

Maya Achievements

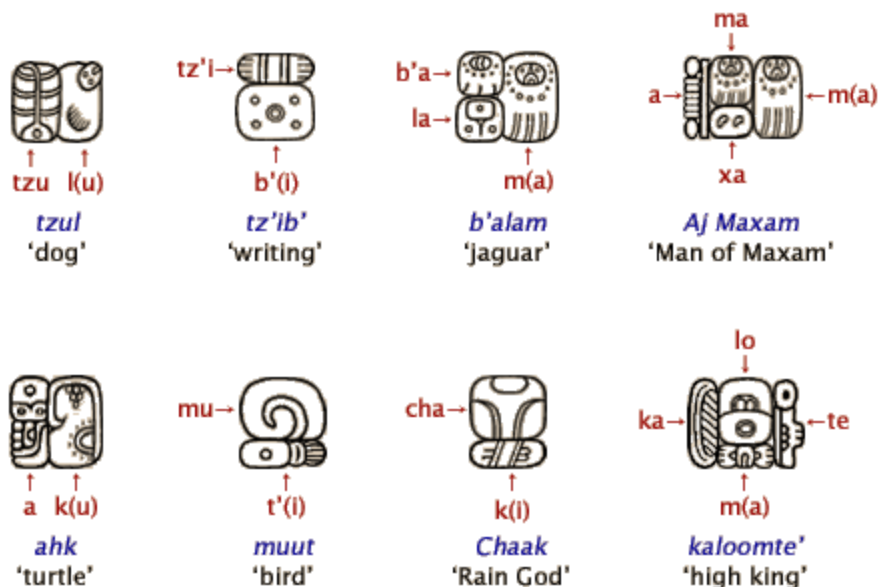
WRITING

The Maya used the most advanced system of writing of the ancient Americans. They probably borrowed the idea of picture writing from another ancient American group known as the Olmec. They then developed their own system of writing based on that.

They did not use an alphabet like we have. Instead, they used a combination of pictures to represent ideas and symbols representing sounds. The pictures and symbols used in their writing are called GLYPHS. We currently know the meaning of about 800 Mayan glyphs.



Scientists study Mayan writing in the few remaining Mayan books and examples that are carved into stones. Many of these stones are from the ancient Mayan buildings. Much of the Mayan writing system remains a mystery. So far, we only know the meaning of fewer than half of the glyphs that have been discovered.



The Mayans also created books made from fibers from the bark of a ficus tree. The name for a Mayan book is a CODEX. They would paint colorful glyphs and pictures of gods, animals and objects. Sadly, only 3 complete Codices remain today. The books were one of the first things the Spanish Conquistadors destroyed. The Spanish saw that as “evil.”



MATH and ASTRONOMY

The Mayans developed an important system of mathematics. The Mayans were perhaps the first people to use the idea of zero. (even before India) They used a picture of a shell to represent the number 0.

A dot was used to represent the number 1, while a bar was equal to 5. The Mayan used a base of 20 the same way we use base 10. They also wrote their numbers from top to bottom instead of from left to right as we do.

0 	1 	2 	3 	4
5 	6 	7 	8 	9
10 	11 	12 	13 	14
15 	16 	17 	18 	19
20 	21 	22 	23 	24

0 	1 	2 	3 	4 	5 	6 	7 	8 	9
10 	11 	12 	13 	14 	15 	16 	17 	18 	19

Example:

$$28 = (1 \times 20) + 8 =$$



$$433 = (1 \times 400) + (1 \times 20) + 13 =$$



An advance system of astronomy was also developed by the Mayans. The priest would study the movements of the Sun, Moon, planets, and stars. They could predict eclipses and the orbit of the planet Venus. The Mayans believed that the heavenly bodies were gods. If they studied the sky, the Mayans hoped to learn to predict events on earth that these gods controlled.



To study the heavens, the Mayans built large observatories in many of their cities. One that still stands is located in the city of Chichen Itza. The Mayan priests would use their knowledge of astronomy and mathematics to develop accurate calendars. (one used for planting and harvesting and the other for religious ceremonies) Mayans believed that the last 5 days at the end of the solar year were “unlucky”.



