

## **1491: The Untold Story of the Americas Before Columbus**

### **EPISODE 104 – ARCHITECTURE AND URBAN DESIGN**

#### **Opening Title Sequence - Narrator - 00:13**

We are the First Peoples of the Americas. We have been here from the beginning. Our ancestors navigated by the wind and stars, crossing vast oceans and mountain ranges, searching for new lands. Over thousands of years, our ancestors became astronomers and architects, philosophers and scientists, artists and inventors. We created distinct societies and built vast trade systems that covered two continents. In 1492, our world was changed forever, but we did not disappear. Today, the languages and teachings of our ancestors remain, and these are the untold stories of the Americas, before Columbus.

#### **Pueblo Houses - Narrator – 01:41**

The architectural styles of our ancestors reflected the diverse, natural environments of the Americas and the social and cultural needs of each nation. Ice houses in the Arctic... adobe apartment buildings in the Southwest... and hide tipis on the plains... ...our unique designs that have endured for thousands of years.

Our architectural accomplishments are not limited to houses. Throughout the Americas, large cities featured temples, central plazas, markets, and ball courts. Over the millennia, indigenous architecture adapted to changes in the environment, innovations in technology, and a growing population.

Indigenous people have lived in southwestern North America for more than 12,000 years. Early Pueblo people lived in underground pit houses constructed from wood and mud. With the natural insulation of the earth, these houses were cool in the summer and warm in the winter. Around 2,000 years ago, the ancestral Pueblo began to cultivate maize, beans, and squash. Farming led to a more settled way of life, and, eventually, to the growth of villages and towns.

#### **Dr. Greg Cajete - 03:15**

Here in the Southwest, this tradition, if you will, of communal building was very well developed. So that community sense, that community spirit, certainly was the essential way you survived. It was through the community and through participation in community work.

#### **Narrator – 04:17**

Architecture changed dramatically as the Pueblo people began to construct rectangular attached family houses above ground. 1,200 years ago, multistoried apartment buildings began appearing across the Southwest. These adobe structures were built under rock overhangs, and on mesas, and were home to hundreds, and even thousands, of people. Pueblo cities, like those at Mesa Verde, in Colorado, and Chaco Canyon in New Mexico, were among the largest ancient cities in North America.

#### **Dr. Greg Cajete – 05:01**

You see the height of the building, of the apartment structures especially, really beginning during the times, I think, of the large cities in Mesa Verde and Chaco Canyon. Those are definitely structures that required an understanding of geometry, an understanding of practical engineering skills, figuring things out in terms of, you know, load-bearing walls, how you can actually place one structure on top of another structure without it caving in.

Those are technical feats which have some central architects, you know, that are guiding the way the structure should be built. But the knowledge of how to do that is actually held collectively, because everyone participated, you see, in building these structures. The individual is, like, one strand of a much larger web of relationship.

And so that community sense, that community spirit, certainly was responsible for, uh, what would be today called the "magnificent" feats of architecture and planning.

**Narrator – 07:18**

For about 400 years, these large urban centres thrived. But change was in store for the people living in these cities.

**Dr. Greg Cajete - 07:36**

We know that there was climate change, you know, that affected and impacted the people, issues like a major drought in the 1200s that catalyzed a lot of movement of communities out of those large structures. Again, water being the central factor here in the Southwest, you know. You have to move to where the water sources are.

**Narrator – 08:04**

A 50-year drought in the Southwest that started about 900 years ago inevitably led to crop failures. The people of Mesa Verde and the Chaco Canyon faced famine, lack of water, and, most likely, social upheaval. They had no alternative but to abandon their cities and search for new places to live. Some people moved south and established new towns along rivers like the Rio Grande. Others joined smaller Pueblo communities in different parts of the Southwest. With new people moving into these towns, the demand for housing increased. Migration out of the major cities did not mean that Pueblo society disappeared, it simply changed.

**Dr. Greg Cajete - 08:50**

Pueblo communities today are really coalitions of large family lineages that have come together, you know, to form that pueblo, and that goes all the way back to ancestral times, you know, in the sense that it's really the extended family, which then forms into what is called a clan, and then the clans come together to, almost through a confederation, create a particular pueblo.

