

= Maya civilization =

The Maya civilization was a Mesoamerican civilization developed by the Maya peoples , and noted for its hieroglyphic script ? the only known fully developed writing system of the pre @-@ Columbian Americas ? as well as for its art , architecture , mathematics , calendar , and astronomical system . The Maya civilization developed in an area that encompasses southeastern Mexico , all of Guatemala and Belize , and the western portions of Honduras and El Salvador . This region consists of the northern lowlands encompassing the Yucatán Peninsula , and the highlands of the Sierra Madre , running from the Mexican state of Chiapas , across southern Guatemala and onwards into El Salvador , and the southern lowlands of the Pacific littoral plain .

The Archaic period , prior to 2000 BC , saw the first developments in agriculture and the earliest villages . The Preclassic period (c . 2000 BC to 250 AD) saw the establishment of the first complex societies in the Maya region , and the cultivation of the staple crops of the Maya diet , including maize , beans , squashes , and chili peppers . The first Maya cities developed around 750 BC , and by 500 BC these cities possessed monumental architecture , including large temples with elaborate stucco façades . Hieroglyphic writing was being used in the Maya region by the 3rd century BC . In the Late Preclassic a number of large cities developed in the Petén Basin , and Kaminaljuyu rose to prominence in the Guatemalan Highlands . Beginning around 250 AD , the Classic period is largely defined as when the Maya were raising sculpted monuments with Long Count dates . This period saw the Maya civilization develop a large number of city @-@ states linked by a complex trade network . In the Maya Lowlands two great rivals , Tikal and Calakmul , became powerful . The Classic period also saw the intrusive intervention of the central Mexican city of Teotihuacan in Maya dynastic politics . In the 9th century , there was a widespread political collapse in the central Maya region , resulting in internecine warfare , the abandonment of cities , and a northward shift of population . The Postclassic period saw the rise of Chichen Itza in the north , and the expansion of the aggressive K 'iche ' kingdom in the Guatemalan Highlands . In the 16th century , the Spanish Empire colonised the Mesoamerican region , and a lengthy series of campaigns saw the fall of Nojpetén , the last Maya city in 1697 .

Classic period rule was centred on the concept of the " divine king " , who acted as a mediator between mortals and the supernatural realm . Kingship was patrilineal , and power would normally pass to the eldest son . A prospective king was also expected to be a successful war leader . Maya politics was dominated by a closed system of patronage , although the exact political make @-@ up of a kingdom varied from city @-@ state to city @-@ state . By the Late Classic , the aristocracy had greatly increased , resulting in the corresponding reduction in the exclusive power of the divine king . The Maya civilization developed highly sophisticated artforms , and the Maya created art using both perishable and non @-@ perishable materials , including wood , jade , obsidian , ceramics , sculpted stone monuments , stucco , and finely painted murals .

Maya cities tended to expand haphazardly , and the city centre would be occupied by ceremonial and administrative complexes , surrounded by an irregular sprawl of residential districts . Different parts of a city would often be linked by causeways . The principal architecture of the city consisted of palaces , pyramid @-@ temples , ceremonial ballcourts , and structures aligned for astronomical observation . The Maya elite were literate , and developed a complex system of hieroglyphic writing that was the most advanced in the pre @-@ Columbian Americas . The Maya recorded their history and ritual knowledge in screenfold books , of which only three uncontested examples remain , the rest having been destroyed by the Spanish . There are also a great many examples of Maya text found on stelae and ceramics . The Maya developed a highly complex series of interlocking ritual calendars , and employed mathematics that included one of the earliest instances of the explicit zero in the world . As a part of their religion , the Maya practised human sacrifice .

= = Mesoamerica = =

The Maya civilization developed within the Mesoamerican cultural area , which covers a region that spreads from northern Mexico southwards into Central America . Mesoamerica was one of six

cradles of civilization worldwide . The Mesoamerican area gave rise to a series of cultural developments that included complex societies , agriculture , cities , monumental architecture , writing , and calendrical systems . The set of traits shared by Mesoamerican cultures also included astronomical knowledge , blood and human sacrifice , and a cosmovision that viewed the world as divided into four divisions aligned with the cardinal directions , each with different attributes , and a three @-@ way division of the world into the celestial realm , the earth , and the underworld .

By 6000 BC , the early inhabitants of Mesoamerica were experimenting with the domestication of plants , a process that eventually led to the establishment of sedentary agricultural societies . The diverse climate allowed for wide variation in available crops , but all regions of Mesoamerica cultivated the base crops of maize , beans , and squashes . All Mesoamerican cultures used Stone Age technology ; after c . 1000 AD copper , silver and gold were worked . Mesoamerica lacked draft animals , did not use the wheel , and possessed few domesticated animals ; the principal means of transport was on foot or by canoe . Mesoamericans viewed the world as hostile and governed by unpredictable deities . The ritual Mesoamerican ballgame was widely played . Mesoamerica is linguistically diverse , with most languages falling within a small number of language families ? the major families are Mayan , Mixe ? Zoquean , Otomanguan , and Uto @-@ Aztecan ; there are also a number of smaller families and isolates . The Mesoamerican language area shares a number of important features , including widespread loanwords , and use of a vigesimal number system .

The territory of the Maya covered a third of Mesoamerica , and the Maya were engaged in a dynamic relationship with neighbouring cultures that included the Olmecs , Mixtecs , Teotihuacan , the Aztecs , and others . During the Early Classic period , the Maya cities of Tikal and Kaminaljuyu were key Maya foci in a network that extended beyond the Maya area into the highlands of central Mexico . At around the same time , there was a strong Maya presence at the Tetitla compound of Teotihuacan . Centuries later , during the 9th century AD , murals at Cacaxtla , another site in the central Mexican highlands , were painted in a Maya style . This may have been either an effort to align itself with the still @-@ powerful Maya area after the collapse of Teotihuacan and ensuing political fragmentation in the Mexican Highlands , or an attempt to express a distant Maya origin of the inhabitants . The Maya city of Chichen Itza and the distant Toltec capital of Tula had an especially close relationship .

