and that's basically how the buffalo almost died out completely.

Aside: Before we talk about the brutal decline, the lumbering comeback, and their hopeful future, let's get some history down with archaeologist, Ken.

Alie: Going backwards a little bit, [*truck in reverse, beeping*] what is a buffalo? What is a bison? What is the difference? What is this animal? What is a bison?

Ken: I think that bison and buffalo are interchangeable terms. I'm sure some taxonomist will write you an email and say, "He doesn't know what he's talking about!" but I refer to them as bison, North American bison. The species is *Bison bison*.

Alie: I read that! Isn't it *Bison bison bison*?

Ken: It can be *Bison bison bison*, yes. [*both laugh*] And the taxonomy of bison is still being debated.

Alie: Really?! What are they thinking the bison derived from? What taxonomy is being debated and where do they think this species came from?

Ken: Well I think what's being debated is the Holocene, the last 10,000 to 12,000 years of bison history. During the Pleistocene we had a species of bison called *Bison antiquus*, some people might say *Bison bison antiquus*, that was probably about a third larger than the modern bison are. The herd sizes probably weren't as big. Their behavior might have been somewhat different than bison are today.

Once the glaciers retreated, between about 10,000 and 5,000 years ago, they went through this diminution. They became smaller in size and became what we know as the modern *Bison bison*. We think a lot of that might have to do with just changes in the environment. The climate was drying out somewhat, the vegetation was changing so it wasn't quite as nutritious. There's a lot of theories being pushed around out there.

Aside: *Bison bison bison*, Plains buffalo. There's another subspecies of North American bison, *Bison bison athabasca*, which were nearly extinct in the early 1900s until this small group of about 200 were discovered in this remote reach of Alberta, Canada. Boyd and Lila told me that they're even bigger, 2,800lbs as opposed to the smaller 2,000lb Plains bison. These Wood bison are kind of like our Canadian neighbors. They're beautifully husky and if you act like a [Canadian accent] hoser and get too close, a Wood bison might gore you, but [Canadian accent] they'll probably say, sorry, eh?

Ken: There's also some argument that the Wood bison extended down and was present in the Rocky Mountains and that was different than the Plains bison. Some people have argued that they looked a little bit differently, their skull structure was a little bit different, they tended to maybe have longer legs, longer humps, and that was an adaptation to deeper snows, trying to forage in the wintertime.

Alie: Going back to bison history, where did they from evolve from? What species did they evolve from? When did they get to North America? How many were there? Give me a brief timeline.

Ken: A brief timeline. Bison originated in Eurasia, migrated to North America during periods of interglacial. They've been here in North America probably somewhere 20 million years ago in different forms.

Aside: 20 million years. 20 million years! In a period of 20 to 30 years they were nearly extinguished from the continent and rendered extinct.

Ken: One of the coolest bison species I was around is called *Bison latifrons* and it was here during the Pleistocene. Probably died out 12,000 to 15,000 years ago. It had huge horns, like, a 10-foot-long spread of horns. Just a monster. ["She's a beast, mate."] Then that became extinct. Then we had *Bison antiquus* - which was probably a contemporary of *latifrons* - and then modern bison. That's a really dirty history of bison. [both laugh] But, yeah, *Bison latifrons*, they're really cool, too.

Aside: I just looked up *Bison latifrons* and boy howdy bejezus these horns! Oh god, they look like if a buffalo made a *Maleficent* Halloween costume out of, like, half a hula hoop. Oh my god! These gore-geous (Get it?) megafauna became extinct between 20,000 and 30,000 years ago but their look, ooh!

Alie: How far back does your research go when it comes to the history of bison in North America?

Ken: The history of bison in my research is kind of dependent on preservation. We've worked on older sites, up to 10,000-year-old sites, but I haven't been lucky enough to find bison that old in the archaeological record. A big part of that is just preservation issues. Yellowstone, and the mountains in general, are just not a great place for preservation. Soils tend to be acidic. They get turned over a lot. Here's a good term: bioturbation. [*robot, "Bioturbation."*] It's trees that are turning up the soils. Animals that live and burrow in the ground are turning up the soils. You have both chemical and mechanical breaking down of these bones, so they just don't preserve very well.

Alie: Let's say we're looking at a bison. Can you explain to me any of the pieces, parts of the bison? I know there are horns. There is a hump of some sort. How big is a bison? If I just beamed down to Earth from an outer planet, I'm a Martian and I'm like, "What is this big, furry creature?"

Ken: I'm about 5'6" on a good day. I think a good bull, we would be looking at each other straight on. I'd probably be looking at his forehead, so a pretty good size. Up to 1200lbs, a good-size male.

Alie: What about females? Smaller?

Ken: Females? A little bit smaller, probably 800lbs.

Alie: What's with the hump?

Ken: They have these really big spinal processes that come off of the thoracic vertebrae and the hump is the fat and the skin that goes over that. It stores a lot of its fat and energy in that hump. That's the part that hunter-gatherers really like because that's where all your nutrition comes from. What's pretty cool? They've got beards. Males.

Alie: I've noticed that. Is that a fashion thing or is that evolutionary?

Ken: I don't know. They've been hipsters for a long, long, long time. [*"They're not hipsters."*]

Aside: Bison beards, kind of like a scarf on an airplane, serve to insulate these critters in the snow. And get this, I just found out that their hairier shoulder region, it's a cape! So more evidence that these creatures are not only strong and powerful, but also just quietly flamboyant.

Let's get back to Dan, who describes a situation similar to the Wood bison discovery in Canada. In the late 1800s in Yellowstone's Pelican Valley, something cool happened.

Dan: Pelican Valley, historically significant in the story of bison generally in the United States because it was there that the last wild bison survived back in the very early 20th century in, like, 1906. 1912 there were only a couple dozen bison left. Those were the *last* wild bison and they were hiding out in Pelican Valley. The reason why they were hiding out back there was, well, there weren't people, but also because it was geothermally active. We all know about the geysers, and Old Faithful, and all that. Well, there's a lot of other warm ground that melts the snow off in the wintertime, these little pockets of warm ground that the bison were using as refuge in the wintertime.

Aside: For more on the super volcano that is Yellowstone Park, please see Episode 1: Volcanology with Jess Phoenix. Yes, anyway, most of today's American bison are descended from those Pelican Valley survivors.

Alie: Tell me a little bit about the bison population and where it has been in the last, say, 150 years. What's happened to the bison population?

Dan: Well, it's like the sea. It sort of receded and got really small. The tide went out with bison. Like I said earlier, they found refuge in places like Pelican Valley in the interior of Yellowstone, one of the most remote areas in the lower 48 United States, especially back then, the early part of the 20th century. Remarkably, since then, we have more bison now in Yellowstone Park than at any time since Europeans showed up. Granted, it's not 30 million, but it is 5,000 or so, is about where we're at now. That's a massive turnaround.

