

John Henderson—Professor in the Department of Anthropology

A professor in the Department of Anthropology at Cornell University, John Henderson's work revolves around early complex societies, particularly in Mesoamerica. Through this interview, Henderson explores the Mayans and Mexica's ability to predict eclipses; defines what 'archaeoastronomy' and 'ethnoastronomy' mean; the relationship between the Mound building with the Hopewell and astronomy, and more.

Interviewee: John Henderson (JS)

Interviewers: Emily Shaver (ES), Amilcar Challu (AC), Graham Burkhardt (GB), Bekah Shively (BH)

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[START INTERVIEW]

[Note: Some tangential discussion from the audio file has been omitted]

ES: [00:03:35] Okay, so you might not be able to see them, but they are here. So, As Dr. Challu said, my name is Emily Shaver, I am an M.A. student here at BGSU. I am in the public history program. I study Appalachian women's history. Bekah, well Bekah and Graham are undergrads. Correct? Yeah. Okay. So, to start off with. Could you just tell us a little bit about you and your background?

JH: [00:03:57] Well, I have a Ph. D. in anthropology. So, I'm an anthropological archaeologist. And almost all of my field work, excuse me, almost all of my field work has been in Mexico and Central America, although I've worked also in Peru and Turkey and Cyprus and in the United States. But mostly in Mexico, Central America, and mostly for the last 40 odd years, I guess, in Honduras.

ES: [00:04:30] Okay. What do you, what are you studying in Honduras?

JH: [00:04:33] Well, basically the prehistory of a particular valley in northwestern Honduras. And I started out working there in the 1970S because Honduran government asked me to come and make sense of what was going on there. And I got interested in the general issues, which are how does it all relate to the Maya? Because this area is just beyond the distribution of those temples and palaces and monuments and hieroglyphic texts that everybody thinks of when they think of Maya civilization. And yeah, they share a lot of things. And so, my question is how do they relate? The conventional notion is that they're not Maya because they don't have temples and palaces and hieroglyphic texts. And my view is they don't have those things because they're

not states. It doesn't keep them from being Mayan. It just keeps them from being from producing things that are the markers of kings and their self-justification. So that's been mostly my focus. But about 10 years or 15 years ago we discovered unexpectedly early deposits in one of our sites that went back, go back, I should say, close to 2,000 BCE. So at the time, people were first settling down and beginning to make patterns and then shortly thereafter we had traces of the first complex society in Mesoamerica, the Olmec. So, it's kind of taken a detour from the issue of are they related to Maya, which is easiest to address much later when the Maya civilization is flourishing a little bit of exploratory stuff in Nicaragua, because many archaeologists and some ordinary folk living in Northern Nicaragua think of their heritages, including the stuff that I'm working on in Northern Honduras, which makes it particularly interesting whether or not I turn out to believe that. I did my first field work in Mexico many years ago on Olmecs. So, it's nice to come back to Olmecs in the context of Northern Honduras. And I've written a bunch of things on writing, and the calendar and astronomy tabulations of things like the planet Venus, and a few things on the Aztecs in Central Mexico, so miscellaneous, but mostly Northwestern Honduras.

ES: [00:07:03] Awesome. Yeah, we've read a couple of your papers on the different ways that astronomy, we've seen astronomy, and like indigenous Mesoamerican culture. [BACKGROUND NOISE] ...I thought that was Dr. Challu. So, I wanted to ask if you could go over the Mayans and the Mexica's ability to predict eclipses.

JH: [00:07:30] It's clearer in the case of the Maya mostly because we have a very elaborate table and one of the 4 surviving Maya books. That gives you essentially you have a series of dates and a series of intervals of the number of days in between them. And they defined windows within which eclipses could occur. But the details of how they used it are a little bit obscure. That may be medium obscure. And specialists are still squabbling among themselves about whether it's lunar eclipses only, solar eclipses only, or both. I think the answer is both because the hieroglyphs clearly refer to the moon and the sun. I don't think they would be referring to the to them if eclipses of both the moon and the sun weren't part of what was going on. Whether they could predict eclipses that were visible in the Maya area specifically, I don't know, because these windows include eclipses that were not visible there. They may well have been able to do that, but we don't have any evidence of it. The Mexica, the Aztecs. Not as clear. My guess is that they probably had windows predicted, predicted windows of eclipse occurrence as well, but we don't have any clear tabulations like the ones we have in the Maya book. That's—I'm always deeply suspicious of absence of evidence. Because that's you know, we don't know everything and not, you know, most Mesoamerican books got consigned to the fires by Spanish churchmen. So, maybe they recorded that kind of thing somewhere else, and we simply haven't seen it. But we do have manuscripts from Central Mexico that refer to astronomical things. So, it's at least suspicious that we don't have a table of eclipse occurrences, but my guess is that they could do it in terms of a window.