= = Geography = =

The Maya civilization occupied a wide territory that included southeastern Mexico and northern Central America . This area included the entire Yucatán Peninsula and all of the territory now incorporated into the modern countries of Guatemala and Belize , as well as the western portions of Honduras and El Salvador . Most of the peninsula is formed by a vast plain with few hills or mountains and a generally low coastline .

The Petén region consists of densely forested low @-@ lying limestone plain ; a chain of fourteen lakes runs across the central drainage basin of Petén . To the south the plain gradually rises towards the Guatemalan Highlands . Dense forest covers northern Petén and Belize , most of Quintana Roo , southern Campeche , and a portion of the south of Yucatán state . Farther north , the vegetation turns to lower forest consisting of dense scrub .

The littoral zone of Soconusco lies to the south of the Sierra Madre de Chiapas , and consists of a narrow coastal plain and the foothills of the Sierra Madre . The Maya highlands extend eastwards from Chiapas into Guatemala , reaching their highest in the Sierra de los Cuchumatanes . The major pre @-@ Columbian population centres of the highlands were located in the largest highland valleys , such as the Valley of Guatemala and the Quetzaltenango Valley in the southern highlands , a belt of volcanic cones running parallel to the Pacific coast . The highlands extend northwards into Verapaz , and gradually descend to the east .

= = History = =

The history of Maya civilization is divided into three principal periods : the Preclassic , Classic , and

Postclassic periods . These were preceded by the Archaic Period , during which the first settled villages and early developments in agriculture emerged . Modern scholars regard these periods as arbitrary divisions of Maya chronology , rather than indicative of cultural evolution or decline . Definitions of the start and end dates of period spans can vary by as much as a century , depending on the author .

== = Preclassic period (c . 2000 BC ? 250 AD) == =

The Maya developed their first civilization in the Preclassic period . Scholars continue to discuss when this era of Maya civilization began . Maya occupation at Cuello (modern @-@ day Belize) has been carbon dated to around 2600 BC . Settlements were established around 1800 BC in the Soconusco region of the Pacific coast , and the Maya were already cultivating the staple crops of maize , beans , squash , and chili pepper . This period was characterised by sedentary communities and the introduction of pottery and fired clay figurines .

During the Middle Preclassic Period , small villages began to grow to form cities . Nakbe in the Petén department of Guatemala is the earliest well @-@ documented city in the Maya lowlands , where large structures have been dated to around 750 BC . The northern lowlands of Yucatán were widely settled by the Middle Preclassic . By approximately 400 BC , early Maya rulers were raising stelae . A developed script was already being used in Petén by the 3rd century BC . In the Late Preclassic Period , the enormous city of El Mirador grew to cover approximately 16 square kilometres (6 @.@ 2 sq mi) . Although not as large , Tikal was already a significant city by around 350 BC .

In the highlands , Kaminaljuyu emerged as a principal centre in the Late Preclassic . Takalik Abaj and Chocolá were two of the most important cities on the Pacific coastal plain , and Komchen grew to become an important site in northern Yucatán . The Late Preclassic cultural florescence collapsed in the 1st century AD and many of the great Maya cities of the epoch were abandoned ; the cause of this collapse is unknown .

== = Classic period (c . 250 ? 900 AD) == =

The Classic period is largely defined as the period during which the lowland Maya raised dated monuments using the Long Count calendar . This period marked the peak of large @-@ scale construction and urbanism , the recording of monumental inscriptions , and demonstrated significant intellectual and artistic development , particularly in the southern lowland regions . The Classic period Maya political landscape has been likened to that of Renaissance Italy or Classical Greece , with multiple city @-@ states engaged in a complex network of alliances and enmities . The largest cities had populations numbering 50 @,@ 000 to 120 @,@ 000 and were linked to networks of subsidiary sites .

During the Early Classic , cities throughout the Maya region were influenced by the great metropolis of Teotihuacan in the distant Valley of Mexico . In AD 378 , Teotihuacan decisively intervened at Tikal and other nearby cities , deposed their rulers , and installed a new Teotihuacan @-@ backed dynasty . This intervention was led by Siyaj K 'ak ' (" Born of Fire ") , who arrived at Tikal in early 378 . The king of Tikal , Chak Tok Ich 'aak I , died on the same day , suggesting a violent takeover . A year later , Siyaj K 'ak ' oversaw the installation of a new king , Yax Nuun Ahiin I. The installation of the new dynasty led to a period of political dominance when Tikal became the most powerful city in the central lowlands .

Tikal 's great rival was Calakmul , another powerful city in the Petén Basin . Tikal and Calakmul both developed extensive systems of allies and vassals ; lesser cities that entered one of these networks gained prestige from their association with the top @-@ tier city , and maintained peaceful relations with other members of the same network . Tikal and Calakmul engaged in the manoeuvring of their alliance networks against each other . At various points during the Classic period , one or other of these powers would gain a strategic victory over its great rival , resulting in respective periods of florescence and decline .

In 629 , B 'alaj Chan K 'awiil , a son of the Tikal king K 'inich Muwaan Jol II , was sent to found a new city at Dos Pilas , in the Petexbatún region , apparently as an outpost to extend Tikal 's power beyond the reach of Calakmul . For the next two decades he fought loyally for his brother and overlord at Tikal . In 648 , king Yuknoom Ch 'een II of Calakmul captured Balaj Chan K 'awiil . Yuknoom Ch 'een II then reinstated Balaj Chan K 'awiil upon the throne of Dos Pilas as his vassal . He thereafter served as a loyal ally of Calakmul .

In the southeast , Copán was the most important city . Its Classic @-@ period dynasty was founded in 426 by K 'inich Yax K 'uk ' Mo ' . The new king had strong ties with central Petén and Teotihuacan . Copán reached the height of its cultural and artistic development during the rule of Uaxaclajuun Ub 'aah K 'awiil , who ruled from 695 to 738 . His reign ended catastrophically when he was captured by his vassal , king K 'ak ' Tiliw Chan Yopaat of Quiriguá . The captured lord of Copán was taken back to Quiriguá and was decapitated in a public ritual . It is likely that this coup was backed by Calakmul , in order to weaken a powerful ally of Tikal . Palenque and Yaxchilan were the most powerful cities in the Usumacinta region . In the highlands , Kaminaljuyu in the Valley of Guatemala was already a sprawling city by 300 . In the north of the Maya area , Coba was the most important capital .