That's a massive cultural shift. You have to understand that bison were weaponized in a lot of ways. They were being eliminated to, basically, drive Indians onto reservations. It was part of the colonization of the Western hemisphere. Western North America was taking out the bison. So to bring those bison back is to challenge some of those ideas, those sort of colonial attitudes. That also holds with the wolf, as well. So yes, these numbers aren't huge, but they're significant nonetheless. I think that's an important cultural process as well as it is a process of conservation and a biological process.

Aside: I asked Ken, the geobiologist/archaeologist, if bison are on the move a lot, like equally enigmatic, hardcore Dave Matthews fans.

Alie: What's their yearly life cycle like? Did they tend to migrate in certain times of the year? Do they go from the north to the south? Where are they moving around?

Ken: The males, they migrate around a lot. They seem to have a pretty big range. The females, they tend to stay in cow-calf groups for most of the year and a lot of the younger males probably stay with the herds, those cow-calf groups, for a couple years. In the fall is when you have the rut, [*"Cuz I'm in a rut."*] so all the males come back from the high country and beat on each other for selection of females. The rut is pretty exciting to watch. They're pushing around each other, and snorting, and trying to see who's going to be the biggest, baddest one out there that gets all the cows.

Alie: Is that how that works? Is there an alpha bison?

Ken: There's usually several alpha bison that have access to the females, the cows.

Alie: Is that common in an ungulate group?

Ken: Yes, I think so. Elk are pretty interesting. They gather up what's known as a harem, [*"Oh heeey!"*] so 10, 12 elk cows get one guy.

Alie: Wow. It's like sister wives.

Ken: [*laughing*] A little.

Alie: I guess we *are* in Utah. [*both laugh*]

Aside: Before you tell me that I'm making generalizations, I'm just honestly sharing data. I looked it up and there are an estimated 30,000 folks in polygamous marriages in Utah, which is six times the population of wild bison in America. PS, I don't know or really care how they counted the polygamous people; it's none of my business. But what about the bison? I asked Dan if they have microchips in them or is there, like, a census taker for

buffalo? Someone with snowshoes and a clipboard just knock, knock, knocking on bisons' doors?

Alie: Is there an exact number? Is there a spreadsheet that has them all catalogued? Are they tagged? How do you keep track?

Dan: Counting. With aircraft.

Alie: Really? How does that work?

Dan: Park Service biologists will get into a small, fixed-wing aircraft, a Super Cub. They will fly certain routes through the park where bison are known to range and they just count them up. It's a total count. It's a census and they do that at least once a year. Sometimes they do it multiple times.

Alie: Do they just film it and then later look at the footage?

Dan: No, they'll count them as they go.

Alie: As they go?! [*"You know, you lose track."*] That seems so easy to lose track.

Dan: But they're so big they're actually easy to count compared to elk.

Alie: Really?

Dan: Well, yeah. Bison are darker, elk are lighter. The bison tend to be out in the open. Some of the elk will be in the trees.

Alie: So counting sheep is out. Counting bison's where it's at.

Dan: I think so, yes. If I had to choose, I would count bison.

Alie: Do you think that bison biologists dream of bison? Do you dream of bison?

Dan: Sometimes.

Alie: What kind of bison dreams do you have?

Dan: I can't remember any off the top of my head, but I've definitely had dreams especially when I'm in the field.

Aside: What does it mean if you dream of buffalo? According to SleepCulture.com, which likely employs kind-hearted interns to make up omens for every noun in the dictionary, "Seeing a buffalo in a dream is a symbol of survival and abundance. It means that you should pay attention to the path you are following in your life." Sure.

Ward family sidenote: Boyd and Lila and my cousins Crystal and James and Jamie bring a huge, traditional tepee to our reunions. The first year I ever got to sleep in it they told me to pay attention to my dreams because in a tepee they could have certain significance. In the morning I recalled I had a dream about seeing Don Johnson from *Miami Vice* at Costco. It was such a bummer. Maybe it just doesn't work on silly white ladies.

Ken: Being in Yellowstone and seeing how tourists think that they are like cows and can go up to them and take their picture. I think that's a big myth, that somehow Yellowstone is this petting zoo out there. These are big, wild animals. They are fairly tolerant of people. They're a lot more tolerant than I would be if it was them and somebody was coming up and snapping

pictures. I think that's kind of an interesting misconception about wild animals, especially wild animals in Yellowstone.

The myths about bison? I think maybe a big thing for people to understand is how pervasive they were on the landscape 150 years ago, especially on the Great Plains. If you were living in California or New York you probably didn't see a lot of bison, but out on the Great Plains they were an amazingly prevalent part of the ecosystem.

To have them disappear in such a short period of time, I think that's really hard for people to understand. It's hard for me to understand how you can go from 30 million bison... If you want to use that number. There's lots of different estimates on how many bison there were out on the Great Plains. Then within a 20- or 30-year period, they're gone. How we can do that? And the technology at that time, it wasn't like we were out there spraying them with gunships. People with single-shot rifles going out and they completely caused the collapse of an amazing population of animals.

Alie: How did that happen over 20 or 30 years?

Ken: Well, that's hard to understand but I think a big part of it was just the trade in bison robes. There was this great demand in the 1860s and '70s for bison robes and people were going out there, they were killing them, and I think they were disrupting herds. And they were just taking the hides. It wasn't like they were using them for food or anything. I think that had a great disruption of the breeding process and the populations just crashed. I think that's a pretty indisputable thesis about how it all happened.

It's difficult to imagine but once you start disrupting those herds... Because they were easy to kill, and hunters got pretty close to them, and could shoot them and the bison didn't necessarily scatter very quickly. And then once you start disrupting those herd structures and scattering bulls and cows, I think it's easy for the system to crash.

They weren't a big animal to flee. They really didn't have any predators. Humans are probably bison's biggest predators. Humans were the only predator, and they were the biggest thing out there. They didn't need to fear anything, and they were big enough herds that they could fend off wolves, their other biggest predator. They didn't need to flee. They're not like antelope. Antelope, as soon as they see something, you can't get within 100 yards of an antelope and it's gone. Bison, they were the biggest things out there so they didn't have to flee.

Alie: Do you work also with indigenous groups, and anthropologists, and other archaeologists to learn more about the relation between hunter-gatherers in what's now North America and a prominent food source, which was bison? Does that figure in a lot to your work?

Ken: Most of the work that we do is either on public lands or funded by public dollars, and we do consult with tribes. In Yellowstone, typically we consult with the Shoshone-Bannock on the Fort Hall Reservation and also the Eastern Shoshone that are over on the Wind River Reservation. They're kept apprised of our work and are certainly able to come and visit and comment on it. We try and do more and more of that consultation process. When I was working up in Yellowstone, I worked a lot with an elder who's since passed away, Hayman Wise, and he gave us a lot of information about the Shoshone and their lifeways. That was a pretty interesting and nice relationship.

Aside: Ken told me that he's been helping out using his archaeological techniques to understand the events and the landscape of the 1863 Bear River Massacre that killed possibly hundreds of members of the Shoshone tribe in a place that's now south Idaho, near a town called Preston. There's a small memorial there now, but the tribe is trying to raise funds for an interpretive center to memorialize what had happened on that site.

