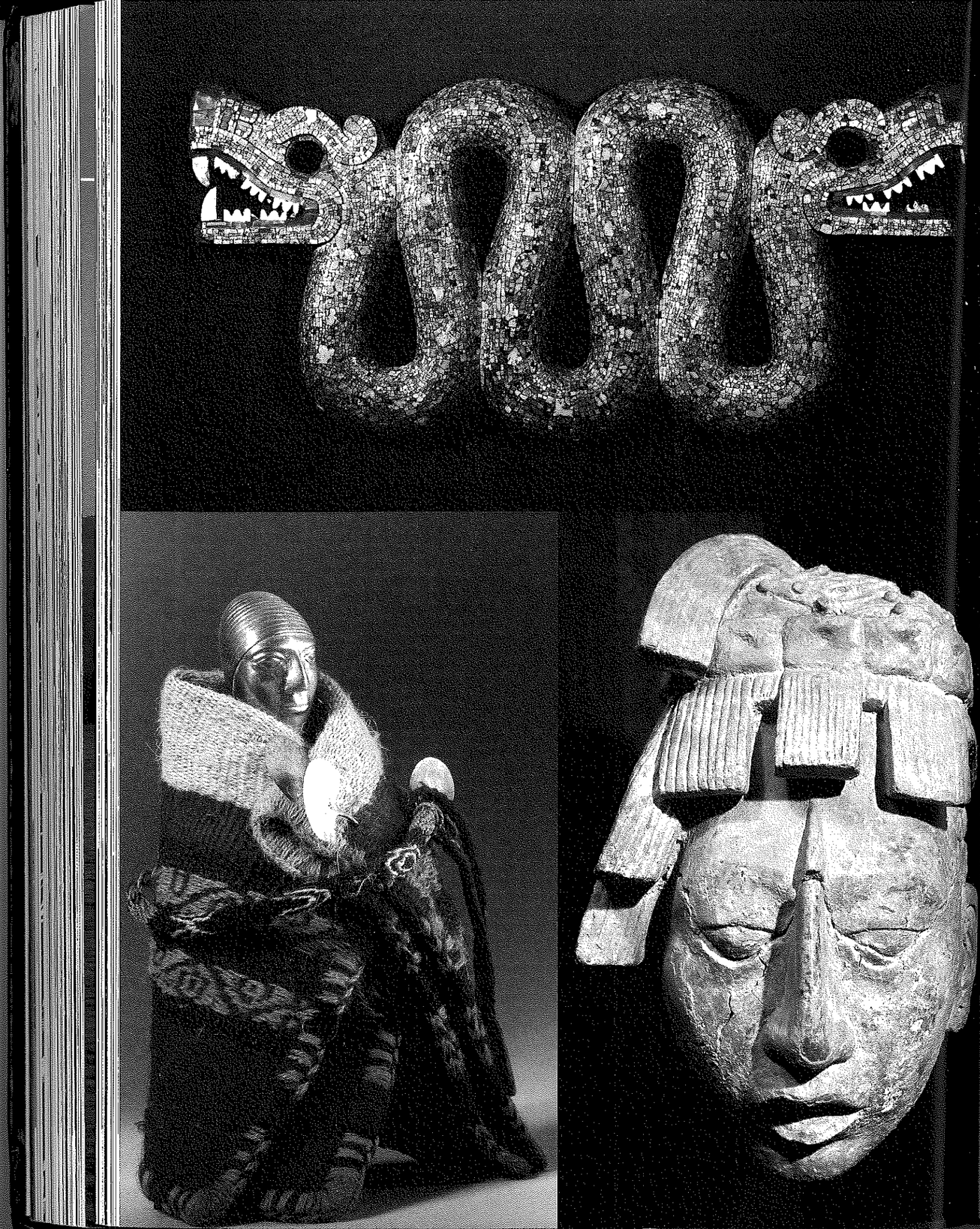


These artworks are from the Aztec (upper), Inca (lower left), and Mayan civilizations.

