Lex Fridman Podcast #446 - Ed Barnhart: Maya, Aztec, Inca, and Lost Civilizations of South America

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Lex Fridman
The following is a conversation with Ed Barnhart, an archeologist specializing in ancient civilizations of South America, Mesoamerica, and North America. This is the Lex Fridman Podcast. To support it, please check out our sponsors in the description. And now, dear friends, here's Ed Barnhart. Do you think there are lost civilizations in the history of humans on earth which we don't know anything about?

Ed Barnhart
Yes, I do. And in fact, we have found some civilizations that we had no idea about just in my lifetime. I mean, we've got Gobekli Tepe and we've got the stuff that's going on in the Amazon, and there's some other less startling things that we had no idea existed and push our dates back and gave us whole new civilizations we had no idea about. So yeah, it's happened and I think it'll happen again.

Lex Fridman
Do you think there's a loss civilization in the Amazon that the Amazon jungle has eaten up or is hiding the evidence of?

Ed Barnhart
Yes, I do. And we're beginning to find it. There are these huge, what we call geoglyphs, these mound groups that are in geometric patterns. I think that the average Joe, when they hear the word civilization, they think of something that looks like Rome. And I don't think we're ever going to find anything that looks like Rome in the Amazon. I think a lot of things there, I mean, wherever you are on the planet, you use your natural resources. And in the Amazon, there's not a whole lot of stone. What stone is there is deep, deep, deep. So a lot of their things were built out of dirt and trees and feathers and textiles.

Lex Fridman
But is it possible that all that land that's not covered by trees is actually hiding stone, for example, some architecture, some things that are just very difficult to find for archeologists.

Ed Barnhart
I think at the base of the Andes where the Amazon connects to the Andes, there's a lot of potential there because that's where the stone actually starts poking up. When you get down into the basin, stone is meters and meters under the ground except for a stray cliff here and there where the river dug deep. And even then only in the dry season, because that river rises over 100 feet every year.

Lex Fridman
Well, that's one of the things, having visited that area, just interacting with waterfalls and seeing the water, I was humbled by the power of water to shape landscapes and probably

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erase history in the context that we're talking about of civilizations. Water can just make everything disappear over a period of centuries and millennia, and so if there's something existed a very long time ago, thousands of years ago, it's very possible it was just eaten up by nature.

Ed Barnhart
Absolutely. In fact, in my opinion, that's almost a certainty in a lot of places. The Grand Canyon was dug by water. There's this wimpy little river in it right now, and you can't possibly imagine that it dug that, but it did. The power of nature and geology is really magical. And when it comes to ancient civilizations that could be from a long time ago, there's probably a lot that are just under the ocean, and just the wave action have destroyed them and what they haven't destroyed buried deep.

Lex Fridman
Under the ocean. So you think Atlantis ever existed?

Ed Barnhart
I don't think that Atlantis existed. I do think it was one of Plato's many parables talking about putting it in an interesting story as a teaching device in his school. If one did exist or a shadow of it, my money would be on Akrotiri. Akrotiri is what's left of a big city that was on the island of Santorini, and when their volcano blew up, it blew up most of the city and shot chunks of it so vast that 70 miles away in Crete there are chunks of Santorini in their cliff. So it blasted what was ever there. But what's left on the side of the crater Akrotiri is strangely advanced for its age. And so if there's anything that's a model for Atlantis, as Plato explained it, it's Akrotiri.

Lex Fridman
Akrotiri, the ancient Greek city, it says, "The settlement was destroyed in the Theran eruption sometime in the 16th century BCE and buried in volcanic ash, which preserved the remains of the frescoes and many objects and artworks." So we don't know how advanced that civilization was.

Ed Barnhart
No, but we can walk around the ruins and see that it's got streets, it's got plumbing, it's got little sconces for torches at night. It was a vibrant city with a lot of, especially in terms of hydraulic engineering, it's very advanced for being 3,500 years old.

Lex Fridman
So if you check it out, here's an image of the excavation. What a project.

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Ed Barnhart
It's an amazing place and you can tell that it's just part of it because it's pretty close to where the crater begins. So the city itself was probably much larger.

Lex Fridman
So in this case, there's a lot of evidence, but like we said, there could be civilizations that there is very little evidence of because of the natural environment that destroys all the evidence.

Ed Barnhart
Right. And I think Akrotiri Is actually a great example of that because here we have the side that did preserve, that looks amazing, but we know there was more of the city that was completely obliterated. It was shot. Chunks of that city are probably in the walls of Crete 70 miles away, and Plato says that it sunk. It was on an island and it sunk. Well, that's exactly what happened to Akrotiri.

Lex Fridman
Do you think this is what Plato was referring to?

Ed Barnhart
If it does exist, at least the model of it, I think this is probably what he was talking about.

Lex Fridman
And there could be other civilizations of which Plato has never written that we have no record of?

Ed Barnhart
Absolutely.

Lex Fridman
And it's humbling to think that entire civilizations with all the dreams, the hope, the technological innovation, the wars, the conflicts, the political tensions, all of that, the social interactions, the hierarchies, all of that, the art can be just destroyed like that and forgotten, completely lost to ancient history.

Ed Barnhart
I reflect upon that often as an archeologist. I think about this great country that I live in and love and all the things we've achieved, but we're a baby historically speaking. We've been around 200 years. Heck, a lot of the cities I study in Central and South America, they had a run of 800, 1,000 years, and now they're ruins. But we're barely getting started in terms of historical civilizations.

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Lex Fridman
So humans, homo sapiens evolved, but they didn't start civilizations right away. There was a long period of time when they did not form these complex societies. So how do we, let's say, 300,000 years ago in Africa, actually go from there to creating civilizations?

Ed Barnhart
I think that a lot of human evolution had to do with the pressures that their environment put upon them. And a lot of things start changing right around 12,000 years ago, and that's when our last ice age really ended. I think there was a whole lot of things that just pressured them into, especially, finding new ways of subsistence. Here in the Americas, a huge thing that happened was all the megafauna went away. When the climate changed enough, the mammoths died out and the bison died out, and they had to come up with different ways of doing things. We were hunters and gatherers, and we had things we got from hunting, and we got things we got from gathering. And in the Americas, when the things that they were used to hunting went away and they had to make do with rabbits, the gathering started to be a much more important thing. And I think that led to figuring out, "Hey, we could actually grow certain things." And gardens turned into crops, turned into intensive crops, and then people were allowed to gather in bigger groups and survive in a single area. They didn't have to roam around anymore and that's where we get the first sedentary communities, which means they stayed in the same place all year long. For the vast majority of human existence, we've been nomadic and we've done these wider or tighter nomadic circles depending on the geographic region where they'd know, "Okay, we'll be in the summer in the mountains because berries and things, and then in the winter we'll be down here and we'll hunt," but they'd move. So once humans figured out how to stay in a place, I think there, that's the initial trigger to what would become civilization.

Lex Fridman
There's a lot of questions I want to ask here. What do you think is the motivation for societies? Is it the carrot or the stick? So you said, is it when resources run out, when the old way of life is no longer feeding everybody, then you have to figure stuff out? Or is it more the carrot of there's always this human spirit that wants to explore, that wants to maybe impress the rest of the village or something like this with the new discovery they made in venturing out and coming out with different ideas or technological innovation, let's call it?

Ed Barnhart
Well, I have an explorer's heart, so I'm biased. I do think that we have an innate desire to see what's on the horizon and to impress other people with our achievements, things like that. We're social beings. That's really the edge that humans have, is our ability to work together. So I think that it's much more the carrot than the stick. When things get ugly, the stick comes out, but usually the carrot does the job.

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Lex Fridman
The really interesting story is how the first people came to the Americas. To me, that's pretty gangster, to go from Asia all the way potentially during the ice Age or maybe at the end of the ice age or during that whole period not knowing what the world looks like going into the unknown. Can you talk to that process? How did the first people come to the Americas?

Ed Barnhart
Well, first off, I agree with you, that was pretty gangster. That's a hard place to live. I listened to some of your podcasts, that guy, Jordan Jonas, he cut the mustard, but I wouldn't have made it crossing there.

Lex Fridman
Well, there you go. The fact that those guys exist, that somebody like Jordan Jonas exists, people that survive and thrive in these harsh conditions, that's an indication that it's possible. So when do you think and how did the first people come?

Ed Barnhart
The traditional theories are still somewhat valid, or at least on the table, that when that land bridge occurred, that nomadic hunters just followed the game like they always had and the game went across there because there was no barrier, and they followed them across. The thing that has changed is how early that happened. DNA has been a total game changer for archeology. We get all these evolutionary tracks that we could never see before. When I was a young archeologist, I would've never dreamed we'd have the information we have now and that information, a lot of it's coming out of Texas A&M. We see the traditional 12,500 years ago that there was a migration, but now we're seeing one that's almost certainly happening closer to 30,000 years ago. And now the thing that seems like madness but might be true is that it could have been as early as 60. A lot of the DNA things are suggesting that the very first migration could have come across as early as 60. And when I was a younger archeologist, it was heresy to go beyond this 12,500. You were a wacko if you said that, but now it's really very clear that they came over at least by 30,000 and the bridge opened and closed, then open and closed.

Lex Fridman
That's during the Ice Age?

Ed Barnhart
Right.

Lex Fridman
I mean, that's crazy, right? That is crazy.

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Ed Barnhart
Yeah. I mean, they didn't roll in and immediately make New York, but there were people. And there were definitely not people here before that, which is fascinating. When the bridge closed, DNA mutated, and so we have specific kinds of haplogroups that are here in the Americas that don't exist otherwise, and that same haplogroup game has been showing us more and more that people came across Siberia. It's not Africa. It's not Western Europe. Those are still, they've become fringe theories, but they're not totally eradicated. DNA is a developing science as well, and I think we all need to keep that in mind, that it's not like they just cracked the code and now we know all the answers. And sometimes, like in any science, a breakthrough puts us two steps backwards, not forwards. So I think we don't need to have too much faith in the models that are now being created through DNA, but they are pointing in the direction of everybody came across from Siberia, that all Native American people are of Asiatic descent.

Lex Fridman
Do you think it was a gradual process? If it's like 30,000 to 60,000 years ago, was it just gradual movement of these nomadic tribes as they follow the animals? Or was it like one explorer that pushed the tribe to just go, go, go, go, and go maybe across 100 years travel all the way across maybe into North America, where Canada is now, and then big leaps in movement versus gradual movement?

Ed Barnhart
I think it was big leaps. Now, this is just mostly guess, I'll admit, but I think that much in the way that a lot of our evolutionary models talk about punctuated equilibrium, that there are big moments of change and then it settles out into a more slow and steady pattern, and then something big will happen again. I do think that the early people went as far as they could go, and there were certain colonies that just got isolated for thousands of years. One of the fascinating things that DNA is showing us, which actually blood types were showing us way before that, is that the oldest people in the Americas are in South America, the ones that got separated early and didn't mix their DNA, like the people in the Amazon. Most of those guys have O-blood type and they're haplogroup D, which is the oldest one that entered the U.S. And what are they doing down there? I do believe they came across the Bering Strait. We have no real evidence to say they came in mass across Oceania. So they made it probably by boat along the coast all the way to South America.

Lex Fridman
So there's some kind of cultural engine that drove them to explore. So if you had to bet all your money, it happened like tens of thousands of years ago, but in a very rapid pace. There's these explorers. They went all the way to South America and there established their more stable existence. And from there, South America, Mesoamerica, North America was gradually expanded into that area?

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Ed Barnhart
I think the next waves came down and did North America and Central America, and the very first wave made it all the way down to South America and got isolated there.

Lex Fridman
Isolated.

Ed Barnhart
And then mixed in with the next groups that came.

Lex Fridman
That's fascinating.

Ed Barnhart
There's an interesting correlate in Europe where today everybody feels like Celtic people are from Ireland, but actually Celtic people started in Eastern Europe and it was the entire area. And when Rome swept everything and Rome was now the ruler of the day, it was only that far edge of the Celtic world, Ireland, that they were like, "Ah, we're not going to mess with those guys on that island. We'll leave them be." So now it looks like that's the heart of Celtic tradition, but actually it's the fringe.

Lex Fridman
So if it is 60,000 years ago, these are really early humans?

Ed Barnhart
Yeah. And there were consistent things that have been coming out for decades about very old carbon-14 dates in the Amazon and in the Andes area that everybody just dismissed as, "No, it didn't get a date of 40,000 years." But I think we're going to come back around to start readdressing some of these based on new evidence at hand.

Lex Fridman
And that's the interesting thing. The early human spread throughout the world and then, like you said, perhaps have gotten isolated, and then civilizations sprung from there, and they all have similar elements even though they were isolated. That's really interesting. That's really interesting that there's multiple cradles of civilization, not just one. One good idea, those ideas naturally come up. Those structures naturally come up.

Ed Barnhart
And I wonder whether the similarities that all those cradles have, it could be a shared much deeper past that they all have, or it could be a more Star Trek thing where Captain Kirk was always talking about the theory of parallel human development, that humans across the universe go through certain stages of development and that, that could be the answer to it.

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Lex Fridman
Which one do you lean on? Which one do you lean towards?

Ed Barnhart
I think it's a case by case thing. I think if we look globally, I'd lean much more towards the human parallel development. But if I look just to the Americas and we have a shorter time period where the things that become major civilizations, now, I'll say up to 30,000 years ago, which is still a blip in the time of humans, I think that there were shared things that those people came over with from Asia and that, as they got separated, that they had core values that then turned into things like religion and cultural customs that we can see. I'm a big proponent that there are commonalities in all the cultures of the Americas that lead back to and point to a single distant origin.

Lex Fridman
You've spoken about the lost cradle of civilization, South America. South America is not often talked about as one of the cradles of civilization, South America, Mesoamerica. Can you explain?

Ed Barnhart
Well, we have very early stuff in South America. You're right. Especially as an American, our country's so big and we are so far removed from these places, we don't even think about it. But more and more we're seeing things that predate the earliest stuff that we like to talk about, like Egypt and Mesopotamia. It's all on the Peruvian coast that we have these cradles of civilization. Someday we might start talking about the Amazon more and more, but right now what we've got are things that date back into the 3000s BCE along the coast of Peru. And there are big stone-built pyramids and temples, and they're amazingly isolated, even now that we've found them. Some of them, Caral is one of the most famous ones just north of Lima, we've known about it for a couple of decades now, how old it is. But every time I visit there, it's like I visited the moon. There's absolutely nobody there, not for miles. It's amazing how such a discovery was made, and yet still nobody goes to see it. It's not easy to get to.

Lex Fridman
So you think there's a bunch of locations like that? Some may not have been discovered in the Peru area.

Ed Barnhart
Oh, there are so many. Peru has tons. That desert gets really ugly quick and it buries things completely. There are so many pyramids out there that are still completely untouched. When people hear the name pyramids, they think of Egypt immediately. Egypt has got about 140 pyramids, and we have pretty much found them all. Peru has thousands, thousands of pyramids, and not all of them were built of stone. Some of them were Adobe bricks, which

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have weathered terribly, so now they're not exciting places to visit today. What's funny too, we started off talking about whether I think there's a lost civilization out there, there are definitely things that are still to be discovered, but there are some things that were discovered 100 years ago and archeologists, or back then they call themselves antiquarians, just passed over. Caral was one of these sites because the coast of Peru has, some of those pyramids that were made by the Moche are full of gold and beautiful ceramics, things that you can sell for big money. But Caral was found a long time ago, but the archeologist was like, "God, no gold, no ceramics. Forget about it. This place is no good. We can't sell anything here." And then about the 1970s or '80s, somebody said, "Hey, no ceramics. Is that older than the invention of ceramics? Shit, we better go take another look at that place."

Lex Fridman
So what's the dating on Caral?

Ed Barnhart
Caral, I think, starts at about 3200 BCE, and it lasts as a major civilization with a lot of other cities around it until about 1800 BCE.

Lex Fridman
So what's the story behind looking at some of these images? What's the story about constructions like that? What was the idea of that thing? Isn't that amazing?

Ed Barnhart
Gosh, it should be some sort of, I'll be a flaky archeologist like, "This is a place where rituals took place."

Lex Fridman
It could mean a million [inaudible 00:26:09].

Ed Barnhart
So many things we say are so just painfully vague, and that's about what we got. A place like this, I know the one we're looking at here, I've been here a couple of times, in the pyramid behind it, the rubble's built in a way where the building won't rock apart. This is a very earthquake-prone place, but the buildings haven't fallen because they make these net baskets of rocks inside that all wiggle around and don't allow the building to fall down. And inside these, we've also found a couple of things that were babies, that were human babies that were buried in there. There's a lot of people that see that and go, "Oh, look at that. They were sacrificing babies, these monsters." I think a lot of the things that are interpreted as baby sacrifices, Coral's evidence being one of them, I think it's more about the tragic nature of infant mortality. In the past, it was a lot more common. There were cultures that didn't even really properly name their kid until they got to five, because chances were they were going to die. And so I think a lot of these babies that we find in these ceremonial contexts

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that are interpreted as sacrifices, I think they're putting them in special places because they mourn the death of their kids, and it just happened a lot more frequently then.

Lex Fridman
One of the things you said that really surprised me is that pyramids were built in Peru possibly hundreds of years before they were built in Egypt. Is that true?