**Dr. Greg Cajete – 09:55**

The people who built Chaco Canyon and Mesa Verde were the same people that you see today among the Pueblo people. This was not a... this was not a dispossession of one group of people over another. Realizing that it was time to set afoot on a new journey.

**Inka Road System - Narrator – 11:20**

People were able to come together in a variety of different kinds of communal ways to do community work. The physical building of community was an integral part of indigenous life. Multi-storey apartment building and towering pyramids were not the only architectural accomplishments of Indigenous Peoples. About a thousand years ago, a vast road system connected millions of people in South America. Originally constructed by the Wari society, this ancient highway was expanded by the Inka.

**Dr. Ruben Mendoza - 11:43**

It is the roads of the ancient Peruvians, of those who came before the Inka, who began building road segments that extended, you know, the ability for communities to send troops, trade, engage in ritual and ceremonial activities. All along the Andes, you had these systems that the Inka built upon. One of the things about the Inka Empire, and it truly was an empire. They extended these throughout the span of the Andes.

**Narrator – 12:15**

The Inka designed their highway system to connect the people living in the four regions of their empire. The 40,000-kilometre Great Inka Road connected hundreds of cities and villages through a wide range of ecosystems and terrains.

**Dr. Ruben Mendoza – 12:32**

These roads extend all the way from Ecuador all the way down into Argentina. Their empire extended in length some 2,000 miles from north to south.

**Narrator – 12:43**

The Inka Road was essential for the transportation of goods and information as well as the movement of armies.

**Dr. Ruben Mendoza – 12:52**

What the Inka had devised was a system whereby they could supply armies or communities from a distance. In order to maintain their over 24,000 miles of roads, they used pre-existing road systems, and then they taxed people to maintain their portion of the road system. This grew in tandem with conquest and population growth. Everybody was involved in the maintenance and construction of these road systems.

**Narrator – 13:24**

The engineers who designed the Inka Road were faced with a range of natural obstacles, including steep mountains, rivers, deserts, and wide gorges.

**Dr. Ruben Mendoza – 13:36**

We're looking at a region that is highly mountainous, very fractured, part of what we call the Neovolcanic Axis. How, then, do you connect road segments when you have, you know, chasms and gorges and? Well, they built suspension bridges, and these, too, are marvels for their day. These ultimately became the models for the kinds of suspension bridges we here use today in modern society. They were able to span entire gorges, build durable rope bridges, sometimes extending all the way to the top of mountains in the region, some 16,000 feet in elevation.

They could run a road right through the desert with shifting sands, and they did this by virtue of building low walls on each side that allowed for those to bank away the sand and allow the road to remain clear. This is a massive system.

**Narrator – 14:28**

Besides being an impressive feat of engineering, the Great Inka Road served the political, social, and economic needs of the Inka rulers. This vast highway system was instrumental in creating one of the largest empires in the world before 1491.

**Caral – Narrator – 15:21**

Long before the Inka Empire rose to power in South America, the people of the Norte Chico region in northern Peru designed and built one of the earliest-known urban centres in the Americas. Carbon dating has confirmed that buildings in the region, including those in the city of Caral, are at least 5,500 years old.

**Dr. Ruth Shady - 15:45**

All of Peru and all of America was inhabited, but it's in the area of North-Central Peru where this form of civilization develops early.

**Narrator – 16:01**

The city of Caral was the most prominent of the 20 or more cities in the Norte Chico region. It featured pyramids, sunken circular plazas, platform mounds, and residential neighbourhoods.

**Dr. Ruth Shady – 16:24**

Because we have 150 radiocarbon dates that support antiquity comparable with civilizations of the Old World. We have identified in the Supe Valley, along a 50-kilometer stretch, twenty-five central towns.

**Narrator – 16:46**

The buildings in the region were built on a foundation of quarried stone and river rock, transported in reed bags to the construction sites.

**Dr. Ruth Shady – 16:57**

You can tell that there were authorities that organized the activities of the people that lived in these centres. Even in the smallest centres you can find public buildings and a sunken circular plaza. This holds great significance to the social structure of this civilization.

