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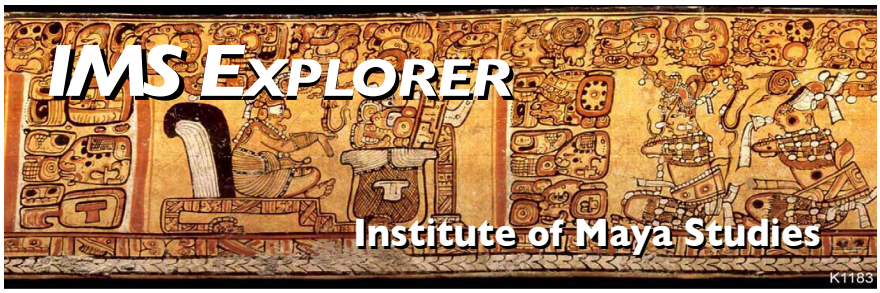

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Inside this issue:

IMS Program Note:
There is no IMS public presentation scheduled for October.

Unreal Archaeology: How The Ancient World Is Being Recreated In Virtual Reality

Featuring David R. Hixson and Jeffrey R. Vadala

Dave Hixson and his work:

(Text by David Anderson, in an article published on *Forbes.com*)

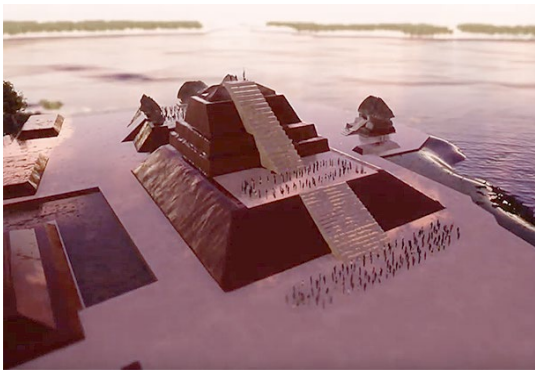
"Archaeological field work typically involves lots of dirt, sun, and at least an insect or two, but archaeologist David R. Hixson of Hood College is opening new frontiers to bring archaeology into the world of virtual reality. While he still keeps a trowel in his back pocket, Hixson now regularly works with drones, digital photography, photogrammetry and three-dimensional imaging software in his attempts to understand the human past. At the same time, the expansion of virtual reality technology is opening possibilities for the public to experience the ancient world in entirely new ways.

"*The age of virtual archaeology has arrived!*

It can hardly get better than this: A digital simulation created by David Hixson of a housing group from the ancient Maya city of Chunchucmil.

"Hixson's traditional fieldwork has focused on the site of Chunchucmil. This ancient Maya city covers ten-sq-klm and is estimated to have been home to more than 30,000 people during the 6–7th centuries CE. It is difficult to conceive what this ancient urban landscape looked like when inhabited. Visiting the site today, its former temples, houses and streets appear to be little more than piles of rubble. With such faded remnants, it is difficult to illustrate a complex urban environment using tradition static images, but while working at the site in early 2000s, Hixson realized a computer program named *Unreal Engine* could open 'a new avenue for archaeological illustration and communications.'

The urban center of the city of Chunchucmil as seen today. Photo by David Hixson.



Approaching sunset at Cerros, (known as Cerro Maya in Belize), from a "brief, but stunning" video by Jeffery R. Vadala.

"*Unreal Engine* is a software program developed by Epic Games to allow game developers to create immersive three-dimensional environments. While Epic offers the software for free to all users, the company actively encourages educators to make use of their platform.

continued on page 3

Jim Reed, Editor

*For many years I have been following in the footsteps of the German explorer Teobert Maler (1842-1917; **Fig. 1**). One of my projects is to relocate the ancient sites on the Yucatan peninsula that this early photographer and documentarist of Maya ruins had visited and which since his explorations – that took place mainly in the 1880s – have been "lost". We are talking about around 20 cases in total; one of them is presented here:*

Dsinábila-Xul: A Maler Maya Site Located Again

by Stephan Merk

On May 28th, 1887, the early explorer saw a small ruin he baptised as Dsinábila-Xul. According to Hanns J. Prem – who edited his notes for the book *Peninsula Yucatan von Teobert Maler*, published 1997 – no one else since the late nineteenth century has published information about this site (Prem in Maler 1997: 280).