CHAPTER 27

Achievements of the Maya, Aztecs, and Incas

27.1 Introduction

In Chapter 26, you learned about the Inca Empire of South America. You have now studied three great peoples of the Americas: the Maya, the Aztecs, and the Incas. In this chapter, you will revisit the cultures of these peoples and explore their unique **achievements**.

The history of these cultures stretches from very ancient times to just a few centuries ago. Mayan civilization dates back to 2000 B.C.E. It reached its height in the Classic Period from about 300 to 900 C.E. The Aztecs and the Incas built their empires in the two centuries before the Spanish arrived in the 1500s.

Scholars have learned about these cultures in a variety of ways. They have studied artifacts found at the sites of old settlements. They have read accounts left by Spanish soldiers and priests. And they have observed traditions that can still be found today among the descendants of the Maya, Aztecs, and Incas.

The more we learn about these cultures, the more we can appreciate what was special about each of them. The Maya, for example, made striking advances in writing, astronomy, and architecture. Both the Maya and the Aztecs created highly accurate calendars. The Aztecs adapted earlier pyramid designs to build massive stone temples. The Incas showed great skill in engineering and in managing their huge empire.

In this chapter, you will study these and other accomplishments of the Maya, the Aztecs, and the Incas. You will focus on three main areas: **science** and **technology**, **arts** and **architecture**, and **language** and **writing**.

Use this illustration as a graphic organizer to help you explore the achievements of the Maya, the Aztecs, and the Incas.

solar year the time it takes Earth to travel once around the sun

stele a stone slab or pillar with carvings or inscriptions

27.2 Achievements of the Maya

Many of the greatest achievements of the Maya date from the Classic Period (about 300 to 900 C.E.). Hundreds of years later, their ideas and practices continued to influence other Mesoamerican groups, including the Aztecs.

Science and Technology The Maya made important breakthroughs in astronomy and mathematics. Throughout Mayan lands, priests studied the sky from observatories. They relied on simple methods, such as looking through a forked stick. Still, they were able to track the movements of stars and planets with striking accuracy.

The Maya used their observations to calculate the **solar year**. The Mayan figure of 365.2420 days was amazingly precise.

These calculations allowed the Maya to create their solar calendar of 365 days. Recall that they also had a sacred 260-day calendar. Every 52 years, the first date in both calendars fell on the same day. This gave the Maya a longer unit of time that they called a Calendar Round. For the Maya, this 52-year period was something like what a century is to us today.

Mayan priests still use sacred calendars. This priest is at a ceremony on February 24, 2000, to celebrate the end of the Mayan solar year 5,115. He prays for peace and prosperity in the coming year of 5,116, which began February 25.

Mayan astronomy and calendar making depended on a good understanding of mathematics. In some ways, the Mayan number system was like ours. The Maya used place values for numbers, just as we do. However, instead of being based on the number 10, their system was based on 20. So instead of place values for 1s, 10s, and 100s, the Maya had place values for 1s, 20s, 400s (20 times 20), and so on.

The Maya also recognized the need for zero—a discovery made by few other civilizations. In the Mayan system for writing numbers, a dot stood for one, a bar for five, and a shell for zero. To add and subtract, people lined up two numbers and then combined or took away dots and bars.

Arts and Architecture The Maya were equally gifted in arts. They painted using colors mixed from minerals and plants. We can see the artistry of Mayan painters in the Bonampak murals, which were found in Chiapas, Mexico. The murals show nobles and priests, as well as battle scenes, ceremonies, and a human sacrifice. These pictures have helped scholars learn about Mayan life.

The Maya also constructed upright stone slabs called **steles**, which they often placed in front of temples. Most steles stood between 5 and 12 feet tall, although some rose as high as 30 feet. Steles usually had three-dimensional carvings of gods and rulers. Sometimes the Maya inscribed them with dates and hieroglyphics in honor of significant events.

Weaving is a traditional Mayan art passed down through generations of women.