Alie: Does it ever get emotional for you?

Ken: Working at the Bear River Massacre site is incredibly emotional, just because it was a horrible event that in no way, shape, or form could ever be justified. Seeing people that are two generations removed from the survivors of that and them telling us their story, yeah, it's hard not to be emotional. You wouldn't be a human if you're not. So, yeah, that does get to be pretty emotional.

My wife Molly and I also worked on the Sand Creek Massacre site, and were sitting with a lot of descendants of the Sand Creek Massacre, and talking with them, and seeing how close that is to them, still. They get very emotional and, you know, it's not my history, but...

Aside: And how do Indigenous communities keep that history alive? The *InterTribal Buffalo Council*, ITBC, is this collection of 69 tribes from 19 different states and they work on programs to return buffalo to tribal lands. But hyper-locally, in their own community, Boyd and Lila themselves donated one of their own prized buffalo.

Alie: I know that in terms of giving back to the community, you guys donated a buffalo, a year or so ago, to one of the Browning schools to, kind of, learn how the buffalo is used in traditional food and other things. What was that like? What prompted that?

Boyd: It was an Indian Studies class at the high school. They wanted to get a hands-on experience, show everybody how they originally butchered buffalo, what parts they took...

Aside: Also, you may be too embarrassed to ask: Is it Indian or Native American? And there are several opinions on words like Indian vs Indigenous vs Native vs First Nations. Different people have different preferences depending on the era and the region. This deserves its own whole episode and that *is* in the works. So, if you are Native, thank you for any emotional labor that you have spent educating others. I highly recommend podcasts like *All My Relations* – it's so good – and following Indigenous folks from all over the world on social media. We all have so much listening and so much learning to do, and that's okay. Learning is exciting.

Now, back to Dan. I asked about the heritage of the bison and the introduced cattle. What's happening there?

Alie: What is a wild bison versus what is a bison that has now domesticated bovine DNA, and do people care? Where are we at with that?

Dan: I was at a meeting in Bozeman, Montana a few years ago. The National Academy of Sciences was doing a review on brucellosis and they had the chair of the InterTribal Bison Cooperative give a talk. One of the things he said that struck me was that, from his point of view, it doesn't really make much of a difference if this bison is 80% bison and 20% Hereford or 5%... it's a bison. From his point of view, this is a bison.

I think he was speaking, too, from sort of a cultural point of view because there's a lot of mixing among human populations. Native Americans have to deal with this in terms of blood quantum to prove that they belong to a certain tribe, and a certain reservation, and so forth. There's a lot of controversy around that and he was sort of referring to that in the context of: what percent of bison do you need in order to be a bison? I think he was saying, "You know what... that's kind of nonsense."

Alie: Right. [*Clip from Twin Peaks: "It's all a bunch of hogwash"*]

Dan: What is a bison is in some ways in the eye of the beholder, I think. And I think that's how I would answer that question.

Aside: Okay, so what about raising bison? I looked it up and it turns out that bison babies are cute to the point that it is enraging. They are like shaggy Muppets. It's infuriating. My heart hurts. I wanna hug 'em.

Alie: Any idea where we're at in terms of bison as a livestock commodity? Where is that industry going?

Dan: Ask Ted Turner. That's what he does. You can go to Ted's Montana Grill and order yourself up a bison steak. And this is not a secret. That's part of what he's been doing for a number of years. He's been growing bison on a number of his properties, and using that bison, and selling it in his restaurant. Ted's Montana Grill.

Alie: Do you eat bison?

Dan: Sure!

Alie: Yeah? You're not like, "Oh! Sorry!"?

Dan: No! Bison are super tasty.

Aside: [*sad voice*] Ooooh bison! But are raising them better for the planet than cows? Some ecologists argue, "yes" because their poops and their hooves have evolved along with the Plains. And, unlike namby-pamby cows, bison typically don't need winter shelter, which saves on energy costs.

Bison meat also tends to be leaner meat. Boyd and Lila supply a few local restaurants and sell steaks to private buyers, but they said not all bison burgers are created equal. Some commercial ones you might find in chain restaurants might be made from older animals and might be higher in fat. I asked how they were, in general, to raise.

Alie: How is it different from raising cows?

Lila: They're a lot smarter.

Alie: Really?

Boyd: They're independent. They're wildlife.

Alie: Do they communicate with each other more than cows do? Are they more social or less social?

Boyd: Oh, way more social. They run around in one little pack.

Alie: What kind of noises do buffalo make?

Lila: Grunts.

Alie: They grunt?

Boyd: Yeah, they grunt.

Lila: Kind of like sheep!

Boyd: Kind of like pigs!

Alie: Really?

Lila: Oh, yeah! Kind of like pigs, that's kind of what they sound like.

[clip from YouTube video, buffalo grunting, like a low-pitched mix of a snore and a belch]

Aside: P.S. Thank you YouTuber Jim Doss who posted this 9-second video of a male bison sticking his tongue out like it was a fraternity burping contest and just letting the grunts rip.

Alie: When do they have occasion to grunt? Do they do it when they're happy, or when they're pissed off, or when?

Boyd: When they communicate with each other. Mostly when they're in a little bunch, there. Yeah, they talk to each other that way.

Alie: Do they have any favorite treats? Are they like, "Yes, it's apple season!" or is it just like, they eat grass and that's it?

Lila: They love crabapples! Absolutely LOVE them!

Alie: Do they grunt to each other like, "Yo, come and get these, man!"?

Boyd: *[laughs]* I don't know!

Aside: Buffalo going batshit on crabapples is such a joy to imagine. I would like to be their friends.

I asked Dan if bison are social, mostly because I would like to know if they will be my friends.

Dan: So, they're extremely social, bison are. They aggregate together and they'll help each other. They're not like elk which sort of flee in every direction and, sort of, every man for himself, generally. Bison are very cooperative in how they defend themselves. But when there's deep snow, that defense breaks down and it becomes every man for himself. Or woman.

Aside: Side note: of course. Or non-binary bison. I'm sure they're out there.

I was recently reading *American-Indian Thought*, which is an Anne Waters anthology of Native writers, and I came across this passage by Alice Kehoe, which happens to relate to the Blackfoot Confederacy. Alice writes:

What really matters to a Blackfoot is autonomy. If a person competently engages in work or behavior ordinarily the domain of people of the other sex, or of another species, onlookers assume the person has been blessed.

Anyway, back to bison. We need more. I think. Right? Let's ask an expert.

Alie: And where are we going in the future in terms of bison conservation and growing the numbers? What do you see coming up around the bend?

Dan: [*deep thinking breath*] Well, my experience in the Greater Yellowstone, I would say we're running up against limits. Just in the 20-25 years that I've been working up there, areas that used to be rangeland have houses on them now. So, it isn't just an issue of livestock grazing on the borders of the park: it's pavement, it's houses, it's fences, it's people, swing sets, that kind of stuff. It's encroaching and there doesn't really seem to be any end to that. And so, bison, and I think wildlife in particular, are increasingly hemmed in in the Greater Yellowstone Ecosystem.