= = = Classic Maya collapse = = =

During the 9th century AD , the central Maya region suffered major political collapse , marked by the abandonment of cities , the ending of dynasties , and a northward shift in activity . No universally accepted theory explains this collapse , but it likely had a combination of causes , including endemic internecine warfare , overpopulation resulting in severe environmental degradation , and drought . During this period , known as the Terminal Classic , the northern cities of Chichen Itza and Uxmal showed increased activity . Major cities in the northern Yucatán Peninsula continued to be inhabited long after the cities of the southern lowlands ceased to raise monuments .

Classic Maya social organisation was based on the ritual authority of the ruler , rather than central control of trade and food distribution . This model of rulership was poorly structured to respond to changes , because the ruler 's actions were limited by tradition to such activities as construction , ritual , and warfare . This only served to exacerbate systemic problems . By the 9th and 10th centuries , this resulted in collapse of this system of rulership . In the northern Yucatán , individual rule was replaced by a ruling council formed from elite lineages . In the southern Yucatán and central Petén , kingdoms declined ; in western Petén and some other areas , the changes were catastrophic and resulted in the rapid depopulation of cities . Within a couple of generations , large swathes of the central Maya area were all but abandoned . Both the capitals and their secondary centres were generally abandoned within a period of 50 to 100 years . One by one , cities stopped sculpting dated monuments ; the last Long Count date was inscribed at Toniná in 909 . Stelae were no longer raised , and squatters moved into abandoned royal palaces . Mesoamerican trade routes shifted and bypassed Petén .

= = = Postclassic period (c . 950 ? 1539 AD) = = =

Although much reduced , a significant Maya presence remained into the Postclassic period after the abandonment of the major Classic period cities ; the population was particularly concentrated near permanent water sources . Unlike during previous cycles of contraction in the Maya region , abandoned lands were not quickly resettled in the Postclassic . Activity shifted to the northern lowlands and the Maya Highlands ; this may have involved migration from the southern lowlands , because many Postclassic Maya groups had migration myths . Chichen Itza and its Puuc neighbours declined dramatically in the 11th century , and this may represent the final episode of Classic Period collapse . After the decline of Chichen Itza , the Maya region lacked a dominant power until the rise of the city of Mayapan in the 12th century . New cities arose near the Caribbean and Gulf coasts , and new trade networks were formed .

The Postclassic Period was marked by changes from the preceding Classic Period . The once @-@ great city of Kaminaljuyu in the Valley of Guatemala was abandoned after continuous

occupation of almost 2,000 years. Across the highlands and neighbouring Pacific coast, long occupied cities in exposed locations were relocated, apparently due to a proliferation of warfare. Cities came to occupy more easily defended hilltop locations surrounded by deep ravines, with ditch and wall defences sometimes supplementing the protection provided by the natural terrain. One of the most important cities in the Guatemalan Highlands at this time was Q'umarkaj, the capital of the aggressive K'iche' kingdom. The government of Maya states, from the Yucatán to the Guatemalan highlands, was often organised as joint rule by a council. However, in practice one member of the council could act as a supreme ruler, while the other members served him as advisors.

Mayapan was abandoned around 1448, after a period of political, social and environmental turbulence that in many ways echoed the Classic period collapse in the southern Maya region. The abandonment of the city was followed by a period of prolonged warfare, disease and natural disasters in the Yucatán Peninsula, which ended only shortly before Spanish contact in 1511. Even without a dominant regional capital, the early Spanish explorers reported wealthy coastal cities and thriving marketplaces. During the Late Postclassic, the Yucatán Peninsula was divided into a number of independent provinces that shared a common culture but varied in internal sociopolitical organisation. On the eve of the Spanish conquest, the highlands of Guatemala were dominated by several powerful Maya states. The K'iche' had carved out a small empire covering a large part of the western Guatemalan Highlands and the neighbouring Pacific coastal plain. However, in the decades before the Spanish invasion the Kaqchikel kingdom had been steadily eroding the kingdom of the K'iche'.

=== Contact period and Spanish conquest (1511 ? 1697 AD) ===

In 1511, a Spanish caravel was wrecked in the Caribbean, and about a dozen survivors made landfall on the coast of Yucatán. They were seized by a Maya lord, and most were sacrificed, although two managed to escape. From 1517 to 1519, three separate Spanish expeditions explored the Yucatán coast, and engaged in a number of battles with the Maya inhabitants. After the Aztec capital Tenochtitlan fell to the Spanish in 1521, Hernán Cortés despatched Pedro de Alvarado to Guatemala with 180 cavalry, 300 infantry, 4 cannons, and thousands of allied warriors from central Mexico; they arrived in Soconusco in 1523. The K'iche' capital, Q'umarkaj, fell to Alvarado in 1524. Shortly afterwards, the Spanish were invited as allies into Iximche, the capital city of the Kaqchikel Maya. Good relations did not last, due to excessive Spanish demands for gold as tribute, and the city was abandoned a few months later. This was followed by the fall of Zaculeu, the Mam Maya capital, in 1525. Francisco de Montejo and his son, Francisco de Montejo the Younger, launched a long series of campaigns against the polities of the Yucatán Peninsula in 1527, and finally completed the conquest of the northern portion of the peninsula in 1546. This left only the Maya kingdoms of the Petén Basin independent. In 1697, Martín de Ursúa launched an assault on the Itza capital Nojpetén and the last independent Maya city fell to the Spanish.

=== Persistence of Maya culture ===

The Spanish conquest stripped away most of the defining features of Maya civilization. However, many Maya villages remained remote from Spanish colonial authority, and for the most part continued to manage their own affairs. Maya communities and the nuclear family maintained their traditional day to day life. The basic Mesoamerican diet of maize and beans continued, although agricultural output was improved by the introduction of steel tools. Traditional crafts such as weaving, ceramics, and basketry continued to be practiced. Community markets and trade in local products continued long after the conquest. At times, the colonial administration encouraged the traditional economy in order to extract tribute in the form of ceramics or cotton textiles, although these were usually made to European specifications. Maya beliefs and language proved resistant to change, despite vigorous efforts by Catholic missionaries. The 260 day tzolk'in ritual calendar continues in use in modern Maya communities in the highlands of Guatemala and Chiapas.