Maya Day Names and Approximate Meanings			
Imix	Water Lily	Chuwen	Frog
Ik'	Wind	Eb	Skull
Ak'bal	Night	Ben	Corn stalk
K'an	Corn	Ix	Jaguar
Chikchan	Snake	Men	Eagle
Kimi	Death head	Kib	Shell
Manik'	Hand	Kaban	Earth
Lamat	Venus	Etz'ab	Flint
Moluk	Water	Kawak	Storm cloud
Ok	Dog	Alaw	Lord

ARTS AND CRAFTS

Nothing remains of ancient Mayan cloth, feather, or basket weaving. Because of the damp weather in the Yucatan Peninsula they have rotted away. We have an idea of what they looked like from the remaining murals, vases, paintings and sculptures.



It was the Mayan women who did the spinning and weaving. Cotton was the most common fiber used, but sometimes they would use rabbit. They would make cloth for both home use and for trading purposes.



Mayan Weaving

- In Mayan culture, weaving was central to a woman's role in the household.
- In addition to its economic importance, weaving was considered to have spiritual elements.
- Today, Mayan descendants in the Guatemalan highlands continue these traditions.

The Mayans used brightly-colored cloth creating the colors from both minerals and vegetables. Some colors had special meanings like black represented war, yellow food, red for blood and blue was used to indicate sacrifice.



Mayan sculptures have lasted through time. Limestone was the most often used material. Clay and wood carvings were used for decoration. They never developed metal work. They used tools made from stone. The most famous Mayan carvings appear on tall stones called STELA.



Painting was another major Mayan art form. Scientists have discovered brightly colored murals on the walls of Mayan buildings. The murals are frescoes. The artists applied the paint while the walls were still wet. Most murals portray everyday scenes as well as religious ceremonies.

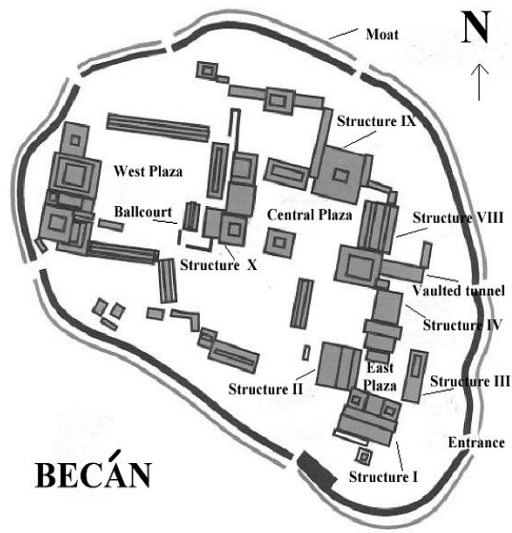


ARCHITECTURE

The Mayans are perhaps best known for their beautiful architecture. Mayans built cities across the southern part of Mesoamerica in the Yucatan Peninsula. Even the cities varied a little they all had some things in common.



All cities were designed around a central area where the pyramids, temples, and palaces were located. This allowed all citizens to participate. There were roads that would connect different parts of the city together. There were also large plazas where the public could gather together.