On the other hand, you've got initiatives, like out in Eastern Montana, the American Prairie Foundation, where they're cobbling together private lands, you know, buying up lands from willing sellers. These lands are adjacent to public lands and they're trying to recreate the kind of shortgrass prairie that we had at the time of European conquest, basically, out there. So, taking corn fields and alfalfa fields and converting those back into prairie, which is not an easy thing to do, by the way.

I also think a big part of the future of bison is on Native American reservations. So, increasingly you see tribes building up their herds, on their lands, under their management and I think that's a big part of the bison story going forward as well.

Aside: Boyd and Lila [*echoey*] echoed that.

Alie: Is there anything population-wise of the Plains buffalo that y'all would like to see happen? As people who have land and have livestock, would you like to see the population rise again to closer to what it used to be like? How do you guys feel about how many buffalo there should be on the Plains?

Boyd: Not a hundred million! [*laughs*] They would overrun Nebraska, and Kansas, Missouri, and there wouldn't be any corn fields. There wouldn't be any wheat fields. You know, they have a place but it's proportionately.

Aside: Okay, I know Futurology was last week, but I asked Dan about what might be in store for our buffalo friends.

Alie: What is the aim? What's the goal in terms of numbers of bison? What can the continent support, given what we've maybe done to the land in terms of agriculture?

Dan: Well, it's completely in our hands, our hands being, sort of, American society. If we want more bison, we can have more bison. There are ways of doing that, likewise with other wildlife. The question is whether or not we're willing to make the choices and the tradeoffs in order to do that. So for example, in Northern Yellowstone, very few bison are permitted outside the park because they interfere with agriculture. Not only conflicts in terms of, you know, raiding hay fields, and busting down fences, but they also carry diseases. Both elk and bison carry brucellosis.

Aside: Side note: brucellosis is caused by bacteria and in humans it's most commonly picked up by eating unpasteurized milk or soft, squishy cheeses like a goat cheese. But who was Bruce and why did someone name a disease after him?

Well, it turns out it's named after David Bruce, an Australian-born microbiologist who worked on investigating the disease right around the time, I guess, folks were running around North America killing all the bison.

Also, David Bruce did not have brucellosis but he did perish and fall from life's supple grasp just four days after his wife... AT HER MEMORIAL SERVICE. He died at her memorial service, which is either really sweet or incredibly obnoxious. But I hope to heaven that the funeral director just gave that poor family an impromptu BOGO (buy one get one) discount. Okay, back to brucellosis.

Dan: And, if a domestic cow contracts this disease, they're at risk of a spontaneous abortion. There's a massive economic cost to having livestock infected with bison because it means that you can't move your livestock out of state, meaning that you can't sell them across the state lines, because other states don't want to get infected with brucellosis. And so, it's a major economic issue to having these species that carry that disease to range far and wide.

And so, all these decisions about wildlife management, these are all social decisions. These aren't necessarily biological processes exclusively. They are very much social and cultural processes. A lot of these decisions get made in public meetings, in various different situations with different agencies – state, local, federal – and so when you say, "How many bison can we have?" well, it really, sort of, depends on the social economic caring capacity. How much are people willing to tolerate? We could have bison in Cache Valley if all the farmers that are grazing cows or growing corn decided they wanted to raise bison. I mean, that's possible.

You have private landowners in the Plains states, elsewhere in the Rockies, that are doing just that. They are raising bison for profit. They are trying to make money off of it. So, there is a model for doing that, but are those livestock? Are they wild bison? Those are social decisions. Those are the kinds of conversations we need to have knowing that up front, that these are cultural discussions that we're having, socio-economic discussions, and not so much biology. So, what we really need to be talking to is a sociologist and an economist. And a psychologist too, probably!

Aside: Sociologists – I have not done an episode on you yet but I will. And economists – I am so sorry, but you are not econologists. Hey, all those in favor of some spin off shows? Maybe an Ologies network? You can Tweet at me! Okay, but first, let's bust some more myths.

Alie: What about any myths or any flimflam that you would debunk? That you see people having misconceptions?

Dan: There's so much flimflam!

Alie: I know! Debunk it! You got the stage here!

Dan: About bison specifically? [*deep thinking breath*] I would just sort of echo Ken's point that they're not farm animals, and so if you're going to Yellowstone in the summer to see bison, don't underestimate how quick they can be to kick you, pounce on you, stomp on you, hurt you. [*Clip from Hot in Cleveland, Betty White: "I will cut you!"*]

Dan: Keep your distance. Other myths about bison... here's a BIG myth, and that is that they are a major source of brucellosis. That's a MASSIVE myth that needs to be debunked that has direct bearing on their conservation outlook, and how people perceive them, how the livestock industry perceives them. To the best of my knowledge, there has not been any instance of bison infecting livestock cows outside of Yellowstone. All those transmissions

have involved elk that have been infected with brucellosis. So, bison get a bad rap. There's still a lot of, I would say, bias, culturally, against bison. In the livestock community, bison are looked at as competitors and threats.

Aside: Boyd and Lila echoed that and they said that it's a big limiting factor in growing bison numbers via ranching.

Boyd: They're never going to populate like beef because there's too many myths out there. For one thing, brucellosis is a big scare. It has nothing to do with the meat. But even people here on this reservation don't eat buffalo because they're afraid of this brucellosis stuff.

Alie: Really?

Boyd: Really. Yup.

Alie: So, that's some flimflam right there.

Boyd: Yeah. It really is! Our food program has buffalo meat. They have buffalo meat that they ration out. But they have trouble getting people to take it!

Alie: Really? That's surprising! Given that buffalo is such a part of Blackfeet history, is it ever weird to you that it's difficult to get over the myths?

Boyd: Yeah! Yeah, it is, because they spread these rumors for, I don't know, a hundred years or whatever? It's kind of frustrating that these...

Lila: The Métis won't even really try.

Alie: Are there any causes or any charities that are helping bison or helping people, maybe, relate to bison or helping... Like how you guys donated a buffalo to a school, anything like that that is doing good stuff that you guys would want to shout out or have a donation go to at all?

Boyd: Yeah, you know, they do have several buffalo coalitions – one in North Dakota and one in South Dakota – and then one that several Indian tribes are all in, and they put buffalo in different places. If somebody in New Mexico wants buffalo, they can get buffalo from the tribal coalition. So, there's lots of opportunities in buffalo.

Aside: Okay, quick **Aside:** I found one, and this week's donation goes to the *InterTribal Buffalo Council* whose mission is to restore bison on tribal lands for cultural and spiritual enhancement and preservation. So, the ITBC coordinates education, and training programs, and the transfer of surplus buffalo from national parks to tribal lands, and works with their partners including the National Bison Association, the National Parks Service, the U.S. Fish and Wildlife Service, the Wildlife Conservation Society, and more. So, you can find out more about them at ITBCBuffaloNation.org. That donation was made possible by sponsors of this show, so you may hear about them now.

[Ad Break]

Okay, so Ken, if you remember, gave us the history of bison and we haven't heard from him in a bit, so let's ask him stuff.

