

Some Thoughts on Stature and Dimorphism Amongst the Yucatec Maya

by David Bolles

“The Maya are Naturally Short”

I grew up in a home which was infused with memories of my father’s stint working for the Carnegie Institute under Sylvanus Morley during the early 1930’s. Although my father was an architect, in the latter 1920’s and early 1930’s he had the good fortune to be asked by various groups doing archaeology, from Meso-America (the Mayan area) to France (Cluny) and Persia (Persepolis), to join their teams, principally as a civil engineer to help with mapping the sites. He was proud of the work he did, and would often talk about his experiences during dinner.

His work in Yucatan, especially on Las Monjas at Chi Cheen Itza, must have been the most rewarding of these various experiences, for we would hear more about Sylvanus Morley, Karl Ruppert, Russell Smith, H.E.D. Pollock and Gus Strömsvik, all Carnegie co-workers, than about any other group of archaeologists. But amongst these there was also frequent talk of Martin Dzib and my father’s foreman, Bernardino Tun, both of Piste. Bernie Tun was a frequent subject included in photographs of the work at Las Monjas, often used to hold the meter stick and give scale to the structure in the background.¹



Bernardino Tun holding a meter stick in front of La Iglesia

¹ See for example pp. 153, 157 and 162 of my father’s book *Las Monjas*.

From photos of my father, who himself was of short stature, about 5'6", with his Mayan co-workers it was clear that the Mayan people he worked with were fairly short. Sylvanus Morley in one of his earlier editions of "*The Ancient Maya*"² gave a physical description of the Maya which closely matched what was so evident in the photos:

"The Yucatan Maya are fairly short in stature and relatively thick-bodied. They have rather long arms and small hands and feet. The average height of the men is 5 feet 1 inch and of the women, 4 feet 8 inches."³

While not so stated in Morley's book, we as children were led to believe that the Maya were a naturally short race of people. When I first went to Yucatan, I carried this belief with me subconsciously, so even when presented with facts which showed to the contrary I was not ready to understand the significance of what I was seeing.



John S. Bolles with a Mayan co-worker beside stela 11 at Yax Chilán, 1931.

² Third Edition, 1963.

³ "*The Ancient Maya*", page 23. Note that while Morley gives 4'8" (142 cm) as being average height of Mayan women it is not uncommon to see mature women of the height of 4'4" (132 cm) and some even smaller at the height at or below 4'2" (127 cm).

Evidence to the Contrary

In the late 1950's various of our family members began to make visits to Yucatan. This, in part, was prompted by the fact that my father's report on Las Monjas was never published and was languishing in the Carnegie archives housed at the Peabody Museum at Harvard. One of the frequent stopping places was at E. Wyllys Andrews IV's house, then just off El Parque de las Americas. The object in part was apparently to see if Dr. Andrews could be of any help in getting the report published through Tulane's Meso-American Research Institute.

In 1961 I was set to work at pulling all of the pieces of the report together so that copies could be made and distributed to people who might have some influence with publishers. By the fall of 1961 the copies were made and I was sent with one copy to deliver it to Dr. Andrews.

It just happened that when I arrived in Mérida the new excavation season had begun and Dr. Andrews, now in his new house, did not have time to go through the report to make his recommendation. However, he suggested that if I would like I could join in on the excavations and when he finally had time he would write-up his report and give it to me. This proposition I gladly accepted, and began to make the daily trips out to the Mirador Group (structures 601-605) near the town of Kom Cheen. After a month of making the 1 ½ hour trip each way from Mérida to the Mirador Group it occurred to me to ask the Mayan workers, who appeared quite fresh from their walk from Kom Cheen, how long it took them to get to work. Answer: 15 minutes! So I got myself invited to stay in Kom Cheen which the workers gladly set up for me.