, and millions of Mayan @-@ language speakers inhabit the territory in which their ancestors developed their civilization .

= = = Investigation of Maya civilization = = =

The agents of the Catholic Church wrote detailed accounts of the Maya , in support of their efforts at evangelisation , and absorption of the Maya into the Spanish Empire . This was followed by various Spanish priests and colonial officials who left descriptions of ruins they visited in Yucatán and Central America . In 1839 , American traveller and writer John Lloyd Stephens set out to visit a number of Maya sites with English architect and draftsman Frederick Catherwood . Their illustrated accounts of the ruins sparked strong popular interest , and brought the Maya to the attention of the world . The later 19th century saw the recording and recovery of ethnohistoric accounts of the Maya , and the first steps in deciphering Maya hieroglyphs .

The final two decades of the 19th century saw the birth of modern scientific archaeology in the Maya region , with the meticulous work of Alfred Maudslay and Teoberto Maler . By the early 20th century , the Peabody Museum was sponsoring excavations at Copán and in the Yucatán Peninsula . In the first two decades of the 20th century , advances were made in deciphering the Maya calendar , and identifying deities , dates , and religious concepts . Since the 1930s , archaeological exploration increased dramatically , with large @-@ scale excavations across the Maya region .

In the 1960s , the distinguished Mayanist J. Eric S. Thompson promoted the ideas that Maya cities were essentially vacant ceremonial centres serving a dispersed population in the forest , and that the Maya civilization was governed by peaceful astronomer @-@ priests . These ideas began to collapse with major advances in the decipherment of the script in the late 20th century , pioneered by Heinrich Berlin , Tatiana Proskouriakoff , and Yuri Knorozov . With breakthroughs in understanding of Maya script since the 1950s , the texts revealed the warlike activities of the Classic Maya kings , and the view of the Maya as peaceful could no longer be supported . Detailed settlement surveys of Maya cities revealed the evidence of large populations , putting an end to the vacant ceremonial centre model .

= = Politics = =

Unlike the Aztecs and the Incas , the Maya political system never integrated the entire Maya cultural area into a single state or empire . Rather , throughout its history , the Maya area contained a varying mix of political complexity that included both states and chiefdoms . These polities fluctuated greatly in their relationships with each other and were engaged in a complex web of rivalries , periods of dominance or submission , vassalage , and alliances . At times , different polities achieved regional dominance , such as Calakmul , Caracol , Mayapan , and Tikal . The first reliably evidenced polities formed in the Maya lowlands in the 9th century BC . During the Late Preclassic , the Maya political system coalesced into a theopolitical form , where elite ideology justified the ruler 's authority , and was reinforced by public display , ritual , and religion . The divine king was the centre of political power , exercising ultimate control over the administrative , economic , judicial , and military functions of the polity . The divine authority invested within the ruler was such that the king was able to mobilise both the aristocracy and commoners in executing huge infrastructure projects , apparently with no police force or standing army . Some polities engaged in a strategy of increasing administration , and filling administrative posts with loyal supporters rather than blood relatives . Within a polity , mid @-@ ranking population centres would have played a key role in managing resources and internal conflict .

The Maya political landscape was highly complex and Maya elites engaged in political intrigue to gain economic and social advantage over neighbours . In the Late Classic , some cities established a long period of dominance over other large cities , such as the dominance of Caracol over Naranjo for half a century . In other cases , loose alliance networks were formed around a dominant city . Border settlements , usually located about halfway between neighbouring capitals , often switched allegiance over the course of their history , and at times acted independently . Dominant capitals

exacted tribute in the form of luxury items from subjugated population centres . Political power was reinforced by military power , and the capture and humiliation of enemy warriors played an important part in elite culture . An overriding sense of pride and honour among the warrior aristocracy could lead to extended feuds and vendettas , which caused political instability and the fragmentation of polities .

= = Society = =

From the Early Preclassic , Maya society was sharply divided between the elite and commoners . As population increased over time , various sectors of society became increasingly specialised , and political organisation became increasingly complex . By the Late Classic , when populations had grown enormously and hundreds of cities were connected in a complex web of political hierarchies , the wealthy segment of society multiplied . A middle class may have developed , that included artisans , low ranking priests and officials , merchants , and soldiers . Commoners included farmers , servants , labourers , and slaves . According to indigenous histories , land was held communally by noble houses or clans . Such clans held that the land was the property of the clan ancestors , and such ties between the land and the ancestors were reinforced by the burial of the dead within residential compounds .

= = = King and court = = =

Classic Maya rule was centred in a royal culture that was displayed in all areas of Classic Maya art . The king was the supreme ruler , and held a semi @-@ divine status that made him the mediator between the mortal realm and that of the gods . From very early times , kings were specifically identified with the young maize god , whose gift of maize was the basis of Mesoamerican civilization . Maya royal succession was patrilineal , and royal power only passed to queens when doing otherwise would result in the extinction of the dynasty . Typically , power was passed to the eldest son . A young prince was called a ch 'ok (" youth ") , although this word later came to refer to nobility in general . The royal heir was called b 'aah ch 'ok (" head youth ") . Various points in the young prince 's childhood were marked by ritual ; the most important was a bloodletting ceremony at age five or six years . Although being of the royal bloodline was of utmost importance , the heir also had to be a successful war leader , as demonstrated by taking of captives . The enthronement of a new king was a highly elaborate ceremony , involving a series of separate acts that included enthronement upon a jaguar @-@ skin cushion , human sacrifice , and receiving the symbols of royal power , such as a headband bearing a jade representation of the so @-@ called " jester god " , an elaborate headdress adorned with quetzal feathers , and a sceptre representing the god K 'awiiil .