In his manuscript, the pioneer gave the following brief description of Dsinábila-Xul and its location:

> "After the first three *leguas* continuing our march from Ichpich to Xul we came to the vivienda (small settlement) of Dsinábila, set within a minor ruin place. The ruins are situated on a low mountain ridge on the left side of the trail. (…) Besides several stone mounds we found a destroyed little pyramid and remains of a small palace; the latter still showed a piece of wall with colonnettes in the upper façade."

The explorer did not take a photograph of this decorated wall.

Reconstructing Maler's moves on that day in May 1887, from the ruins of Ichpich in a northern direction to the village of Xul, the only modern settlement far and wide that matches the explorer's information is the small village of Benito Juárez. For Maler, one *legua* was the distance he could travel within an hour, normally between three and four kilometers. Benito Juárez lies ten kilometers north of Ichpich and along the old road to Xul. It is obviously the settlement known in earlier times as Dsinábila.

In March 1999, Karl Herbert Mayer and I visited, with the help of locals from Benito Juárez, a small ruin place on a hill around 150 meters west of the village.

***Fig. 2:** Fallen front side of one of the central rooms, showing parts of the vault.* Photo by Stephan Merk, 2019.

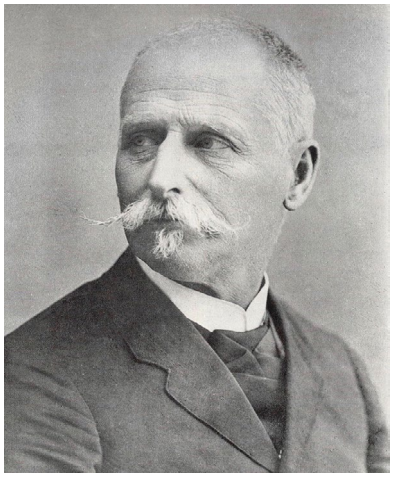


***Fig. 1:** A portrait of Teobert Maler, taken a few years after he explored Dsinábila-Xul.* Photo courtesy of Ibero-Amerikanisches Institut, Berlin.

We made notes and took photographs and GPS data. Twenty years later, and equipped with Maler's description, Eduardo González Arce and I returned in July 2019 to the site to find out if my suggestion that the ruin is identical with Dsinábila-Xul is correct or not. The location fit the explorer's description perfectly: the distance Maler gave, as well as the situation of the ruin to the left (west) of the road and on a low to medium high hill correspond.

The only ancient Maya structure there with still visible architecture is a widely destroyed probably former four-room range-type building, with roughly east to west axis, which faced a platform or courtyard towards the south. The front façades of the rooms are all fallen (**Fig. 2**), but the eastern one of the two central chambers shows still some decoration on its back side (see **Fig. 3**, page 6).

Over a plain lower wall a three-member medial or central molding rises; the lower two horizontal members are made of apron-type cut stones, one row above the other while the top member consists of a protruding row of flat stones. In the middle row of the molding, plain stones alternate with packs of three short columns. On top of the molding is the upper façade, which was formed most likely by only three horizontal layers of stones, here and there interrupted by single and plain vertically-set columns. The upper molding, which normally closes a Maya Puuc building on top, no longer exists, and the base molding on the bottom of the structure is covered with debris, therefore we can guess about how they once looked.