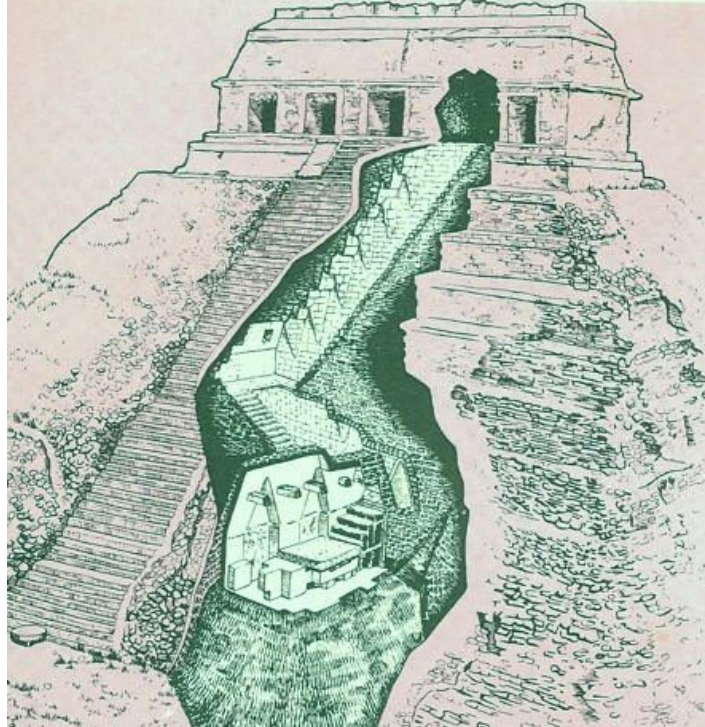
Mayan temples, palaces and plazas were built with large stone blocks. The Mayas did not have work animals or wheeled vehicles to help them move the supplies around the cities. It took man-power to move the materials around. Remember their tools were also made from stone.



Pyramids were the largest buildings in the cities. They could be over hundreds of feet into the air. At the top of the pyramid was a temple for sacrifices. Some even had secret passageways.



Inside the pyramids... secret mazes and tunnels



Inca Achievements

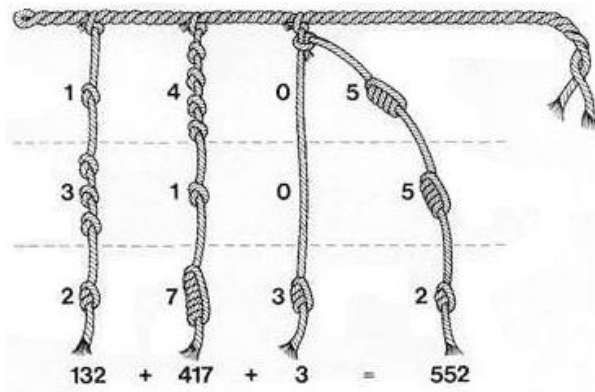
WRITING

The early history of the Incas is a mystery since the Inca never developed a writing system. The Inca like the ancient Africans had an oral tradition. Their spoken language was called Quechua. With a common spoken language the people could share myths and histories helping to unify the empire. We can study ancient artifacts of the ancient cities for clues to the early Inca story. We also can look at the writings of the Spanish conquerors for any Incan history.



MATH

The Inca did develop a counting system that used a base 10. They would use a QUIPU to remember numbers. The quipus had a main cord about 2 feet long. They would tie many different colored strings together at the main cord. Each string had knots tied in it representing different items and quantity of them. The color of the strings and the distance between the knots also had meaning. Each year the government would take a census (counting of the people) to be sure that they had enough food and supplies to take care of them.



ARTS AND CRAFTS

Weaving was one of the most important crafts of the ancient Inca. The Inca valued these textiles even more than gold work. The women did most of the dyeing, spinning and weaving of cloth. However many Incan men were also weavers.



The incas used wool from the llama to make blankets and ropes since it was more coarse and came in more colors.. Wool from the alpaca which was white with some gray and brown was used to make clothing while the wool from the vicuna was reserved for the leader since it was considered the finest cloth and some thought even thought it was as smooth as silk.



Inca cloth had bright, bold colors. They would get the colors to dye the wool from metals like copper and tin. They also like the Maya used vegetables and plants to get color. For example the indigo plant gave a bright blue and the achiote tree was a brilliant red.



They even used ground shellfish to create purple. The Incas used embroidery to decorate their cloth. The more important might even have gold, silver and copper attached to them while others might have feathers woven in for decoration.



The Inca might be most famous for their weaving, but they also developed skills using metals. They used gold, “Sweat of the Sun”, silver, “Tears of the Moon”, copper and tin. They even discovered how to make bronze by melting copper and tin together. Mining for the metals was usually done by the men. All of the gold would become the property of the ruler. Metal workers would pound the gold into thin sheets to cover the walls of the palaces.