Another important art was weaving. We know from steles and paintings that the Maya wove colorful cloths in complex patterns. Women made embroidered tunics called *huipiles* and fashioned lengths of cloth for trade. Mayan women use similar techniques today. They still make their huipiles in traditional designs. People from different towns can be distinguished by the colors and patterns of their garments.

In architecture, the Maya built temple-pyramids from hand-cut limestone bricks. An unusual feature of Mayan buildings was a type of arch called a *corbel vault*. Builders stacked stones so that they gradually angled in toward each other to form a triangular archway. At the top of the arch, where the stones almost touched, one stone joined the two sides. The archway always had nine stone layers, representing the nine layers of the underworld (the place where souls were thought to go after death).

Language and Writing The Maya developed the most complex system of writing in the Americas. They used hieroglyphics to represent sounds, words, and ideas. Hieroglyphic inscriptions have been found on stoneware and other artifacts dating from as early as 50 B.C.E.

Over time, the Maya created hundreds of **glyphs**. Eventually, scribes could write down anything in the spoken language. They often wrote about rulers, history, myths and gods, and astronomy.

Not all Mayan groups shared the same language. Instead, they spoke related **dialects**. Today, about four million Mesoamericans still speak one of 30 or so Mayan languages.

glyph a symbol or character in a hieroglyphic system of writing

dialect a regional variety of a language

The people of the Valley of Mexico have use chinampas, or artificial islands, for centuries. The land bordering these canals in the famous Xochimilco Floating Gardens in Mexico City was created with chinampas.

27.3 Achievements of the Aztecs

The Aztecs adapted many ideas from earlier groups, including their calendars and temple-pyramids. But the Aztecs improved on these ideas and made them their own.

Science and Technology One of the Aztecs' most remarkable technological achievements was the building of their island city, Tenochtitlan. As you read in Chapter 24, the Aztecs enlarged the area of the city by creating artificial islands called *chinampas*. To make a chinampa, they first formed a bed of soil by piling boulders and mud on a mat made of reeds. They tied the mat to wooden posts and drove the posts into the lake. Trees and willows planted around the posts anchored the soil beds.

Today, flower farmers in Xochimilco, near Mexico City, still use chinampas. Tourists enjoy taking boat trips to see these "floating gardens."

Just as impressive as the chinampas were the three causeways that connected Tenochtitlan to the mainland. The causeways were often filled with people traveling to and from the capital. During the rainy season, when the lake waters rose, the causeways also served as dikes.

For tracking time, the Aztecs adapted the Mayan solar and sacred calendars. The 365-day solar calendar was especially useful for farming, since it tracked the seasons. Priests used the sacred 260-day calendar to predict events and to determine "lucky" days for such things as planting crops and going to war.

One of the most famous Aztec artifacts is a calendar called the Sun Stone. Dedicated to the god of the sun, this beautifully carved stone is nearly 12 feet wide and weighs almost 25 tons. The center shows the face of the sun god. Today the Sun Stone is a well-known symbol of Mexico.

Arts and Architecture The Aztecs practiced a number of arts, including poetry, music, dance, and sculpture. Poets wrote verses to sing the praises of the gods, to tell stories, and to celebrate the natural world. Poetry was highly valued, as you can see in this short poem:

I, the singer, I make a poem
That shines like an emerald
A brilliant, precious, and splendid emerald

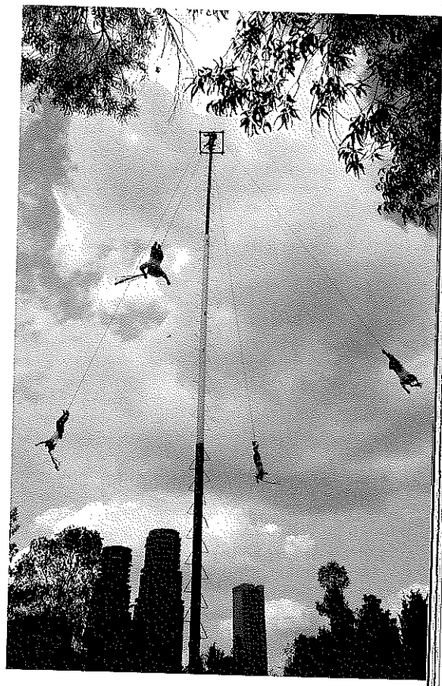
Aztec poets sung their poems or recited them to music. Sometimes actors performed them, creating a dramatic show with dialogue and costumes.