The ancient ruin is part of an area that the late George F. Andrews described as Chenes-Puuc Transitional Zone because the architecture found there shows elements from both, Classic Puuc styles and Chenes style.

continued on page 4



L) An aguada, or water source, located along side a housing group and C) the main plaza group in the city of Chunchucmil. R) The site sits directly above the Yucatan Aquifer. During the rainy season, localized rains have nowhere to drain. This fills up depressions the ancient Maya excavated below the limestone cap to acquire stone and sascab. In my videos, I replicate the flood of 1999 when only built architecture and boundary walls were above the flooding. Click on this hyperlink to view the results: https://www.facebook.com/david.hixson.963/videos/2323102391302183/

Unreal Archaeology: How The Ancient World Is Being Recreated In Virtual Reality

Featuring David R. Hixson and Jeffrey R. Vadala

continued from page 1

"Using the Unreal Engine 2, Hixson created his first simulation of Chunchucmil to test the feasibility of the concept. By going through the process, he found he had to consider many questions to create an accurate immersive virtual rendering of an ancient city.

"In his most recent work, Hixson is exploring how new developments in photogrammetry, a process that extracts three-dimension data from digital photographs, can enhance the process of rendering sites in virtual environments. By bringing drones to the site of Chunchucmil, Hixson was able to create a three-dimensional model of the archaeological site in a matter of weeks, when traditional mapping practices had taken years to cover the same territory."

For Hixson, that collaboration meant teaming up with off-site Research Associate Jeffrey Vadala.

My colleague and friend Jeffery Vadala has upgraded his 3D reconstruction of Cerro Belize. Check out the improvements in this stunning video at: https://www.youtube.com/watch?v=96lGg4WViKg&feature=share&fbclid=IwAR13VfP3RIBuHH_dI8IDuJomv097jTSVuF_68BsXn3tPu6jwTA4mGntG3GE

Get to know Jeffrey Vadala:

Jeffrey R. Vadala holds a PhD in Anthropology (University of Florida 2016), an MA with a focus in Archaeology (California State University Los Angeles 2009), and a Bachelor of Science (University of California Riverside 2005).

Vadala works on a variety of archaeological and anthropological research projects. One of his current research projects focuses on developing new forms of virtual reality ethnography. This entails anthropologically exploring the social processes that create cybernetic identities and new forms of social organization within burgeoning virtual reality online communities.

In 2005, he began mapping and exploring ancient Maya sites in the Yucatan. In 2007, with the support of David Hixson, Vadala began experimentally using 3D computer modeling technologies to analyze data gathered from the Preclassic Maya site of T'isil, located in Quintana Roo, Mexico.

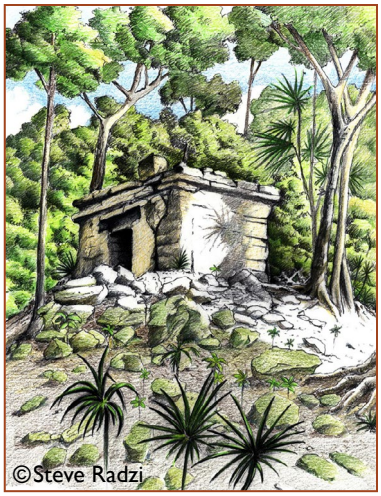
Later, he had the opportunity to pioneer the use of the virtual reality headset software program Oculus Rift. Among the first of the archaeologists to embrace the new wave of consumer-grade modern virtual reality headsets, he was able to design and explore a highly accurate, interactive, and immersive 3D virtual representation of the ancient Maya site of Cerro Maya, Belize (Cerros).

Check out Jeffrey's videos and more at: *http://www.jeffreyvadala.com*

Hixson notes: "Here's another project that was part of my SAA paper from 2007. This was a test model of the Temple of the Inscriptions at Palenque. It can be walked through just like a first-person video game. I also added a virtual site museum that you teleport to from Pakal's tomb!"