ES: [00:09:46] Awesome. Thank you for that. I was wondering if you could kind of expand on, so we read your article “Ancestors and the Sun: Astronomy, Architecture, and Culture at Chaco Canyon.” I was wondering if you could talk a little bit about how astronomy and architecture intersect in this way.

JH: [00:10:08] Okay, actually, I didn't write that article.

ES: [00:10:11] You didn't, okay. You recommended it, though? Right?

JH: [00:10:15] Yeah. I recommend it to lots of people.

ES: [00:10:17] Gotcha, okay. And we had it under your file, totally missed that you didn't write that, but—

JH: [00:10:24] That's just the truth in advertising here. Well, I think, I think architecture is the clearest way we can see how astronomy mattered to elites, and how it mattered to them in the sense that it was one of a whole array of mechanisms that reinforced their power. Generally, the ability to predict celestial events probably was a source of prestige and power everywhere in Mesoamerica. But in the Maya case and in the Mexica case we have some pretty clear examples that relate mainly to architecture. One surprising thing is that we don't. We have lots of Maya inscriptions, but we don't have very many references to eclipses in those inscriptions, there are a few. The reason is that the inscriptions we have are all about history, particularly history that glorifies the ruler in question, the ruler who's commissioning the text, and most of the time they would rather talk about their parentage and the deities they're associated with and their conquests than things like astronomical associations. But even there we do see some things more clearly in the case of things like Jupiter and Venus being associated with warfare. But they do refer to eclipses as well, so they clearly had some role in a comparable kind of way, but I think the best evidence is in architecture and other material kinds of things. In the Maya world, there's an architectural complex called an E-group named after "group E" at Uaxactun, a particular classic Maya center. And they show up, oh, maybe as early as 400 BCE 500 BCE in the Maya world, and the early ones are fairly simple. What they have, what they are, is an elongated platform on the east side of the group, with usually 2 small constructions, or maybe 2 stone monuments, one at either end, and then a platform, often with a temple building on it, but not necessarily. Maybe just a platform with a flat space on top on the west side such that if you sit on the top of the thing on the west side and watch the sun rise over the platform on the east side, the sun will come up over the north end of that east platform at the June solstice, and over the south end of these platforms at the December solstice. As time goes on, they get a little bit bigger, and then at the time Maya kings emerge, at the time Maya societies become states have clearly centralized political organization and are being run by kings, those complexes suddenly get really big, really fancy elaborate architectural decoration, and that decoration relates to kings. It's portraits of kings and portraits of deities that kings like to invoke. So, I think that's, that's a really clear connection between astronomy and architecture. There's another particular example at the site of Palenque. There was a very famous king at Palenque, named Pacal, who ruled for most of the seventh century. He died around 700, and his son and successor, who built a mortuary temple for Pacal and another temple that celebrates his own succession, his own accession to power following his father. He set those 2 things up so that at the December solstice, the setting sun lights up a panel in the temple that celebrates the successor's accession. First it shines on the sun god, and then it shines on Pacal, the image of Pacal, then it shines on the image of the successor, Chan Bahlum. And then, if you're looking from that temple, if you were up there watching that light and shadow thing, and you turn around, you see the sun setting right behind the mortuary