They also made statues and other decorations for the ruler. The ruler and nobles also used silver for decoration. Mask, plates and jewelry were also created. Copper, tin and bronze were also used to make artistic, as well as useful items. Archaeologists have found many examples of Incan metal items such as knives, weapons, pins for garments and tools.



The Inca also created a variety of pottery. Examples survive of three-legged pots, plates and drinking cups. The most unusual Inca pottery was the aryballuses. These were jars with a pointed bottom. It balanced itself upright when filled. It rested on its side when empty. Most Incan pottery had knobs attached to tie ropes to make them easier to carry. Most decorations elaborate which small geometric Patterns.



ARCHITECTURE

The Incas were master builders. They had the best planned cities in the ancient Americas. Cities were laid out in a grid. Each city had a central plaza, with the major temples and public buildings surrounding it. The center of each city included temples, a palace for the visiting Inca, and housing for the priests and nobles. The everyday common people lived in the surrounding area.



The Inca did build large stone fortresses near each city where the citizens could gather in times of danger. Inca buildings remain among the most amazing ever built. The Incas used huge blocks of stone. One stone even measured 36x18x6 feet. They would cut and polish each stone with small stone tools and then move them into the proper place. The stones fit together perfectly, so there was no need for cement to hold them in place. Even today, a knife blade cannot fit into the cracks between the stones of these ancient buildings. These buildings have even withstood earthquakes that shake the Andes Mountains.



The Incas used trapezoidal openings for all of their doors and windows. The four sided openings were smaller at the top than at the bottom.



The Incas did not decorate the outside of their buildings, but they made beautiful decorations for the insides of the palaces and temples. Usually using solid gold. The two most famous cities and Cuzco the capital and Machu Picchu.

Machu Picchu





City of Cuzco

ENGINEERING

The Incas built irrigation canals and terraces for farming. They also drained swamps.



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But their greatest engineering accomplishment was their roads and transportation system. The Incas built one of the ancient world's best transportation systems. They built roads and bridges to keep the empire together. The transportation system allowed them to have fast communication between villages and cities. They also used it to move food and other supplies. The roads also allowed the military troops to move faster. Much like the Roman Empire and Trajan did. The Incan roads stretched for close to 15,000 miles. There were 2 main roads in the Inca Empire. The Royal road was 3,250 miles long traveling through the countries of Ecuador, Peru, and Bolivia in to Argentina and Chile. The other major road, the Coastal highway was 2,520 miles. The Inca roads crossed through deserts, mountains and even jungles.



They also crossed through rivers on bridges that swung from cables. These bridges were called *chacas*. The hanging bridges are the most famous of the Inca *chacas*. One was over 250 feet long. Built in 1350 it lasted until 1890.



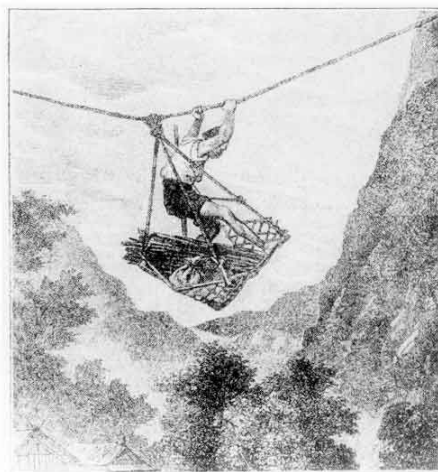
The Inca used the fibers from the maguey plant to weave the cable for the bridges. The main cables were from four to five feet thick. The usually needed to be replace every two years.



The Inca also built pontoon bridges made of reed boats tied together.



Another type of bridge had a basket that hung from a cable stretched between two stone towers. Travelers got into the basket and a workman then pulled along the cable to the other side.



The roads were paved with stone. Even today, some of these ancient roads can still be seen in parts of the Andes Mountains. The roads belonged to the government and could only be used with permission. The Inca did not have wheeled vehicles. The travelers and messengers would walk or run to their destination. The Inca used llamas to carry goods. They built rest houses called *tampus* about every 12 to 20 miles to provide a place to rest and eat if needed.