Note: **Dave and Jeffrey** will be the presenters at the November 1 monthly meeting of the Pre-Columbian Society of Washington, DC. Details at *www.pcswdc.org*

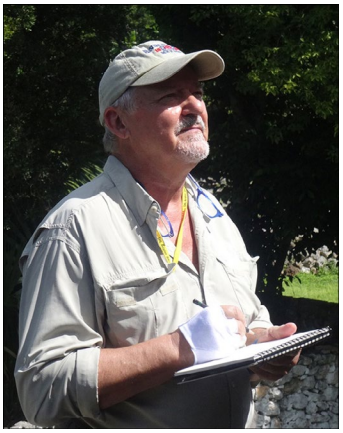
At their PCSWDC presentation, Dave and Jeffrey will not only present their own 3D creations, but also highlight the inspiring works of others. A team of friends have created highly realistic renditions of Chichen Itza. The trees and foilage are impressive. Check out their "Tales of the Maya Skies" trailer created for Chabot Space & Science Center at: https://www.youtube.com/watch?v=43kbf30fFGU



Maya Magic at Xaman Ha *by artist Steve Radzi*

For me, there is a kind of magic in finding these small, simple structures at the end of what is often barely a path. I also feel great trust and admiration for those friends who have guided me to these sites and shared their knowledge.

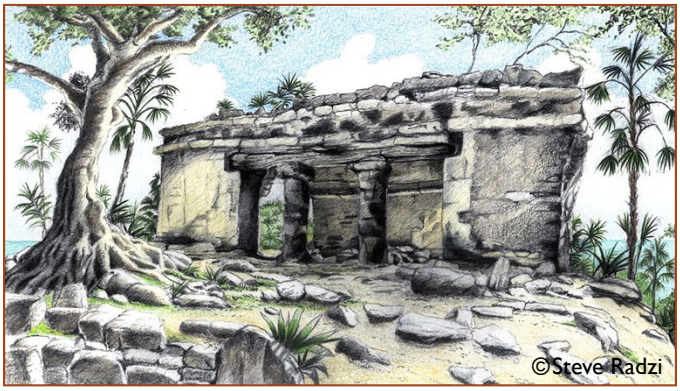
Each of these seemingly insignificant Late Post Classic buildings, though not as grand as a palace or pyramid, served an important human function. From sacred shrine to strategic lookout, they still stand, murmuring ancient secrets.



Steve in the field at Acanceh.

It has been a privilege to record these structures, as they will no doubt soon fall to the ravages of climate and time.

For those interested, further reading on the Caribbean Coastal Maya can be found in the research and writings of Arthur G. Miller and Anthony P. Andrews.



Steve presented his new illustrations at the recent Maya at the Playa conference. Check out Steve's beautiful website that he constantly updates with new works of art, most available for purchase, at: *www.mayavision.com*

Dsinábila-Xul: A Maler Maya Site Relocated

by Stephan Merk

continued from page 2

The US American architect had visited the Precolumbian settlement in the 1980s and had classified its architecture as "what little is still preserved in Benito Juárez seems mostly Chenes in character" (Andrews 1997: 123).

The back wall in **Fig. 3** fulfills the requirements Maler gave as a "standing part of a wall with the rest of a frieze with half-rounded columns", but this alone would not be sufficient as a proof given that many similar adorned façades can be found in the Puuc area. However, the wall decoration together with the location of the ruin should be enough evidence for an identification of Dsinábila-Xul with the ancient settlement of modern Benito Juárez.

Fig. 3: *Two photos of the back wall with short columns in the medial molding and single large columns embedded in the upper façade.* Photos by Eduardo González Arce and Stephan Merk, 2019.