**Narrator – 17:19**

The Norte Chico region is prone to earthquakes, and the engineers of the day designed buildings that could withstand seismic activity.

**Dr. Ruth Shady - 17:29**

The pyramids are built with seismic-resistant technologies.

**Narrator – 17:34**

Innovative design techniques were used to prevent buildings and walls from collapsing during an earthquake. A grass called shicra was woven into a mesh bag and filled with stones and used to

form the retaining walls and foundations of buildings. The construction of short wall sections prevented major damage during an earthquake.

**Dr. Ruth Shady – 17:55**

By using these principles it is said to be earthquake-proof.

**Snow Houses - Narrator – 18:01**

The accomplishments of this ancient society that existed more than 5,000 years ago reflects a society that had superior engineering skills, and advanced social and cultural structure, and a strong sense of community pride.

In the high Arctic region of North America, Indigenous People had to adapt to the extreme weather conditions that existed most of the year. Hide tents were used for summer homes, and in the winter, whale bones, sod, hides, and snow were the building materials commonly used for housing.

**Michael Kusugak – 18:43**

The engineering, you know, that goes into an igloo, it's built in a dome shape, of course, but that's not the most amazing thing. The entrance way down low traps heat inside the igloo. Because heat rises, you sleep about halfway up the dome, and that's the, you know, one of the warmest places.

**Narrator – 19:05**

Snow houses, or igloos, were used for both hunting expeditions and as semi-permanent winter homes. Sleeping areas and storage spaces were placed near the wall, and the central area was a communal space for cooking and daytime activities.

**Michael Kusugak – 19:22**

When you build an igloo, you test the snow to make sure it's even all the way down because where the layers are, the blocks will break. Usually, you find a place with snow on a slant. You start at the top of the slope and trim your blocks, like, into a wedge shape. You trim your blocks so that it goes up in a spiral, until you get to the top, and you lean them in, you know, so you make a nice dome. You stick the last piece up through the hole, and you trim it so that it fits right in the hole, and you just let it drop. And then you're done. If you build your igloo that way, it will not fall down. You can actually climb up on top, and it won't fall down. It would be nice, you know, if somebody could find the original igloo, but of course, you know, snow melts every spring.

**Narrator – 20:26**

The extreme weather conditions and scarcity of building materials in the Arctic region led the Inuit People and their ancestors to develop innovative housing designs that were used for thousands of years.

**Tenochtitlan - Narrator – 21:02**

600 years ago, the Aztec civilization was at the peak of its dominance in Central Mexico. Founded in 1345, Tenochtitlan was the capital city of the Aztec world, and home to close to 200,000 people. It was not only the political and spiritual centre of the Aztec Empire; it was one of the most impressive technical achievements in the world.

**Dr. Gerardo Gutiérrez - 20:30**

So we have to go back to this geography of Central Mexico, 4,000 metres or 5,000 metres in elevation. In between all these volcanic ranges, a gigantic lake collecting all the water melting from the glaciers of these volcanic edifices, and this lake doesn't have an outlet. So basically, this lake is going to be growing and growing and growing and growing because there is no river that is going to empty this lake. One of the big achievements of the Aztecs is going to be the modification of tiny silt islands into a gigantic artificial island of 13 square kilometres and an unknown volume of cubic metres of dirt that had to be brought from the shores of the lake artificially to create that massive island.

**Narrator - 22:35**

At the centre of this man-made island was the sacred precinct of the Aztecs.

**Dr. Gerardo Gutiérrez – 22:43**

There is a big plaza. The palace of Moctezuma is on one side. The palace of the father of Moctezuma is on the other side, and then you see the main temple and the sacred precinct. The entire cathedral of Mexico City would fit inside the volume of the main temple, and that's only one structure in the sacred precinct of the Aztecs. We know that this area had more than 80 specialized temples. So from this centre, you are going to have four causeways. One is going to be the Itzapalapa one to the south. The other one is going to be the Tacuba Street that is going to connect to the western shore of the lake, and then there's going to be another causeway to the north that is going to connect the centre of that part with the twin city of Tenochtitlan, and that's Tlatelolco. We don't have to pay attention to the pyramids. The pyramids were small elements. It's the volume of building an artificial city in an island.