Medicine

Brain surgery

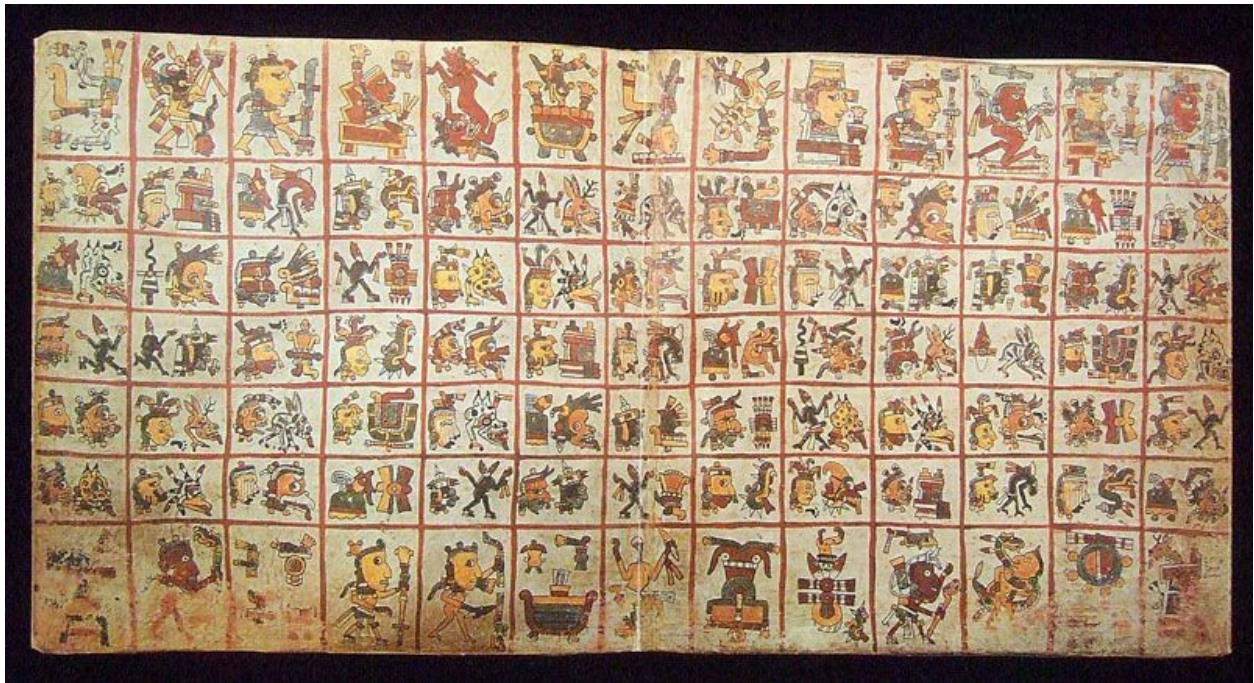


Brain surgery among the Incas was common, and surgeons successfully removed small portions of patients' skulls to treat head injuries suffered during combat. A similar procedure is performed today to relieve pressure caused by fluid buildup following severe head trauma. Around the ancient Inca capital of Cuzco, skulls dating back to AD 1000 show advanced surgical techniques. Many of the oldest skulls showed no evidence of bone healing following the operation, suggesting that the procedure was probably fatal, but by the 1400s, survival rates approached 90 percent, and infection levels were very low.

Aztec Achievements

Writing

The Aztecs valued words and language. They created beautiful bark-paper books, similar to the Maya codex. Aztec writing was less advanced than the Maya system, so these books mainly contained lists of names and dates. Though their writing system was important for record-keeping, it was the spoken language that mattered the most to the Aztecs. The Aztecs were orators, or public speakers. In fact the word *tlatoani*, great speaker, was often used to refer to the Aztec emperor. Orators would perform at both public and private gatherings. Their favorite topics were stories from the past and legends of their gods. This was a way to pass down history from one generation to another. (oral tradition) The Aztec language is called *Nahuatl* and is still spoken today.