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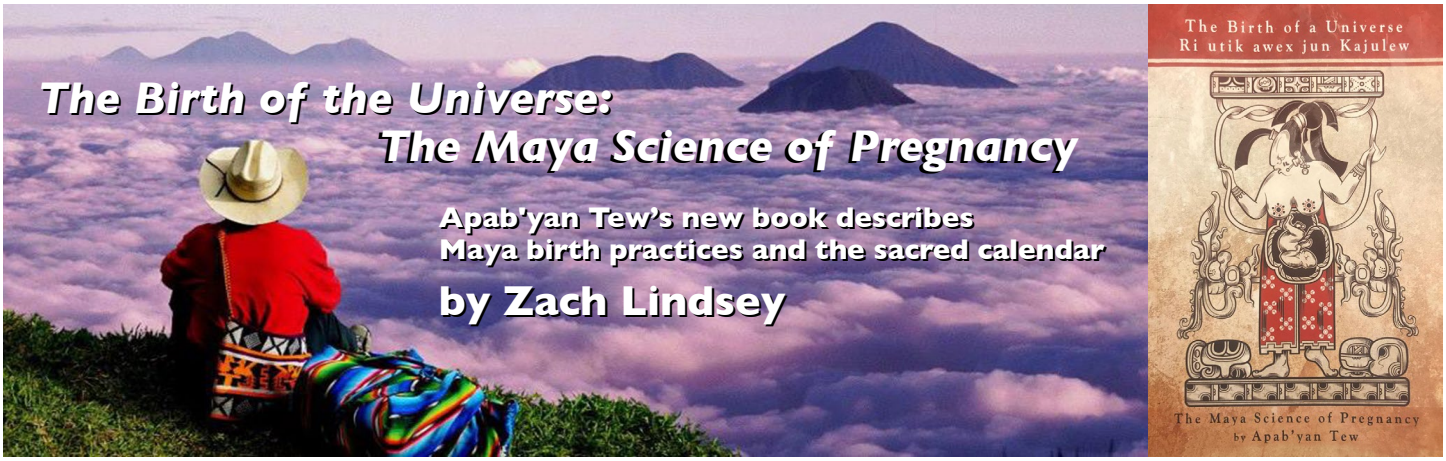

High above a sea of clouds, Apab'yan Tew contemplates the beauty of the Highlands of Guatemala. Book cover image by Walter Paz Joj.

Birthdays are important in the Maya sacred calendar, so it is no surprise the daykeepers who use the calendar today in Guatemala know a thing or two about birth.

But *ahq'ij* (daykeeper) Apab'yan Tew knows more than a thing or two. In addition to his training in the sacred calendar, he is one of very few men trained as midwives in the Maya tradition.

Fearful of the loss of traditional knowledge happening in indigneous communities where he worked, Tew recently published: *The Birth of the Universe: The Maya Science of Pregnancy*. In the text, Tew lays out the Maya philosophy surrounding birth and the way pre-birth stressors and traumas on a mother can affect the future development of a child.

Under this idea, the day we are born is no accident: It is influenced by the experiences of the mother and her relationship with the mother's companion, if that person is around or not. The day, in turn, imbues the child with certain sacred forces which daykeepers call *Nawalib'*, a word many readers may recognize.

That stressors experienced by mothers can affect fetuses is almost certainly accurate, but Western psychology is only now beginning to work out the implications; Tew says the Maya have known it for 3,000 years.

The book has a metaphysical component, and Tew is interested in the epistemology of Maya knowledge. But Tew is also a more direct practitioner of Maya science. He is an instructor at the Kaqchikel Maya University in Guatemala who has aided in the delivery of many babies, as he says, in the "misty mountains" of the highlands.

There, patients often lack access to hospitals and give birth in their homes. But the ancient Maya practices still save lives. For example, breech births often require cesarean sections, which women in the rural areas cannot get. However, according to Tew, Maya midwives have the skills to avoid breech births altogether, using a combination of massage techniques and song vibrations.

Western doctors have typically not incorporated these sorts of skills, but at least some people are learning them again. San Antonio-based *doula* (Greek for birth servant) Xelina Flores brought him to speak to *doulas* and midwives in Austin, which is where I got to see him. But he's spoken around the United States, and plans to come back in November if he can raise the funds. Until then, he's teaching Flores what he can so she can incorporate into a training session for other *doulas* and midwives, and he's providing Skype consultations of birthdays in the Maya calendar. If you're interested in one, email Flores at *xelinaflor7@gmail.com*

L) Apab'yan stays true to his roots and is also an accomplished musician and dancer; original painting by Julia Elena Zavalia. R) Tew sings a birth-day song for a participant in the Austin, TX, sessions that Zach attended.