**Narrator -23:54**

Outside of the sacred precinct was a vibrant city where residents traded and bartered in a large central marketplace for flowers, fabric, jade, spices, chocolate, and everyday goods. Along the side streets were workshops, where artisans specialized in metal, jade, and fabrics... but constructing an island from scratch and designing and building a city on top of it was only the beginning. There had to be infrastructure built to grow food for Tenochtitlan's large population.

**Dr. Gerardo Gutiérrez – 24:31**

And they began to play with the levels of the lake. They had to create a system of dykes to basically regulate the flow of water in the lake, prevent the brackish water to enter the area, and also delay the movement of the fresh water that is coming down from the rivers in the mountains, so that the dykes basically change the ecology of the lake completely.

**Narrator – 25:02**

These dykes, levees, and causeways divided the waters around Tenochtitlan into large freshwater ponds, some of which were used for fish farms. Along the shallow lake beds, crops were grown in manmade fields called chinampas.

**Dr. Gerardo Gutiérrez – 25:22**

But even if you are not cultivating for producing food, you are cultivating to create this magnificent gardens, beautiful gardens.

Then, when we have that context, we have to go back to the first Europeans arriving to this and climbing these paths between the volcanoes, and then, at one point, when they are at this high point, for the first time, they look at the lake. They see these cities around the lake, and in the middle of the lake, one gigantic island, an island that is artificial. We need to be very firm in this. That island is not natural. That island is completely manmade It's the product of the Aztec Empire. Seeing the architectural deeds of the Aztecs, they said, "This is another Venice." Tenochtitlan, basically, that was the comparison. It's like, "this is another Venice."

#### **Narrator – 26:24**

Tenochtitlan was not only the ceremonial, economic, and political heart of the Aztec Empire, it was among the most impressive engineering feats in the world.

#### **Dr. Gerardo Gutiérrez - 26:35**

The Inkas had a larger empire than the Aztecs. The Aztecs had a more dynamic demographic empire, and Tenochtitlan became the largest city, Indigenous city, ever created by the Indigenous people.

#### **Big Houses - Narrator – 27:34**

In Northwest North America, the abundance of red cedar made it a natural choice for a building material. The trunks of these massive trees were used to build structures called "big houses" that were used for both residences and community ceremonies. The diverse Nations of the Northwest Coast lived in villages that consisted of several big houses. Some of the larger communities were made up of 30 or more houses and had populations of more than a thousand people. Building a Big House involved weeks of preparation, with several families working together to construct the house.

#### **Andy Everson - 28:16**

Different clans, different families would help each other out, and through kind of ancient engineering, they were able to move these and be able to maneuver them into place. It took a village, really, to be able to move the pieces for the house post. Pre-contact era, some of those house posts would have been, you know, 500, a thousand years old... very ancient cedars. Even more so, the beams that go across from house post to house post were huge.

#### **Narrator – 28:52**

Several related families shared a Big House. Each family had its own cooking fire and sleeping area.

#### **Andy Everson - 29:01**

The bedrooms were often made out of planks or mats, and each section of the Big House, there'd be a number of different fire pits. We'd open up smoke holes in the roof for the smoke to escape, but when we wanted to hold a winter ceremonial, we'd clear out all of the bedrooms out of the Big House, and we would light one central fire, and for us, when we light a fire in our ceremonies, it's a way to connect to our ancestors. It's like a conduit right to the spirit world, through the smoke that rises up through the smoke hole. So we light one fire in the Big House and invite other tribes to come inside of that Big House and to witness our dances and listen to the songs that belong to that family or clan.

Inside of a Big House, in our territory, we usually have four house posts, and all four of those house posts are carved, and they relate generally to the origin story of the family that lives in that Big House, and that's the purpose of our house posts, is to remind us of where we come from. When you'd wake up in the morning, you'd look up at your house post and realize that, you know, where you come from, and where you come from means so much to us. It's literally the structure you're living in. If you can imagine being able to look at your origin and realize that your whole ancestry is holding up your house.