Maya political administration , based around the royal court , was not bureaucratic in nature . Government was hierarchical , and official posts were sponsored by higher @-@ ranking members of the aristocracy ; officials tended to be promoted to higher levels of office during the course of their lives . Officials are referred to as being " owned " by their sponsor , and this relationship continued even after the death of the sponsor . The Maya royal court was a vibrant and dynamic political institution . There was no universal structure for the Maya royal court , instead each polity formed a royal court that was suited to its own individual context . A number of royal and noble titles have been identified by epigraphers translating Classic Maya inscriptions . Ajaw is usually translated as " lord " or " king " . In the Early Classic , an ajaw was the ruler of a city . Later , with increasing social complexity , the ajaw was a member of the ruling class and a major city could have more than one , each ruling over different districts . Paramount rulers distinguished themselves from the extended nobility by prefixing the word k 'uhul to their ajaw title . A k 'uhul ajaw was " divine lord " , originally confined to the kings of the most prestigious and ancient royal lines . Kalomte was a royal title , whose exact meaning is not yet deciphered , but it was held only by the most powerful kings of the strongest dynasties . It indicated an overlord , or high king , and the title was only in use during the Classic period . By the Late Classic , the absolute power of the k 'uhul ajaw had weakened , and the

political system had diversified to include a wider aristocracy , that by this time may well have expanded disproportionately .

A sajal was ranked below the ajaw , and indicated a subservient lord . A sajal would be lord of a second- or third @-@ tier site , answering to an ajaw , who may himself have been subservient to a kalomte . A sajal would often be a war captain or regional governor , and inscriptions often link the sajal title to warfare ; they are often mentioned as the holders of war captives . Sajal meant " feared one " . The titles of ah tz 'ihb and ah ch 'ul hun are both related to scribes . The ah tz 'ihb was a royal scribe , usually a member of the royal family ; the ah ch 'ul hun was the Keeper of the Holy Books , a title that is closely associated with the ajaw title , indicating that an ajaw always held the ah ch 'ul hun title simultaneously . Other courtly titles , the functions of which are not well understood , were yajaw k 'ahk ' (" Lord of Fire ") , ti 'huun and ti 'sakhuun . These last two may be variations on the same title , and Mark Zender has suggested that the holder of this title may have been the spokesman for the ruler . Courtly titles are overwhelmingly male @-@ oriented , and in those relatively rare occasions where they are applied to a woman , they appear to be used as honorifics for female royalty . Titled elites were often associated with particular structures in the hieroglyphic inscriptions of Classic period cities , indicating that such office holders either owned that structure , or that the structure was an important focus for their activities . A lakam was possibly the only non @-@ elite post @-@ holder in the royal court . The lakam was only found in larger sites , and they appear to have been responsible for the taxation of local districts .

Different factions may have existed in the royal court . The k 'uhul ahaw and his household would have formed the central power @-@ base , but other important groups were the priesthood , the warrior aristocracy , and other aristocratic courtiers . Where ruling councils existed , as at Chichen Itza and Copán , these may have formed an additional faction . Rivalry between different factions would have led to dynamic political institutions as compromises and disagreements were played out . In such a setting , public performance was vital . Such performances included ritual dances , presentation of war captives , offerings of tribute , human sacrifice , and religious ritual .

= = = Commoners = = =

Commoners are estimated to have comprised over 90 % of the population , but relatively little is known about them . Their houses were generally constructed from perishable materials , and their remains have left little trace in the archaeological record . Some commoner dwellings were raised on low platforms , and these can be identified , but an unknown quantity of commoner houses were not . Such low @-@ status dwellings can only be detected by extensive remote @-@ sensing surveys of apparently empty terrain . The range of commoners was broad ; it consisted of everyone not of noble birth , and therefore included everyone from the poorest farmers to wealthy craftsmen and commoners appointed to bureaucratic positions . Commoners engaged in essential production activities , including that of products destined for use by the elite , such as cotton and cacao , as well as subsistence crops for their own use , and utilitarian items such as ceramics and stone tools . Commoners took part in warfare , and could advance socially by proving themselves as outstanding warriors . Commoners paid taxes to the elite in the form of staple goods such as maize flour and game . It is likely that hard @-@ working commoners who displayed exceptional skills and initiative could become influential members of Maya society .

= = Warfare = =

Warfare was prevalent in the Maya world . Military campaigns were launched for a variety of reasons , including the control of trade routes and tribute , raids to take captives , scaling up to the complete destruction of an enemy state . Little is known about Maya military organisation , logistics , or training . Warfare is depicted in Maya art from the Classic period , and wars and victories are mentioned in hieroglyphic inscriptions . Unfortunately , the inscriptions do not provide information upon the causes of war , or the form it took . In the 8th ? 9th centuries , intensive warfare resulted in the collapse of the kingdoms of the Petexbatún region of western Petén . The rapid abandonment of

Aguateca by its inhabitants has provided a rare opportunity to examine the remains of Maya weaponry in situ . Aguateca was stormed by unknown enemies around 810 AD , who overcame its formidable defences and burned the royal palace . The elite inhabitants of the city either fled or were captured , and never returned to collect their abandoned property . The inhabitants of the periphery abandoned the site soon after . This is an example of intensive warfare carried out by an enemy in order to completely eliminate a Maya state , rather than subjugate it . Research at Aguateca indicated that Classic period warriors were primarily members of the elite .

From as early as the Preclassic period , the ruler of a Maya polity was expected to be a distinguished war leader , and was depicted with trophy heads hanging from his belt . In the Classic period , such trophy heads no longer appeared on the king 's belt , but Classic period kings are frequently depicted standing over humiliated war captives . Right up to the end of the Postclassic period , Maya kings led as war captains . Maya inscriptions from the Classic show that a defeated king could be captured , tortured , and sacrificed . The Spanish recorded that Maya leaders kept track of troop movements in painted books .

The outcome of a successful military campaign could vary in its impact on the defeated polity . In some cases , entire cities were sacked , and never resettled , as at Aguateca . In other instances , the victors would seize the defeated rulers , their families , and patron gods . The captured nobles and their families could be imprisoned , or sacrificed . At the least severe end of the scale , the defeated polity would be obliged to pay tribute to the victor .

= = = Warriors = = =

During the Contact period , it is known that certain military positions were held by members of the aristocracy , and were passed on by patrilineal succession . It is likely that the specialised knowledge inherent in the particular military role was taught to the successor , including strategy , ritual , and war dances . Maya armies of the Contact period were highly disciplined , and warriors participated in regular training exercises and drills ; every able @-@ bodied adult male was available for military service . Maya states did not maintain standing armies ; warriors were mustered by local officials who reported back to appointed warleaders . There were also units of full @-@ time mercenaries who followed permanent leaders . Most warriors were not full @-@ time , however , and were primarily farmers ; the needs of their crops usually came before warfare . Maya warfare was not so much aimed at destruction of the enemy as the seizure of captives and plunder .