While the Mayan workers met my expectations in their general stature, once I was installed at the school in Kom Cheen (that is where they decided I should sleep) I began to get acquainted with the other town's people. There was one family which appeared to be particularly well off and both the father and the older boys worked at jobs in Mérida, no small task in those days as the road from Kom Cheen to the main road to Mérida was not much more than a cleared pathway over which the bus would crawl at about walking speed. The thing about this family was that the boys were all quite sizeable, at about my height (5'9"). Despite this, it did not occur to me to question the thesis that the Maya were naturally short.

Another Clue about Stature, this time Pre-Columbian

At around Christmas another excavation started up, this time at Structure 500, a formative period building. For a while I was moved with a number of Kom Cheen workers to this site. Unfortunately, the archeologist working on this site became ill and the notes to the excavation were lost.⁴ However, the one thing I do remember about this site is that the workers came across a burial in

⁴ See page 56 of "*Excavations at Dzibilchaltun*", published by MARI in 1980.

which one of the femurs was intact. There was great excitement among the workers at this find, since they had never seen a femur of this length. After “trying it on” on a number of people, me included, they went to the tallest archeologist, who was about 6’2”, and finally found a match. It should be remembered that the Maya are quite used to exhuming their family members, due to the custom of taking the bones out of the grave after two years in order to make room for future burials, this because of the limited burial space in Yucatecan cemeteries. Thus, they are well aware what length the various bones should be.⁵

A Quote from Landa’s *Relaciones de las Cosas de Yucatán*
indicating that in the 1500’s the Maya were taller than they are today.

Landa, in his *Relaciones de las Cosas de Yucatán*, has this to say about the Mayan women: “Que las indias de Yucatán son en general de mejor disposición que las españolas y más grandes y bien hechas, que no son de tantos riñones como las negras.” (“The Indian women of Yucatan are generally better looking than Spanish women and larger and well made, for they do not have such large loins as the black women.” Tozzer, 1941.) Given that recent research indicates that the average height of European women in the 1500’s was about 5’2”, it would appear that the height of Mayan women has decreased between the time Landa made his observation and the time when Morley carried out his studies.

An Unusual Taxi Driver in Kom Cheen

My experience in Kom Cheen set me on the path of learning more about the Mayan language. After getting married to Alejandra, who was born in Ticul, we bought a lot in Kom Cheen and spent our winters there. The timing was quite coincidental with radical changes for Kom Cheen. As mentioned above, before 1970 there was limited communication with Mérida due to the road. By 1970 this had been fixed and now one could reach downtown Mérida in a matter of ½ an hour. Electricity was also brought into town as well as a government clinic.

The introduction of the paved road brought along with it a small fleet of taxis which ran back and forth between Kom Cheen and Yax Che, the point where

⁵ Cogolludo (1971:244-245) records a similar circumstance which happened in 1647 in which a very tall body was found buried near the town of Becal: “Hubo indios en tiempos pasados, de mayores cuerpos que los <245> ordinarios, y que se hallaron en sepulcros de esta tierra, de estatura como gigantea. El año de mil y seiscientos y cuarenta, y siete, junto al pueblo de Vecál (**Becal**) en el camino real de Campeche, mandando el padre Fr. Juan de Carrion (hoy comisario provincial para el capítulo general próximo) hacer una ramada para un recibimiento, cabando para poner los palos con que se hace, dieron con la barreta en una sepultura muy grande, hecha de lajas una sobre otra, sin curiosidad alguna. Los indios huyeron de ella, y fueron á llamar al padre, que llegando les mandó sacasen lo que en ella había. Los indios no quisieron, diciendo les era vedado tocar á cosa alguna de aquellas, con que el religioso, ayudándole un muchachuelo, sacó unos huesos de hombre de estatura formidable.”

the town's road meets the main highway between Mérida and Progreso. This is where one could catch a bus at fairly frequent intervals to go to either Mérida or Progreso. It was at this time that we met another unusually tall member of the town, José, who was in his late teens at the time. He had managed to buy a car to use as a taxi. José is about 6'2". Other than that, there was nothing to distinguish him from other people in Kom Cheen. However, as I understand the situation, his mother was a "**kech**", meaning a mistress for some person from Mérida. Apparently this man gave José's mother enough money so that they lived better than the average family in town. There were two results from this: José grew to his full potential in height and he was able to afford a car, something almost unimaginable for most of the families in Kom Cheen. Again, José's physical stature should have been something which should have alerted me to the fact that the Maya of Kom Cheen are short in stature not because of genetics but because of being malnourished.