Given their love for language, it is no surprise that poetry was the most important form of Aztec literature. Poets were highly respected in society. The most famous of the royal poets was *Nezahualcoyotl*, the great ruler of the city of Texcoco. In one of his poems he reflects on the fleeting nature of life:

*"Is it true that on earth one lives?
Not forever on earth, only a little while.
Though jade it may be, it breaks;
though gold it may be, it is crushed;
though it be quetzal plumes, it shall not last.
Not forever on earth, only a little while."*

-Nezahualcoyotl



Aztec poetry could be joyful, too. Flowers and the beauty of nature were also typical classic themes. This poem compares poetry and the role of the poet to flowers in bloom. Author unknown

*The flowers sprout, they are fresh, they grow;
They open their blossoms,
and from within emerge the flowers of song;
among men You scatter them, You send them.
You are the singer!"*

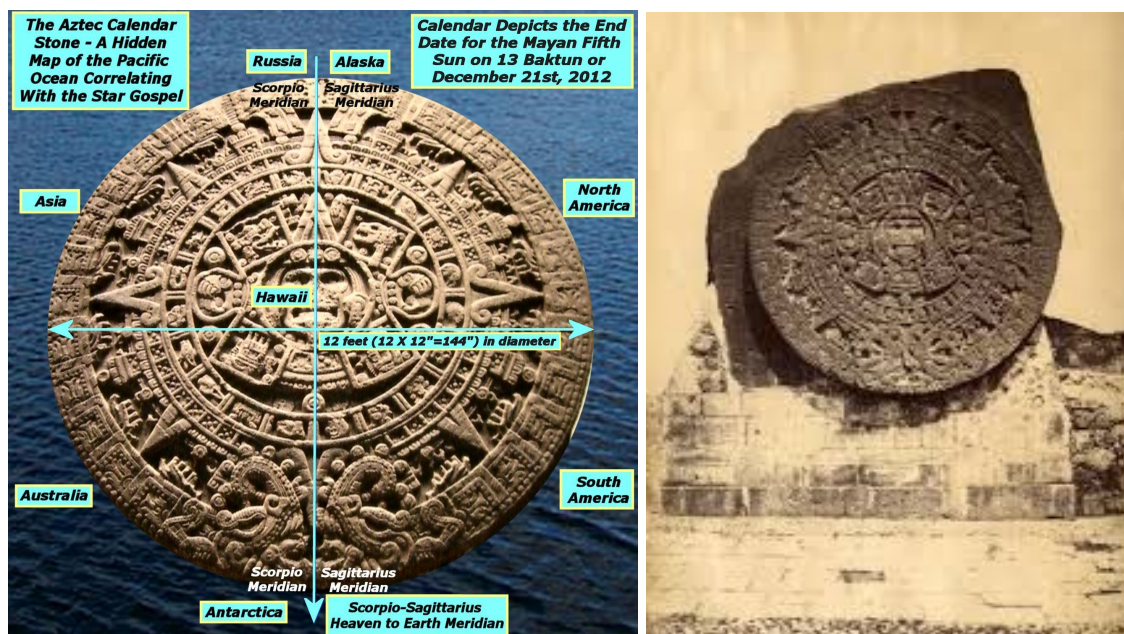
Aztec poem author unknown

MATH and ASTRONOMY

The Aztecs used the calendar much like the Maya. They used two different ones. The first was based on the lunar calendar and the phases of the Moon. The lunar calendar has only 260 days. The Aztecs divided their calendar into 13 months, each having 20 days. They thought this calendar was magical. The priests would use the lunar calendar to decide which days would be used for religious ceremonies and rituals. Priests also used this calendar to decide which days were lucky and should be used for important activities such as planting crops or going to battle. A number of dots represented the months and each of the 20 days had a name and a hieroglyph. The Aztecs based their second calendar on the movement of the Sun. Similar to ours today, it had 365 days based on the time it took the earth to orbit the Sun. They divided their solar calendar into 18 months each having 20 days. The extra five days were "nothing" days added to the end of each year. The Aztecs, like the Mayans thought these five days were unlucky. The Aztecs did nothing during these five days. At the conclusion of the fifth day they would sacrifice a victim in tribute to the gods.