Ed Barnhart
Absolutely. Absolutely.

Lex Fridman
That's crazy.

Ed Barnhart
In fact, there's one that's now pushing 6000 BCE. That's thousands of years before the stuff in Egypt. And that one's called Huaca Prieta. And it was not an Egyptian pyramid, but it was a pyramid and it was thousands of years before.

Lex Fridman
What do you think is the motivation to build a pyramid? The fact that it can withstand the elements structurally, that kind of thing? Why do humans build pyramids and why do they build it in all kinds of different locations in the world?

Ed Barnhart
Well, my rude answer is pretty boring, really. A lot of people ask me, "Why are there pyramids all over the planet? Is that a coincidence?" I think that when people wanted to build a big building without rebar or cement, you end up building something with a fat base that goes up to a skinny top, and that turns into a pyramid. Any kid who's playing with blocks on the floor builds a couple towers and his brother knocks them down, and if he wants one that's going to stay and be tall, he ends up making something with a fat base and a tiny top. And I think that building something big and tall together is one of those human things like, "We built that. That will be here after we're gone. People will remember who we were." If there's any human commonality, it's fear of our own deaths and that we were nothing and no one will ever remember us. I think that the first big monuments like that were probably a group of people saying, "We're going to do something that people will remember forever." Now, that being said, remember we were just talking about Huaca Prieta and this one that's almost 6000 BC now, is the first one, that one's a funny case. We just talked about all these lofty goals, but actually I'm pretty sure that Huaca Prieta's first pyramid was about capping a smelly pile of trash. I think everybody piled up their trash in the middle of town and it stunk. It's on the coast. It stunk like fish. And somebody said, "If we just bury this thing with dirt, it won't smell anymore." And then it was a big mound where people could get up and talk to everybody and then said, "Well, it's squishy. If we cap it with clay, then it will really not smell."

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I really think that the very first pyramids in Peru were about trash management. Talk about deflating, huh?

Lex Fridman
Yeah. But then they probably saw it and they were impressed and humbled by the enormity of the construction, and they were like, maybe the next guy thought, "Maybe we should keep building these kinds of things."

Ed Barnhart
Yeah. Not to jump ahead, but in North America, where they also made pyramids, there's this interesting evolution where there were these piles of shells along rivers and along the coastlines. People ate a lot of shells. That was an easy thing to collect and eat. So these piles of shells would be near communities, and they probably became landmarks, but eventually they started burying their dead inside those too. Probably, again, about stink and about, "Well, we don't want the dogs to eat them. Maybe we'll put them in the middle of the shell pile." But then that all of a sudden became this, " That's where my grandfather's body is. That's where great-grandfather's body is." And all of a sudden people started being attached to place, not just for the resources, but for the shared memories of their ancestors. So when the very first pyramid was built in the Ohio area by the Adena people, it was built out of dirt, but it's full of bodies. And I think it's an echo of an old thing where they used to be putting bodies in shell mounds.

Lex Fridman
So where and who were the first civilizations in South America, Mesoamerica?

Ed Barnhart
Well, I think we're still piecing that together. Coming back to the first things we talked about, I think we're still missing a lot of stuff, especially in South America. It just keeps getting older and older. Part of the reason it's hard to answer that question is, at what point do we consider people a civilization or a culture? We have in the Americas this long period of time that we call the Paleo-Indian time where they were hunting megafauna. And then when those went away, we get into this even longer period of time called The Archaic, where they're just hunters and gatherers. Sometimes somebody's coming up with a cool different kind of arrowhead. They go back and forth with different hunting tools, but really nothing changes for thousands of years and then finally they start developing into these larger groups, which for the most part has to do with agriculture. It used to be archeology that was just the end all, be all. Civilization starts with the invention of agriculture. And we can't have sedentary communities until people learn how to farm. But that's been discounted. Peru was a big part of that. That area of Caral, it's connected to another city on the coast called Aspero. Aspero starts about the same time, but they're all about fishing. They have no farming. And Caral, who's upriver from them, is farming, but funny enough, they're not really farming food. They're farming cotton and they're making nets and they're

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trading the nets with the people on the coast for the fish. So it's not as simple as, it's just agriculture anymore. But it is, I think, still rooted in, how can we feed more people than just our family? How can we together create a food abundance so we're no longer scared about running out of food?

Lex Fridman
So is it possible, which is something you've argued, that civilization started in the Amazon, in the jungle versus the coast?

Ed Barnhart
I do think so. I think religion in South America began in the Amazon. I think there were people there, very old. Actually, the earliest pottery in all of the Americas, all these places that we have civilizations that grew up, you know where the oldest pottery is? The middle of the Amazon.

Lex Fridman
So there's interesting cultures developing in the Amazon. So religion, you would say, preceded civilization?

Ed Barnhart
In South America, Caral and Aspero that I was just talking about, it's weird what a dearth of art and any evidence of religion we have. We have those pyramids and things that we call temples, but we don't really know what went on in there. And there's no... ... Things that we call temples, but we don't really know what went on in there, and there's no hints of religious iconography, ceremonies, nothing like that. The first stuff that we get is right when that culture ends, about 1800 BCE. This culture called Chavin starts up and their main temple is up in the Andes in this place of path of least resistance between the Amazon and the coast. It's about three days walk either way, from this place where this temple is. That's where we start seeing the very first religious iconography and it's all over the temples. There are things that are definitely from the coast, but the iconography are all jaguars and snakes and crocodiles, and those don't come from the coast. All of those things are coming out of the Amazon.

Lex Fridman
Religion is a really powerful idea. Religions are one of the most powerful ideas. There are the strongest myths that tie people together. And to you, it's possible that this powerful idea in South America started in the Amazon.

Ed Barnhart
I do. I do think it did, and you're right, ideas are more powerful than weapons, but archeology can't see them at all. Sometimes we can see ideas manifesting in the things they

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create and lead to, but there's an interpretation problem. Are we right about what idea created this? Those are things that archeology just can't get at.

Lex Fridman
That's one of the challenges of archeology and looking into ancient histories. You're trying to not just understand what they were doing in terms of architecture, but understand what was going on inside their mind.

Ed Barnhart
That's really what I'm in it for, trying to understand these people and it's real detective work, and we know we're dealing with a totally flawed record. We only have what could preserve the test of time. If we look around this room here, if 2,000 years of weathering happened in this room, what would be left and what would we think happened here?

Lex Fridman
Right, right, but not in this room, but if you look at thousands of rooms like it, maybe you can start to piece things together about the different ideologies that ruled the world, the religion, the different ideas. Tell me about this fanged deity. One of your more controversial ideas is that you believe that the religions, there's a thread that connects the different civilizations, the societies of the Andean region and the religion they practiced is more monotheistic than is currently believed in the mainstream.

Ed Barnhart
That is exactly what I think, and I think it's all about this fanged deity who somewhere, thousands of years ago, crawled his way out of the Amazon up into the Andes and a religion took hold. That could have been a combination of ideas from the coast and the Amazon. But he is the one creator deity, in my opinion, through all of these cultures. And the people in the Amazon still talk about him there. His name is Viho Masse in some groups, but they say that his emissaries on earth are the jaguars and that he is the creator deity.

Lex Fridman
Why is the current mainstream belief is that a lot of the religions are not monotheistic?

Ed Barnhart
Well, there are bona fide pantheons. Greece had one, Egypt had one, Mesopotamia had one. Lots of the early religions of the old world were pantheons, and I think that was part of the problem. The earliest archeologists walked in there with a preconceived notion that ancient cultures have pantheons. And so they went to the art looking for them, and they came up with things like the shark god and the moon goddess and the sun God, and all these things. But when I look at the art, and I was trained by a person right here in Austin, Texas as an art historian, you follow certain diagnostic traits through art to see the development over time. And when I look at it and use that methodology, there's a single face with goggle eyes and

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fangs and claws on his hands and feet and snakes coming off of his head and off of his belt. He's got really identifiable traits. He also likes to sever people's heads off and carry them around, but he's the fanged deity and he's there. He shows up in Chavín de Juantar, the capital of that Chavín culture, and he keeps showing up through every culture, even thousands of miles away throughout the next two millennium, right up to the Inca. The Inca have a creator deity they call Viracocha, but Viracocha is the fanged deity. When we do see him, by the time you get to Inca, they do this almost Islamic thing where they say you can't understand the face of Viracocha. So when they do put him in a cosmogram, they'll make him just a blob, like he's just unknowable, but he's at the very top. I think we're misunderstanding a lot of things that we used to say were deities as just supernatural beings. If we flip the mirror on Christianity and take a look at it, which of course, Christianity is monotheistic, right? It would be heresy to say otherwise, but who are all these other characters? Who are all these angels and demons and Jesus Christ? I don't even know who the Holy Spirit is, but he's some sort of supernatural being. But it's that monotheistic system has lots of things that have supernatural powers that are not God. That's where I think the crux of us misunderstanding ancient Andean art is.

Lex Fridman
So what is the process of analyzing art through time that try to figure out what the important entities are for that culture? Do you just see what shows up over and over and over and over?

Ed Barnhart
Well, certainly without the advent of writing, depictions in art have all sorts of meanings encoded in them, and there are certain, what we call diagnostic elements. We can pull apart the same sort of thing like in the Greek pantheon, you know by their dress and what they're holding, what the different gods are. You can tell Hades from Zeus by the different things they're holding lightning bolts or tridents or whatever. So they all have these diagnostic elements to them. So that's how art history goes about analyzing art over time. Once we can put it in a chronological sequence, then we can say, "Okay, here's a deity here in Chavín culture." Now we move forward 500 years. Now we're in Moche and Nazca culture. Where are the deities here? And what I see is that same guy with not just one or two traits, but a whole package of them that shows up again and again and again for thousands of years in each one of these cultures. He's got circular eyes, he's got a fanged mouth. He's got claws on his hands and feet. He's a humanoid, but he also has snakes coming off of his head like hair and snakes coming off of his belt. And then not so much in Chavín, but as it goes forward, he starts carting around severed heads, human severed heads. So they're like, in the old literature, the Moche will call him the decapitator deity, but then they have these other like, "Oh, here's the crab deity and here's the fox deity." But if you look at them, the crab deity is just that guy's face coming off of a crab, and the fox deity is that guy's face coming off of a fox. So I think on that particular instance, I explain it similar to what Zeus did. You know how Zeus was able to turn into whatever animal he wanted to get with the woman he wanted,

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and he showed up in all sorts of forms, but he was always Zeus. I think that the fanged deity manifests himself through people and animals throughout the art and that there are missing stories of mythology that we don't have anymore.

Lex Fridman
And across hundreds of years, thousands of years from Chavín to Moja to Inca, as you're saying.

Ed Barnhart
Right. Wari has them too, Tiahuanaco, that famous place, Pumapunku, he's all over there.

Lex Fridman
I wonder how those ideas spread and morph of this fanged deity?

Ed Barnhart
I think people walked and proselytized and places like Chavín, there's a later one in Inca times called Pachacamac that are pilgrimage places where people come in to be healed if they're sick, but also just to pay homage to the powers that be. So Chavín was a place where people from the Amazon and people from the coast were all coming together. In fact, we saw it in the archeology there. There's these interesting labyrinths under the pyramids with the fanged deity all over them that have... One labyrinth will have all pottery. The next labyrinth will have a bunch of animal bones. The next one will have a bunch of things made out of stone. So people are showing up and giving this tribute and they're learning and then they're going back to their communities. So I think it dispersed from certain pilgrimage spots and became just like pilgrimage spots do. Somebody goes back and they build a temple to the fanged deity.

Lex Fridman
Do we know much about the relationship they had with the fanged deity and their conception of the powers of the fanged deity? Were they afraid of the fanged deities and all-knowing God? Is it something that brings joy and harvest or is it something that you're supposed to be afraid of and sacrifice animals and humans to keep at bay?

Ed Barnhart
I think he had two sides of the coin. A lot of the Hindu gods are... One aspect is terrible, the other aspect is lovely. I think he had that same sorts of qualities because we do see him as a fierce warrior taking people's heads off, and he is a jaguar, which in and of itself implies a certain power and ferocity, but then there are other funny things about him. He is definitely involved in a lot of healing ceremonies and a lot of those healing ceremonies are involved with sex acts. When it comes to the Moche, there's this whole group of sexual pottery where priests are having sex with women or men, and some of them show their faces transforming into that fanged deity, he is acting through them. But the thing that most cracks me up that

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shows his softer side is the fanged deity has a little puppy. He has a puppy that's just dancing around his feet and jumping up on him in various scenes. They see him again and again. Sometimes he's in these healing sex scenes. In fact, I tracked that puppy from other contexts to these sex scenes where a priest was having sex with somebody in a house and a fanged deity, and there's a puppy just scratching at the door like, "Hey, you forgot me." And then finally, one day I found one with the puppy having sex with the woman instead of the fanged deity. I was like, "Oh, he really is very involved in this. What is this weird puppy?"

Lex Fridman
Okay.

Ed Barnhart
So yeah, he likes to take heads off, but he also has a puppy he adores.

Lex Fridman
This awesomely makes sense now because I saw the opening of a paper you wrote 30 years ago on shamanism and Mocha civilization. It reads, "The Mocha are the major focus of this paper. Sex puppies and headhunting will be shown to be related to ancient Mocha shamanism." So now I understand. I was like, "Well, the puppies."

Ed Barnhart
Puppies, yeah, it's true.

Lex Fridman
And the headhunting. That's the decapitator.

Ed Barnhart
And I've added rock and roll to that list since actually. Rock and roll music is also a big part of it.

Lex Fridman
Oh, interesting.

Ed Barnhart
They call spirits down. There's this whole spirit world. There's the ancestors and the people that drink San Pedro cactus juice, they don't talk about the fanged deity anymore. I think Christianity in 500 years has somewhat put him in the back. It was unpopular to have a pagan deity. So they don't talk about him much anymore though he's still around. They're around Trujillo. They call him Iopec. But music, in the Amazon, they play flute. Sometimes a chorus of women sing and that's supposed to bring the spirits down into the ceremony. There's a spirit that's hurting the person that's sick, and then the priest or the shaman or the corundero, whatever you want to call him, has his own posse of spirits that are going to help

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him figure out what's going on. So when the music starts, that's bringing those spirits in and people don't see them unless they've imbibed the San Pedro cactus juice, which is this hallucinogen, which is in the Amazon side, it was Ayahuasca. On the coast, it was San Pedro cactus, but that's what allows you to actually see that other world.

Lex Fridman
Yeah. I went to the Amazon recently and did Ayahuasca, a very high dose of it.

Ed Barnhart
Bold move.

Lex Fridman
When in Rome. How far back does that go?

Ed Barnhart
Oh, I think longer than anybody can remember, but it's a natural plant that's been there forever. I think that it's thousands and thousands of years. That's another thing Chavín de Juantara was talking about where I think the things came, the religion came from the Amazon. There's this wall on the backside that faces the Amazon side. So if you're entering the city from the Amazon path, you see this wall first, and it's a bunch of faces that some of them are humans. Some of them are total jaguar and some of them are transforming in-between. But there's a group of them that are midway through transformation and they show their nostrils leaking out this snot that's coming down their face. San Pedro doesn't do that to you, but Ayahuasca does. Ayahuasca traditionally, they'd take a blow gun and just shoot it up your nose or up your ass, but a lot of times up your nose and when it shoots up your nose, the first thing that happens is just this gush of snot comes out of you. And there are stone depictions of people uncontrollably snotting on the backside of this temple from 3,000 years ago.

Lex Fridman
So that you think could have been a big component of the development of religion and shamanism?

Ed Barnhart
I think that hallucinogens opened the mind then like they opened the mind now.

Lex Fridman
Do you think that the stoned ape theory, do you think that actually could have been an actual catalyst for the formation of civilization?

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Ed Barnhart
In the Americas, yes, I do, though hallucinogens are not part of every ancient tradition in the world. In fact, strangely, the majority of plants that are actually psychotropic, not just mood altering, are from here in the Americas. There are very few drugs that will make you hallucinate outside of the Americas. Of course, now they're global and they can be grown all over the place. But originally speaking, very, very few were outside of the Americas. So they were part of the experience here in a way that they just couldn't be in other places.

Lex Fridman
I wonder to what degree they were just part of a ritual and the creative force behind art versus literally the method by which you come up with ideas that define as civilization. It's the degree to which they had a role in the formation of civilizations. It's fun to think about psychedelics being a critical role in formation of civilizations.

Ed Barnhart
I think in terms of South America, they probably really were.

Lex Fridman
It's possible.

Ed Barnhart
In North America where we're in a more northern climb here, and there are less of them, not so much, at least in terms of psychedelics, things like tobacco was always a big part of it. There's more than one way to reach a hallucinatory state. The hard way is starvation, sleep deprivation. And for the Maya, for example, would go sleep deprivation, starvation, and then they'd cut themselves very badly. And that loss of blood, we believe triggered hallucinations and visions. Nothing to do with drugs. I would much prefer the drugs route.

Lex Fridman
It's the result. The tools aren't the thing that creates insight. It's the result.

Ed Barnhart
Hallucinogens are poisoning us. They're killing us. It's a near death state and people of the Americas believed sleeping was entering that other world, death. You entered this other world and that when you took this mighty dose of poison, it was helping you enter that other world for a period of time.