temple of Pacal, the place where his tomb is. So, it enters the underworld through the tomb of Pacal. That's a, that's a pretty effective kind of essentially making the natural environment confirm your political succession, the legitimacy of your political succession. You see some kinds of things like that among the Mexica. The Mexica used eclipses metaphorically to talk about, to characterize the deaths of kings. And the other side of that coin is that eclipses seem to have been conceptualized as the beginnings of things, and as in the beginning of a new reign following the death of a king, but more generally as the beginnings of kings. And they apparently, they, the Mexica, were big on maybe fiddling is not the right word, but arranging chronology so that it highlighted relationships that they were sure of. They were not above rewriting history entirely. So, they were selective about recording and emphasizing eclipses in order to emphasize their connections with the things they thought were important like the deaths of kings. One of the interesting things about eclipses among the Mexica is that they were feared, there were occasions for great hubbub and pandemonium, and all kinds of shouting, perhaps to frighten off the monsters who were, who's devouring the sun was thought to be the cause of the eclipse. But they weren't threatening in the way that the light of Venus was threatening. I'm going to keep going back to the Venus analogy, because we understand it better. We understand that case a little bit better. In the case of Venus, the light of Venus, when it rose as Morning Star was really dangerous to all kinds of people, basically everybody, but to particular categories of people on particular dates. And so, the Maya paid really close attention to documenting all of the heliacal rises of Venus so that people could take the proper precautions. Eclipses didn't seem to work the same way, either among the Maya or the Mexica, and among the Mexica they were feared as harbingers or potential harbingers of the destruction of the world. So, they brought danger, but on a bigger scale. And not danger that individuals could counter by individual rites, by individual rituals. They had the response or the, the attempt to avoid the danger posed by an eclipse had to be at a more societal scale. So, not entirely clear what that means. But it's clear that eclipses were conceptualized differently than some of the other kinds of astronomical things that we understand better. Myth is another place where you see the relationship between rulership and astronomical things. Particularly for the Mexica, the key example is the myth of the birth of the sun god, Huitzilopochtli, one of the sun gods. But he was also, and maybe more importantly, the god who embodied Mexica identity. He was the god who was the Mexica. He led them on their migration from their ancient homeland to where they founded their capital, predicting all the way along that they were going to be the legitimate rulers of all of Central Mexico, even though they came from the northwest fringe. But he was, really did embody not only the identity of the Mexica, but also the agenda of the Mexica State of the Aztec Empire. And so, he was fairly important. One of the things that the Mexica paid attention to was his birth. He was born magically. His mother, the goddess Coatlicue, became magically pregnant, and that angered her existing children, who thought there was something wrong with that, that maybe she was hiding something. And so, they came, they got together, her daughter, Coyolxauhqui, who was the moon, and her many sons, who were the stars of the night sky, came to a place called Coatepec, where she had withdrawn to give birth to Huitzilopochtli, and they were going to kill her because he had dishonored the family name with this pseudo-magical pregnancy. But Huitzilopochtli was born fully grown, and fully armed and put the brothers to flight, and beheaded and dismembered Coyolxauhqui, and threw her body parts down the mountain

Coatepec. Well, that's, remember Huitzilopochtli is a sun god. So, the sun is born, and the moon and the stars are put to flight. That's what happens every morning when the sun comes up in terms of metaphor, but also, especially given the killing, and in some versions the eating of the moon goddess Coyolxauhqui by Huitzilopochtli that suggests that that could be read as an eclipse as well. Because eclipse, eclipses were conceptualized as the devouring of the sun by somebody. So conceptually, the birth of the sun happens in the contexts of lunar eclipses and the ruler embodies the sun. That's a pretty close connection. Moreover the accession ceremony for an Aztec ruler, for a Mexica ruler, so after the death of the predecessor which is associated with eclipses because the death of kings are associated with eclipses, the ruler designates the new ruler, designating withdraws as he gives up all of his symbols of identity, all of his titles, and all of his authority. And performs rituals relating to Huitzilopochtli as the sun for 4 days, living in a very small temple in the temple complex. And then he emerges and is symbolically reborn as the ruler who embodies the sun. So that's a pretty clear connection between eclipses and rulership. So, you see it in terms of symbolism that's reflected in things like myth. And you see it in architectural things as well.

ES: [00:21:53] And this might be a little bit out of your kind of geographical range, but a big topic here right now is the Hopewell Mound building. It just became a UNESCO world heritage site.

JH: [00:22:11] Yeah, I saw that!

ES: [00:22:10] And I kind of see parallels between like, this architectural tradition. In the Mexica, in Chaco Canyon, and the Mound building with the Hopewell, and how it relates to astronomy. Would you be able to talk a little bit about that? Do you see any connections there?