Mayanists both interested in the contemporary culture and the past will find insights of value in Tew's work, and you may just find some spiritual solace in it as well. Tew's website: *https://mayanscience.net/*

Speaking of the past, Tew and I chatted about many things after his presentation, but one thing I wanted to share with readers is the way contemporary Maya can provide important interpretations of their own past. I asked Tew about Palenque leader K'inich Kan B'ahlam, whom I'm studying at the university.

Kan B'ahlam's father was the great and successful Pakal... but Pakal was not the direct descendant of the Palenque founders. The lineage had been interrupted. When I asked Tew about Kan B'ahlam's birthday, the daykeeper was immediately suspicious. Kimi is a day associated with ancestors; people born on that day are intimately connected to the past and their ancient ancestors. It would be quite appropriate for a man who is trying to prove his right to rule to be born on the day Kimi.

We may never know for sure if Kan B'ahlam lied about his birthday, but doing so would certainly match with other propaganda pushed by the Palenque kings.

Unbundling the Past: Events in Ancient and Contemporary Maya History for October

26 October 709 CE On 9.13.17.15.12 5 Eb 15 Mak G6, Yaxchilan rulers Itzamnaaj B'aalam II (Shield Jaguar) and Lady K'ab'al Xook entered a dark room and, with only the light of her husband's torch to guide her, Lady K'ab'al Xook drew a rope through her tongue to let blood for the gods. This date appears on the famous Lintel 24 from Yaxchilan Structure 23.

Lady K'ab'al Xook (Lady Sharkfin)

Lintel 24: Lady Xook pulls a thorned cord through her tongue. (The British Museum)

Explore the Lintels of Yaxchilan Structure 23: Royal Life and Power

Shield Jaguar II's commissions at Yaxchilan's central complex of buildings (called the Central Acropolis) include carved lintels (the beam at the top of a doorway), stairs faced with hieroglyphic writing, and stelae (upright wood or stone slab monuments).

Some of the most famous lintels are those on Structure 23 – a *yotoot* (palace building) showing Shield Jaguar II's wife, Lady K'abal Xook. Anyone entering Structure 23 would pass underneath the limestone lintels when entering the doorways; the lintels are thus situated in a liminal space between exterior and interior.

Before the construction of Structure 23, there was a hiatus in building at Yaxchilan for about 150 years. This building's construction is therefore important, and so too are the individuals it showcases. But why focus on Lady Xook rather than Shield Jaguar II exclusively? It might be that the ruler wanted to promote his lineage and power through his principal wife (who had more prestige than his other wives). Structure 23 is therefore important not only for advertising Shield Jaguar II's power, but also for highlighting the important role of royal women in Maya culture.

Detail of Lintel 25: Lady Xook holds a bowl in her left hand while she looks up towards the rising serpent. In addition to her patterned huipil (square-cut blouse), Lady Xook is festooned with a headdress, elaborate bracelets, earrings, and a necklace – likely made of jade. (The British Museum)

Lintel 25: In the bowl are pieces of paper stained with her blood. She has likely burned the paper to allow the blood to ascend to the gods, and to bring about the vision serpent. (The British Museum)

Three important lintels

The three lintels on Structure 23 – known as Lintels 24, 25, and 26 – depict different ritual moments in the life of Lady Xook. While they appear to have been carved years apart from one another, they seem to show a narrative. Note: the monuments and objects uncovered at Yaxchian are numbered in the order in which they were found – so Lintel 1 is not the oldest, but rather the first to be excavated by archaeologists.

Lintel 26 represents Lady Xook helping to dress her husband for battle. (Museo Nacional de Antropologia, Mexico)

On Lintel 24, Lady Xook pulls a thorned cord through her tongue so that she can bleed onto paper that fills a basket on the ground before her. She is engaged in bloodletting – the ritual shedding of blood. Her husband, Shield Jaguar II, holds a lit torch above her.