Lex Fridman
Yeah, as Tom Waits said in that one song, "I like my town with a little drop of poison." So maybe that poison is a good catalyst for invention. So who were the early first mother cultures, mother civilizations in South America? If we look chronologically, is there a label we can put on the first peoples that emerged?

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Ed Barnhart
That picture is evolving. Forever, it was just the Chavin people that we've been talking about. The ones with all the first depictions of religious art were the mother culture, and they certainly did transmit a lot of stuff, but then all of a sudden, we find Kerala. The next one that we've barely even begun looking at, but it's probably older than Kerala, is Sachin culture. I was just poking around there last year and just from the bus on the highway, I could see, "That's a pyramid out there. Oh, there's another one." And I know how old the stuff we have studied there is. It's again, 3000 BC. We're just barely beginning to understand them. Kerala frustrates me to no end, the lack of art there. We've got stones and bones and not even ceramics to go on, and they didn't have the courtesy to leave me a bunch of art I can interpret. So I don't know what those people believed.

Lex Fridman
Right. So one of the ways to understand what people believe is looking at the art, the stories told through the art, and then hopefully deciphering if they were doing any kind of writing.

Ed Barnhart
That's our most fruitful place to try to get at this elusive ideas.

Lex Fridman
And it sucks when they don't have art. If we just go back to the Amazon, you've mentioned that it's possible that there's a law civilization that existed in the Amazon, so it's carried a lot of names. Lost City of Z or El Dorado. Do you think it's possible it existed?

Ed Barnhart
Well, City of Z and El Dorado are in pretty different places. El Dorado, the ideas of where it is center around towards Columbia.

Lex Fridman
Okay.

Ed Barnhart
And the City of Z is named after a region of Brazil called the Xingu. And so those are an America worth of distance apart. People don't really think about it on the map, but the entire United States would fit inside the Amazon. That's how big that place is. And these two are on either end, but both of them have evidence of civilizations. It's lowland and it floods all the time. So what they did is they'd make these big mounds and then they'd make huge causeways between mounds so they could walk through their cities while they were seasonally inundated. And a bunch of that stuff has been found in the Xingu area, like huge areas that would support tens of thousands of people. Again, it's not stone built and it's been under the forest forever. So it's very torn up, but it's there. Brazil is big on cattle farming more than ever now, and a thing that I think is completed now is Brazil and Bolivia

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partnered together and built a highway all the way across and opened up a whole bunch more land, which has found more of these what we call like geometric earthworks. So there's more and more evidence of these civilizations. It's not, it could be there. It's there for sure.

Lex Fridman
By the way, the people who are trying to protect the rainforest really hate the highway. One of the things I learned is if you build a road, loggers will come-

Ed Barnhart
Yep.

Lex Fridman
And they will start cutting stuff down. Now, from an archeology perspective, if you cut down trees, you get to discover things. But from a protective, very precious rainforest perspective, it's obviously the opposite way. But it is interesting, I've seen where loggers cut through the forest and when they leave, the forest heals itself very quickly.

Ed Barnhart
So quickly.

Lex Fridman
And you just think that across decades, you expand that to centuries and you could see how a civilization could be completely swallowed up by the rainforest.

Ed Barnhart
And it happened for sure in the Amazon. One of the ways that we're trying to push the frontier of where people were in the Amazon, because yes, the trees and just the biomass have eaten so much evidence, but they're finding more and more of these places that they call terra preta, which is black earth, and they're huge swaths of it. So I guess the anthropology term is anthropogenic landscapes. And what they're saying is that that really dark earth couldn't have just got that way through natural forest processes, that sometime in the distant past that forest wasn't there and there was major farming and human activity to the point where they totally turned the soil black and it's much more enriched. And when I took a trip into the Amazon, I went from Manaus, up the river, the Black River a couple of days, and went and met some different communities. And I asked them about this black earth, and they were like, "Yeah, that's why we're here. Sometimes we move our village, but when we move, we look for the terra preta, and that's where we're going to put our village, because that's a place that all of our gardens work. The other places, they don't."

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Lex Fridman
One of the things you talked about, literally just you have to ask the right question. And the stories, all the secrets are carried by the people and they'll tell you.

Ed Barnhart
Yeah, there's so many of them. A thing that excites the world about archeology right now is Gobekli Tepe, and this 10,000, now Karahan Tepe is 11,000. The whole area is called the Tas Tepler. We only found it a couple of decades ago, but it was just an archeologist rowing through the area and ask a sheep herder, "Hey, you guys know where anything ancient is?" "Oh yeah, let me show you this." And then all of a sudden we've got a lost civilization. And the shepherds always knew where it was. Just nobody asked them.

Lex Fridman
So speaking of Gobekli Tepe, what do you think about the work of Graham Hancock, who also believes that there's a lost civilization in the Amazon?

Ed Barnhart
Well, I've met Graham, and personally I like him. He's a nice guy, got a nice sense of humor, and I think he's smart. And I also think he is a very good researcher. He and I are working on the same set of facts. The differences are interpretations. I do not believe Graham's idea that a single, now lost ancient civilization seeded the rest of them. I just don't see that on a number of levels, artifact wise, technology wise, art, historical analysis. So I think his research is great. I think that he's very well-read, in fact, better read than a lot of my colleagues, but his conclusions I disagree with. And he and I have talked about this and had a very civil and normal conversation about it and agree to disagree without spitting any venom at any point in the conversation.

Lex Fridman
That would be a fun argument to be a fly on the wall for. So he's proposed that it's possible that the Amazon jungle is a man-made garden. So it was planted there by advanced ancient civilization. Is there any degree to which that could be possible?

Ed Barnhart
Frankly, I agree with him. It's just like what I was just talking about. It's the conclusion part that we differ from.

Lex Fridman
Sure.

Ed Barnhart
But the facts that he's basing that on are that terra preta are the huge geometric earthworks, are the ever-increasing evidence of them. They are now from the bottom of

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Bolivia to Guyana. They're everywhere. Every time we open up the jungle, we find these big works. So yes, there was a vast civilization that was there. How advanced they were is a question and also a perspective thing. Graham really focuses in on what we don't know and what could be.

Lex Fridman
Just to educate me, what's the key idea that he's proposing that you disagree with? Is it it was the level of advancement the civilization was, or how large and centralized it was?

Ed Barnhart
My main point of disagreement is that his... And his ideas evolve like everybody's. No scientist or researcher in anything has an idea at the beginning of their career and holds it till the day they die. His ideas are evolving, but his ideas remain. A core of them are that there was a very advanced single ancient civilization that was utterly destroyed by climactic conditions, and the younger Dryas hypothesis is part of that. Most recently, he used to not say that. Now he's into this meteor thing, but he believes that that civilization was destroyed, but that members of it escaped this cataclysm and then spread out all over the world to seed all of the world's civilizations for the next revival. There's where I disagree with him. I think these were independent civilizations that grew up in their own ways, that they were not seeded by some more advanced civilization from the past, and that they all hold things in common because they have this common ancestry of... In his early books, he suggested it's Atlantis. I don't think he suggests that anymore, but he still hangs on to the single advanced, now completely lost civilization. And archeologists, all of our ideas are theories. Very few of them are facts, and we could have the story wrong, but one thing we're real good at is finding stuff. We find fish scales, so I find it just too big a pill to swallow that there was a civilization that was that technologically advanced and that large that we can't even find a potsherd from.

Lex Fridman
Yeah, and of course, it is a compelling story that there's a single civilization from which all of this came from, because the alternative is the idea that we came across the Bering Strait from Asia went all the way down to South America and got isolated and created all these marvelous, sophisticated civilizations and ideas, including religious ideas that look similar to other... Everybody has a flood myth.

Ed Barnhart
Right.

Lex Fridman
So there's a lot of similarities, everybody building pyramids, but there could be a lot of other explanations. And for even if it's a simple compelling explanation, that has to be evidence for it, and what would that evidence look like?

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Ed Barnhart
Well, that's the bottom line.

Lex Fridman
That's tough.

Ed Barnhart
Everything's theories were... And as responsible scientists, we're trying to disprove our theories. We are not supposed to be trying to prove our theories. That's one more foot out of the science box that archeology often steps. We're supposed to be disproving what we think is happening, not proving it.

Lex Fridman
You don't want to lean into the mystery too much. It's such a weird discipline because you're operating in... It's really in a dark room. You're feeling around a dark room. So it's mostly mystery. I would say a lot of sciences operate in a mostly well-lit room. It's like a dark corner and you're figuring out a way to light it. But yeah, in archeology, most of it is a mystery. Right?

Ed Barnhart
Yes, it's job security. I like that part. But I do also try to always remind myself that every paradigm shifting idea that humans have ever had began as heresy and lunacy. That guy was crazy up to the second. He was brilliant. And so we got to keep our minds open to the things that sound outlandish, because one of them eventually is going to lead us to the big paradigm shift. And if we are busy burning books of ideas that we don't like, that's where we close our minds to the possibility of advancing things.

Lex Fridman
I really love that, and I really appreciate that you're saying that. One of the fascinating things about just the Amazon to me is that there's still a large number of uncontacted tribes. To rewind back into ancient history, you can imagine all of these tribes that existed in the Amazon that were isolated, very distinct from each other. Can you speak to this, your understanding of these tribes and their history that are still here today?

Ed Barnhart
Well, a lot of them are these... By uncontacted, we mean we don't know anything about these guys. We know roughly where they are, but places like Ecuador have very responsible policies where no one's allowed to go contact them. So we have a dearth of information. If they walk out of the jungle and talk to us, that's one thing, but we don't go out and there looking for them, but they do seem frozen in time, and I don't think any of us have a good estimation of how long they've been like that. But we were saying earlier that humans change based on pressures of their environment. Mother necessity is oftentimes how we

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invent things or why we change, it's pressure. And one thing the Amazon is, once you figure out how not to die in it, it's a paradise of food. Food's fallen from the sky all the time there, and once you learn to adapt to that environment, you've got very little need. There's no pressure to make anything else. Things are working.

Lex Fridman
So for the modern humans that come across these uncontacted tribes, one of the things they document and notice is the propensity of these tribes for violence. So they get very aggressive in attacking whoever they come across.

Ed Barnhart
And not just foreigners. They attack each other. The Yanomamo are famous for just having never ending feuds with each other.

Lex Fridman
What do you think is the philosophy behind that?

Ed Barnhart
I'm a relatively peaceful person, but I've got the monster in me like everybody does. I've got the monster in me, like everybody does. And I think that these, it's cultural norms that become institutionalized. For the Yąnomamö, they really, part of the right of passage to be a man is to go kill or maim somebody from an outer village. And they go in there, they oftentimes, the way they don't let inbreeding set in and ruin everybody, not that they think of it scientifically, but they typically go and steal women from far-off communities, and that starts a big fight. Another thing that starts fights, that when nobody even fought, is illness. Illness in the Amazon and all of the ancient Americas wasn't seen as a biological thing, it was a spiritual thing. So if somebody in your village gets sick, the question is asked, "Well, what spirit is menacing him and who called it out on him?" And then, the rumor starts, "Well, I bet you it was Joe over there in that other community. He's still pissed off for that time when we stole his daughter, and we ought to go over there and kill Joe, and then he'll get better." And so this round of never-ending violence, like Hatfields & McCoys had that thing, and the people of New Guinea also do that. So there are certain areas, mostly wooded areas, now that I think about it, where people just hide out and they attack each other as a cultural institution.

Lex Fridman
It's such a tricky thing to do, to study an uncontacted tribe, without obviously contacting them, to figure out their language, their philosophy of mind, how they communicate, the hierarchy they operate under.

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Ed Barnhart
And yeah, there was a fascinating story in Peru, I guess it was probably like eight years ago or something. But there was a ranger from one of the biology stations who, just in the by and by of protecting his area, met one of these uncontacted tribes and befriended someone. Not the whole tribe, but he made some friends who would meet him in the woods, not in their community. And he started to learn their language over a couple years. And so he was this kind of important guy who actually could be the first translator to talk to these people. And one day, a couple of them just came out of the woods, and just plugged him with arrows, and just killed him, and then they went back in the woods. Like, "That's the one guy who understands what we're saying, we should kill him and move our village."

Lex Fridman
So those folks really lean into the, as you said, the monster versus the puppy.

Ed Barnhart
You know, everybody's got it, I think. I think we need to listen to our better angels, because if we don't, we, as a human species, can easily devolve into just using violence against others to get what we want. It's a daily choice we make not to be savages.

Lex Fridman
Which is a fascinating thing to remember. We're kind of thinking civilized society, we've moved past all that, but it can be summoned, like in 1984, the two minutes of hate. With the right words, that primal thing can be summoned, and directed, and lead to a lot of destruction.

Ed Barnhart
And our sports are really based on taking those kinds of urges and channeling them positive, where somebody's not dead at the end of it.

Lex Fridman
Yep. So at which point did what we now call the Maya Civilization arise?

Ed Barnhart
That's another complicated one, another group living mostly in a jungle that we have barely begun to explore. You know, the truth is a lot of the questions in the Amazon and what we're talking about now is the Patan and the mountains there. Those aren't places archeologists want to live, they're horrible. I mean, I've been there. I don't want to live in a tent and eat rations. I want to live in a nice town. So a lot of the places where the answers are, we still really haven't gotten there, because it takes a special person to be educated enough to know what they're looking at, and tough enough to want to be there. I've done my tour of duty, I'm now in a nice little podcast studio. But seriously, the Maya, the first hint that we see people who are culturally Maya, very close to where the time period for that Chavin

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culture, is about 1800 BCE. There's a culture that's some called the Mokaya, not Maya, but they're on the Pacific coast, where Guatemala and Mexico connect. It's called the Soconusco. And those are the first people that are really going to be culturally Maya, and they're interacting with the culture that has traditionally been seen as Mexico's mother culture, which is the Olmec. They're kind of the same thing as we were talking about in South America, where the Maya, the original Maya, there's not a whole lot to indicate that they have a religion. But the Olmec have this religion they develop, and they start exporting it. And you see the Maya become more and more involved in the religion that's being created by the Olmec, who are to the north of them, in the swamps of what we call the Isthmus of Tehuantepec.

Lex Fridman
I have a lot of questions to ask here about just natural stupid confusion I have. So first, did the Maya or the Olmec come first, and are they distinct groups? How do you maintain a distinct civilization when you're so close together?

Ed Barnhart
I just finished filming a whole thing on the Olmecs and their interaction with the Maya for The Great Courses. I'm thrilled for it to come out next spring. I think they co-evolved. Archeology, in this regard, is the worst enemy of this. So we put these names on cultures, we talk about how they evolve from one to another, we draw these lines where there aren't any. We make these time periods that a culture magically transforms into somebody with another name, where I'm pretty sure they didn't care about any of those names. But the Maya and the Olmec are two parts of a larger interaction sphere that's happening in Mesoamerica, a very dynamic time. The Olmec are really bringing the religion part, but the other areas are bringing technology, ceramic technology, making hematite mirrors, making tools out of obsidian and other stone types. So you've got the Olmec in the middle, where Mexico gets skinny, and it gets swampy down there. That's called the Isthmus of Tehuantepec. That's where the Olmec are. Then, you've got the Maya to the east of them. Then, you have the Valley of Oaxaca, where the people called the Zapotecs, they're rising up. And then, you have the Valley of Mexico, which will eventually become the Aztecs, but not for millennia. All those areas are interacting with each other.

Lex Fridman
Can we just also draw some more lines?

Ed Barnhart
Yeah, sure.

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Lex Fridman
So what is Mesoamerica and what is South America? And what you just said, the Olmecs and the Maya, can we just linger on the geography that we're talking about here in the... What is this, like 1000 BC?

Ed Barnhart
Yeah, the time period we're talking about, where the Olmec are there, 1000 BC is a great midpoint of it. I'd say it starts about 1800 BCE, and by 500 BCE, the Olmec are gone, and a whole new wave of civilization and population increase happened. In terms of Mesoamerica, looking at your map here, I'd say about halfway through the Chihuahua Desert, up there in the top left, that's about the boundary of Mesoamerica. There's this big desert where almost nobody lives, and once you get north enough, you get into the ancestral Pueblo people of what's now America, the Four Corners area. They're not Mesoamerican, they have different lives.

Lex Fridman
Where does modern Mexico end?

Ed Barnhart
Modern Mexico ends, right, you see the name Maya there with the white line around it?

Lex Fridman
Yeah.

Ed Barnhart
That's Guatemala, so Guatemala cuts off most of Mexico from Central America.

Lex Fridman
Got it.

Ed Barnhart
But Mesoamerica only goes about halfway through Honduras, and then it's really kind of a no man's land. Nicaragua, Costa Rica, Panama, they really, they're neither. They're not Mesoamerica, they're not South America. They're more South America, because they've got some gold there. But then, basically, you get on the other side of Panama, and you're fully in South America, with two distinct groups, too. You've got the guys that are on the Andes, on the west coast, and then you have the Amazon.

Lex Fridman
So the Andes and the Amazon are very distinct.

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Ed Barnhart
Yep.

Lex Fridman
So when you refer to the Andean region, is that referring to the Andes and the Amazon, or just the Andes?

Ed Barnhart
Just the Andes and the coast to the Pacific there. That's Andean civilization.