There is some evidence from the Classic period that women provided supporting roles in war , but they did not act as military officers with the exception of those rare ruling queens . By the Postclassic , the native chronicles suggest that women occasionally fought in battle .

= = = Weapons = = =

The atlatl (spear @-@ thrower) was introduced to the Maya region by Teotihuacan in the Early Classic . This was a 0 @.@ 5 metres (1 @.@ 6 ft) long stick with a notched end to hold a dart or javelin . The stick was used to launch the missile with more force and accuracy than could be accomplished by simply hurling it with the arm alone . Evidence in the form of stone blade points recovered from Aguateca indicate that darts and spears were the primary weapons of the Classic Maya warrior . Commoners used blowguns in war , which also served as their hunting weapon . The bow and arrow is another weapon that was used by the ancient Maya for both war and hunting . Although present in the Maya region during the Classic period , its use as a weapon of war was not favoured ; it did not become a common weapon until the Postclassic . The Contact period Maya also used two @-@ handed swords crafted from strong wood with the blade fashioned from inset obsidian , similar to the Aztec macuahuitl . Maya warriors wore body armour in the form of quilted cotton that had been soaked in salt water to toughen it ; the resulting armour compared favourably to the steel armour worn by the Spanish when they conquered the region . Warriors bore wooden or animal hide shields decorated with feathers and animal skins .

== Trade ==

Trade was a key component of Maya society , and in the development of the Maya civilization . The cities that grew to become the most important usually controlled access to vital trade goods , or portage routes . Cities such as Kaminaljuyu and Q 'umarkaj in the Guatemalan Highlands , and Chalchuapa in El Salvador , variously controlled access to the sources of obsidian at different points in Maya history . The most important cities in the northern Yucatán Peninsula controlled access to the sources of salt . In the Postclassic , the Maya engaged in a flourishing slave trade with wider Mesoamerica .

The Maya engaged in long distance trade across the Maya region , and across greater Mesoamerica and beyond . Within Mesoamerica beyond the Maya area , trade routes particularly focused on central Mexico and the Gulf coast . In the Early Classic , Chichen Itza was at the hub of an extensive trade network that imported gold discs from Colombia and Panama , and turquoise from Los Cerrillos , New Mexico . Long distance trade of both luxury and utilitarian goods was probably controlled by the royal family . Prestige goods obtained by trade were used both for consumption by the city 's ruler , and as luxury gifts to consolidate the loyalty of vassals and allies . An Early Classic Maya merchant quarter has been identified at the distant metropolis of Teotihuacan , in central Mexico .

Trade routes not only supplied physical goods , they facilitated the movement of people and ideas throughout Mesoamerica . Shifts in trade routes occurred with the rise and fall of important cities in the Maya region , and have been identified in every major reorganisation of the Maya civilization , such as the rise of Preclassic Maya civilization , the transition to the Classic , and the Terminal Classic collapse . Even the Spanish Conquest did not immediately terminate all Maya trading activity ; for example , the Contact period Manche Ch 'ol traded the prestige crops of cacao , annatto and vanilla into colonial Verapaz .

=== Merchants ===

Little is known of Maya merchants , although they are depicted on Maya ceramics in elaborate noble dress . From this , it is known that at least some traders were members of the elite . During the Contact period , it is known that Maya nobility took part in long distance trading expeditions . The majority of traders were middle class , but were largely engaged in local and regional trade rather than the prestigious long distance trading that was the preserve of the elite . The travelling of merchants into dangerous foreign territory was likened to a passage through the underworld ; the patron deities of merchants were two underworld gods carrying backpacks . When merchants travelled , they painted themselves black , like their patron gods , and went heavily armed .

The Maya had no pack animals , so all trade goods were carried on the backs of porters when going overland ; if the trade route followed a river or the coast , then goods were transported in canoes . A substantial Maya trading canoe was encountered off Honduras on Christopher Columbus 's fourth voyage . It was made from a large hollowed @-@ out tree trunk and had a palm @-@ covered canopy . The canoe was 2 @.@ 5 metres (8 @.@ 2 ft) broad and was powered by 25 rowers . Trade goods carried included cacao , obsidian , ceramics , textiles , food and drink for the crew , and copper bells and axes . Cacao was used as currency (although not exclusively) , and its value was such that counterfeiting occurred by removing the flesh from the pod , and stuffing it with dirt or avocado rind .

=== Marketplaces ===

Marketplaces are difficult to identify archaeologically . However , the Spanish reported a thriving market economy when they arrived in the region . At some Classic period cities , archaeologists have tentatively identified formal arcade @-@ style masonry architecture and parallel alignments of scattered stones as the permanent foundations of market stalls . A 2007 study analysed soils from a

modern Guatemalan market and compared the results with those obtained from analysis at a proposed ancient market at Chunchucmil . Unusually high levels of zinc and phosphorus at both sites indicated similar food production and vegetable sales activity . The calculated density of market stalls at Chunchucmil strongly suggests that a thriving market economy already existed in the Early Classic . Archaeologists have tentatively identified marketplaces at an increasing number of Maya cities by means of a combination of archaeology and soil analysis . When the Spanish arrived , Postclassic cities in the highlands had markets in permanent plazas , with officials on hand to settle disputes , enforce rules , and collect taxes .

= = Art = =

Maya art is essentially the art of the royal court . It is almost exclusively concerned with the Maya elite and their world . Maya art was crafted from both perishable and non - perishable materials , and served to link the Maya to their ancestors . Although surviving Maya art represents only a small proportion of the art that the Maya created , it represents a wider variety of subjects than any other art tradition in the Americas . Maya art has many regional styles , and is unique in the ancient Americas in bearing narrative text . The finest surviving Maya art dates to the Late Classic period .

The Maya exhibited a preference for the colour green or blue - green , and used the same word for the colours blue and green . Correspondingly , they placed high value on apple - green jade , and other greenstones , associating them with the sun - god K 'inich Ajau . They sculpted artefacts that included fine tesserae and beads , to carved heads weighing 4 - 42 kilograms (9 - 7 lb) . The Maya nobility practised dental modification , and some lords wore encrusted jade in their teeth . Mosaic funerary masks could also be fashioned from jade , such as that of K 'inich Janaab ' Pakal , king of Palenque .