Change comes to Kom Cheen And with it A Radical Change in Stature

In about 1980 the social structure of the town underwent a huge change. The town's henequen plantations were shut down, thus forcing the male population to find new ways to earn their living. At the same time the women began to get jobs at the maquilladoras set up in the nearby town of Dzit Ya, mainly as seamstresses.

These facts meant that now the women were wage earners, and their spending priorities were quite different from that of the men. The men would drink away a large part of their pay on Saturday and Sunday. The women however were much more concerned about having food for their children and made sure to budget their money so that the family had adequate food throughout the week. One of the side effects of this transition was that whereas before this happened meat was only available of weekends, now meat is available throughout the week, and there are more places selling meat.⁶

By the mid-1990's the effect of a better-nourished population was making itself very noticeable. There are now many younger people who are quite sizeable, and I would say that the height of 5'9" is not unusual, even among the girls. As an example, just before the Mexican Olympics of 1968 the government set up basketball courts throughout the country, and Kom Cheen was one of the towns to have one built in the **kiuic** or downtown square. Before this transformation in height the game of basketball seemed like a real challenge for the kids, but now things are more in proportion.

⁶ Another side effect is now people from the north of Mérida and the surrounding area come to Kom Cheen to buy freshly killed meat rather than buy packaged meat in the supermarkets which have sprung up in the northern outskirts of Mérida. This is of course a boost to the local economy.

The Tale of Three Generations of a Guatemalan Family

During Easter Week of 2011 my wife and I were in Antigua, Guatemala. We were watching one of the processions and a Guatemalan family which was speaking a mixture of Spanish and English came to stand beside us. One of the men of the middle generation, a fellow of about 50, began to talk with us and in the course of the conversation informed us that his parents had moved to the United States when he was 4 years old. Standing with him to watch the procession was his mother's sister who was in her late 70's, a couple of cousins of about his age, and his daughter and nephew, both of whom were born and brought up in United States. The man was about 5'7", somewhat taller than his cousins who were born in and lived in Guatemala. His aunt, who the man said was the same height as his mother, was a little shorter than a typical lady from the Chimaltenango region, about 4'4". His daughter was about my height (5'9") and the nephew was about 6'. At one point in our conversation we talked a bit about this height variation in his family and we both came to the same conclusion: nutrition was the driving factor for the variation in height in his family.

Dimorphism

As mentioned in the report about the average height as recorded by Morley, there was a noticeable amount of dimorphism between males and females in the 1930's. This was also true when I first went to Yucatan, with the men being noticeably taller than the women. While in Kom Cheen there is a still certain amount of dimorphism between the height of boys versus girls, it appears to me that the amount of difference is now quite a bit less. There may be various factors involved here. The girls are now much more active and compete with the boys in games such as the late afternoon basketball games. How this might contribute to the diminution of dimorphism is something open to study, but perhaps it might have to do with an increase appetite. Furthermore, perhaps the difference in height is not as evident with the taller stature which means proportionally the difference is less.

What struck both me and my wife about the stature of males and females in Mayan communities in Guatemala was that there was almost no observable dimorphism. In fact, at times it seemed that the females were actually somewhat taller than the men. However, this may be because of several contributing factors, amongst them being that often working-aged males were away working either in the agricultural fields of Guatemala or as is now more often the case they have gone off to the United States to work, thus draining these towns of many males.