Lex Fridman
So did Maya make it to the Andes, the Andean region?

Ed Barnhart
Not that archeology can prove, but it's almost certain that they interacted with each other. Number one, it's just, it's biased to think that these people couldn't travel as widely as people on the other side of the planet did, but there's all sorts of hints like that first ceramics I was talking about, that the Maya made, they show up strangely sophisticated technologically already. And down in Ecuador, they had them for 1,000 years before. So a lot of people, myself included, think that the idea of ceramics actually came from South America to the Maya.

Lex Fridman
Did the Maya get seeded by the second wave across the Bering Strait, or did that initial wave of people that came and populated South America, were they the ancestors of the Maya? How did the migration happen here? Do we understand that?

Ed Barnhart
We're still piecing it together. You know, I'd be lying if I told you I had the answers. But we do have evidence of Maya stature people. They were small people. Generally speaking, people that grow up in the forest are smaller and people that grow up in the open plains are taller, probably about just generations of people that hit their head on a branch or not.

Lex Fridman
You're joking, but there could be something to that.

Ed Barnhart
I think there's some truth to it. I mean, the Pygmies are small and the people on the plains in Africa are big. The North American Indians are tall and the Maya are small. There is definitely a pattern of smaller people in the forests. But anyway, there's a cave in the Yucatan called Loltun Cave that has hand prints in the cave. It's somebody who put their hand on the cave and spit charcoal around their hand, like a negative print. We can date that

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charcoal, and it comes from 10,000 years ago, and the hands are all small. It's typical Old Mexico. I walked right up to these things and could put my hand... I didn't mess with them, but I put my hand next to these hands, and they're all smaller than my Northern European hand, and so either it was a bunch of kids who were in this cave 10,000 years ago, or it was people of Maya stature who did it.

Lex Fridman
It's so cool that you can date the charcoal, and it's so cool that 10,000 years ago there are people leaving [inaudible 01:22:37]-

Ed Barnhart
And actually, we have one that's I think 2,000 years older now, just a couple years ago, again in Yucatan, in a cave, they found a woman they named Naia now, and she's like 12,000 years old.

Lex Fridman
So the best guess maybe that you have is it goes across the Bering Strait to South America, possibly the Amazon, develop a lot of cool ideas in the Amazon, and started drifting back up into Mesoamerica?

Ed Barnhart
Was kind of a co-evolution, the technology of ceramics I think got there through an interaction with-

Lex Fridman
See, the interesting thing is that the Maya didn't really have religion, didn't have as a vibrant religious set of ideas, and they borrowed it from the Olmec.

Ed Barnhart
I've been doing a deep dive on this for this Olmec course that I just did, and it really does seem like these other cultures that have jade, and hematite, and obsidian, the Olmec had none of that stuff. They were living in a swamp, and building things out of dirt, but they were importing those materials from those areas, carving them into all sorts of religious iconography, and then exporting them back to them.

Lex Fridman
And still, the fanged deity show up [inaudible 01:23:58]-

Ed Barnhart
No, the fanged deity is nowhere in Central America and Mesoamerica, that's why... There's jaguars, there's jaguar iconography, but it's not the same thing. This whole jaguar transformer deity does not exist there. They do have a pantheon.

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Lex Fridman
So the Maya, the Olmecs are the interesting peoples of the regions. I'd love to ask questions about who were they? So one question I'm curious about, what was their sense when they looked up at the stars? What was their conception of the cosmos?

Ed Barnhart
That's a question I've spent my entire career trying to answer. I think that they saw it as proof of the cyclical nature of life, and certainly, they saw, like every ancient group did, like, "Are those the gods? Why are those things far away?" But I think that the Maya especially looked at it with a much more mathematical mind than most did. And so they watched these things move every night, and if you do that even today, you notice that all the stars move in tandem. They're just this blanket, they're like this curtain behind me. They're the stage upon which some very important players are dancing, and that's the Moon, the Sun and the planets. There's five planets we can see visibly. So they started watching, like, "Why are just those seven moving differently than the rest?" And those are the things that they keyed on mathematically. The Sun, of course, was also involved in the agricultural cycle, so that was important in and of itself. But the planets, we can see them coming up with ideas, definitely doing the math, and seeing that there is a repeated cycle, and then coming up with mythology around them, like Venus for them was associated with war, and they had very ritualized times to go to war that had something to do with Venus. Sometimes, in the classic period Maya, it was the first appearance of Venus as the Morning Star. That was a good time to go to battle with your neighbors. And when it became the post-classic, with Chichén Itzá being the capital of the Yucatan, then it looks like, if you watch Venus day after day, it goes slowly up every day, and then when it hits its highest point as Morning Star in the morning, it goes down to the Earth like three times as fast. All of a sudden, it just shoots down and hits the Earth. And so the people of post-classic Maya civilization saw that as the gods shooting a spear into the Earth, and that was a good time to attack your neighbors. That was like war time, when the spear is going to hit the earth.

Lex Fridman
All right, so this is fascinating. They just had at the foundation, a sense that life, existence at the various timescales is cyclical.

Ed Barnhart
Yeah.

Lex Fridman
That's a starting point, and then you just look out there, and if you're extremely precise, which is fascinating, how precise they were, you can just measure the cycles.

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Ed Barnhart
Yeah, and they did it really well. Now, of course, they are the only ones to develop a fully-elaborated writing system in all of the Americas. The South America had the quipu, but it's so different than our writing. We're still trying to figure out what the heck it is. We know there's math there, too. But they had the ability to take a lifetime worth of measurements and hand it to the next generation, who would then do it more and do it more. That's how they figured out kind of the Holy Grail of ancient astronomy. How good were they was whether they could see the procession of the equinoxes, the fact that we're just barely wobbling, and there's a 26,000-year period where the stars as that backdrop will spin all the way around and come back. It's 26,000 years. But the Maya we're able to figure out, "Wait, it's moving one degree every 72 years," and did a calculation based on where it should be in the ancient past, and they were using constellations. They're showing us they know by saying like, "This planet's in this constellation right now, and 33,000 years ago, it would be in this constellation."

Lex Fridman
It's just fascinating that they were able to figure this out. I would love to sort understand the details of the scientific community, if you can call it that.

Ed Barnhart
I think we absolutely could, and that's actually one of the things that I'm hoping to move the needle on in my generation, with my career, is to give these cultures the respect they deserve, as standing toe to toe with the rest of our ancient civilizations we respect. There are things that should be called science that are not being called science at the moment. Their math is incredible, their hydraulic engineering is incredible, their chemistry is incredible, and so I hope to talk about these things differently, as a way to get people to recognize the achievements in a different way.

Lex Fridman
Yeah, I mean, unquestionably incredible scientific work in the astronomy sense, especially here. Can you speak to all the sophisticated aspects of the Mayan calendar that they've developed?

Ed Barnhart
Don't know, you got another five hours?

Lex Fridman
Let's go.

Ed Barnhart
No, I'm kidding.

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Lex Fridman
I should say that you also gave me the 2024 Mayan calendar.

Ed Barnhart
Yeah, I do this just to show the world that calendar system is evergreen. It can go into the future or the past for billions of years in the system they made, just like our system is.

Lex Fridman
So can you speak to the three components here as I'm reading? The Tzolk'in, the Haab, and the Long Count, what are these fascinating components of the calendar?

Ed Barnhart
It's neat how obsessed... They were really math nerds. It wasn't good enough for them to just make one cycle to describe time. They had all these cycles that interlocked into each other, like cogs in a machine, though they never thought of it like that. But the Tzolk'in is their oldest one, and the one that still endures today. There are millions of Maya people that are living their lives based on a 260-day count. No weeks, no months. It's just 13 numbers combined with 20 day names, for a total of 260 days, and then it goes again. Everybody in the highlands knows what their birthday is in that calendar, knows what it means about their personality and the kind of jobs that they're supposed to do. Each one of those days has their own spirit and what's supposed to happen in those days. The Maya collectively call them the Mom, the Grandmother, Grandfather spirits, and they talk to each one of those days, and they pray to them. There's now an association of some 8,000 people that are called [inaudible 01:31:33], that are daykeepers who are keeping the days, and they're also like community psychologists, almost. People come to them and say, "You know, my life is mixed up. What's wrong here?" "Well, let's ask the Mom. Okay, well, it looks like you're not doing this or that, or you know what, you're an accountant? You're not supposed to be an accountant. You're supposed to be a midwife. What are you doing? You're living your life wrong. You're a Kib'. You need to start being a Kib' person."

Lex Fridman
So they take extremely seriously the day on which you're born, what that means, the spirit that embodies that day?

Ed Barnhart
Right. Like, I'm Kib', I'm 13, Kib', and it's funny how accurate a lot of them are. Mine is basically, is I'm an irresponsible husband and parent, but people like me, so my family still prospers. Like, well, God, that's horribly accurate.

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Lex Fridman
I mean, some of it is also the chicken or the egg. If you truly believe, if you've structured society where this calendar is truly sacred, then it kind of like, the spirit does manifest itself in the life of the people that is born on that spirit's day.

Ed Barnhart
Absolutely.

Lex Fridman
It's interesting.

Ed Barnhart
And the Maya really feel this, in this system. So that's the core system. This 260-day calendar was the very first calendar they made thousands of years ago, and it's the one that's most important today.

Lex Fridman
Why 260 days, by the way? Is there a reasoning behind it?

Ed Barnhart
Most Maya agree with this today, and who knows what the original architects, thousands of years ago were thinking, but it's nine months, it's the human gestation period. So if you conceived on the day 13, monkey, chances are your kid's coming out on or near 13, monkey, and I think it's beautiful. I mean, if that's right, that means the Maya and the people of Mesoamerica will all share it together, when they thought about, "We need a count of time for us," they didn't look up into the heavens, they looked into their bodies. "What's the first cycle that we actually go through as humans?" and they picked this nine-month thing. It really is our cycle, and no other culture on the planet looked inside themselves to create their calendar like that.

Lex Fridman
So that's the oldest one and the sacred one that still carries through to today. What's the second one, the Haab?

Ed Barnhart
The Haab is the solar calendar, the one that everybody on the planet eventually comes up with. We know it's second, though, because when they start talking about it, they use all the symbols and the numbers from the 260 one. They say, "Well, we need a solar one, too. Let's just keep counting this another 105 days, and we'll get to 365."

Lex Fridman
Oh, interesting. They kind of carry the same.

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Ed Barnhart
Right.

Lex Fridman
Got it, got it, got it, got it. And that's useful, for all the sort of agriculture, all those kind of reasons?

Ed Barnhart
Right. Though, interestingly, they never put a leap year in. The Haab is also called the vague year, because it's just 365, which means every year, they're off a quarter of a day, and eventually, it starts really adding up. In fact, it's even caused modern problems. In this calendar here, I just do the straight math from 1,000 years ago. And so I place the beginning of the solar year differently than some Maya groups do, especially the guys in the highlands of Eastern Guatemala. They write me nasty emails saying, "I don't know what time the year is," but their relatives changed it in the 1950s, because their agricultural cycle was so far off. They moved it 60 days back to make it in the spring again, but it drifts, which is strange, because it's not a very good thing for the agricultural cycle. It's one of these mysteries we still don't have an explanation for.

Lex Fridman
So that's the Haab, and then what's the Long Count?

Ed Barnhart
The Long Count's their really mysterious, cool one, because it's a linear count of days, which are not like them. It's a bunch of cycles, like ours. You know, our weeks are a cycle, our months are a cycle, but it's weird in that its estimation of the year in the Long Count system is only 360 days, so it's miserably off a solar year. They count in base 20, so like we count in 10s, we're decimal, they count in base 20 vigesimal. And so it should be there's 1s, there's 20s, there's 400s, there's 8,000s, there's 160,000s. It goes just like our 10s, 100s, 1,000s, 10,000s, but it's times 20. So they have days, months of 20 days, and then they have these years that should be, by their math, 400, but it's only 360. And that throws the whole thing out of whack going further up. Then, they have a 20-year period and a 400- year period. 400 years to their calendar, but by that time, it's only 396 years in our reckoning. So it's mysterious that it's... Why did they tweak it at the year to be only 360 days? That doesn't follow any astronomy, that's not the human cycle.

Lex Fridman
Yeah, but it's interesting that they build up towards thinking about very long periods of time, like baktuns is 144,000 days.

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Ed Barnhart
Right, ar a baktuns is 400 of the Long Count's years, so it's kind of like our millennium. You know, we think it's a big deal when we hit a millennium or a century. They have a 20-year period that they do a lot of celebrations on, called a k'atun, and then they have the 400 baktun, which is the big one. That's like their millennium, and 13 of those baktuns occurred in the creation before us. They also think that the world has had multiple creations. They're not alone in that. There's lots of ancient civilizations who say that, but we're technically in the fourth creation. And they have a creation story called the and the Popol Vuh, and the Popol Vuh is clear as day that the third creation ends with the help of these heroes called the Hero Twins, and the fourth creation begins. And so on the Maya monuments, we see them doing the math through the Long Count, and we can calculate it back very exactly. It happened, the fourth creation started on August 11th 3114 BC. And it doesn't say it's day one, it says it's the last day of the 13th baktun of the third creation, which leads us to believe that a creation is only 13 baktuns long.

Lex Fridman
Right, and this would be the fourth creation? The calendar starts-

Ed Barnhart
This is the fourth creation. But if you do the math, going from 3114 BC, and count 13 baktuns forward, you get to 2012.

Lex Fridman
And hence, the very popular notion, the 2012... Whenever that was December, something like-

Ed Barnhart
December 21st 2012.

Lex Fridman
... will be the end of the world.

Ed Barnhart
Right.

Lex Fridman
So can you explain this?

Ed Barnhart
Those were very fruitful years for me. I had so many lectures around the country that it's like Garrett Morris in Saturday Night Live. The apocalypse was very, very good to me.

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Lex Fridman
Ah, yeah, but that is pretty interesting. So technically, it would be, what, in the fifth? No.

Ed Barnhart
Yeah, technically we'd be in the fifth, though my argument was that, actually, if you look through all the corpus of Maya mathematics and calendars, they never say anything like that. In fact, there's a handful of dates that tell us that the fourth creation does continue farther on, that that baktun place should have 20 baktuns in it, like their counting system would dictate, not 13. And there's a place in Palenque, there's a place in the Dresden Codex, and one other place I'm forgetting, that all talk about time after 2012. So how does that happen? It's a conflict.

Lex Fridman
Is there supposed to be an overlap of the... So it's like 13 is the core of it, and it's 20 long?

Ed Barnhart
They love the number 13, it's all over the place. It's a magic number to them. My explanation, which I admit is not very solid, but I think that the magical deeds of the Hero Twins, in their creation story, at the end of the third creation, hit the magical reset button, and that it just restarted time right there, because of their magic, but that was not to say that the natural baktun cycle should be 13. And there are certain texts that go way forward in time or way backward in time, and whenever they want to do that, there are higher increments than just the baktun. Above that, there's the piktun, then there's the kalabatun, then there's alawatun, and it goes on and on. And these are like 160,000 years, huge increments of time. Whenever they want to do that, and they talk about a long period of time, they start putting 13s in all of those increments, those higher increments. And I think what they're saying is they're making an esoteric statement about the never-ending nature of time. That's what I think they're telling us in those texts, that time goes on forever, magically.

Lex Fridman
But they still had a conception that it didn't go on forever before, right? That there was other civilizations that came before in there, and this is the fourth creation?

Ed Barnhart
This is the fourth creation, and the gods made everybody. The first ones made of mud and they melted. The second ones were made of sticks, but they were jerks to the animals. The third ones were like us, but flawed in some other way. And then, we're finally made of the blood of the gods and corn. We're made out of corn, so we're perfect. And as it explains to us, the Popol Vuh does, we got it right this time. There's no reason to believe that this creation has a set duration. One of the weird things is that the Aztecs, who we talked to a lot at contact, they also had the concept of multiple creations before us, but they were real clear to the Spanish that they weren't all the same time element. Some of them were in the

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three hundreds of years, some of them were in the seven hundreds of years, but they were not the same time period. So our mathematical logic that if the third creation was 13, this one must be third creation, or also be 13, it's in direct opposition to what the Aztecs told us about the nature of creations. They're different time periods.

Lex Fridman
Why do you think there was the myth of the previous creations? Did they have some kind of long, multi-generational memory of prior civilizations?

Ed Barnhart
It may have had some echo in the flood myths.

Lex Fridman
Right, so same? It's the same kind of major myths carried through long periods of time?

Ed Barnhart
There's a lot of different opinions about it. And if they were all 13, if we have 5 creations, like the Aztecs said, and they were all 13, they would come up to roughly 25,000 something years, which is very close to that processional cycle. So some people are like, "They designed it all to be one completion of the procession of the equinoxes." I don't believe that one, but that one sure sounds good, doesn't it?

Lex Fridman
Yeah.

Ed Barnhart
That's going to get a lot of internet hits.

Lex Fridman
And one of the things I do obviously wonder about is why- Wonder about is why the flood myth is part of most societies and most religions.

Ed Barnhart
I think that one's pretty easy. It's the end of the ice age, when the bathtub filled back up.

Lex Fridman
So it's just the ice age bathtub refilling.

Ed Barnhart
It's the seas filling back up.