On Lintel 25, the effects of bloodletting are on display. The loss of blood and the burning of incense produced hallucinations, which were desired in certain ritual contexts to access other realms. In this lintel, Lady Xook (in the lower right) kneels before a vision serpent, from whose mouth emerges an ancestral figure.

Skilled carving

A glyphic inscription (oddly, written backwards) in the upper left corner of Lintel 25 notes the date of Shield Jaguar II's ascension to the throne in October 681. The image and the inscription both reinforce the reign of the ruler and his dynastic ties, in this case via his wife. The lintels exemplify the skilled carving of Maya artists at Yaxchilan – and the Maya more generally. The scenes are carved in high relief with carefully incised details decorating the raised surfaces.

The Yaxchilan lintels were originally painted, although only traces remain, including red on Lady Xook's clothing and the brilliant Maya blue color on the background of Lintel 24.

Source: Structure 23 text from an online article by Dr. Lauren Kilroy-Ewbank on "Smart History" – a really nice website worth checking out at: *https://smarthistory.org/yaxchilan-lintels/*

Settlement Patterns:
Archaeology of the 99%

The vast majority of people in antiquity were too poor to leave many artifacts behind. But archaeologists have learned how to look beyond the temples and palaces.

An interview with archaeologist Jeremy Sabloff of the University of Pennsylvania and the Santa Fe Institute by Bob Holmes for Knowable Magazine online

Jeremy Sabloff

Dr. Gordon Willey

Until the past few decades, archaeology was all about the grand and the wealthy, focused on temples, palaces and spectacular artifacts – think King Tut's tomb, or the great temples and palaces of the Maya city of Tikal. **Jeremy Sabloff**, an archaeologist now retired from the University of Pennsylvania and the Santa Fe Institute, was part of the generation that changed that. Sabloff built his career on the study of the common folk of the Maya civilization of Mexico and Central America, mapping and excavating entire cities to study who lived where, and how.

In the 2019 *Annual Review of Anthropology*, Sabloff looks back over the 50-plus years of his career and reviews what archaeologists have learned about the Maya through the study of settlement patterns.

Why had archaeologists overlooked the commoners for so long?

Before World War II, archaeological research was funded mostly by museums or wealthy individuals or foundations. They wanted spectacular finds – temples and palaces, not the remains of perishable structures of everyday life. They wanted royal burials, such as King Tut's tomb, the royal treasures of Ur, great sculpture, murals, beautiful pottery, jade, what have you. They were looking for materials that they could bring back and display in museums.

And why did that change?

Until the middle of the 20th century, much of archaeology was also carried out by people of wealth. The makeup of the field changed significantly after World War II, and its practitioners became much more middle class. One reason is there were a lot more jobs available, particularly at state universities. And you started to be able to get grants for fieldwork that wasn't based on looking for objects or spectacular finds. All of this is related to the switch from the 1 percent to the 99 percent, as I've flippantly called it.

For the Maya area specifically, the galvanizer was **Gordon Willey** at Harvard. He had already been a pioneer in what was called the settlement pattern approach: He wanted to see the whole settlement of an archaeological site, not just the major buildings. He was just as interested in mapping the remains of perishable wooden thatched houses, what little was left, as in stone temples and palaces. It's not that houses of ancient Maya peasantry had been ignored, but Willey was the first to concentrate attention on these and say: How can we understand Maya society as a whole?

This concern with settlement pattern, with looking at the 100 percent instead of just the 1 percent, not only broadened our understanding, but completely changed it. The older view of the Maya was of a non-urban, peaceful people ruled by priest-astronomers. The elaborate temples people had found at Tikal and elsewhere were thought to be merely ceremonial centers with minimal populations, and not cities in their own right. But mapping projects at Tikal and other places showed that they weren't just ceremonial centers – there were large numbers of remains of houses. These were actually urban centers of some kind. That totally changed the understanding of the Precolumbian Maya. *cont. on page 8*

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Settlement Patterns: *continued from page 7*

Archaeology of the 99%

Why did you choose to focus on the archaeology of commoners?