JH: [00:22:39] Well, I do see, I think the whole tradition of mound building in North America does relate to Mesoamerica, not just the Hopewellian mounds, but also the mounds of places like Cahokia. And they're, yeah. They're associated with artifacts also that suggest a Mesoamerican connection. There are sets of wooden posts at Cahokia, for example, that do seem to mark astronomical kinds of things. I would expect that Hopewell mounds would likely do the same thing, but I don't know of any specific examples that have been pinned down. I see the particular the Cahokia mounds look like Mesoamerican platforms, but the Hopewell mounds look like Mesoamerican mounds that are effigies. And some of the Mesoamerican mounds are effigies as well as, they built effigies as well as platforms. So, and since Mesoamerican constructions very often have architectural markers, have an archi... That's not what I want to say. Mesoamerican platforms and other architecture often mark astronomical alignments. I would expect to find the same thing in the Hopewell mounds. Chaco Canyon is an interesting case, some archaeoastronomers have found lots of alignments in Chaco more conservative. Archaeoastronomers more recently have been doubtful of some of those kinds of things. The things that are clearest in the case of Chaco is the location of architectural complexes in places where there's a clear horizon marker for things like solstice sunrise. That's sort of the same kind of logic as the potential for Hopewell mounds to mark some kind of astronomical event. So, I hope somebody figures that one out.

ES: [00:24:48] And we've been talking a lot about ancient cultures. Do you think that this tradition of like, placing this power in astronomical events has expanded throughout the centuries? And how do you see that playing out?

JH: [00:25:11] Well... that's a hard question. Yes, I think the evidence is much stronger in later periods in Mesoamerica in particular, but also in the Andes for increasing, for the increasing importance of astronomy in relation to essentially the legitimacy, legitimation of State power, particularly the legitimation of royal power. But at the same time, how our information is getting better over that period. So, it's really hard to decide whether that's an apparent thing or a real thing. Maybe we just know more about the later periods. I would say it seems to be pretty clear that the societies of the Mesoamerican classic period the societies everybody thinks of when they think of Mesoamerican civilizations, Teotihuacan in Central Mexico, the Maya in Eastern Mesoamerica, and the Zapotecs in the valley of Oaxaca. So, from maybe, I don't know, 100 BCE up to maybe 8 or 900 CE, those places were using astronomy in relation to state and royal power way more obviously than any of their predecessors were. Whether it gets more intense in later periods than that in the last 500 years or so of pre-Columbian time, or whether we just know more about that later period, I'm less sure.

ES: [00:26:59] Gotcha. And we kind of characterize this kind of whole study about astronomy and indigenous cultures, as like ethnoastronomy, and/or archaeoastronomy. Would you be able to define those terms? And if there's a difference between ethnoastronomy and archaeoastronomy?

JH: [00:27:21] Yeah, I think there is. And I also think there's a difference between ethnoastronomy and indigenous astronomy. I see ethnoastronomy and archaeoastronomy as branches of academic astronomy whose subject is indigenous or ancient, indigenous astronomy. Indigenous, contemporary, indigenous astronomy in the case of ethnoastronomy and ancient indigenous astronomy in the case of archaeoastronomy. And in Mesoamerica there's enough continuity that you can use insights that you get from what ethnoastronomy shows about indigenous astronomy to create hypotheses about ancient societies. That is, for our ideas about archaeoastronomy. But you can't just project because, you know, what people do today and have done over the last couple of centuries is a complicated blend of things that have their historical origins in Mesoamerica, things that have their historical origins in Europe and innovations. Indigenous people in the Americas have been remarkably adaptive. So, what they do is a blend of different kinds of things. I like to, I would, I kind of like to have a term that covers both ethnoastronomy and archaeoastronomy. I like paleo-archaeoastronomy. Paleo-ethnoastronomy, rather, on the model of paleo-ethnobotany, which is what botanists who study indigenous botany and ancient botany like, but astronomers don't like that. They like cultural astronomy better. But I would emphasize that in both cases, archaeoastronomy and ethnoastronomy, you're getting an academic view. And it's particularly telling, or it's particularly important to remain aware of that in thinking about ethnoastronomy, because it's an outsider's view. It's an edict view not an emic view in anthro-speak. Because although the subject is indigenous astronomy, and that's what ethnoastronomers want to understand, they are inevitably framing it in terms of academic astronomy's understanding of things. So, it's not quite the indigenous view.