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Lex Fridman
And they, without really understanding what happened, they just carried that story.

Ed Barnhart
Everybody knows that everybody's nice coastal village went under water and they had to seek higher ground.

Lex Fridman
And then just like people talking about the weather, everybody was talking about the weather for many generations as the sea level was going up, and then that myth carried.

Ed Barnhart
"Why do we live here, grandpa?" "Well, we used to live over there, but then the water came."

Lex Fridman
And then many grandpas later is just kind of permeates every idea.

Ed Barnhart
It becomes mythology, but global mythology. So that one, there's a lot of things I don't have a reasonable explanation for, but the flood myth is almost certainly the rise in sea level.

Lex Fridman
So this idea that every day represents, carries a spirit. There's modern day astrology. Most people kind of consider astrology this maybe a bit unscientific woo-woo type of set of beliefs, but do you think there's some wisdom that astrology carries? From your scholarship of the Maya calendar, do you think if we carry that to the astrological perspective on the world, do you think there's some wisdom there?

Ed Barnhart
I don't know. I have a woo-woo part of me. I would like to believe that stuff. But I don't think as a scientist, I cannot come up with a biological scientific reason why that would be true. And when you look at it objectively, I mean really? Is everybody born with the sign Scorpio a moody person? That's just objectively not true. But it is funny how oftentimes these Maya horoscopes, for lack of a better word, do hit the mark. There was some student who surveyed like 300 people with the app I made and asked them about their Greek sign and their Maya sign, and his conclusion for his term paper was that the Maya one was working way better, which that's fascinating. At least that's fun. But no, I think I'm too much of a scientist to believe that. I just don't have any foundation in science that would allow us to believe that the month in which we were born in a cycle sets our personality and destiny.

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Lex Fridman
I agree. And yet there's so much mystery all around us that ... What I do like is the inbuilt humility to that worldview, that there's this whole, you can call it a spiritual world, but a world that we don't quite understand. And then you can wonder about what is the wisdom that that world carries. And then you can construct all kinds of systems to try to interpret that, and then there is where the human hubris can come in. But it's good to be humbled by how little we know, I suppose.

Ed Barnhart
I do love the mysteries of the world. And I would love to find an ancient civilization, but I don't want to solve the mysteries of the world. I think they're one of the things that make life worth living.

Lex Fridman
That's true. That's true. You mentioned the Maya writing system. What are some interesting aspects of their language that they've used in the written language that they used?

Ed Barnhart
Well, one of the things that confound me as a guy who's spent a better portion of my life studying it, I had the honor of being the student of Linda Schele right here at the University of Texas at Austin. She got the group together who broke the Maya code of hieroglyphics in the 1970s. So I learned from the best and loved every minute of it. I miss Linda.

Lex Fridman
Can you speak to that code actually, the hieroglyphic code and what it takes to break it?

Ed Barnhart
Oh boy, what a thing. We had kind of a Rosetta Stone. We had a page out of Diego de Landa's book. A priest who was converting the Maya in Yucatan asked his informants about their writing system and what every sound meant. And he was convinced they had an alphabet like we do. So he got this Maya guy, sat down in Spanish, and he said, "Okay, you're going to write all the symbols right here in my book. Write an ah here, write a be here, write a ce here." And that guy just wrote all of the sounds that the priest told him to write. They were actually syllables. They were vowel consonant combinations. They weren't an alphabet, but that turned into our Rosetta Stone of sorts. The big key is that the Maya still speak that same language. There are millions of Maya people who are speaking a version of Maya. Now there's where I get confused, that we've got a single writing system that is intelligible, we've broken the code, so we know that it's basically the same writing system from the top of the Yucatan into Guatemala and El Salvador. But we have 33 Maya languages today that are mutually unintelligible. And we backwards project the language of what they spoke back then that the glyphs are in to something called Ch'olti', which is a combination of Ch'orti' and Ch'ol, two of those languages. But it doesn't work for me at all. If there was one language,

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maybe two back then, how did it flower into 33 mutually unintelligible languages in just 500 years during acculturation and horrible infectious diseases that killed 90% of the population? How did that happen? So we're missing something huge here. I think it's more like Chinese, where Chinese letters, writing can be read in multiple languages and still understood. I don't know exactly the mechanics of how that would happen, but it just seems impossible that there are more languages, not less languages, in the Maya area after the last 500 years that they've been through.

Lex Fridman
So you think that there's some kind of process of either rapidly generating dialects or there always has been these dialects, or I should say they're distinct languages, even though there was a common writing system?

Ed Barnhart
There must have been a way that multiple languages understood the same writing system. Or maybe there was something like Latin. You know how there was a period in Europe where most people were illiterate and there was this priesthood who all understood Latin and they wrote in Latin? Maybe the hieroglyphs represent a kind of Latin in the ancient Maya world.

Lex Fridman
But we don't really know, and there's not clear evidence to fill in the gaps of how it's possible to have that.

Ed Barnhart
Right. But we did realize, it was actually a Russian scholar named Yuri Knorozov who broke the code. The Americans and the Europeans were absolutely sure that the written language was a dead language. But Yuri not knowing any of that, not being filled with all of those thoughts from America and Europe, went about it in the way that he was taught in his grad school in Moscow and just went to the dictionaries. And he looked at Yucatec language that they're speaking today, and he applied it to the symbol system, and he knew that there were certain sounds. He used Landa's alphabet. His two key examples were a picture of a dog with a symbol over it and a picture of a turkey with a symbol over it. And the dog, a dog in Yucatec is tzul. So he saw two symbols and he said, "This one's probably tzul and this one's ul". And then the Turkey was kutz, so it would be ku ending in tz. And he showed how, look, this is, this is tzul. Those two things that should be tz are the same symbol. And that began this process of unraveling the syllables that we're still working on today.

Lex Fridman
That's fascinating. Just that decoding process is fascinating. How do you even figure that out? And there's probably still, are you aware of any written languages that haven't been decoded yet?

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Ed Barnhart
Yeah, there's a number of them. There's Easter Island script. I was just talking to, we've apparently made a few advances there now. It's called Rongorono. And we only have about maybe 25 examples of texts, but we're beginning to break that. There's also, the big one is Harappan. For a long time we used to say there were five independent scripts on the planet, and those were Chinese, Cuneiform, which is Mesopotamian, Egyptian, Maya, and then Harappan, which is from Northern India. That's the only one that we've never cracked. And now all the epigraphers, the people, that's the term, epigraphy is translating these languages, they're all ganging up on Harappan and want to kick it off the list because we can't break it. It had a big enough symbol set, but no one's been able to crack it. And now they're saying it's just an elaborate symbol set and doesn't reflect the spoken word.

Lex Fridman
That's a hypothesis, which would explain why it's so difficult to break.

Ed Barnhart
But we could just be faced with a quitter generation. Maybe somebody will pick up the baton next generation.

Lex Fridman
Kids these days.

Ed Barnhart
The other one that fascinates me is from the Americas. It's the quipu. The Inca had the quipu, this knotted string records, but it was definitely encoding more than just math. We know the math. I can do the math quipus and figure out what they're totaling of things. Yeah, there's a quipu right there.

Lex Fridman
"Quipu are recording devices fashioned from strings historically used by a number of cultures in the region of Andean South America. A quipu usually consists of cotton or camelid fiber strings." So there's a set of strings and they're supposed to what, to be saying something?

Ed Barnhart
There's one long string that the little ones dangle off of. And each one of the dangling strings have sets of knots on them. And the knots, some of them are mathematical quipus, and those, we can just do the math. We can prove that it's math. They also encoded language in there. They had entire libraries in Cusco where Spanish conquistadors were brought through, and the caretakers of the libraries would just, they'd say, "Pull that one down, read that one to me." And he'd pull it out and just read a history of something that happened 200 years earlier. So it was definitely writing. But in the 1570s, one head of the

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church there had all of the people that could read them called quipucamayocs, gathered up, had them read all of their quipus and transcribe them into Spanish books, and then had the quipus burned and those people murdered.

Lex Fridman
Well, there you go.

Ed Barnhart
And so we can't break the code still today, but we know it was absolutely a written language. Though it wasn't written, it was weaved or knotted.

Lex Fridman
And there's still some quipus available that could be-

Ed Barnhart
I think now we've just crossed the 1,000 mark. So we have 1,000 quipus. There's enough to break the code, and I think this generation might be the one that does it.

Lex Fridman
It's sad that so few have survived. 1,000 is good, but its-

Ed Barnhart
But see, Peru has barely scratched the surface with archeology. There's so much out there. There was a priest I read about named Diego de Porres, who was one of the early people in Peru converting communities. And his chronicle is real clear that he wanted to teach this community of 3,000 people all the Spanish prayers, the important ones for them to be converted into Christianity. And he had the community's quipucamayocs knot quipus for each person that told them that they could read them out and memorize the prayers. And if they were caught without their quipu in town, they were flogged. So he had 3,000 of the same quipu made and handed out to this community. If we find that community and find its cemetery, there is our Rosetta Stone.

Lex Fridman
It is probably the case there is somebody in Peru and maybe a large community that knows this language that understands, and you just have to show up and ask them. And it's like, they're like, "Oh, yeah, yeah, yeah."

Ed Barnhart
There are some communities that are using them. There's a couple of them that we had high hopes for, and then it was apparent that they were just making shit up. They didn't actually know how to read it. They just knew it used to be read so they made a bunch of stuff about what it says, and they bring it out and they act like they can read it. But then when you

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ask them the details, they don't know. But then on a much simpler level, there's llama herders who keep a string in their pocket and they've got the knots equaling how many llamas they have, and then they have subcategories of information like, this one's sick, we've lost these ones, this one's pregnant. So they have these more simple and more mathematical quipus, but they're using them to affect as a record.

Lex Fridman
Is it possible through archeology to know what the social organization of the Maya was? Maybe if there was a hierarchy, maybe what the political structure was, if there was a leader, different roles, priests, who had the power, who was powerless, who had certain kinds of roles, is it possible to know that?

Ed Barnhart
Actually because of hieroglyphs, yeah, we know a whole lot. There's basic things that archeology, which is a very blunt tool, can figure out like this guy lives in a rich house, this guy lives in a poor house. But the hieroglyphs tell us specific stuff about who can rule, that it was hereditary, that hereditary rule was based on royal blood that could be burned and connect to the ancestors that lived up in the sky versus the one that's lived in the underworld. It also told us things about hierarchy like that there were councils of lords underneath the king who each represented clans who had their own neighborhoods, and that there were revolving positions of authority. There was the site that I mapped for my dissertation and spent years in the jungle there, Palenque, had a lord's title named Fire Lord. That was one of the generals of their army. And we could tell that position changed over time. So there was one guy named Chak Suutz' who was the Fire Lord for the early part of a reign of a king called Ahkal Mo' Nahb. Then by the time he carves this other panel, there's another guy in the position of K'ak Ajaw, which was the Fire Lord. And so he had-

Lex Fridman
Got promoted or demoted?

Ed Barnhart
Well, he could have been killed in the case of that. But then we have the interesting case of in the Postclassic, they shed the idea of kings. They don't like kings anymore. That's probably a big part of why the Classic disappearance and the abandonment of all those cities happened. People just got sick of kings. And so they turn into this more council system at Chichen Itza. But then when Chichen Itza falls, there's a new city that's architecture looks a lot like Chichen Itza. It's called Mayapan. But it has what is called the League of Mayapan. And it has a council of representatives from the communities from all around the Yucatan. And it is basically a democracy. It is a Maya democracy that happens. The individuals from all around the Yucatan are there. Each family has their own council house at Mayapan, though they live back at their place. It's kind of like a Maya Congress.

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Lex Fridman
Representative of democracy.

Ed Barnhart
It really was. And this happens in, I guess, 1250 AD that this Maya democracy happens. And we know the names of them, we know the families. And of course, they were humans, so eventually they screwed it all up. One family murdered another family and the whole city burned.

Lex Fridman
And of course, it's probably some fascinating corruption, which is hard to discover through-

Ed Barnhart
Part of it was the Aztecs screwing things up. The Aztecs came down with all sorts of, "We'll buy everything you're making." And then eventually they were like, "Could we maybe buy some humans?" And then one family was like, "No." And the other family was like, "I don't know, they're making us a lot of money." So then they murdered each other, and the water supply got polluted, and then the city burned.

Lex Fridman
It seems like slavery, murder, and disease is a large component of the story of humans. You mentioned different periods in the Maya, the Classic, the Postclassic, the Preclassic, the Archaic. Can you just speak to that? So Archaic is before there was really a civilization?

Ed Barnhart
Archaic's pretty much when everybody's hunter-gatherers.

Lex Fridman
So the Classic period was the golden age. And then the Preclassic is the interesting time that we were talking about. And the Postclassic is when the democracy came about.

Ed Barnhart
Well, midway through it. Reverted back to council systems. The Maya loved to be part of councils. So yeah, we have Preclassic is like the origins of civilization. They're starting to build cities. They're starting to create their calendar. They're starting to create these wonderful works of art. And the Classic period, if you look at 10 different textbooks for the Maya, you'll get 10 different dates that wiggle around in there. But basically that's the age of kings to me. That's when these cities decide that they're going to organize themselves around elite royal families that have this magical blood that can contact their ancestors that are directly in contact with the gods. The Maya never contact their gods directly. They contact their ancestors who are up there who act like liaisons to the gods. And so the Maya age of kings has these dynasties sprouting up where these people have basically snowed

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the rest of the people, that they've got a special quality of their blood and only their offspring can do the same trick and talk to the gods, where everybody, every Joe Maya can let their blood and burn it and contact their ancestor. But Joe Maya's dad is just a corn farmer who lives down below and he's got no influence over the gods. But the rulers, their spirits go down briefly, but then they go up into the heavens and reside where the gods are and act as liaisons. So that's the validation for this kingship that happens for about 400 years. I know we say 250 to 900, which is kind of the encompassing edges of it, but it's interesting that it's actually specifically the ninth bak'tun of their history. The ninth bak'tun begins in like 426, and it ends in like 829. So it's a 400-year period of time. And before that, there were no kings. And after that, there really aren't kings. They're heads of councils. So I call it the age of kings, where everybody's following the directives of basically a despot. And for a while, that's great. Cities build up, populations happening. I see it as kind of a cult of personality moment too. Strong, charismatic leaders inspire people to do great things together. But eventually happens all the time with power, too much power corrupts. All of a sudden there's this unwieldy huge elite class that has to be treated special by everybody else. And they start saying, "Well, I think we should fight with those guys and you guys should go take these things." And people eventually get sick of it and they walk away from these cities, and that's how we get the mysterious Maya collapse where all these cities are just gone.

Lex Fridman
That's one of the great mysteries of the Maya civilization is that over a very short period of time, like a hundred years, it seems to have declined very rapidly. It collapsed. What do you think explains that? What happened?

Ed Barnhart
I think it's a failing of archeology to properly see what was happening. I think that most of those cities populations moved no more than 20 to 40 kilometers out and started their own farm, and they lived in perishable houses. And all archeology signature sees is that nobody lives in the city center anymore. We don't see a bunch of mass bodies. There's no evidence of people getting sick. There are certain cities that fought with each other at the end, and we see that signature plain as day. We know when a city was attacked and burned. Mostly that didn't happen. People moved and migrated. And it seems like right there around between 800 and 900, a lot of the elites that were on top, most of it was in the rainforests of northern Guatemala, they move. They move in two directions. Some of them move into the highlands of Guatemala, and some of them move up into the Yucatan. The city of Chichen Itza becomes the next big capital in Yucatan. But the word Itza is actually a word describing the people who lived around Lake Peten Itza in northern Guatemala. And all of the Maya are super clear about that, that the Itza came in as immigrants with these new ideas and created Chichen Itza. So the elites who were no longer welcome in their cities just moved and set up shops somewhere else.

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Lex Fridman
So why was there a decline? What was maybe the catalyst? Was there a specific kind of events that started this? Was this an idea that kind of transformed the society?

Ed Barnhart
We are still debating that. I don't think there is a single reason. I think humans are complicated. I think a lot of things led to this. One thing we can see archeologically is that every one of the cities became overpopulated. They were too popular. And we think that they pushed the limits of their capacity to feed and house people. We see it in lots of the cities at the end of the Classic period that people are seasonally starving. I remember really stark evidence in Copán, Honduras. Copán was this beautiful city, lineage of 17 kings. But the last kings and the last elite burials that we dig from the city center, the teeth are the telling part. They get this thing, when you're growing up and you're not getting enough food seasonally, it shows up in the enamel of your teeth. It's called dental hypoplasia. And if somebody's seasonally starving, it gets these lines in their teeth. And that last generation of Maya before they left Copán, even the rich people are seasonally starving. So there's a problem there for sure. But I also think, it's a weird thing, it was not an empire. It was a group of independent city states like Greece. Some of them were allied, some of them were enemies. There was a huge civil war that settled out about the end of the Classic period. So if it was Europe, the victors would've taken over, the losers would've beat it and gone wherever they went. But when they abandoned these cities that were independent still, they all left both the guys that won and the guys that lost the war. So it couldn't be just as simple as spoils go to the victor. It's such a wide area. Not everybody was starving like the people in the Copán Valley. So I personally think it was calendrically timed. It is interesting to note that that ninth period, that ninth 400-year period ends right then. And I think a lot of people, I can't prove it archeologically, but I think a lot of people said we're coming to the end of a great cycle and we need to renew. We need to change what we're doing. When you talk to the Maya today, like at the end of this 2012 thing, if you actually talk to Maya, say, "What happens at the end of a big cycle here?" They say cycles are a time of renewal and transformation, that it is all of our obligation to change our lives at the end of cycles. That change is coming. We can either be part of it or we can get steamrolled by it. The Aztecs did this neat thing called the New Fire Ceremony every 52 years, which was the biggest their calendar would go. They'd burn down perfectly good temples. And they'd burn down their houses sometimes. And they would just, everybody in society would perform this, what they call the New Fire Ceremony, and they would renew the world. So I think my personal theory is that the Maya decided at the end of the ninth bak'tun that it was time to renew the world.