Music and dance were important parts of Aztec ceremonies and holidays. People dressed up for these special occasions. Women wore beautiful blouses over their skirts. Men painted their faces, greased their hair, and wore feathered headdresses. The dancers formed large circles and moved to the beat of drums and the sound of rattle bells. The dances had religious meaning, and the dancers had to perform every step correctly. Sometimes thousands of people danced at one time. Even the emperor occasionally joined in.

The Aztecs were also gifted painters and sculptors. Painters used brilliant colors to create scenes showing gods and religious ceremonies. Sculptors fashioned stone statues and relief sculptures on temple walls. They also carved small, lifelike figures of people and animals from rock and semiprecious stones such as jade. In technical craft and beauty, their work surpassed that of earlier Mesoamerican cultures.

In architecture, the Aztecs are remembered most today for their massive stone temples. The Aztecs were unique in building double stairways, like those of the Great Temple in Tenochtitlan. You may remember that the staircases led to two temples, one for the sun god and one for the god of rain. Smaller pyramids nearby had their own temples where sacrificial fires burned before huge statues of the gods.

In the spectacular Aztec pole dance, dancers tie their feet to long cords wound around a tall pole. They jump from the top of the pole, and the cords unwind as the dancers fly around the pole until they reach the ground.

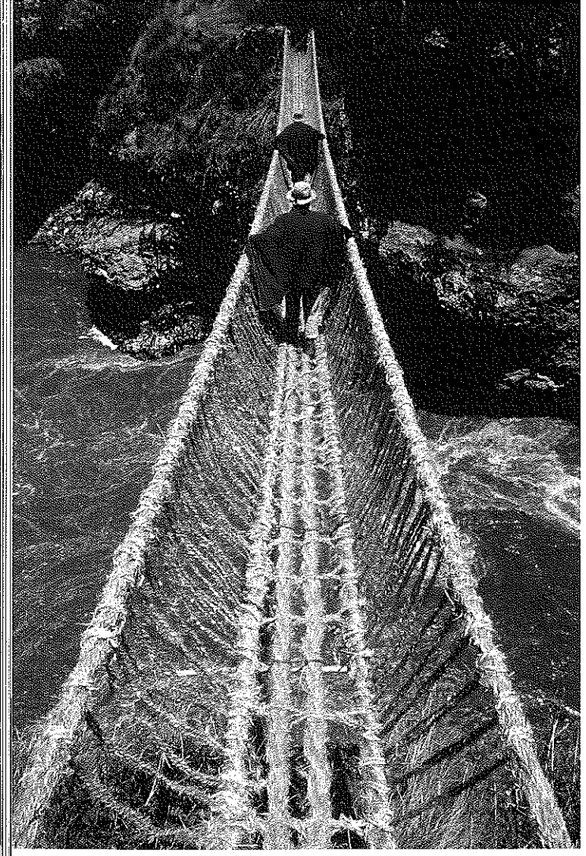


Language and Writing Spoken language was raised to an art form in Aztec society. Almost any occasion called for dramatic and often flowery speeches. The rich vocabulary of the Aztec language, Nahuatl, allowed speakers to create new words and describe abstract concepts.

The Aztec system of writing used both glyphs and pictographs. A **pictograph** is a drawing that stands for an idea. For example, the Aztec pictograph for war was a symbol of a shield and a club.

pictograph a written symbol that represents an idea or object

The Aztecs did not have enough pictographs and glyphs to express everything that could be spoken in their language. Instead, scribes used writing to list data or to outline events. Priests used these writings to spark their memories when relating stories from the past.