**Narrator – 30:35**

The cedar beams and posts that form the frames of the Big Houses were permanent, but the wall planks could be removed and transported to summer village sites.

**Andy Everson – 30:47**

For our people, planks were very important possessions. There is methods in order to take planks off of living trees and still have the tree survive, so today, you can find culturally-modified trees that have had planks removed in even pre-contact time.

**Tiwanaku Narrator – 31:05**

The temperate climate and abundance of food in the Pacific Northwest led to the establishment of many permanent village sites. As a result, the Big House was the primary housing structure in the region for thousands of years. Today, Big Houses are still used for potlatches and other ceremonies by Indigenous communities throughout the Pacific Northwest.

Between 900 and 1700 years ago, Tiwanaku was the dominant society in a region that included parts of Bolivia, Peru, and Chile. Its far-reaching influence is thought to have been based on religion, trade, and culture. Tiwanaku, the empire's main city, was built on the southern shores of Lake Titicaca. The seven-tiered pyramid, called "Akapana", dominated the city's skyline. The city also featured impressive works of monolithic art. Tiwanaku featured running water, sewers, and painted walls. The buildings were made from massive red sandstone blocks, that originated in a quarry 10 kilometres away. One theory is that the stones were transported on reed boats across Lake Titicaca.

**Dr. Ruben Mendoza - 32:50**

You have this massive lake system, Lake Titicaca, and this was a system that was an incredible resource for the populations of that region, and through time, the populations grew.

**Narrator – 33:04**

As Tiwanaku expanded, so did its influence. The city centre was organized to the cardinal points. Its temples, palaces, observatories, and pyramids had both religious and astrological functions.

**Dr. Ruben Mendoza – 33:21**

It was a place where people were prompted, and I believe, by virtue of the ancestors, that spread its influence and set the basis for the principal cult of the Andes, where mountains were sacred, and sacrifice was key.



**Narrator – 33:41**

Among the most imposing structures in the city, is a solid 10-tonne block of andesite. called "The Gate of the Sun."

**Dr. Ruben Mendoza – 33:51**

These massive gates, the tenant heads, the moats around the city, the waterborne causeways, the various structures like the Kalasasaya, all of these were structures that clearly are devoted to ceremonial edification of the elites, so the elites in this ancient city clearly stood apart from the commoners in the city.

**Narrator – 34:17**

About 1,000 years ago, Tiwanaku had evolved into a large urban centre, with a regional population in the hundreds of thousands. At the same time, further to the north in Peru, the Wari civilization was expanding its power base through military conquest.

**Dr. Ruben Mendoza – 34:39**

And Wari, as it grew, was a juggernaut. It engaged in conquest and conflict interaction, and we have a lot of evidence for it in the archaeology of the Andean region and along the coastal margins where they dominated. So you have these two juggernauts of civilization, both of them expanding into imperial status. They were no longer kingdoms. In order to assert themselves and to build their places of prominence and their sacred civic enclosures, they began carving massive blocks of stone, like the Gateway of the Sun, with what some have identified as the Staff God, or Viracocha to others, this deity that kind of was an overlord, a creator being.

**Tipi - Narrator – 35:27**

While there is no evidence the Wari ever conquered Tiwanaku, they were the two major civilizations of their time.

The Indigenous large-game hunters of North America faced one significant challenge above all others. Elk, buffalo, and caribou migrate constantly in search of food. To survive, hunters and their families had to follow the migration of these animals, sometimes hundreds of kilometres every year, across the central plains or the subarctic regions. This nomadic lifestyle created a dilemma, if housing was permanent, it couldn't be packed up and taken with them each time the herds moved on, but if it was too lightweight, it wouldn't protect them from the cold winters on the plains. The solution was the tipi.

**Corey Linklater - 37:02**

The word "tipi" would be considered a southern word. That's from the Lakota language, which is a "tipi," which means "a gathering place for people."

**Narrator – 37:14**

The tipi is a conical structure made up of multiple poles covered by animal hide or birch bark. These portable houses were relatively easy to put up, take down, and transport from one encampment to the next. The earliest forms of tipis were made from tree bark with wood frames.