There are really two answers to that. One is, I was a student of Willey's. I started in 1965 on a project in the tropical rainforest of Guatemala that was looking at the full range of Maya remains. So I was thrust into that. But also it was related to my general interest, which was: How do we understand the development through time of Maya civilization? Clearly, if you were going to ask questions like that and get useful answers, you had to look at the full range of ancient Maya society.

The ruins of Mayapan, in Yucatan, Mexico, abandoned in the 15th century, has fewer and less elaborate temples and large buildings than older sites like Tikal. But, says Sabloff, that may be because the city focused on the infrastructure needed for trade. Courtesy of Knowable Magazine / Age Fotostock / Alamy Stock Photo.

How do you study settlement patterns?

We want to get a sense of the distribution of all the kinds of housing and how they're situated on the landscape, and in particular find information about the inhabitants of the different kinds of architecture through detailed collection of materials on the surface, and excavation where that was possible.

One of the projects that I co-directed was at the site of Sayil in northern Yucatan, south of modern-day Merida. We wanted first of all just to produce a map of the urban area, so we could get some idea of the extent and nature of the structures. One reason we chose to work at Sayil is that there had been very little disturbance after the 16th century. Where there had been a wooden thatched house, the single row of stones that supported the wooden poles of the walls was still there, so you could actually see the layout of rooms, the platforms they might have been built on, and so forth.

We also did a little excavation of these more perishable structures, so we could fill in a little more. Could we get a sense of household composition? How many rooms would a family have had? What would we find in the kitchen area? One of the interesting things we found is that open spaces between houses, which used to be thought of as small plazas or something, in fact were vegetable gardens where they'd been growing beans, squash, tomatoes and so on.

We found stone tools made of obsidian, which is not available locally. So you start getting into questions of trade. Economically, where could you find marketplaces? What was being sold there? Were goods accessible to both elite and non-elite, or are some things available only to one and not the other? All of those let you ask questions about how the ancient society functioned, and also how this might have changed through time. It's a much richer picture of Precolumbian ancient Maya society.

Excavation of a room of a wood-and-thatch house at Sayil, Yucatan. Courtesy of the Sayil Archaeological Project.

The richer picture we're getting of the 100 percent is aided by tools that archaeologists 50 years ago just didn't have available. In terms of settlement-pattern mapping, one of the huge technical breakthroughs in recent years is remote sensing, particularly LiDAR, where low-flying aircraft or drones send down laser beams and you can see the ground without the trees. You can see stone courses. You can see the remains of houses, causeways, roads, defensive fortifications. That's going to make the mapping of sites much simpler, particularly in difficult situations like tropical rainforest or a heavily wooded area. We're able to cover much bigger areas with much greater detail and accuracy than ever before. New LiDAR-based studies in the Southern Maya Lowlands are showing that many Precolumbian Maya cities were more extensive than previously thought, although these new data are awaiting confirmation by on-the-ground research.

Are there lessons we can learn from the Maya that apply today?

Classical Maya civilization collapsed in the 9th century, but the Maya didn't disappear – there are over 10 million Maya speakers today. What allowed them to continue after their cities collapsed? This gets into questions of population growth, of warfare, drought and climate change, which are all relevant. Answers to those aren't necessarily going to solve modern problems, but I'm a firm believer that there are potential lessons from the past. What were they successful at? What did not work? How were they resilient in the face of drought or warfare? Obviously the Precolumbian Maya and other ancient states are different from today, but they can at least give background and context to illuminate modern problems. I think this is why archaeology classes are still booming around the country today.

Source: Read the full interview featuring Jeremy Sabloff by Bob Holmes, on *Knowable Magazine* online released 7.23.2019, at: *https://www.knowablemagazine.org/article/society/2019/archaeology-of-everyday-people-life*

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