Lex Fridman
I think this theory makes sense because they really internalized the calendar. That was a really big part of their culture, the sense of the cyclical nature of civilization.

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Ed Barnhart
That's what I think. I think that they created that calendar to perceive the cycle and to harmonize with it.

Lex Fridman
You mentioned the Aztec. What was the origin of the Aztec? Where did these people come from, at what time, and how?

Ed Barnhart
Almost every one of the cultures we're talking about now, we have two different versions of the answer to that question. We have the archeology version, and we have the Aztecs themselves. The Aztecs have this wonderful migration story where they say that they came from a place well to the north called Aztlán. And that they had this migration that went through kind of a hero's journey where they go to this snake mountain place and they encounter the birth of the war god that they'll worship after this. And how they stepped into the Valley of Mexico as the last, the lost brothers of everyone in the Valley of Mexico. They said that they all came from the north near Aztlán as a place, a cave with seven different passages called Chicomoztoc. And that all the people who spoke the language Nahuatl came from the cave. And most of them went early to the Valley of Mexico. And in the Aztecs' story, they were just the lost tribe. They were the last brothers to come in. But then they show up late game, and they become mercenaries. They just start working for communities in the Valley of Mexico. And this takes place in the 1300s. So about 200 years before Cortez shows up, the Aztecs show up to the Valley of Mexico. And they make themselves this indispensable group of mercenaries. They do the dirty work. All the civilized communities around Lake Texcoco, which is now Mexico City, it's all dried up, but those guys were too civilized to fight with each other. But they could hire the Aztecs to do their dirty stuff. So the Aztecs did that and really changed the politics in the game of the Valley of Mexico.

Lex Fridman
The dirty stuff. They were the muscle.

Ed Barnhart
Yeah. They'd go in and they'd kill whoever you wanted killed, and now you're the king of this area. So one of these kings that they were working for really liked them and decided, I'm going to make the Aztecs part of our ancestry. I'm going to give them my daughter to marry the head of the Aztecs. And the Aztecs sacrificed her. And that really pissed that guy off. So he took his whole army and ran the Aztecs out for a while. They say they live in this horrible desert section eating lizards. But then one of their priests say, "We're going to walk around the lake, and my visions say that where we see an eagle sitting on a cactus with a snake in its mouth is where we will build our capital." And they see that, but it's out on an island in the lake. And he said, "Well, I don't know, that's the place." So they build up an island, they go to that island, and then they just start piling up lake muck until they make a whole city there in

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the middle of the lake. They make an island city. And all of this occurs in about a hundred years. So they show up about 1300. The capital of Tenochtitlan, as they called it, is really established. And from there, they quickly take over the entire valley. They make what they call the Triple Alliance, which is the two other big communities of the lake are now their allies, but they're not really allies. The Aztecs were brutal. Those guys agreed to shut up and let the Aztecs run the show. And then the Aztecs spread like a wildfire all the way down into the Maya area. Everywhere they go, they rename everybody's towns and make them pay tribute.

Lex Fridman
Pretty short lasting civilization. Spread extremely quickly. Famous. What are some defining qualities that explain that?

Ed Barnhart
I think they were very much like they had an attitude like Attila the Hun. They just had no problem ripping your skin off. Everybody else had become too comfortable and too civilized. And the Aztecs were just mercenary. They told everybody, "We can either rip your heart out or you can work for us. And if you work for us, you'll be just fine." They'd go to every town they'd go to. The first thing they'd do is they'd show up with a bunch of merchants. There was a merchant class who were also military. They were really the people who assessed where they were going to attack next. They'd go in with a bunch of Aztec products and say, "We'd like to trade with you." But all the time, they were assessing their military prowess, what products they had that they could take. And then soon after the pochteca were there would come the military with the reconnaissance.

Lex Fridman
So the Aztec had a huge warrior class, as you're saying. So can you linger on their whole relationship with war and violence?

Ed Barnhart
They worshiped a war deity. Their main temple was the Templo Mayor. It had two temples up on top. One was Tlaloc the Rain God, who liked a lot of sacrifice himself. But then the other one was Huitzilopochtli. That translates "The hummingbird on the left." But he's the war god. I love that he's a hummingbird. Maybe he's fast and he comes from the magical side or something. But then right next to the temple, on either side were the two temples of the warriors. One was the Eagle Warrior clan, the other one was the Jaguar Warrior clan. And they were symbolically in competition with each other, though a unified force. I guess probably an analogy between the Navy and the Air Force. They had a good-natured competition of who was better, but they were the same force. So those were their symbolic warriors. Force. So those were their symbolic warriors dressed up in all of their finery, and they would come at people with these two forces, and it was very unlike anything that had happened before in Mesoamerica. Again, I think I could draw a parallel to what happened in

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Europe. The famous Henry V moment in Agincourt where his kind of ragtag army wipes out half of France's aristocracy with the Longbow. Up until that moment, Europe had a very war is for the elite classes kind of attitude. And then after France lost half their aristocracy, then it was like, maybe we should be hiring from the villages. The same sort of thing happened with the Aztec that there was, Mesoamerica really didn't have huge standing armies, but the Aztec put this army together and they intimidated people. They didn't actually have to use it a lot. It was used to great effect in the valley of Mexico and for the rest of Mesoamerica it was mostly the fear factor.

Lex Fridman
But there also seemed to be a celebration of violence. I think you said that beauty and blood went hand in hand for the Aztec, maybe like the Roman Empire, was it, they just had maybe a different relationship with violence, where that stood in the purpose of life, purpose of existence. Is that fair to say?

Ed Barnhart
I would hypothesize so. I mean, I think it's one of the wonderful things about studying these ancient cultures, knowing what our human capacity is and the Aztecs, when I said that statement, what I meant by that is they were absolutely comfortable with human sacrifice and ripping people's hearts out. They had this just grotesque, violent bent, but in the same way, they also absolutely loved flower gardens and poetry and music and dance. The same Aztec king who would order the hearts of a thousand people extracted also would stand up at dinner parties to recite his own poetry or the poetry of famous statesmen that had come before him. And they spent money on things like flower gardens. All of the causeways leading to the Aztec capitol had beautiful flower gardens and they had a museum and they had an aquarium and a zoo, and they had an opera and they had a ballet. And these things existed together. There was not, in the Aztec mind, any conflict between witnessing someone's heart getting ripped out one moment, and in the evening we'd go to the ballet.

Lex Fridman
How does that contrast the relationship with war and violence with the other civilizations of Mesoamerica and South America, maybe the Maya? What was their relationship like with war?

Ed Barnhart
The Maya were certainly influenced by the Aztec at the end, so we get a skewed perspective from the contact period accounts because the Maya were much more violent and sacrifice-oriented in their post-classic rendition. But in the classic period, it was mostly the priests and the king who were doing the sacrificing of themselves that we know that the Maya kings would cut their penises and then bleed that blood onto paper and the paper would burn and become the smoke through which they'd commune with their ancestors. But they'd actually tie this paper onto their penis, cut it, and then dance. So the blood

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splattered, but it was them cutting themselves. It was different than killing a bunch of other people for it. It was a auto-sacrifice, we call it. Still very macabre, but very different than deciding a whole bunch of other people should die. It was a self-sacrifice thing.

Lex Fridman
Can you speak to the sacrifice a bit more? Animal sacrifice, human sacrifice. What role did that play for the Maya, for the Aztec, for the different cultures here. Was that religious in nature?

Ed Barnhart
It was absolutely religious in nature, and the Aztecs were of the opinion that the war God demanded people were captured and sacrificed and it had to be valuable people. There was a lot of... before they made that big standing army, they had just ritual battles that they would have and they'd take captives. In fact, all around Mesoamerica, they wanted captives so that they could bring them back and sacrifice them for the gods and the Aztecs deciding to specifically follow the war God, did this more than anybody. They did it so much and so successfully that they didn't have any enemies nearby. So they decided this one poor sucker group, not that far away, called the Tlaxcallans, that they were never going to make peace with them so that they could go close by every year and just have a little symbolic war with the Tlaxcallans and haul them back for a sacrifice. Cortes met those guys and he was like, here are people who hate their guts. I'll just use these guys. So we say, oh, Cortes took over the Aztec world. It was Cortes and 20,000 super pissed-off, Tlaxcallans.

Lex Fridman
And the actual sacrifice, so there would be kind of these ritual battles or is it chopping off people's heads? Like, is there some interesting rituals around the sacrifice?

Ed Barnhart
It's mostly heart extraction, sometimes heads, but they bring them up on top of the temple so everybody can see it. And they had a specific stone where they would bend them over so their rib cage would come out and they'd use a thick obsidian knife, and they had a really, just, tried and true way to do it. They'd stab it in in a certain place close, and then they'd push down on the sternum as they ripped up on the rib cage. So they'd just make a place where they could just rip it right out.

Lex Fridman
With their hand?

Ed Barnhart
Yeah, with their hand. But they were really just surgical about it. They'd use a thick obsidian knife where they could just break the ribs right along the sternum and then push the sternum down, pull up and just [inaudible 02:27:00].

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Lex Fridman
While the person was alive?

Ed Barnhart
Yep. While the person was alive. And the Aztecs had this idea, there was a horrible drought that went on that almost ruined the entire valley, and they came to this conclusion that it's because we haven't been killing enough people. We've got to bump this up. And then when they did and they decided, they really took it out on the Tlaxcallans, it rained again. So it was proof positive that they should just keep doing that. And they ate people as well. They really did.

Lex Fridman
As part of the sacrifice or?

Ed Barnhart
After the sacrifice, then they would eat them. And this was part of the drought and the famine thing that started, but then it was just kind of the thing to do when Cortes got there, they were still having certain special feasts that involved humans and it really upset the Spanish that they would be tricked into eating human. Like, "Hey, you're liking dinner? That was a human."

Lex Fridman
So the idea, was it actually having a taste for human flesh or is it just these kinds of ideas of if you eat a person's heart that you can get their spirit and their strength?

Ed Barnhart
In the case of the Aztecs, it seemed like they just liked it. This guy, Sahagun, who was a very responsible chronicler, that was pretty specific, that there was a distribution thing. The elites got butts. The butts were the best part, so the butt cheeks, those are the best parts to eat. And then it went down the chain until some people just got fingers and toes.

Lex Fridman
Literally bought taste for the Aztec. Boy. All right.

Ed Barnhart
They really did. They really did. In fact, that's what caused the, have you heard of the Noche Triste? The sad night? The night that the Aztecs really go nuts on the Spanish and kick them out. It's all triggered by this one guy, Pedro de Alvarado, who's left in charge by Cortes. As Cortes goes to the coast and tries to talk to the New Force, talk him into being for him, which he does. But Pedro Alvarado is left back in town in charge and they're doing another one of these huge Aztec buffets and parties to honor them. And it happens. The guy says, "Hey, do you like dinner?" Like, oh yeah, it's a nice dinner. "Well, it's humans. You're eating

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humans. See, I told you they were good." And Alvarado just freaks out and he has the guards close the doors and he murders everyone in the party. Women, children, nobody has weapons. He just murders everyone. And that's what spazzes the Aztecs out to eventually murder Montezuma who was their captive and then try to murder all of them. And it was all Pedro Alvarado's fault for freaking out about eating humans.

Lex Fridman
Just a little practical joke.

Ed Barnhart
Yeah. It was just, they thought it was funny. He did not.

Lex Fridman
That's fascinating. I didn't realize. So I kind of assume that some level of cannibalism would have to do with eating the heart to gain the spirit of the person or something like this, but.

Ed Barnhart
In certain deer hunting rituals, things for sure. But the Aztecs, no, they just liked eating humans. It was part of the fear factor too. I mean, they could walk into a new town and be like, you guys could either send us a number of quetzal feathers every month or we could eat you.

Lex Fridman
So that's psychological warfare and actual warfare. It worked and that's how they spread quickly.

Ed Barnhart
And they were just about to take over the Maya when the Spanish came and messed everything up, they had the Maya surrounded and they were about to take over the whole Yucatan.

Lex Fridman
So you think without the Spanish, there would be this Aztec empire that would last for a very long time.

Ed Barnhart
I think there would've been an Aztec empire. I think they would've finished dominating everybody, but they did it through hate and everybody hated the Aztecs.

Lex Fridman
[inaudible 02:31:09].

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Ed Barnhart
So it wouldn't have lasted forever. They were not ruling justly. They were ruling by force. And that can only go on so long before revolution happens. The Inca Empire, I think that would've gone on forever. Because they were really community oriented. Once the Inca took over, no one in the Inca Empire starved, they built architecture. Everyone was safe. It was the society that could have lasted a long time.

Lex Fridman
What was the origin of the Inca Empire?

Ed Barnhart
Well, it was bloody at first. Like most of them are, but once they started taking over, what they did is they Empire built. Everybody else had just raided their neighbors to get the resources, but everybody they raided, they turned them into the Inca Empire and they created this incredible Mit'a system where you took turns working and they created the road system so they could get groups of workers back and forth. So a town of let's say 5,000 people, the Inca would roll up with an army of a hundred, 200,000 people and say, would you guys like to be part of the empire? Or would you like us to escort you to the edge of the empire? And if your mayor here agrees, then he can have a town. He can have a house in Cusco. But then the very next month, a big work crew would show up and they'd start building agricultural terraces and storage units. And every month with the agricultural excess, they would have big parties and everybody would eat. So people lived well in the Inca Empire. It was a rough beginning, but everybody who agreed to be part of it immediately had access to a whole bunch of resources and security they never had.

Lex Fridman
So they started in South America and Peru and Cusco. Cusco was the center of it.

Ed Barnhart
Cusco in their language, Quechua, it means navel or belly button, and it's up in the mountains, but there's four quarters that they called their empire Tawantinsuyu, the land of four quarters. And the center of those four quarters was Cusco.

Lex Fridman
It sprung to life in 1200 A.D.C.

Ed Barnhart
We backwards project what it was, but it was probably mid-twelve hundreds when the first Sapa Inca, the first ruler came in, but it was the, I think it's the ninth one, [inaudible 02:33:45] Pachacuti who really started being an empire builder.

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Lex Fridman
Part of that, what really defined the empire, as you said, roads, they build a massive road network.

Ed Barnhart
Roads, and in the same way that the Roman strategy of building roads and infrastructure, and then every place they took over, they'd create certain key pieces of Roman architecture that kind of made that city Roman and they'd rename it something. The Inca did the same thing. They had certain signature Inca architecture that they would build in as the administrative part. They'd send the Khipukamayuq, the guys who would weave or knot the khipus as accountants, and they would go through and say what everybody did. Okay, you're a good farmer. You're going to farm. You are a good weaver. You're going to weave. All the men here are going to take a turn at being part of the army. And then they sent independent Khipukamayuqs too. Every community had five or six that were not allowed to work with each other, and they all had to independently send their Khipus back to Cusco. And if there were accounting discrepancies that were called to Cusco to figure out who was lying about what.

Lex Fridman
So there's a super sophisticated record-keeping system.

Ed Barnhart
Yeah. And that was the Khipu and the Spanish recorded what they could and then burned them all.

Lex Fridman
But that's an interesting development for an empire because that allows you to really expand and have some kind of management, some level of control.

Ed Barnhart
They couldn't, at the end, they were at least 10 million people and there was just no way to do that without some sort of sophisticated record-keeping system.

Lex Fridman
If the Inca had to face Aztec, who wins?

Ed Barnhart
Inca.

Lex Fridman
Inca.

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Ed Barnhart
I mean, the Aztecs were psychotic, but the Inca had just reserves for miles and they had that essential hearts and minds. There was only one thing that everybody got pissed off about when they joined the Inca Empire. For some reason, everything was owned communally except the llamas. The llamas were the kings. And so that was the one thing that some of them would stay in town just to be work llamas, but you don't own your llama anymore. And people are really attached to their llamas. To this day they are like family members. So it'd be like everybody walked in and said, everybody's family dog is now mine. [inaudible 02:36:23] really upset people on an emotional level.

Lex Fridman
Well, I mean, so llamas got domesticated at some point, probably. I don't even know when, but early on.

Ed Barnhart
We have rock art that progresses to make it seem like a progression from people depicted hunting them to people depicted standing next to pregnant ones. So it was still in that archaic period at least that they became friends.

Lex Fridman
But if you roll in and you own them, that's?