This Inca suspension bridge, over the Apurimac River near Cuzco, is still in use today.

27.4 Achievements of the Incas

Like the Aztecs, the Incas often borrowed and improved upon ideas from other cultures. But the Incas faced a unique challenge in managing the largest empire in the Americas. Maintaining tight control over such a huge area was one of their most impressive accomplishments.

As you read in Chapter 26, the Incas created a large bureaucracy with many layers of authority. The various levels of officials were in charge of larger and larger units within the empire. As more groups were brought into the empire, local leaders were trained in Inca laws and customs.

Through this system, the Incas not only unified their empire but also spread Inca culture throughout their lands. Let's look at some of the Incas' unique cultural achievements.

Science and Technology The Incas' greatest technological skill was engineering. The best example is their amazing system of roads.

As you learned in Chapter 26, the Incas built roads across the length and width of their empire. To create routes through steep mountain ranges, they carved staircases and gouged tunnels out of rock. They also built **suspension bridges** over rivers. Thick rope cables were anchored at stone towers on either side of the river. Two cables served as rails, while three others held a walkway.

In agriculture, the Incas showed their technological skill by vastly enlarging the system of terraces used by farmers in the Andes. The Incas anchored their steplike terraces with stones and improved the drainage systems in the fields. On some terraces, they planted different crops at elevations where the plants would grow best.

To irrigate the crops, the Incas built canals that brought water to the top of the terrace. From there, the water ran down, level by level. People in South America still grow crops on some Inca terraces.

The Incas also made remarkable advances in medicine. Inca priests, who were in charge of healing, practiced a type of surgery called **trephination**. Usually the patient was an injured warrior. Priests cut into the patient's skull to remove bone fragments that were pressing against the brain. As drastic as this sounds, many people survived the operation.

Arts and Architecture One of the most important Inca arts was the making of textiles for clothing. The quality and design of a person's clothes were a sign of status. The delicate cloth worn by Inca nobles often featured bright colors and bold geometric patterns. Inca women also made fine feather tunics, or shirts, weaving feathers from jungle birds right into the cloth.

Another important art was the fashioning of objects out of gold. The Incas prized gold, which they called the "sweat of the sun." Gold covered almost every inch inside the Temple of the Sun in the capital city of Cuzco. Goldsmiths also fashioned masks, sculptures, knives, and jewelry.

Music was a major part of Inca life. The Incas played flutes, seashell horns, rattles, drums, and panpipes. Scholars believe that the modern music of the Andes mountain region preserves elements of Inca music.

In architecture, the Incas are known for their huge, durable stone buildings. The massive stones of Inca structures fit together so tightly that a knife blade could not be slipped between them. Inca buildings were sturdy, too—many remain standing today.

Peruvian musicians today use instruments similar to some of those used by the Incas, such as these panpipes and drums.

Language and Writing The Incas made their language, Quechua, the official language of the empire. As a result, Quechua spread far and wide. About 10 million people in South America still speak it today.

The Incas did not have a written language. As you have learned, they had an ingenious substitute: the knotted sets of strings called *quipus*. The Incas used quipus as memory aids in sending messages and recording information.

suspension bridge a bridge whose roadway is held up by cables that are anchored on each end of the bridge

trephination a type of surgery that involves penetrating the skull

27.5 Chapter Summary

In this chapter, you explored the cultural achievements of the Maya, Aztecs, and Incas. All three peoples had unique accomplishments in science and technology, arts and architecture, and language and writing.

Some of these achievements are especially noteworthy. The Maya are admired today for their writing system, their calendar, their knowledge of astronomy, and their architecture. The Aztecs are noted for their calendar and their massive temples. The Incas showed great skill in managing their huge empire and in engineering.

In the next unit, you will return to Europe. You will pick up where you left off at the end of Unit 1 to discover what happened in Europe after the Middle Ages.