Alie: Can I ask you some questions from listeners?

Ken: Oh sure.

Alie: Yeah? They might be stupid. You okay with that?

Ken: Yup! [both laugh]

Alie: We may have gone over a bit of this too, but John Worster wants to know: How many bison were around during their peak population period? Do you think 30 million, or...?

Ken: Yeah, I think 30 million is a good number.

Alie: And how long ago was that?

Ken: 1860s they were probably at their peak. 1850s-1860s.

Alie: [with wonder] 30 million... Meeann Dingman says: For a very long time I thought the American Bison was extinct, that the good ol' boys back in the railway days had hunted them to extinction. Fast forward to me being Today years old and I still don't know what the story is.

So, they are not extinct. This is the same species from the 1800s. It's not a hybrid species or...

Ken: Yes.

Alie: Let's see, a bunch of people, I'm going to read their names as fast as I can: Anna Thompson, Allison Tuuri, Lacie J. Scheuer, Sydney Brown, Kelli Brockington, Jessica Bailey, Ashra Kolhatkar, and Sebastian Osterbrink all kind of want to know: How related are American Bison and European Bison? Like, what is, essentially, their closest... Like, where are they in terms of the musk ox and water buffalo? I didn't realize there was a European Bison.

Ken: Yeah, it's *Bison bonasus*, is the European bison, a little bit smaller, mostly seems like it was adapted to woodlands. Probably not nearly as prevalent, but probably just as good to eat. They show up on the archeological record. They're all bovines.

Aside: An ungulate is animal that hooves, and a bovine is a type of ungulate that includes cattle, and African buffalo, and yaks, and water buffalo, and bison. And the bison, like cows, are also ruminants, which means it chews its food, and then kinda yaks it back in its mouth and enjoys an encore meal of it. And I DARE you to try that during the salad course at your next business dinner. Just do it. So gross, so baller.

Alie: A bunch of people had questions about their fur. Stephanie Broertjes, Bonnie Fairbanks, Jen Athanas, Colette Ayers, they want to know: Why do they have so much hair and fur? And what makes the hair so good at insulating them? And was that helpful during colder periods?

Ken: Yeah, they have really thick, dense, fur that they grow throughout the year, plus their fat. They're well adapted to cold temperatures. You know, it gets 20, 30 degrees below zero in Yellowstone and up into Canada, and these animals are out there. And really, what I think is amazing to see is, in the middle of winter they have snow on their backs, and the snow is not melting because of the insulation, so they're not losing a lot of the heat that way. They are well insulated, and well adapted to that really extreme environment. They live in environments that go from -30 to over 100 degrees, so they are incredibly well adapted to North American extremes.

Alie: And they can handle the 100-degree weather because, again, the insulation?

Ken: Well, they lose a lot of their fur. If you look at the difference between a bison in the winter and a bison in the summer, they don't have a lot of fur left on them in the summertime.

Alie: Oh wow, it just sheds off?

Ken: Yeah.

Alie: And then, buh-bye. I wonder if there's any application for that. Just go around collecting bison fur?

Ken: You could, yeah, you could go up there and look for it.

Aside: So all that fur protects them from the elements, and I asked Boyd and Lila about it, having seen it first-hand half the year, where it can get to -50 degrees Fahrenheit.

Also, super side note: just this past week, my dad, which is your grandpod, just told us a story about growing up in Montana, walking to school *a mile and a half* EACH WAY in snowy, -70 degree-weather. Pop, I'm so sorry I live in L.A. and I use a space heater when it dips below 70. I just do not possess the Montana vigor of the bison.

Alie: How do they do in the snow? Like, how cold does it get up in Browning?

Lila: Snow doesn't bother them at all.

Alie: Yeah?

Boyd: Cold doesn't bother them either. They're kinda the opposite of cows. A buffalo looks into the wind, into the storm, and the cow turns her back to the storm.

Alie: [laughs] Is that right?

Boyd: They really do. I mean, they're totally different in storms.

Alie: What does their fur feel like? Because I've gotten a chance to sleep and, obviously, feel your buffalo hide because we have one, but how would you describe their hide and their fur?

Boyd: Kind of wooly. They have a nice fur, but they're more wooly than - it's not just hair. It's more of a cross between hair and wool.

Alie: Do you remember that story when we were up at the homestead, and you guys had the teepee up, and it was me and my parents sleeping in it? So, we're sleeping in the teepee and the plains winds are flapping the smoke flaps and you can see the stars through the top of the teepee. And my parents are sleeping, and to keep warm, are sleeping on top of one of your buffalo hides. Then [slight giggle] we go to sleep and about five minutes later I just hear my dad say to my mom, "Oh, I thought I was petting your hair, but you's a buffalo." [everyone laughs] Because my mom and I have such curly hair my dad mistook the buffalo hide for my mom's curly hair.

Lila: Well, if he ever gets lonesome, now you know what to give him. [Alie laughs] A piece of buffalo! [laughs]

Alie: Every time I have to go flat iron my hair, I always think: it's a lot like a buffaloooh. [laughs]

Aside: Man, if I want a haircut though, I can't roll around like a bison until it just falls off. Oh... It's pretty damaged actually... so I probably could.

Ken: So they roll around and, yeah.

Alie: And that's how they fall off, it's just wallowing?

Ken: Yeah.

Alie: That makes sense because someone asked why they wallow and I thought they just meant, like, in disposition that they were kinda emo, so... [*Ken laughs*] I thought they just seemed like an Eeyore and I was like, "That's rude." But okay, so wallowing is an actual word that relates to behavior. That makes sense.

Some people asked, Melissa Huston and Mike Melchior asked about their roaming, and why they roam? Also, Mike Melchior wanted to know: How do buffalo manage their cell phone bills with all the roaming charges? [*ba-dum-TSH!*]

Ken: Ooohhh...

Alie: Which, I don't think was a serious question, but yeah, why did they roam? Why were they on the move so much? And did the plains make that easy because it wasn't mountainous?

Ken: Well, they're moving to find food. They're constantly looking for good nutritious grasses to eat, so that's why they're constantly on the move. [*clip from Mean Girls: "Get in loser, we're going shopping!"*]

Alie: So, they've already eaten that patch and now they just keep going.

Ken: Yep.

Alie: Oh, got it. Kinda like big furry locusts, but cuter.

Ken: [*laughs*] Yeah, very big locusts.

Alie: HUGE locusts. Let's see...

Ken: More cuddly than locusts though, I think.

Alie: I think they're more cuddly. I think they would probably beg to differ. They're like, "No we're not. Don't touch me."

Aside: The excellent science writer Ed Yong published a piece in The Atlantic a few months back titled, "What America Lost When It Lost the Bison" and it was about bison surfing a green wave of new shoots and grasses to eat. And researchers recently discovered that the bison's grazing changes the landscape, and Yong writes:

In areas where the bison graze, plants contain 50-90% more nutrients by the end of the summer. This not only provides extra nourishment for other grazers, but prolongs the growing season of the plants themselves.