One of the important artifacts from the Aztecs is the famous calendar stone. It was discovered in 1790. It is about 12 feet in diameter and weighs close to 20 tons. In the center of the stone is an image of the Sun god Tonatiuh. Other carvings on the stone represent the Aztec days and religious symbols.



ARTS and CRAFTS

Basic craft goods like baskets pottery and sandals were created and traded by the Aztecs. Most crafts were created for a purpose while some were fine art or works that are just to be looked at and admired.



Jewelry and mosaics were one of the Aztecs specialties. Mosaic artists would decorate knives, cups and sometimes even human skulls with tiny bits of colorful stones and shells. Jewelers made unique rings, necklaces, and other pieces from gold, silver and even beautiful precious stones like diamonds and pearls. The Aztecs also made items of metal. They used metals easily found in nature.





Aztec craftsmen also made clay pottery. Some of it was plain and for everyday use. The Aztecs kitchens contained many clay jars and other utensils. They also created elaborate and brightly colored ritual pottery.



Aztec women spent much of their time weaving cloth. They dyed, embroidered, and decorated the cloth. The higher a person's social status the more elaborate the decorations on their clothing. The Aztecs also excelled at feather weaving, one of the most prestigious art forms. Specialists made fans, headdresses, capes and shields from the brightly colored feathers of tropical and exotic birds they kept in aviaries to get the brightly colored feathers. This magnificent art was very fragile. The weavers attached the feathers to a net to make cloaks, headdresses, and other decorative items. Sadly only one example of Aztec feather weaving survives today. A headdress given by Montezuma to Cortes.