Physical Attributes of the Maya of Yucatan

While it has long been supposed that the Yucatec Maya are derived from Asian populations, recent DNA tests on various skeletal remains, including

that of Naia, a roughly 12,000 year-old skeletal remains of a teenaged girl found in a cenote near Tulum, has confirmed this. Thus, as to be expected, the Maya have many physical traits which are Mongoloid.

Round Heads, Round Faces

Starting with the head, the Yucatec Maya are round headed, with a cephalic index being between 85 and 86. They are also round-faced. The distinctive Mayan nose is yet another feature. Throughout the artwork of the Maya the portrayal of the hooked nose is quite distinct and amongst the modern Maya the hooked nose or Mayan nose continues to be a distinguishing feature. Another noticeable characteristic is the placement of the various features of the face, with high cheek bones and the eyes being placed fairly high on the face when compared with European types.

Hair

The hair on the head is rather coarse, making cutting the hair somewhat more difficult. Facial hair on males is rather sparse much like that of other people of Mongolian descent such as the Koreans. Body hair is in general absent with the exception of pubic hair and in some individuals under the armpits. Incidentally, it would appear that the lack of body hair is a recessive genetic trait because children born of mixed race parentage with one of the parents being of European decent generally have very noticeable body hair. This seems to be a function of the coarse hair gene combining with the body hair gene resulting in rather coarse body hair.

Hair color is generally black, but there are some individuals who have a reddish tint to their hair, at times quite noticeable. Of course, at the present time this may be a result of mixed race heritage, as for example the people from Kanasin who claim to have a certain amount of Austrian ancestry due to the fact that the guard regiment of Empress Charlotte was supposedly stationed at a nearby hacienda during the mid-1800's. In many older individuals the hair turns partially grey with the grey and black hairs being intermixed, or in some few individuals the hair turns completely grey. Balding is rarely seen amongst the Maya, although the hair of some individuals tends to get thin. According to folk wisdom, the thinning of hair in women is due to the fact that women are constantly combing their hair. Be this as it may, the fact is that some women do loose a significant amount of hair in old age.

Skin Color

Skin color tends to be fairly dark brown and the Maya refer to themselves as **"box uinicoob"** or black people. The Mayan word **"box"**, black, is also incorporated into Yucatecan Spanish with the word **"boxito"** which is one of the terms used by the Yucatecan Spanish people when they refer to the Maya. However, it would seem that there has always been a variation in skin color and that some individuals were fairly light color just as is the case now. These people are referred to as being **"chel"** or **"rubio"** (blond or fair) in Spanish.

The reason for supposing that there have always been light-skinned people is because Ix Chel is the name of the most important goddess in the Mayan pantheon and it is reasonable to assume that as the name implies she was thought to be a light-complexion person. As is the case with many cultures, light-skinned people are admired and held in revere more than the dark-skinned people amongst the Maya. Despite their dark color the Maya are susceptible to sunburn and being constantly in the sun makes the skin yet another shade darker.

“Cul Cal” or seated / short neck

Working down the body: the next noticeable physical trait is something which the Maya refer to as “**cul cal**”, meaning “short neck” or “seated neck”. This is something which sets the Maya apart from the Mongoloid cousins who tend to have necks of normal length. The trait “**cul cal**” is nicely portrayed in the Mayan pots K511 and K1339. No Nefertitis to be found here, nor as a general rule amongst the modern Maya. “**Cul cal**” appears to be a dominant genetic trait because many individuals of mixed race heritage, with one parent being either of European or Oriental heritage, will also have “**cul cal**”.

The “Figura Maya”

Like their Mongolian and other oriental cousins, the Maya have long torsos, long arms and relatively short legs when compared to European body types. Another of the physical traits of the Maya, especially in Mayan woman, is the lack of a discernable difference between the waist and hip, unlike the European body type where an hour-glass shape is the norm. This seems to hold true even for those woman, few that they are, who are reasonably trim. But for the most part the body types tend to be fairly stocky and the hour-glass shape is either lacking completely or at least hidden by a hefty layer of fat.