### **Corey Linklater - 37:40**

The tipi would have been more like a sweat lodge in its very ancient origins, which could be as far back as 10,000 years ago, so it would have been a small bent wood frame, and it wouldn't have had a fire in it traditionally. They would have used rocks to heat it and done the cooking outside. That would have been mostly bark covering, and those benders would have been willow, black spruce, possibly younger lodgepole pine as well.

### **Narrator – 38:18**

Over time, the Ojibwe, Cree, and other woodland peoples moved into the plains, where bark was scarce. Eventually, the bark was replaced with the more accessible and durable hides of larger game. The shape of the tipi was also altered to accommodate the central fire within the structure.

### **Corey Linklater – 38:44**

As time went on, and as people expanded and trade routes opened up some more, following the buffalo was also probably the most important development of the tipi, because you would have had to have been able to move camp very quickly throughout the summer months, and so it would have made economical sense to have something that you could take down very quickly and set up very quickly following the buffalo along their routes. In the Great Plains area, everything east of the Rockies, tipis were always faced the door to the East because of the prevailing winds, as well as also the first light of the sun that would make you warm.

### **Narrator – 39:28**

In historic times, the tipi was the primary possession of the woman... and it was almost exclusively the women's responsibility to pack up the tipi and properly put it together for transportation. Women were primarily the manufacturers of the hide and the builders of the tipis.

### **Corey Linklater – 39:53**

There's no definitive evidence for dating. There are many remains. There's Bighorn Medicine Wheels, which are the most famous of them, and they show that there was very large tipis, if that's, in fact, what they were for. There're other suggestions that these were not tipis like we know them for living, but they were tipis for astronomical observation, and so they would set up the rocks around the tipis in a very particular manner. There's also evidences in Alberta, Saskatchewan, Montana, of many large encampments, the evidences being the rocks that were used to stabilize the tipi poles. I think as far back as between 4,500 to 5,000 years ago.

### **Narrator – 40:43**

Despite being portable and lightweight, the tipi could withstand inclement weather and constant handling through set-up and tear-down.

### **Corey Linklater – 40:54**

It is a very remarkable structure. First of all, as a circle goes, that is always one of the strongest structures there is to build with. This is shown time and again throughout the world with other similar structures that are using the circle as well. So in the case of storms, in the case of any sort of inclement environment or weather, the circle is the strongest. As far as tipi goes in architecture, its portability is remarkable. It's incredible to see how fast a home is made with a few poles and a cover. I mean, a lot of people say, "Well, it's just a tent," and it's not just a tent. This is possibly

technology that is thousands and thousands of years old, and it hasn't been advanced on. It doesn't need to be. It's perfect the way it is.

### **Narrator – 42:02**

Ancient architecture is a window into the cultural worlds that existed in the Americas before 1491. From the tundra of the High Arctic, to the slopes of the Andean Mountains, to the jungles of Central America, Indigenous People created unique housing from ice, wood, stone, Adobe, and hides. The villages and cities they designed and built were powerful expressions of the innovative spirit of our ancestors.

### **Credits**

#### **Dr. Joe Watkins – 43:33**

My name is Joe Watkins. I'm a member of the Choctaw Nation of Oklahoma. The Choctaws, originally, were moved into Oklahoma in the 1830s, from Alabama and Mississippi, a trek of about 700 to 800 miles in what was the original Trail of Tears. Growing up, I wanted to be a paleontologist, you know, dig up dinosaurs, go to China and dig up dinosaur egg nests. That's what I wanted to do. But I was walking with my grandmother on the family homestead and found a projectile point. It was about 6,000 years old. I showed it to my grandmother. She didn't speak English, but she let it be known through my cousin, who translated, that... that was not part of the unwritten history of the Choctaw. She knew that people lived there before the Choctaw were actually moved into Oklahoma, but she thought it was very important that we not let that unwritten history get lost. So, when I was about 17 or 18, I understood what archaeology was and what that meant, and from that point on, I felt it was my duty not to let that unwritten history get lost.

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