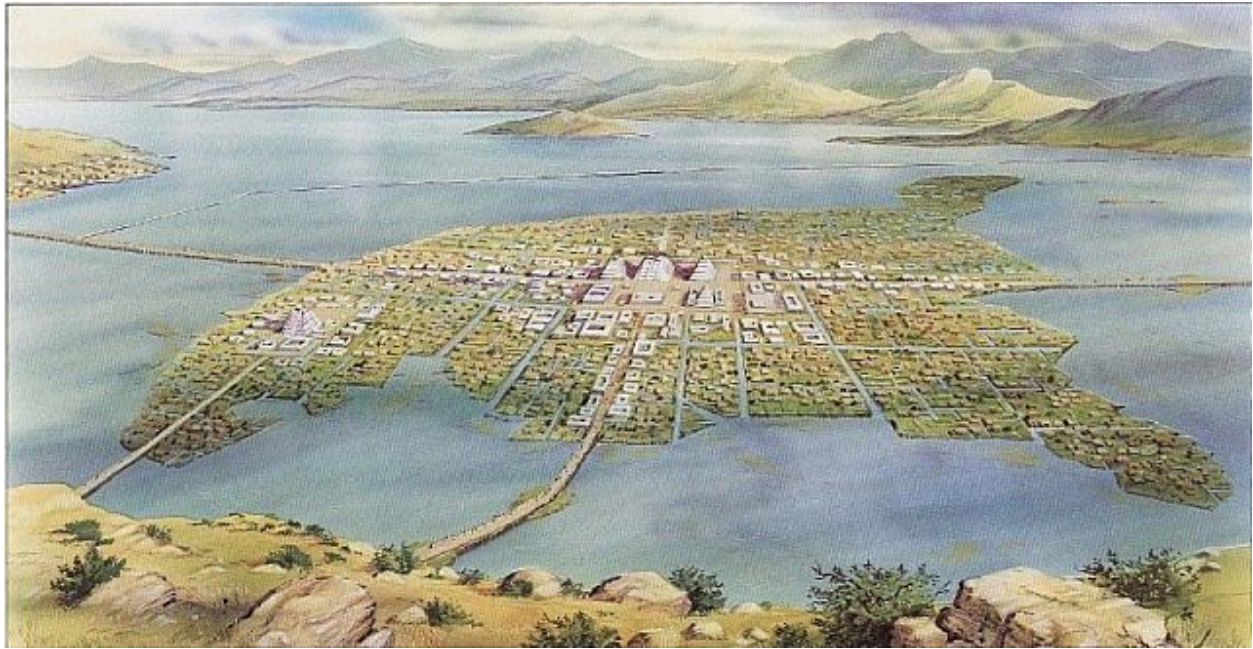


The Aztecs also carved beautiful stone sculptures. Aztec sculpture remains among the most elaborate in the Americas. Almost all Aztec art used religious subjects as themes. Some sculptures were small figures or masks made of jade or quartz crystal. Others could be huge like the Calendar Stone. Most of the sculptures came from decorations of the temple. The sculpture used a variety of subjects. Animals and representations of the gods were favorite subjects. We still see examples of sculptures of spiders. Some of the sculpture is huge, like the calendar and some is very small and delicate. The Aztecs used a variety of material for their sculpture. Stone was the most often used material. However, examples of Aztec art remain that were made of wood, jade, turquoise, emerald, and volcanic glass.



ARCHITECTURE

The Aztecs were accomplished architects. They designed and built an extraordinary capital city. Scholars have used historical accounts and archaeological remains to recreate the Aztec capital at its height. Tenochtitlan, the capital city was an island city built in the middle of Lake Texcoco. They divided the city into four quarters that were crossed by streets and canals. Long causeways, raised roads, connected the island to the lakeshore. The Aztecs built aqueducts to bring fresh water into the city. They also protected their cities from flooding and used the water to bring in fresh water to the chinampas floating around the city.



In the center or heart of the city was a large plaza. This was a sacred site used for public ceremonies and festivals. Dozens of pyramids, temples, and other buildings were scattered around the plaza. Facing the plaza on one side was the emperor's palace. The temple was the most magnificent structure in each Aztec town. It was visible from miles away and stood on the top of huge pyramid. The great pyramid at Tenochtitlan had two temples at its peak. The largest structure in the plaza was the *Templo Mayor*. This was a huge pyramid painted in bright colors. At the top of the pyramid were two shrines or places of worship dedicated to a sacred object or person. Another temple was built in the shape of a cylinder and had a huge door resembling a serpent's mouth.



The Aztec homes were spread out throughout the city and the plaza. Each area had its own small temples and markets for trade. The greatest market was in the area of Tlatelolco. The Spanish soldier Bernal Diaz described the scene this way:

"On reaching the marketplace...we were astounded at the great number of people and the quantities of merchandise ..You could see every kind of merchandise to be found anywhere in (the Aztec Empire)...If I describe everything in detail I shall never be done."

-Bernal Diaz del Castillo, The Conquest of New Spain

Every type of product was available at the market of Tlatelolco, from food and medicine to live animals and building materials.



MEDICINE

Ancient Aztec medicine was a combination of religion, belief in magical powers, and the use of plants and herbs to create different medicines. The Aztecs believed that some illnesses were punishments sent from an angry god or goddess. They also thought that an enemy could use black magic to cause an illness. The third source of an illness might be from natural causes. Aztecs practiced magic to avoid illnesses. They often wore amulets for protection. An amulet is a good luck charm. It is worn to keep away harm and evil.



Aztec doctors also used plants, roots, herbs, and barks to make medicines. Most of the plants and herbs used were sacred to the rain god Tlaloc. The two plants used most often were *yauhtli* and *iztauhyatl*.



They used both plants to cure fevers, epilepsy, stiffness, swelling, colds, and coughs. The doctors used the plants and herbs in many ways. Sometimes they would have the patient inhale the fragrance of a plant or the smoke from the burning plant. At times doctors ground up the dried plants or combined them with liquids to create different medicines. Another favorite source of medicine was the sap from the maguey plant. They used the sap in the treatment of battle wounds and other injuries.



The Aztecs also had skilled surgeons. They used knives made from volcanic glass to perform surgery. After doctors cut out a tumor, they covered the wound with crushed plants to speed its healing.