Yong continues:

When we lose animals we also lose everything those animals do. When bison are exterminated, springtime changes in ways we still don't fully understand.

Ed Yong. SO good.

Okay, other things we don't understand? Butts, as always.

Alie: Makenzie Miller wants to know: Why, oh why, are their rears so small?! It doesn't make any sense visually. Please rescue me, evolutionary logic! Why do they have such small butts? [*Ken laughs*] It's a big question. I guess it's all in the hump!

Ken: I... guess. I mean, that's where all their power comes from.

Aside: He explains that by having a big chest up front, bison are able to act like a wedge through the snow, pushing aside these frozen drifts so that they can forage at these grasses below the snow. And they invested all their muscular material toward their head and their shoulder muscles.

Alie: So, business in the front. They're like, "Why are you even bothering with my butt? Look at my hump. This is where I get my stuff done." Okay, that makes some sense.

Asriel King wants to know: How did buffalo become a term for so many things? Like, are buffalo mean? What's their temperament like? Do they have friends? This is a lot of questions and I'm not sorry, they say.

Ken: I don't know. I mean, they're certainly prevalent in our lexicon, and I think maybe that goes back to their... because they're such an iconic species.

Alie: A lot of people have this question. Raymond J. Doidge, Laura Cunitz, and Heather Densmore all wanted to know: Are bison related to woolly mammoths?

Ken: Not in the least.

Alie: REALLY?

Aside: Other than, they're mammals. The bison, by the way, as of 2016, is the official mammal of the United States.

Alie: So their hair has nothing to do with it.

Ken: *[laughs]* No.

Alie: Laura Merriman wants to know: In Theodore Roosevelt National Park bathrooms there's a sign that says, "Bison can weigh up to 2,000lbs and run up to 30mph which is 3x faster than you." Is that true? And what do you do if you upset a danger cow? Hide behind a rock?

Ken: *[laughs]* Yeah, the best thing is not to get them mad.

Alie: Not to get them mad. Charlotte Grzegorowicz wants to know: I heard somewhere that bison can jump six feet in the air, is this true?

Ken: I don't think so. We did see a bison when we were working up along Yellowstone Lake - and this, I think, attests to the quality of their eyesight - and we had an excavation unit opened up and we were eating lunch, and a little bit removed, probably 20 yards away from our excavation unit. And this lone bull came walking up, and got right to the edge of our hole, and saw it, and he kinda wheeled up, like, "WOAAHHH. WHOAH. WHOAH." *[Alie also makes wooaahhh-noo sound]* Yeah. It was pretty freaky. We're all like... *[laughs]*

Alie: Can you imagine if a bull tumbled into your hole?

Ken: Yeah, that's all we could think, is like, "Okay, who is going to get that one out?"

Alie: Ohhhh noooo. Have you ever had a scary encounter with a bison?

Ken: Yeah. Again, working along Yellowstone Lake with geologist Ken Pierce, because we were trying to understand how the archeological record is related to lake level changes. So, we were walking along the cut bank and collecting samples and Ken, doing his thing of

describing soils and everything. And we came up on this little marsh that we were able to climb up, and there was a bison sitting right there, and it's like... [Ken laughs, Alie gasps] and we jump back down, and he went on his merry way. That was kind of freaky.

Alie: I'm surprised that they startle. I mean, I guess they're probably...

Ken: Yeah, I think their eyesight is not great, and you know, all of a sudden you see this funny white guy with a hat on and it's like, [laughs] "What would you do?"

Alie: [laughs] I might gore you. But that's just me.

Evan Jude wants to know: How similar are bison to domesticated bovine? Can a bison produce offspring with a cow the way a horse can with a donkey?

Ken: That was a big thing that was going on in the 19th century, the late 1890s, and into the teens. They were trying to breed cows and bison. I don't think they were... I think the biggest problem was that they were using bull bison and cow cattle. And a lot of times the babies, the fetuses, were too big and killing the cow. There's 'beefalos out there...

Aside: So yeah, you wouldn't breed, like, a Yorkie mom with a Great Dane dad. Also, I feel you should know, some cattle-bison hybrids are called 'beefalo' or 'cattalo'. And I think personally, Ancient Cattalo sounds like a really good TV spy name.

PS: neither one of them have a favorite buffalo movie. I tried. I asked.

Ken: I have a buffalo joke, though.

Alie: I'll hear it.

Ken: Okay. What does the momma buffalo say to their kids as they go off to school?

Alie: [pause]

Ken: Bye Son. [laughs]

Alie: That's great. [laughs] How did I not see that!? How did I not see that coming? I'm like a bison, I have very poor eyesight when it comes to wonderful jokes. [Ken continues laughing]

Aside: I have finally been out "daddled."

And also, that's a great note to leave on. So now, let's get to the questions you asked wildlife ecologist Dan, who I always want to call Ken, but Ken is the archeologist. But this is Dan. Let's talk to wildlife ecologist Dan.

Alie: Can I ask you some Patreon questions? Some listener questions?

Dan: Please.

Alie: Okay, Victoria Demerest, Kathleen Fast, Ivory Dettter, want to know: What's up with birds and bison? And also, why are they just hanging out, just kickin' it, sitting out on their humps and picking at their wounds? What's going on with the birds?

Dan: They're eating parasites. Ticks, flies, things like that. You see this with magpies, they'll sort of perch on a bison and do a little foraging.

Alie: Okay. They're bros though? They're friends?

Dan: Yessss... [*That's not very convincing.*] However, if the bison is sick, and if it does have a wound, it can attract a lot of scavengers, and it turns in to sort of more of a harassment type of issue.

Alie: Oh. Gross.

Dan: Yeah, so... But generally speaking, it's not a big deal for bison to have a magpie on them.

Alie: Kristin Smith wants to know: Do bison really only have one lung? Or was that a myth made up by white people who couldn't fathom how Native Americans were able to kill an animal so big without a gun?

Dan: Wow! That's a really interesting question! I did not know of that myth, so I really can't comment on whether it was a good one or a bad one, other than to say, you know, it's not true. They do have two lungs.

Aside: P.S.: this myth started because, while bison have two lungs, they share one lung cavity with no division between the lungs. So now you know that little trivia nugget and all you will talk about will be buffalo.

Alie: This is a question I got from two past ologists, Jennifer Buz, an areologist, she's a Mars expert. Also Julie Lesnik, who studies eating bugs as sustainable protein. They both asked: Can you please dissect the sentence: Buffalo buffalo Buffalo buffalo buffalo buffalo Buffalo buffalo? Do you have any idea what they're talking about?

Dan: No. I'm afraid not.

Alie: This was also asked by Graham Tattersall: In your experience do Buffalo buffalo Buffalo buffalo buffalo buffalo Buffalo buffalo? And I've no idea what they're talking about. [*Dan laughs*] But I have a feeling there's some kind of grammatical loophole where that is a sentence.

Dan: Yeah, I'm sorta queasy just thinking about it.

Ken: They're verbs *and* nouns.