It should be mentioned that until recently Mayan men preferred pleasingly plump women, and women who were relatively skinny tended not to have suitors. Thus there was in fact an incentive to be full-figured and weight-watching was definitely not part of a woman’s thinking. At the present time this is changing with the Barbie syndrome now having itself felt amongst the modern population.

The change in stature does not seem to affect body proportions, with the taller Mayans still having a “**cul cal**” and long torso, although from casual observation it appears that proportionally longer legs is one area which might be affecting over-all stature.⁷

⁷ For more on this subject see Barry Bogin and Maria Inês Varela-Silva, Leg Length, Body Proportion, and Health: A Review with a Note on Beauty; *Int. J. Environ. Res. Public Health* 2010, 7, 1047-1075. See specifically: “Guatemala Maya, for example, consume only approximately 80% of the total energy needed for healthy growth, and 20.4% are also iodine deficient. Iodine deficiency during infancy and childhood results in reduced leg



A close-up of K1339 showing the traits of the Mayan nose, “**cul cal**” and “Figura Maya”

Formerly body shape, especially in women, were hidden by clothing, with the **uipil** not being revealing of body shapes. But now most women wear western-style clothing which reveal their body types, so the “Figura Maya” has become much more apparent.

It might also be mentioned that the **uipil** neck opening with its embroidery tends to minimize the feature of **cul cal** whereas western style clothing does not so this is another feature which is more apparent then formerly due to the change in dressing habits.

length, especially the distal femur, the tibia and the foot. Maya children and adults spend considerable time and energy at heavy labor, which diverts available energy in the diet away from growth. This nutrition and lifestyle combination is known to reduce total stature and leg length. ... Maya-American children are currently 11.54 cm taller and 6.83 cm longer-legged, on average, than Maya children living in Guatemala. The values indicate that about 60% of the increase in stature is due to longer legs. Consequently, the Maya-Americans have a significantly lower average sitting height ratio than do the Maya in Guatemala.”



A close-up of K511, again showing the traits
of “cul cal” and “Figura Maya”

Bowlegged and Knocked Kneed

In his *Relaciones* Landa made the observation that the Maya are bowlegged due to the custom of carrying babies about astride the hip in a method known as **hetz mek**. (See the *Relaciones*, page 15v.) In my estimation this observation is incorrect. The male population does indeed show a marked tendency towards being bowlegged, but a fair number of women, especially the younger girls, tend to be knocked-kneed. One possible explanation for this gender difference is that the male population from early age is required to carry heavy loads on their backs whereas the female population tends not to be subjected to these heavy burdens.

There are certain towns in which the inhabitants show a more marked tendency to being bowlegged than others. It would be an interesting study to see if the underlying cause is genetic or some dietary deficiency which cause bowleggedness to be more common in these towns.

The Mongolian Spot

In common with many Asian populations as well as Amerindian populations, the birth mark called the “Mongolian Spot” is a common feature seen on young Mayan children. This spot normally occurs on the sacrum-coccyx region at birth but disappears with time. Often children of mixed-race ancestry, in which one of the parents comes from a race in which the Mongolian Spot does not appear, will also have the Mongolian Spot at birth, so it seems to be a dominant genetic feature.

Body Proportions

In his work on body proportion, *Vier Bücher zu menschlicher Proportion*, Dürer noted differences in the proportion between head height and the overall body height. He showed that peasants tended to have proportionally larger heads for their body height than people from the upper classes. The Maya in general fit into the peasant class category, with head-height ratio being somewhere between 5:1 or 6:1. There are some individuals which fit into latter categories where the head-height ratio is closer to 7:1 or 8:1, such as José mentioned earlier in this paper, but they are the exception.