ES: [00:29:54] Right. And we've seen like, how indigenous tribes still use their ethnoastronomy today, and especially we've seen cases in the first nations in Canada, where there are schools that are emphasizing the teaching of ethnoastronomy and indigenous astronomy alongside more like contemporary scientific astronomy. How would you characterize the relationship between ethnoastronomy and contemporary astronomy? And how they like, coexist today.

JH: [00:30:40] Well, part of it for me is the that academic astronomy includes ethnoastronomy, and I see both of them as pretty different from indigenous astronomy. Mostly in terms of the ultimate goals. If you look, for instance, come back once again to Venus in Mesoamerica, the Mayas and Central Mexicans were very good at calculating tabular when understanding the motions of the planet. So, the difference is not in observations or in recording, the difference is in what you're doing it for. In the case of Venus, the 4 is to keep yourself in in a position to ward off harm, keep yourself right with the supernatural. So, it's kind of an astrological take whereas academic astronomy wants to build models of how the universe works, wants to understand the universe. In the Mesoamerican case, the models don't seem to be in question, the models are already there and they're being used to understand what's going on. In terms of what actually goes on in contemporary indigenous societies in Mesoamerica, that for me, the clearest example of astronomy, indigenous astronomy, is the fact that indigenous calendars are still in use in many communities despite the fact that at least some of them are in direct competition with European calendars. That's particularly true of the 365-day year. And yet there's an awful lot of indigenous communities that still use the the Mesoamerican 365-day year calendar, which has a different, different array of months than the Christian calendar. So, they use it anyway. And maybe more importantly for their lives, they use the 260-day cycle which is, in function, is a divinatory calendar like an astrological calendar. It's real, only real function is to schedule important ritual activities and to make sure you understand what moved the supernatural within at any given point, and you alter your behavior accordingly. But that calendar probably owes its origin to astronomical kinds of things, to the length of time between zenith passages, for example. And indigenous people in Mesoamerica today still pay attention to zenith passages of the sun. Because in many parts of Mesoamerica it'll happen twice a year, and the timing of it falls near the beginning of the agricultural season and near harvest time. So, it's kind of a symbolic and "now it's time to do X" marker. Lots of other kinds of things still go on. People pay attention to eclipses. They still relate to them. They think of them the same way as ancient Mesoamericans did in terms of either animals or monsters devouring the sun. They track the path of the moon against the stars, lots and lots of continuities there.

ES: [00:34:31] How would you say that this knowledge has been passed down, like what mode of transference has happened, both orally and textual?

JH: [00:34:40] I think both. You know, some kinds of things are, oh, I guess you could think of them as parts of general knowledge that people are thought to, they're thought to be important for everybody to have the kinds of things that are taught in the context of households, of homes by families, kinds of things that are learned in neighborhood groups, the kinds of things that are learned in communities. That includes all kinds of stuff, you know, sort of like basic astronomical stuff like the relationship between the movements of the sun and the seasons, the

solstices and the equinoxes, zenith passages of the sun, the specific movements of celestial bodies, and the occurrence of eclipses, things like that. I think those were the province of, in ancient times, those were the province of specialists who were associated with royal courts. Today, they are those more esoteric dimensions of astronomical events are the province of calendar priests. What happened, of course, was the Spanish invasion was a watershed in terms of indigenous life, and it didn't affect family and community and learning in the same way that it affected State-related learning. So, things that were passed out of the context of families and neighborhoods and communities have lasted longer and been less affected, were affected in different ways at least. Whereas things that were connected with the State were much more problematic. Anything that was directly connected with the State and with kings was basically stamped out in the case of some of the astronomical observations and knowledge that the role of State officials in pre-Columbian times was taken over by more informal calendar specialists today. So, they, yeah, they're basically diviners. They most often work, this is generalizing over quite a lot of diversity, but in general they work for clients. A client will come and consult a calendar specialist, a diviner, sometimes called shamans, about a particular kind of thing that they're worried about, an event. Is this a good time to have a merchant venture? What's going to be the fate of my kid who was born today? And the diviner will respond in terms of a very subjective feeling about the calendar and about astronomical events, both of which they pay close attention to. So, it's operating partly in a different kind of context than it did when most of that was happening in the context of State specialists. Although the same kind of thing certainly exists today and, in the past, in terms of the implications of the calendar position, and the astronomical associations of your birth that to a great degree determines your fate. It does today, and it did in the past.

[Note: Some tangential discussion from the audio file has been omitted]

[END OF INTERVIEW]