Alie: Yeah. Right. [*laughs*] I'm gonna... yeah, I'll unpack it. I'm like, "How are two ologists both on the same hallucinogen, submitting questions?"

Aside: Of course, I looked this up, and in this case, it is INDEED a grammatically correct English language sentence. With Buffalo meaning, 'of Buffalo, New York', another buffalo meaning 'bison', and another buffalo, meaning the verb, 'to buffalo, or 'to bully'. So, according to my friend, Wikipedia: Buffalo buffalo Buffalo buffalo buffalo buffalo Buffalo buffalo, is translated to mean: the buffalo from Buffalo, who are buffaloes by buffalo from Buffalo, buffalo other buffalo from Buffalo. [*warped*] God, I need to nap.

Alie: So a lot of people asked this question, and I will put them all in an aside.

Aside: Possibly hungry Patrons, Teresa Dezazzo, Lale Stefkova, plus a bounty of first-time question askers, Brittany K, Milo Cuesta, Holly Boud, Daniella Buchanan, Michelle Grondine, and Samantha Kenny specifically all asked:

Alie: Why do we eat bison burgers? Are there enough bison for that? And if they're threatened to low numbers how can they be used as a food product?

Dan: They're commercial herds. They live on big ranches out in places like South Dakota, elsewhere, so these are not what I would call conservation herds like Yellowstone, or Wind Cave, or the Henry Mountains, or National Bison Range. Those wild conservation herds, they're not turned into burgers at restaurants. Now, they're hunted, right? Yellowstone bison are hunted by... There's a tribal hunt every fall that occurs on the northern end of the park. The Henry Mountains herd is hunted; the Utah Division of Wildlife oversees that hunt. But these aren't animals that are, you know, being shipped to processing plants. That's more like a regulated hunt.

Ken: Can I interject something interesting about bison?

Alie: Yes!

Ken: Even though they were down to a couple dozen at the turn of the last century, they've never been on the endangered species list.

Alie: Why is that?

Dan: That's a good question.

Ken: I don't know, but they have never been nominated as an endangered species, even today. No one has taken that task on.

Alie: That seems... Is that a political choice? It couldn't be that big an oversight. I'll look into that, that's...

Dan: There's probably some interesting history there.

Alie: Yeah. That's bananas. I'll look into that. That's nuts.

Aside: From what I can gather, the population was so regally boned by European settlers that bison were just considered ecologically extinct. And while there may only be a few thousand in wild herds, ranching has now grown bison's numbers to several hundred thousand in the US, so they're considered 'near threatened' which is the lowest level of concern. It offers pretty much an, "Eh, you'll be fine kiddo," level of protection.

Alie: Brigid Fitzgerald, Queen Bee Ceramics, and Carla Hickenlooper said... Queen Bee Ceramics asked: I just found out that Yellowstone bison population is managed by culling the bison herd every winter. Reading about this makes my heart hurt, as I didn't realize that bison were not a protected species. What's your take on the Interagency Bison Management Plan? What are they doing right? What are they... What's going on with it?

Dan: Well, they're dealing with a difficult problem in terms of increasing numbers of bison and not necessarily increasing amounts of area in which to have bison. So, they're forced to come up with a plan to keep numbers at a level that, you know... in which they have enough habitat for them, because if bison aren't allowed to roam unhindered outside the park then you're going to need fewer bison.

But I think what listeners also have to be really clear about is that wildlife being culled in Yellowstone is not a new phenomenon, a new thing. Of course bison, now, aren't being culled inside the park. There's a broader misconception that wildlife in Yellowstone are free from human interference, and that is not the case. You're moving across the park boundary, and you're dealing with human beings, and that often means having to dodge a bullet. And

that's been a part of life as a large non-human mammal in Yellowstone, you know, really, since Europeans arrived.

Aside: Which of course, is shitty. Now, what is shitty about archeologist Ken's job?

Alie: What's the hardest thing about your job, or what is something that you dislike about your job? Something about your job that suuuucks, that you're like, "I wish *this* didn't happen."?

Ken: Lack of funding. That's the biggest thing.

Alie: Grants.

Ken: Trying to find funds, yeah. Spending an inordinate amount of time begging for money to do research.

Alie: Do you have to present a case, why this is important to ecology, why this... Is your angle more ecological? Or anthropological?

Ken: It's both. It depends on what we're looking for. My dissertation research and continued research is bison ecology, so it's understanding the ecology of bison, and yeah, it's tough. But we don't need a lot of money, we work really cheaply and get a lot out of the money we do get.

Alie: How much does a field season cost? I asked this of a paleontologist. He could fund a field season for less than a used Toyota.

Ken: Oh yeah.

Dan: Sure.

Alie: What?? I was like, "You could have the cheapest wedding, or you could find a dinosaur?"

Ken: Yep.

Alie: So, you have to petition, and petition, and petition for funding that other people might spend on, like, a rafting trip?

Ken: Sure, yeah.

Alie: Or a very nice bicycle or something.

Ken: Yeah. A very nice bicycle will get a lot of samples analyzed. It's kind of crazy. And what's equally annoying is that it takes as much time to write a grant for \$1,500 as it does for a \$150,000.

Alie: That's a lot of time you could be spending looking at things.

Ken: Yeah. Politicians complain they're always having to raise money to get re-elected. Weeelll, so do we. And I think we do a better job with the money that we get.

Alie: Bison for President.

Aside: And let's talk crap with Yellowstone Dan.

Alie: What's the shittiest thing about your job? What suuuucks? Does it get cold? Do you get snow in your pants? Something must suck.

Dan: I think this is not an uncommon complaint. I think a lot of people have this problem with their jobs, is just the volume of work that we're all expected to do in a very short period of time, and trying to do it all as well as you want to do it. That's tough.

Alie: What's the best thing about bison? Best thing about your job?

Dan: The best thing about my job is that, for the most part, I get to set my own agenda in terms of the questions that I ask, the people that I seek out as collaborators, those are all decisions that I get to make. What was the other part of your question?

Alie: Just what you like about your job or about bison in general.

Dan: Oh, about bison... I like bison 'cause they're so tough. Bison are really interesting because, you know, you'll see them out on the landscape, and they'll sort of lull you into this false sense of knowing what they're all about because, "Oh, there they are, there's a herd of bison, and that's the same herd of bison that was there last year, and the year before that, and the year before that." And all of a sudden the following year they're gone! You don't know why they're gone, where did they go? Why did they leave? And so I think bison are... They can be surprising in a very unpredictable way. That seems kind of silly to say, but they can catch you off guard and that's what makes them interesting subjects of study, I suppose.

Alie: And a last question that I always ask is what do you love most about your job? What do you love about bison?

Ken: What do I love about my job? I think what's great about archeology is how we get to do a lot of things. We get to be in the field, we get to collect data, we get to get dirty, we get to get rained on, and then we get to come back and sit in front of computers and try and make sense of all that stuff. So, it uses a lot of different parts of your brain and your body, and some of the best people, my best friends, I've met doing this work. My wife, I met doing this work.

Alie: Is she a bisonologist?!