Some Thoughts

About Comparisons of Physical Attributes

Those of us from European descent often look at the world from our own experiences. However, should one take the time to consider what the world looks like from the Mayan point of view, and thus consider Mayan physical traits as being the norm, then the world looks a lot different. Of all of the physical traits of various races of people throughout the world perhaps the Tutsi would seem to be the most extreme, but European physical traits would not be that far behind in being unusual variants of head and body types compared to what a Mayan person would consider to be the norm. The National Geographic ran an article about Neanderthals in October, 2008 and depicted a reconstruction of a Neanderthal woman. Interestingly enough, many of attributes shown there are similar to attributes which are talked about in this article about Mayan physical attributes. As woman of mixed European-Native American ancestry wrote in a letter to National Geographic, published February 2009, to her the model depicted looks like a “worn-out version of me”. I think most Maya women would say the same, and that it is the European head shape and body type which is not normal.

Further Study Needed

Of course, the above is all through casual observation. I should have thought that a very interesting project could be set up which would take actual measurements to see what is really happening. Morley and other sources talk about the typical caloric intake of the Maya before this transition took place. This could be compared to what is in the diet now, and that could be compared against the stature of the older people who grew up prior to 1980 versus the younger ones who are growing up with a richer diet.

Comparison of Body Types

Neanderthal

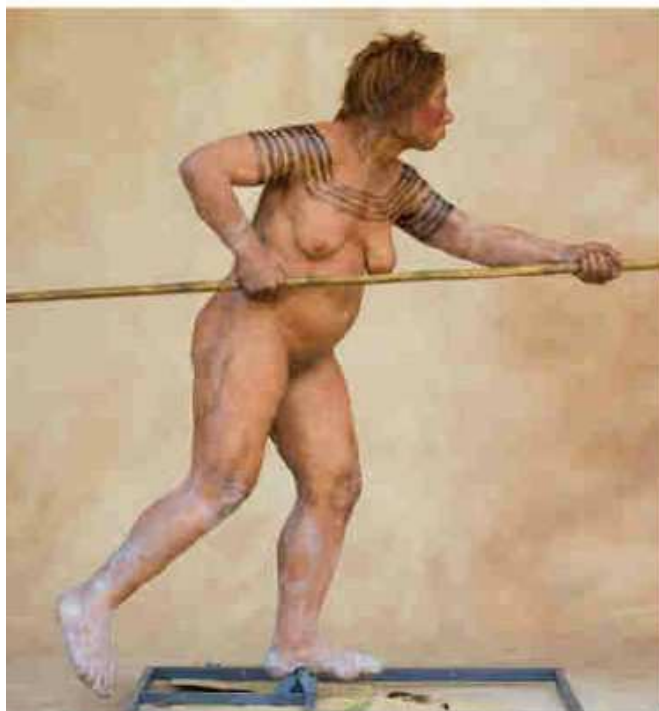
European

Mayan



Neanderthal

Mayan



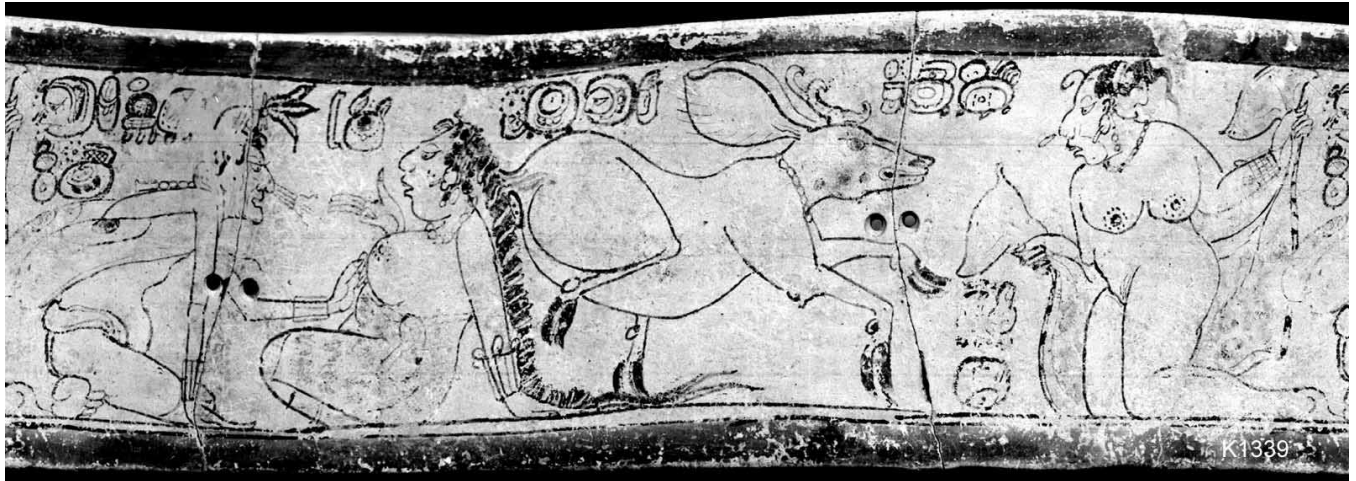
Depiction of a Neanderthal Woman



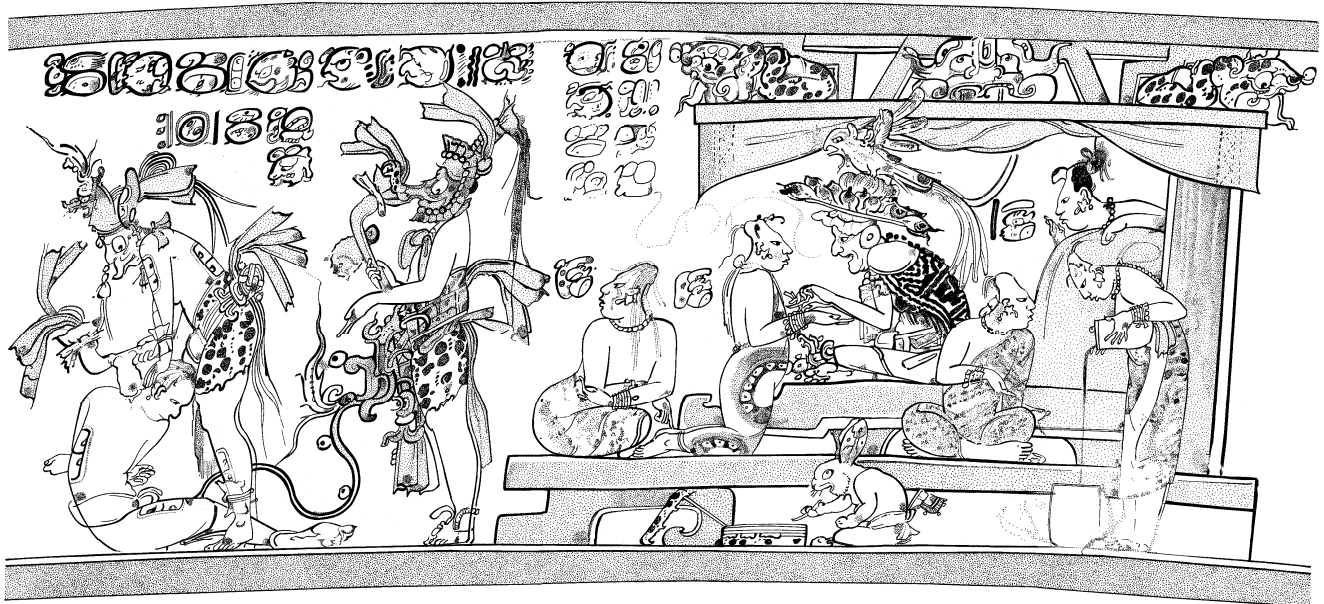
National Geographic, October 2008, pp. 38-39



Facial Reconstruction of Naia compared with a modern Korean Actress



Full Rollout of K1339



Full Rollout of K511