Ed Barnhart
Yeah, that pissed everybody off. For some reason, the Inca owned everybody's llama instantly, and he would take anything he wanted. A lot of them would just get carted away that day, just sent to Cusco. And they'd also take their mummies. That was a weird thing. Everybody mourns, they're dead, but the Inca just ceased to accept it. They would just, the mummies were still there. Okay, he's dead, but look, he's still got clothes. He's at the party. Let's put a beer in front of him. They just kept people as mummies. And so the ancestral mummies of every town, part of being absorbed into the empire was, okay, your most important mummies are now going to have their own beautiful house in Cusco, but they would physically bring those mummies to Cusco to make now Cusco the spiritual heart of their belief system.

Lex Fridman
I mean, I could see how that would piss people off, but it's also a pretty powerful way to say, the ancestors that you idolize, that you respect are now in the capitol.

Ed Barnhart
They've been elevated. We didn't steal them. We have given them a new place of honor, and you're welcome to come visit them all the time. And they did. They have these festivals where everyone from all corners of the Inca world would come to Cusco.

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Lex Fridman
And which of the civilizations mummified people?

Ed Barnhart
The Incas for sure mummified people and even did some of that kind of Egyptian- esque taking out of organs and preparing the body. They put straw inside the cavity and mummify them, but the Maya didn't do it at all. The Maya, in fact, on purpose would flood tombs with water so that the skin would float off the skeletons faster, and then they'd get back in there. It was jungly. So I think the bugs probably had part of it too. But then they would get back in there to get the bones. They'd open it back up and take the bones out and paint them with red Cinnabar, the one that I was in, in Copan, we had evidence that they had gone in there four different times, and the last couple times they only took the skull out and repainted it and then put it back in articulated on the skeleton. But they didn't mummify. They on purpose would grossly float the bodies so they could get the skin off faster and get to the bones.

Lex Fridman
But would they keep the bones?

Ed Barnhart
Yeah, they'd keep the bones and they'd pull the bones out occasionally and do rituals to them or commune with them and then put them back in.

Lex Fridman
So there's still a deep connection to the ancestors through the physical manifestation of the ancestors then, whether mummified or bone.

Ed Barnhart
And to this day, if you do an excavation here in the United States, Native American people don't like it. They don't like their graves, which is fine enough. I wouldn't want somebody digging up my grandma either. But the Maya, they love it.

Lex Fridman
They love it.

Ed Barnhart
And every Maya person, if we find a grave, they're like, yeah, look at that. Bones, cool. Can I touch? They're not spooked about it at all. They think it's exciting. I, one time, helped out a physical anthropologist in town in Copan to get a osteology collection together of various animals. So if we got bones from an excavation, we could see what kind of animal it was based on the collection. And this family said, well, our family dog died last year and we buried him in the backyard. You could go dig him up. And so we were like, okay, yeah, I mean,

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we do need a dog. We'll go dig up your dog. And they were like, but the kids really want to help you. So their kids came out and this was like their puppy, and it died less than a year ago. When we got to it, one of them just grabbed up a bone and he was like, [inaudible 02:40:59] like little bitty bones. Yay. What a weird attitude. That's your dead dog there. But they have a different relationship with the dead.

Lex Fridman
In some sense that's a beautiful attitude, right?

Ed Barnhart
Yeah.

Lex Fridman
Why pretend like we're not mortal and this is just the process of it. And as you say it now, it kind of will be cool.

Ed Barnhart
That's what Day of the Dead is all about. And I love Day of the Dead. Halloween's this creepy thing where they're all monsters, but Day of the Dead is this beautiful time where we remember our ancestors. I convinced my kids after the movie Coco came out. Now we have an altar with all of our great-grandparents on the altar, and we talk about who they were and how they lived, and we put things on the altar that mattered in their life, and we remember them on that day and it turned something that was a weird eat too much candy and wear a monster mask thing into something beautiful where we discuss where we came from.

Lex Fridman
I have to ask about the giant stones the Inca has been able to somehow move and fit together perfectly. Do you understand? Is it understood how they were able to do that so well?

Ed Barnhart
No. The moving of it, I think that we have reasonable theories. There are ways to pivot large weights. There's a great guy named Wally Wallington, a retired contractor here in the US who built Stonehenge in his backyard in Minnesota, single-handedly showing how you can move big stones. So I think Wally's already figured out how to move them. It's the perfectly fit so carefully fit together that you couldn't even put a dime in between the stones. That's the one that I think still has people baffled. The common archeological wisdom that you'd find out of a textbook is that they just kept pecking away at it with hammer stones and setting them and resetting them until they were perfect, which has to be bullshit, that there is no way that they just were that meticulous. I mean, everybody's got a hammerstone. I personally think it's acids. I think they melted them together. And there are weird places when you really look at closely to these stones, which I've done a number of times. I'm going

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back next month to Machu Picchu and especially Cusco. I walk around in the alleys where these 500 to a thousand-year-old walls are still there. And I see things like the crystals in the andesite are almost stitched together along the seams. The andesite around it is melted and the crystals haven't. And there are other places where there are weird wipes on the wall. It's just melted. Like somebody took a rag and wiped it while it was soft. Lots of talk about soft stones turning hard too. I haven't been able to prove it. This is one of these end of my archeological career chapters. I'm either going to prove myself wrong or prove it, but I think they used acids. My dad's a chemist and he told me a long time ago that there's no way, there's no naturally occurring acids. But my current theory, actually, I got the idea initially from the show Breaking Bad. I don't know if you ever saw that show, but there's a point in which they're trying to dissolve a body and they're using hydrofluoric acid and it goes right through the ceiling. That hydrofluoric acid is so fascinating. It won't go through plastic, and you can also bring it in inert parts and then combine it. The Inca made tons of jewelry out of fluorite. Fluorite is big in the Andes, and they also mined a lot of things for gold and silver. And the byproduct of that mining is sulfuric acid. You put sulfuric acid and fluorite together and it's hydrofluoric acid, and that will burn through andesite or anything. And if you learned how to do it judiciously and you didn't care whether servants lost an arm or two, then you could actually use them to fuse these together. And I think they're fused together. I asked the city of Cusco if I could take some core samples, and they said, go away, gringo. Don't touch our walls. So actually this next time I'm going to go try to talk to the more Quechua authorities in a place called Ollantaytambo and maybe I can convince them, but right now, they just think I'm a weird-ass gringo who wants to put holes in their walls.

Lex Fridman
That's a fascinating theory. And so how could you get to the bottom of that? So getting core samples to see if there's some kind of trace.

Ed Barnhart
Chemists I'm working with say that if there was hydrofluoric acid in between these, that a core sample right along the seam, they can separate out the elements in there and detect whether there was actually elements of hydrofluoric acid. I wanted to go straight to burning rocks, but they were like, no, I mean we already know that's true. I mean, yeah, we can burn some rocks, but it would happen. And that's just chemistry. We got to prove that it would happen in the walls. So go get us samples. And that was before COVID and all sorts. You know how it is, you probably are the same guy where you've got a thousand ideas and the ones that are fruitful, you run with and the other ones you'll get back to.

Lex Fridman
That'd be fascinating if true, and I hope you do show that it's true or follow, either one.

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Ed Barnhart
I'll try to disprove it.

Lex Fridman
Disprove it. Yeah. I wonder if we discount how much amazing stuff a collection of humans can do, because it just feels like if a large number of humans are just working a little bit chipping away at stuff. At scale, they can do miraculous things. So the question is, how can a large number of humans be motivated to do a thing? When we think about Stonehenge, some very challenging architectural construction, we don't think about a large number of humans working together.

Ed Barnhart
Well, that large number of humans are motivated to work together by a small number of administrators who are dynamic and convincing in some way or another.

Lex Fridman
Right.

Ed Barnhart
One of my favorite quotes is, and I'm probably going to misquote it here, but I think it's Margaret Mead who said, never underestimate the power of small groups working together. And the truth is that those are the only people that have ever changed the world. That small dedicated groups of people are what changed the world, and they inspire big groups of people to embrace their vision.

Lex Fridman
Yeah, I think we sometimes underestimate how much humans can do across time and across scale.

Ed Barnhart
And we are way less capable than we used to be. I mean, the average human had all sorts of skills that at least I personally do not. I'm wearing a shirt, but I can't make a shirt. That's for somebody else to do.

Lex Fridman
You've also lectured, which I really enjoyed, about North America. And also helped teach me that there was a lot more complex societies going on here for a long period of time. So maybe can we start at the beginning? Who were the early humans in North America?

Ed Barnhart
Well, we go through that paleo Indian and archaic period for thousands of years. As we started this conversation, probably 30,000 years is a conservative now, humans first

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entered the Americas, but the first cultures we get here are mound-builders around the Mississippi and to the east, and then also a totally separate group in what we call the American Southwest now, the four Corners, who will develop into mostly the people we call the Pueblo people who are still there today, like Zuni and Hopi people. So we've got these two clusters. The very first major community in North America is in the most unlikely place. It's in Northern Louisiana. People think I'm crazy when I say this, but there is a pyramid in Northern Louisiana, a big one at a site called Poverty Point that is 3,500 years old. So it's the same age as the pyramids in Egypt, and it is a giant thing just poking out of the bayous of Louisiana. And people don't believe me when I say it, but it's there.

Lex Fridman
The Mound Builders, what was that society like in comparison to everything else we've been talking about in Mesoamerica [inaudible 02:50:41].

Ed Barnhart
They evolved over thousands of years. We call them Mound Builders. This is something I object to. I think we should have a better... We do. The last version of them, we call them Mississippians now. But generally speaking, we call all these guys Mound Builders, but what they built were pyramids. They look like mounds now, and they didn't build them out of stone. That's kind of our just inherent western bias. Something that's built out of stone is sophisticated, and something that's built out of dirt is rudimentary. But in their full living form, they did have cores of dirt, but then they also had kind of clay caps. So they had terraces. They had whole complexes of buildings up on top. There were kings that lived up there. There's the biggest of the Mississippian cities is called Cahokia, and it's right outside of St. Louis. And it was huge. It had a population of 20,000 people and pyramids all over the place, a huge palisade wall around it. It was absolutely gigantic, a thriving metropolis. And we in America have kind of a collective amnesia. We never hear about these massive civilizations. Cahokia was the big first city, but then it spread from the Mississippi all the way to the Atlantic. There were hundreds and hundreds of these big cities that had five to 10,000 people each.

Lex Fridman
Were they their own thing or was there some kind of thread connecting all of them.

Ed Barnhart
They had a unified religion and culture. They were, again, not an empire. So they were warring city-states. There were kind of territories that were owned by big kings, and then the cities around them were kind of the subsidiary lords and kings. And then one kingdom could either ally with a neighbor or have a fight. So they were kind of countries, I think for, yeah, we could safely say they were different countries within this patchwork that was Eastern United States. And it's so weird that we don't know this because it was clearly documented by the Spanish. I'm not talking about just archeology. We find him in

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archeology now. But Hernando de Soto landed in Florida and went for three years from, he went up into the Carolinas and over down into Alabama and Louisiana, and he's the first one to see the Mississippi up there. But for three years he went through city after city after city, unfortunately decimating them, eating all their corn, giving them diseases. But the documentation's clearly there. He met collectively, millions of people in a very sophisticated and uniform civilization.

Lex Fridman
So it's disease and stealing of resources. But was there explicit murdering going on?

Ed Barnhart
Unfortunately, yeah. He was a murderer and a psycho and a liar. He snowed them that he was some kind of deity. Actually learned a trick from the Inca who he was with Pizarro in his first run and went back to Spain, was rich, had a wife, a castle. Then he got bored and he decided to have a reign of terror on Northern America for three years. But he had people burned at the stake. He had his dogs rip them apart. He was very, very brutal. He ruled that area through fear and had absolutely no respect for anybody. He made promises and broke them all the time. He was really a brutal man.

Lex Fridman
So this whole period when Christopher Columbus came, how did that change everything?

Ed Barnhart
Well, there's a great anthropological body of literature. Anthropological body of literature. It's called the Columbian Exchange based on Columbus. But it's all this trade back and forth between the new world and the old world. And the old world got just wonderful stuff. All of a sudden their diet didn't suck. All these vegetables came in. The new world got herd animals. It got pigs and cows and goats that it didn't have, but it also got 13 infectious diseases. Europe had had wave after wave and kind of had herd immunity on a lot of things, but it didn't actually go away. It just couldn't spread like a wildfire through the community. So when they arrived to the Americas, all of a sudden these just a pile of horrible diseases hit people. I think in the first 20, 30 years, there were people who had contracted multiple deadly diseases at once and died of them. But the numbers, it's a shameful part of history, and it wasn't something that Europe perpetrated on them. Medical science at that time was still the four humors theory, that people were made of yellow bile, black bile, blood, and phlegm. And we did things like, well, you've got to bleed him. He'll feel better then. So we had no idea what an infectious disease was, but the reality was that this horde of diseases hit everyone. And the numbers are now saying in the first 50 years that 90% of everybody was dead, and that the number of people has increased as well as far as our estimates. We're thinking it's somewhere around 150 million people and 90% of them died. And with them, all their knowledge. Just, I mean, imagine the moment where who dies when things get bad? It's the young and the old. So all the knowledge keepers die suddenly. The children die. This

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next generation that's half taught and now completely demoralized thinking that this is a spiritual attack, that their gods hate them, that the only way out of it is to accept this new Christianity. But they don't want to have to bring kids into this world where everybody's dying. And even if they do, they can't teach them what the old people were going to teach them because the old people are gone and didn't finish the transmission. So in a single terrible moment in human history, the generation loses all their knowledge. So a lot of the things these people knew just blipped out.

Lex Fridman
But with that also, just the wisdom of the entire civilizations-

Ed Barnhart
So much of-

Lex Fridman
... fades away.

Ed Barnhart
... what they knew was just lost at that moment. We have the Maya who had those hieroglyphs and that we've learned a lot from that.

Lex Fridman
Yeah. But not a significant integration of that wisdom into. So it wasn't when the Europeans came, it wasn't like the cultures were integrated. It was a story of domination. Of erasure, essentially.

Ed Barnhart
In North America, there's a new term in the literature that I like. We call it the Mississippian Shatter zone. That Mississippian civilization was millions of people, but they got spread out all over the place over the next centuries. And now we have this Shatter zone where we have ruins, and the people that were actually from those ruins are somewhere else on a reservation far away. And I'm just about to talk to a Cherokee man who listened to some of the things I had to say and says, "All those Ho-Chunk things you were saying from that Ho-Chunk culture, my grandparents talk about this sort of thing too. Can I talk to you by phone and tell you about these things?" So we've got this Shatter zone where we're going to try to put the puzzle back together, especially in terms of Mississippian religion. I really think we're making headway in this generation, and it's exciting to be part of piecing this old religion and its mythology back together.

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Lex Fridman
Just as since a lot of people refer to Christopher Columbus as the person who discovered America, I read that the Vikings reached North America much earlier in 1000 C.E. And why do you think they didn't expand and colonize?

Ed Barnhart
Because they got their ass kicked.

Lex Fridman
Okay. Simple.

Ed Barnhart
It's the truth. It is absolutely true that the Vikings were here. There's a great site in Nova Scotia called L'Anse aux Meadows, which definitely has what's left of a Viking colony. It was Leif Eric and his father Eric the Red, who they got kind of kicked out of Europe because they apparently couldn't stop murdering people. And so they went to Greenland and then kind of island hopped over to Canada. But I think the culture that was in that area was named the Dorset, but they would have nothing to do with the Vikings. They attacked the Viking settlement every day and did not give them an inch until they decided it was just worthless and they left it. The Vikings attacked Ireland, and they just found a bunch of monasteries full of gold with a bunch of guys going, "We're men of God, we don't fight." And the Vikings were like, "This is great. That's great. This will be easy, then. We'll just loot all these Easter eggs." But the Native Americans in Canada were not having it. They kicked their ass. In fact, Leif Erickson's brother Thor died there. The natives killed him. He was supposed to be in charge of expanding the settlement, but they just killed him.

Lex Fridman
So a lot of the Native American cultures were also, I mean, they're sophisticated, warring cultures also.

Ed Barnhart
Yes, they fought. Especially the Mississippians. Boy, they were tough. And so were the five nations. The Mohawk, the Huron, the ones that kicked the Vikings' ass up there, they were probably Algonquin speakers. But they were connected just above the Great Lakes, but they were all very tough people.

Lex Fridman
When you think about the Spaniards and the Portuguese and the over a hundred million people that were killed, do you see that as a tragedy of history or is it just the way of history?

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Ed Barnhart
I think that the epidemics, I consider it a tragedy. That did not have to happen, and that was not a fair fight. Nobody knew what to do about it. There was just a tragic, perfect storm of events. I think that the Spanish and the Portuguese get unfairly maligned in what's been called the Black Legend, that they just marched into America and murdered everyone. That's not the fact. It was the diseases that murdered everyone. In fact, there was a really poignant story I read of a Spanish priest in the Amazon, in the Brazilian northern part of the Amazon where he made this utopian community and he was bringing people in that were getting sick, and he wrote, "I'm baptizing everyone. I have baptized 10,000 people a day, and yet God's still killing them. Why is he doing this to them? They're doing everything that I ask them to do. They are submitting to the will of God." But this guy doesn't realize that the same bowl of holy water that he's baptizing them in, he's just wiping the disease on everybody's faces. He's accelerating it when he doesn't even realize. He thinks he's saving them, but he's actually killing them. That's a tragedy. That's not just like spoils go to the victor stuff. That's just straight up tragedy.