Maya stone sculpture emerged into the archaeological record as a fully developed tradition , suggesting that it may have evolved from a tradition of sculpting wood . Because of the biodegradability of wood , the corpus of Maya woodwork has almost entirely disappeared . The few wooden artefacts that have survived include three - dimensional sculptures , and hieroglyphic panels . Stone Maya stelae are widespread in city sites , often paired with low , circular stones referred to as altars in the literature . Stone sculpture also took other forms , such as the limestone relief panels at Palenque and Piedras Negras . At Yaxchilan , Dos Pilas , Copán , and other sites , stone stairways were decorated with sculpture . The hieroglyphic stairway at Copán comprises the longest surviving Maya hieroglyphic text , and consists of 2 , 200 individual glyphs .

The largest Maya sculptures consisted of architectural façades crafted from stucco . The rough form was laid out on a plain plaster base coating on the wall , and the three - dimensional form was built up using small stones . Finally , this was coated with stucco and moulded into the finished form ; human body forms were first modelled in stucco , with their costumes added afterwards . The final stucco sculpture was then brightly painted . Giant stucco masks were used to adorn temple façades by the Late Preclassic , and such decoration continued into the Classic period .

The Maya had a long tradition of mural painting ; rich polychrome murals have been excavated at San Bartolo , dating to between 300 and 200 BC . Walls were coated with plaster , and polychrome designs were painted onto the smooth finish . The majority of such murals have not survived , but Early Classic tombs painted in cream , red , and black have been excavated at Caracol , Río Azul , and Tikal . Among the best preserved murals are a full - size series of Late Classic paintings at Bonampak .

Flint , chert , and obsidian all served utilitarian purposes in Maya culture , but many pieces were finely crafted into forms that were never intended to be used as tools . Eccentric flints are among the finest lithic artefacts produced by the ancient Maya . They were technically very challenging to produce , requiring considerable skill on the part of the artisan . Large obsidian eccentrics can measure over 30 centimetres (12 in) in length . Their actual form varies considerably but they generally depict human , animal and geometric forms associated with Maya religion . Eccentric flints show a great variety of forms , such as crescents , crosses , snakes , and scorpions . The largest and most elaborate examples display multiple human heads , with minor heads sometimes

branching off from larger one .

Maya textiles are very poorly represented in the archaeological record , although by comparison with other pre-Columbian cultures , such as the Aztecs and the Andean region , it is likely that they were high value items . A few scraps of textile have been recovered by archaeologists , but the best evidence for textile art is where they are represented in other media , such as painted murals or ceramics . Such secondary representations show the elite of the Maya court adorned with sumptuous cloths , generally these would have been cotton , but jaguar pelts and deer hides are also shown .

Ceramics are the most commonly surviving type of Maya art . The Maya had no knowledge of the potter's wheel , and Maya vessels were built up by coiling rolled strips of clay into the desired form . Maya pottery was not glazed , although it often had a fine finish produced by burnishing . Maya ceramics were painted with clay slips blended with minerals and coloured clays . Ancient Maya firing techniques have yet to be replicated . A quantity of extremely fine ceramic figurines have been excavated from Late Classic tombs on Jaina Island , in northern Yucatán . They stand from between 10 to 25 centimetres (3 to 9 in) high and were hand modelled , with exquisite detail . The Ik style polychrome ceramic corpus , including finely painted plates and cylindrical vessels , originated in Late Classic Motul de San José . It includes a set of features such as hieroglyphs painted in a pink or pale red colour and scenes with dancers wearing masks . One of the most distinctive features is the realistic representation of subjects as they appeared in life . The subject matter of the vessels includes courtly life from the Petén region in the 8th century AD , such as diplomatic meetings , feasting , bloodletting , scenes of warriors and the sacrifice of prisoners of war .

Bone , both human and animal , was also sculpted ; human bones may have been trophies , or relics of ancestors . The Maya valued Spondylus shells , and worked them to remove the white exterior and spines , to reveal the fine orange interior . Around the 10th century AD , metallurgy arrived in Mesoamerica from South America , and the Maya began to make small objects in gold , silver and copper . The Maya generally hammered sheet metal into objects such as beads , bells , and disks . In the last centuries before the Spanish Conquest , the Maya began to use the lost wax method to cast small metal pieces .

One poorly studied area of Maya folk art is graffiti . Additional graffiti , not part of the planned decoration , was incised into the stucco of interior walls , floors , and benches , in a wide variety of buildings , including temples , residences , and storerooms . Graffiti has been recorded at 51 Maya sites , particularly clustered in the Petén Basin and southern Campeche , and the Chenes region of northwestern Yucatán . At Tikal , where a great quantity of graffiti has been recorded , the subject matter includes drawings of temples , people , deities , animals , banners , litters , and thrones . Graffiti was often inscribed haphazardly , with drawings overlapping each other , and display a mix of crude , untrained art , and examples by artists who were familiar with Classic period artistic conventions .

= = Architecture = =

The Maya produced a vast array of structures , and have left an extensive architectural legacy that places the Maya civilization as one of the great preindustrial civilizations of the world . Maya architecture also incorporates various art forms and hieroglyphic texts . Masonry architecture built by the Maya evidences craft specialisation in Maya society , centralised organisation and the political means to mobilise a large workforce . It is estimated that a large elite residence at Copán required an estimated 10,686 man-days to build , which compares to 67 man-days for a commoner's hut . It is further estimated that 65 % of the labour required to build the noble residence was used in the quarrying , transporting , and finishing of the stone used in construction , and 24 % of the labour was required for the manufacture and application of limestone based plaster . Altogether , it is estimated that two to three months were required for the construction of the residence for this single noble at Copán , using between 80 and 130 full time labourers . A Classic period city like Tikal was spread over 20 square kilometres (7 sq mi) , with an

urban core covering 6 square kilometres (2 @. @ 3 sq mi) . The labour required to build such a city was immense , running into many millions of man @-@ days . The most massive structures ever erected by the Maya were built during the Preclassic period . Craft specialisation would have required dedicated stonemasons and plasterers by the Late Preclassic , and would have required planners and architects .