Ken: She's not a bisonologist but she's an archeologist and we do a lot of work together.

Alie: How'd you guys meet?

Ken: She was working with me.

Alie: Yeah? Did you guys work alongside each other for a while before you were like, "Oh no! There's a smoldering attraction happening!"?

Ken: Well... Um...It's a different time period...

Alie: Okay...

Ken: I was actually her boss. *[laughs]*

Alie: OOOHHHHH! But it seems like it worked out.

Ken: *[laughing]* Yeah. She has yet to file any suits against me.

Alie: How long have you been married?

Ken: 17 years.

Alie: So it's working out.

Ken: Yeah! We've got four kids

Alie: Oh! You don't wear a ring though?

Ken: Uh, it broke.

Alie: Oh No! How did it break??

Ken: *[laughing]* My fingers got fat.

Alie: *[laughs]* Oh boy! Well that's one way to do it!

Ken: Yeah.

Alie: You're just storing up for the winter.

Ken: Yes. I've been doing that for way too long. *[both laughing]*

Alie: So, great people. Wonderful people.

Ken: Yes, wonderful people.

Alie: It never gets old?

Ken: It never gets old, no. It never does.

Alie: Well, thank you so much for talking to me about *Bison bison bison*.

Ken: Oh sure, Alie. And thanks to your listeners for great questions.

Alie: They care about bison.

Ken: They do. That's nice to hear. *[laughs]*

Alie: Everyone loves a bison.

Aside: Everyone, including my cousin Boyd and Lila.

Alie: What is your favorite thing about a buffalo? Is there anything that's just, like, charmed its way into your heart?

Boyd: They're really playful.

Alie: Really??

Boyd: Oh yeah. You can watch them chase each other around, and run and jump, and play.

Lila: And then if a car stops to watch them, they all stop and watch the car.

Boyd: They do! They're posing for the picture.

Alie: *[laughs]* They're models! They're total goofballs, and then they act cool when people are looking.

Boyd: Yeah!

Alie: That's so cute! I want to come visit. When I come in summer for the reunion can I come visit?

Lila: You're more than welcome! We have an extra bed at the house.

Alie: Yay!!

Aside: One more very important question:

Alie: Do buffalo accept hugs or is that a bad idea?

Boyd: No! *[laughs]*

Lila: Bad idea!

Alie: *[laughing]* Okay.

Boyd: Uh... yeah. *[laughs]*

Alie: All right, fine. I'll cross that off my list then. I won't hug a buffalo.

Lila: You don't want to try.

Boyd: Well, you can when you come up. You can hug one.

Alie: Okay, I'll make sure my health insurance policy is up to date before...

Lila: When you come up we'll take you out to a guy's place that's out by the border that has white buffalo!

Alie: WHAT?! There's white buffalo??

Boyd: Some of them are born white, and some of them are born brown and then turn white.

Alie: Wooww! Oh, that's nuts! I want to look that up! I didn't even know that existed!

Lila: The white buffalo is...

Boyd: It's big medicine to the Blackfoot Tribe.

Lila: He's really big medicine to all the tribes.

Alie: What does that mean, 'big medicine'?

Boyd: It's, like, the top of the medicine. So he's like a...

Lila: ... god.

Boyd: Yeah.

Alie: Oh wow! Gosh, I bet that's got to be such a sight to see, especially in the snow.

Boyd: They're pretty cool.

Alie: This makes me want to look up pictures of buffalo all day now. I just want to go online and look up pictures of buffalo. I'm gonna go do that. Have a good rest of your Sunday, you guys.

Boyd: You too! Bye.

Lila: Love you!

Alie: Bye.

Bison, love ya too, but I will not hug you out of respect of your big-ass horns. So, if you loved all of these folks, head to AlieWard.com/Ologies/Bisonology to find out more about them, and some links to the organizations we talked about, and to the sponsors of the show. Those links are also always in the show notes. And please be our friend on [Instagram](https://www.instagram.com) and [Twitter](https://twitter.com), we're @ologies. I'm [@alieward](https://twitter.com/alieward) on both. You can subscribe, and rate, and leave a review for me to read, possibly on the podcast, on Apple Podcasts or iTunes. *Ologies* t-shirts, and hats, and totes, and sweatshirts, and socks are available at OlogiesMerch.com. Thank you, Shannon Feltus and Boni Dutch, of the comedy

podcast *You Are That* for managing that. Thank you, Erin Talbert and Hannah Lipow, for adminning the Ologies [Facebook group](#). Bleeped episodes and transcripts are up at [AlieWard.com/Ologies-Extras](#). There's a link in the show notes. And thank you Emily White and all the *Ologies* transcribers in the Facebook group for your amazing, hard work. The theme music was written and performed by Nick Thorburn of the band Islands.

And special thanks to heartthrob Jarrett Sleeper of the mental health podcast *My Good Bad Brain* for staying up way too late helping me string this beastly, beastly episode out while I was in the middle of a really tough weekend, worrying about my sick Pops, who is now on the mend. Love you, Pops. And Mom, I'm so sorry that I told the buffalo story, but I'm very proud to share your curly-headed genes.

Thank you, as always, every week to the rare, gentle creature Steven Ray Morris and his buffalo mustache for bearing with tight deadlines, and multiple files, and editing all our pieces together to get it to your ears on time. And if you'd like to spend time with Steven Ray Morris, heads up on Saturday January 18th, he's hosting Jurassic January, with Jurassic Park Trivia and themed cocktails, and it'll benefit Santé D'Or kitty rescue. That is at Idle Hour on Vineland in LA. That's on January 18th.

And if you last until the end of the episode each week, you hear a secret! This week's secret is a sweet one. Our Ward Family Reunions every few years in Montana are what made me love science so much, and I'm so lucky to have gotten to sit on a dock in the summer and watch these bats at dusk, and see these big, huge osprey nests, and get to sleep in a family teepee, and hear stories. For the longest time I thought that when you just get older you start talking weird, and then I learned later that it was just my aunts' Montana accents. And we'd sometimes call my grandpa on the phone, and we'd ask what he was up to, and he'd say, [*with accent*] "Oh ya know, just watching the wind blow." And the older I get the more that hobby seems, like, tight as hell.

Also, sidenote: If I can improve any language, or if you have anyone you think I should interview, please email me through the website [AlieWard.com](#). I'm so behind on emails but I will get through as many as possible. Okay, berbye.

Transcribed by:

Mickey McGrath

Debbie Ward

Mara Spensieri, Toronto, Ontario, Canada

Keely Langford

Erica Smith

Some links which you may enjoy:

[Dr. Ken Cannon bio](#)

[Dr. Dan McNulty's bio](#)

[Blackfeet Nation](#)

["American Indian Thought,"](#) edited by Anne Waters

[How much does a buffalo cost at auction?](#)

[Big horned Bison latifrons — like a Maleficent Halloween costume](#)

[Utah polygamy stats](#)

[Bison dreams](#)

[Boyd and Lila donate a buffalo](#)

[Buffalo grunts](#)

[Ed Yong's "How Bison Create Spring" article](#)

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