Lex Fridman
Yeah, yeah. But that one is hard to know what to do with, like Black Death. I mean infections, they don't operate on normal human terms, right? They just go through entire populations. Back to wild ideas.

Ed Barnhart
All right, just my style.

Lex Fridman
I mean we didn't really talk about how life originated on Earth or how humans have evolved, and we did talk about that there could be just a lot of stuff in ancient history we haven't even uncovered yet. Do you think it's possible that other intelligent civilizations from outside of earth, aliens ever visited?

Ed Barnhart
You had me right until the ever visited thing. That one I'm not entirely sure about. I'm not sure whether we have any... We certainly have no archaeological proof that I would cite or contemplate as the evidence of such. But the guys that discovered DNA, Watson and Crick, Watson who actually habitually used hallucinogens to invigorate his thinking, he said that he thought that DNA on this planet was way too complex to have developed over the time period that it had at its disposal. And that his guess was that our DNA was somehow seeded from outside of our planet. And take that for what it is. But the guy who we respect on many other levels also said that. So that's interesting. But in terms of aliens visiting us, I don't know. It does smack of a kind of human hubris that we think we're important enough for some advanced species to give a shit about us. Statistically speaking, the universe is way too big. We can't be the only sentient beings. There's got to be somebody else out there.

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Whether they care about us, that's a question. I've been on Ancient Aliens a number of times. I show up and I'm an educator. I mean, refusing to be part of the conversation is an immediate fail in my book. But there was one time where they asked me at the end, "Do you have anything else do you want to say?" And I said, "Well, y'all's premise is that aliens came down a long time ago and they gave humanity these wonderful gifts of science and medicine, engineering, all these things. Today we also have a lot of stories of the aliens coming down, but now all they're doing is mutilating cows and sodomizing rednecks." Like whatever we did, we super pissed them off apparently."

Lex Fridman
The quality of the gifts has decreased rapidly. It's an interesting thought you've mentioned. What archeologically would you have to see to be like, this might be an alien?

Ed Barnhart
A technology that doesn't belong there first and foremost. I mean, if we just run with the premise that somebody was capable of making a vehicle that could get them from somewhere far away to here, that was almost certainly mechanical. Now, I love the aliens thing where biomechanical is something that certainly could be and that would disintegrate. We wouldn't see that at all, but I would expect some kind of technology that showed up out of the blue and changed things. That would be something. But I would think mechanical or a substance that's not from here.

Lex Fridman
But of course we would only see the results of that mechanical. You mean literally a mechanical thing?

Ed Barnhart
Right. Some sort of thing like that. The typical thing people say is how did they move these giant stones? But just look at that on the face for a second. Aliens come from across the universe to meet humans, and the thing they tell them is how to move rocks? Are you fucking kidding me? I mean, give them antibiotics or a combustion engine or something. They came across the universe and they showed them how to move big rocks? I mean, that doesn't make any sense. That just doesn't make any sense.

Lex Fridman
What do you think earth will look like 10,000 years from now?

Ed Barnhart
That's an interesting question. I think it will be a lot more automated or it'll be a smoldering pile. There is a possibility we could end ourselves. There's always that possibility that we've really opened Pandora's box in some regards. I did listen to one of your podcast guests with what would happen in the case of nuclear war. That was chilling. Her opinion was certainly

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we would burn everything to a crisp within minutes apparently. So we have that capacity. That's scary. That's a possible future for us. But I'm an optimist. I'd like to think that guys like you are going to make friendly robots who make my job better.

Lex Fridman
But 1,000, 10,000 years is a long time. And technology is improving and becoming more advanced rapidly, and the rate of that improvement is increasing ever more so.

Ed Barnhart
That's the part that frightens me actually. I don't know, does that frighten you?

Lex Fridman
Yes. Terrifying.

Ed Barnhart
I heard somebody say, I forget who it was. But systems of any kind, human systems, biological systems can be put on a graph that's change over time and any graph that the change is way faster than the time and the line starts going straight up, that is a system in crisis. In almost any biological system that has that fast to change over that little of time, any other thing you'd describe it as a crisis. When you apply that chart to technologies change, it's a crisis.

Lex Fridman
From that perspective, absolutely. But I also have a faith in human ingenuity that we humans like to create a really difficult situation and then come up with ways to get out of that difficult situation. And in so doing innovate and create a lot of awesome stuff and sometimes cause a lot of suffering. But on the whole, on average, make a better world. But with nuclear weapons, the bad stuff might actually lead to the death of everybody.

Ed Barnhart
I guess there's always that chance, but I am an optimist. I think you're an optimist too. I think exactly as you just said. I think that the greatest capacity of humans is our ability to innovate. And we are never more innovative than when we're under distress. I think that a lot of the developments of humans over the last thousands of years have been about we didn't change the world when we were comfortable. It was when we were in crisis. Necessity is the mother of invention. But I think we'll be all right. I think that this impending climate crisis is real and happening. I actually personally think that I'm going to answer a question that you didn't even ask me. I think we're wasting our time thinking that we can reverse this. We're delusional. I'm all for electric cars and being good stewards of the environment, but we are wasting our time not technologically adapting to what's about to happen. We're spending too much time pretending, the average American thinks if we all just drive electric cars, we'll be okay. That's bullshit. That's not going to happen. We need to start making

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technologies that desalinize water, a host of things that we need to use our technological capacity to accept it and adapt, instead of Pollyanna thinking we can make it go away.

Lex Fridman
Yeah, kind of accept that the world will change and a lot of big problems will arise and just develop technology that addresses them.

Ed Barnhart
I think you have some guys that have their finger on the pulse there. We need to start thinking about how we're going to survive this, not that we're going to make it go away.

Lex Fridman
And not just survive, thrive. Again, we're pretty innovative in that regard. But if some catastrophic thing happens or we just leave this planet, what do you think would be found by aforementioned alien civilizations when they visit? The anthropologists, the grad student anthropologists that visit Earth and study, how much of what we know, have, and love and think of as human civilization will be lost do you think?

Ed Barnhart
Well, time moves on and things that are perishable perish. So you didn't put a time element in there, but I would say that everything that can perish will, and whoever shows up here will be stuck with only the things that didn't perish. So we'll have buildings, plaques, but they won't have any books. They won't have any billboards. They'll have the incomplete record I have. I one time did a talk in Sioux Falls and I said I drove in here and there was a big obelisk in front of the town. And everywhere I go, I see the names Lewis and Clark. And a thousand years from now, if I was an archeologist investigating this place, I would think that it was founded by the Egyptians and their kings were named Lewis and Clark. But the truth is, you know Lewis and Clark stayed one night here, but it's just a big deal. So I would be so wrong about what I thought about your town based on what preserved.

Lex Fridman
It's so beautiful as a thought experiment. What would archeologists be really wrong about? And what would they could possibly be right about?

Ed Barnhart
Washington D.C. was clearly made by a combination of the Egyptians and the Greeks and the Romans because that's what all the architecture is.

Lex Fridman
Yeah. And would they be able to reconstruct the important empires, the powerful empires, and the warring empires?

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Ed Barnhart
For that matter, have me and my colleagues done that at all? I am almost certain that the Maya would just gut laugh at what I think I know what they were.

Lex Fridman
I wonder, do you ever think about what we just as a human civilization are wrong about the most? Like mainstream archaeology. Just like a suspicion. What could we get completely wrong? Well, one way to get something wrong is totally lost civilization. An obviously gigantic civilization that was there along with the Maya or something like this in the 10,000 years ago.

Ed Barnhart
There's certainly that. There could be things that were either wiped away or still hiding under the oceans that would completely change the way we think about things.

Lex Fridman
And everybody knew they existed and everybody interacted with them. It was [inaudible 03:15:31].

Ed Barnhart
I think it's our estimation of their motivations that were probably most wrong on. My teacher Sheila a long time ago said, I've come up with all sorts of theories. I was always thinking about stuff. And she looked at me and she said, "If you don't stop thinking like a western European and start trying to put yourself in the mindset of these people, you will never understand any of it." Which I've always taken to heart. I mean, I really do. When I approach these things, I try to step out of my cultural assumptions, try to think like they would think as the best I could. And it's very different. This whole, the Maya are cyclical, the whole sacrifice, we're so obsessed with that. But that wasn't an austere actual sacrifice on their part. They weren't just, "Hey, let's all get together and kill that guy that's pissing us off." I mean, they were giving the best of them. It was a different mentality. This was not brutal. This was a bonafide sacrifice on their part, a loss.

Lex Fridman
Plus the whole mystery of the puppy that eventually starts having sex with [inaudible 03:16:44].

Ed Barnhart
I'm going to unweave that one of these days.

Lex Fridman
One of these days. Now that puppy appeared on Pottery?

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Ed Barnhart
All over Pottery. He's everywhere. I got to write this book. This next year is the year I'm going to write my Fang deity book and I will have a whole chapter dedicated to the puppy.

Lex Fridman
The mystery solved. I mean, it could just be the birth of memes of humor. I don't know. I mean, again, humor. You don't know what the nature of their humor, of what their jokes are.

Ed Barnhart
Oh, that's a neat one too. And that's so human. I'll tell you a little side story here, that when I worked with the Maya people in Palenque, I spent three years making this map of the city and hiking through the jungle every day. And they would talk to each other in their own language. [Celtal 03:17:34] was the group I was working with. But I noticed after a while they were big jokers. They loved to make jokes and they would laugh at jokes, but then they would also, one of them would say something and the other ones would go, hoo hoo. And I eventually asked, "What is that? Why do you guys always make that hoo hoo noise?" And he said, "That's because..." He made a really smart pun. It was like he said three different things at once. It was a turn of phrase that was smart. And they didn't make laughs at that. They had a noise for when somebody said something just super clever. So there's also that just clever turn of speech.

Lex Fridman
Yeah. Wit.

Ed Barnhart
And I think about that when I'm a hieroglyphic translator. Here's a beautiful thing that's going to be like a poem or a political statement, and I'm just ploddingly looking in a dictionary of what that word means. There's probably double, triple entendres all through this text. And the real meaning is the subtext. And I'm thinking they're talking about corn and they're talking about the nature of life.

Lex Fridman
It could be satire, it could be as it was in the Soviet Union when there's a dictator, maybe there's an overpowering king. You're not allowed to actually speak. You have to hide the thing you're actually trying to say in the subtext, in all of that.

Ed Barnhart
There was a funny Maya ceramic that had, the ceramics are neat, because the monuments can be kind of broken records. I'm the king, I was born this time, I beat these people up. I married this woman, I died. But the ceramics will tell us things out of mythology stories. And there was this one with a rabbit looking at the merchant God. And nobody could translate the text. And finally this eastern European, actually a Ukrainian guy translated it and the

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rabbit's saying to the merchant God, "Bend over and smell my ass." And like, oh man, we were expecting this wonderful piece of mythology. But no, it translates bend over and smell my ass. That's great. That's human.

Lex Fridman
As we mentioned previously, human nature does not change. You mentioned Palenque and mapping it. Just out of curiosity, what is that process like? It seems fascinating.

Ed Barnhart
Oh, it was a great adventure. I loved it, but it was difficult. I woke up every morning thinking I will be hurt today somehow. I don't know how. I don't know badly, where on my body it will occur, but it's going to happen. It was the jungle.

Lex Fridman
So in the jungle, what's the process like? What do you have to do to map it?

Ed Barnhart
Well, it was tricky too because it was also a national forest. So the forestry department didn't want us to cut down anything more than we had to. So we basically just cut tunnels through the foliage and we'd map everything twice. The first thing we'd do is I'd go in, find a building, draw it on a piece of graph paper. And I'd say, "You guys go north. You guys go east, west. Find other buildings. And when you find them, pace back to this one." And so I'd start making a map and I'd make the whole... One piece of graph paper was enough to. Then we'd bring the machine in, we'd bring the laser theodolite and get really accurate information. But on that piece of paper, I would write, "Don't bring the machine this way. There's a tree fall." Or, "Stand on top of this building and you'll see four different buildings at once from this one."

Lex Fridman
And all of this is in dense jungle?

Ed Barnhart
Right. And the deeper we got off the road, the deeper it was. Sometimes it would clear out, but certain places, if it was low, it would be such thick vegetation and it would grow back so fast. Sometimes we would cut just tunnels through tall grass and we'd come back five days later and they were gone. We couldn't even find where our trails were. They would grow back that fast.

Lex Fridman
But you see the building, so you could see?

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Ed Barnhart
Right. And that was the fun part. I mean, sometimes it would just be a little neighborhood with little low buildings no bigger than this table, but sometimes just five more meters in and I'm standing under a pyramid that nobody had ever mapped. Like, wow, I've just found another one. And some days on good days, we'd find three pyramids. And I felt that's such a more exciting job than the typical excavation, say. All my buddies were all just in a hole for the whole week in the middle of the city. And where I'm dancing around through the jungle, I could find 10 buildings today. I might find a pyramid today. Who knows?

Lex Fridman
What's that feel like to find a pyramid or buildings that you are one of the only humans that are not from that civilization to ever see this thing? What's that feel like?

Ed Barnhart
It's great. I love that feeling. I am an explorer at heart, so finding something like that, when I was 25 years old, I found a whole Maya city. Got to name it, its name is Ma'ax Na. It's off in the Belizean jungle. And that was just outrageous. I mean, it almost... That one almost depressed me. I had this great life ambition that I would find a lost city. And then I did it at 25 and I was like, God, now what do I do? I thought that was supposed to take me my whole life. I actually, I wrote a bunch of letters to NASA trying to get them to let me be the first archaeologist on Mars. I never got a single reply back. I'm sure I'm on NASA's list as some weirdo.

Lex Fridman
How'd you find a Mayan city?

Ed Barnhart
I used a topography map of the area and I played the game. If I was a Maya, where would my favorite place to live in this big area be? I looked for the biggest mountain because they call all of their pyramids tune wheat stone mountains. I knew they loved mountains. And when I found that mountain, there were two others right next to it that made a triangle and they love those triads, and there were rivers in between them. And I thought, that's it. That's where I would build the city. And I hiked out there over two seasons with students. The other grad students were like, "He's just having his students just wander in the jungle all day." But I came back with a city.

Lex Fridman
So given that you've looked into the deep past of humanity, what gives you hope about our future, maybe our deep future of this human civilization?

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Ed Barnhart
That's a good one, and I do have hope. I do have hope. I believe in the spirit of humankind. I as a person who have studied history, I kind of feel like history does kind of a sine wave. There's highs and there's lows, but no matter how low we go, we get up again and we climb. And I think that humanity will continue that. We will rise to the challenges. Now, some of the challenges may be created by ourselves as well, but we will adapt and overcome. That's what we do.

Lex Fridman
Yeah, humans find a way, right? That's the thing you see with history. Even when the empires collapse, the humans that come out of that, they pick themselves up and find another way. They build anew.

Ed Barnhart
And the people I study believe in the cyclical nature of life. That you really can't, life can't continue without death being part of the cycle. We get our lows, we get our highs, but the cycle continues forever.

Lex Fridman
I should mention that you have a lot of great lectures on the great courses, but you have also an amazing podcast, ArchaeoEd. If people want to listen to it, this is a tough question, but what would you recommend? What episodes should they listen to? What's the answer?

Ed Barnhart
Oh, that is a tough question.

Lex Fridman
What is the sampling? It's like asking a chef what's the best stuff on the menu?

Ed Barnhart
Well, different strokes for different folks. I do two different things on that podcast. Sometimes I just teach about cultures that you've never heard about. I love... I start off by saying, "It's my podcast and I'll talk about whatever the heck I want to talk about." Sometimes I talk about really specific things like a tool type or an animal type, but my favorite ones have become when I just tell my stories of my adventures. I've got a lot of weird adventure stories and it's been fun and they've been very well received. I can put my humor in there and I can talk about the things that went right, the things that went wrong. The adventures that I had are all part of this ArchaeoEd thing. ArchaeoEd's kind of a double entendre. It's me, I'm just Ed. But it's also education. What I'm really trying to do with this too, it's specifically the Americas. I want to be part of the reawakening that there were these great civilizations here, especially North America. I think that we have a group amnesia that there was no great civilizations here before Europe showed up. That's simply

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not true. I think it should be part of our history books. In fact, I have a program called Before the Americas that would introduce as part of American history, the part before European contact. And I think that kids in the K through 12 level should grow up not being told this fallacy that no one was here before we showed up in 1492. And one of these days I'm going to find a funder to help us put together Before the Americas and we're going to make it part of the curriculum for every kid in the U.S. to know the full history of this country.

Lex Fridman
That's a great project. Thank you so much. Thank you for talking today. Thank you for all the fascinating ideas that you put out into the world, and I can't wait to hear your new course.

Ed Barnhart
Thank you so much, Lex. It was a real pleasure.

Lex Fridman
Thanks for listening to this conversation with Ed Barnhart. To support this podcast, please check out our sponsors in the description. And now let me leave you some words from Joseph Campbell. "Life is but a mask worn on the face of death, and is death then but another mask? How many can say, asks the Aztec poet, that there is or is not a truth beyond?" Thank you for listening and hope to see you next time.

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