= = = Urban design = = =

Maya cities were not formally planned , and were subject to irregular expansion , with the haphazard addition of palaces , temples and other buildings . Most Maya cities tended to grow outwards from the core , and upwards as new structures were superimposed upon preceding architecture . Maya cities usually had a ceremonial and administrative centre surrounded by a vast irregular sprawl of residential complexes . The centres of all Maya cities featured sacred precincts , sometimes separated from nearby residential areas by walls . These precincts contained pyramid temples and other monumental architecture dedicated to elite activities , such as basal platforms that supported administrative or elite residential complexes . Sculpted monuments were raised to record the deeds of the ruling dynasty . City centres also featured plazas , sacred ballcourts and buildings used for marketplaces and schools . Frequently causeways linked the centre to outlying areas of the city . Some of these classes of architecture formed lesser groups in the outlying areas of the city , which served as sacred centres for non @-@ royal lineages . The areas adjacent to these sacred compounds included residential complexes housing wealthy lineages . The largest and richest of these elite compounds sometimes possessed sculpture and art of craftsmanship equal to that of royal art .

The ceremonial centre of the Maya city was where the ruling elite lived , and where the administrative functions of the city were performed , together with religious ceremonies . It was also where the inhabitants of the city gathered for public activities . Elite residential complexes occupied the best land around the city centre , while commoners had their residences dispersed further away from the ceremonial centre . Residential units were built on top of stone platforms to raise them above the level of the rain season floodwaters .

= = = Building materials and methods = = =

The Maya built their cities with Neolithic technology ; they built their structures from both perishable materials and from stone . The exact type of stone used in masonry construction varied according to locally available resources , and this also affected the building style . Across a broad swathe of the Maya area , limestone was immediately available . The local limestone is relatively soft when freshly cut , but hardens with exposure . There was great variety in the quality of limestone , with good @-@ quality stone available in the Usumacinta region ; in the northern Yucatán , the limestone used in construction was of relatively poor quality . Volcanic tuff was used at Copán , and nearby Quiriguá employed sandstone . In Comalcalco , where suitable stone was not available locally , fired bricks were employed . Limestone was burned at high temperatures in order to manufacture cement , plaster , and stucco . Lime @-@ based cement was used to seal stonework in place , and stone blocks were fashioned using rope @-@ and @-@ water abrasion , and with obsidian tools . The Maya did not employ a functional wheel , so all loads were transported on litters , barges , or rolled on logs . Heavy loads were lifted with rope , but probably without employing pulleys .

Wood was used for beams , and for lintels , even in masonry structures . Throughout Maya history , common huts and some temples continued to be built from wooden poles and thatch . Adobe was also applied ; this consisted of mud strengthened with straw and was applied as a coating over the woven @-@ stick walls of huts . Like wood and thatch , adobe was used throughout Maya history , even after the development of masonry structures . In the southern Maya area , adobe was employed in monumental architecture when no suitable stone was locally available .

= = = Principal construction types = = =

The great cities of the Maya civilization were composed of pyramid temples , palaces , ballcourts , sacbeob (causeways) , patios and plazas . Some cities also possessed extensive hydraulic systems or defensive walls . The exteriors of most buildings were painted , either in one or multiple colours , or with imagery . Many buildings were adorned with sculpture or painted stucco reliefs .

= = = = Palaces and acropoleis = = = =

These complexes were usually located in the site core , beside a principal plaza . Maya palaces consisted of a platform supporting a multiroom range structure . The term acropolis , in a Maya context , refers to a complex of structures built upon platforms of varying height . Palaces and acropoleis were essentially elite residential compounds . They generally extended horizontally as opposed to the towering Maya pyramids , and often had restricted access . Some structures in Maya acropoleis supported roof combs . Rooms often had stone benches , used for sleeping , and holes indicate where curtains once hung . Large palaces , such as at Palenque , could be fitted with a water supply , and sweat baths were often found within the complex , or nearby . During the Early Classic , rulers were sometimes buried underneath the acropolis complex . Some rooms in palaces were true throne rooms ; in the royal palace of Palenque there were a number of throne rooms that were used for important events , including the inauguration of new kings .

Palaces are usually arranged around one or more courtyards , with their façades facing inwards ; some examples are adorned with sculpture . Some palaces possess associated hieroglyphic descriptions that identify them as the royal residences of named rulers . There is abundant evidence that palaces were far more than simple elite residences , and that a range of courtly activities took place in them , including audiences , formal receptions , and important rituals .

= = = = Pyramids and temples = = = =

Temples were sometimes referred to in hieroglyphic texts as k 'uh nah , meaning " god 's house " . Temples were raised on platforms , most often upon a pyramid . The earliest temples were probably thatched huts built upon low platforms . By the Late Preclassic period , their walls were of stone , and the development of the corbel arch allowed stone roofs to replace thatch . By the Classic period , temple roofs were being topped with roof combs that extended the height of the temple and served as a foundation for monumental art . The temple shrine contained between one and three rooms , and were dedicated to important deities . Such a deity might be one of the patron gods of the city , or a deified ancestor . In general , freestanding pyramids were shrines honouring powerful ancestors .

= = = = E @-@ Groups and observatories = = = =

The Maya were keen observers of the sun , stars , and planets . E @-@ Groups were a particular arrangement of temples that were relatively common in the Maya region ; they take their names from Group E at Uaxactun . They consisted of three small structures facing a fourth structure , and were used to mark the solstices and equinoxes . The earliest examples date to the Preclassic period . The Lost World complex at Tikal started out as an E @-@ Group built towards the end of the Middle Preclassic . Due to its nature , the basic layout of an E @-@ Group was constant . A structure was built on the west side of a plaza ; it was usually a radial pyramid with stairways facing the cardinal directions . It faced east across the plaza to three small temples on the far side . From the west pyramid , the sun was seen to rise over these temples on the solstices and equinoxes . E @-@ Groups were raised across the central and southern Maya area for over a millennium ; not all were properly aligned as observatories , and their function may have been symbolic .

As well as E @-@ Groups , the Maya built other structures dedicated to observing the movements of celestial bodies . Many Maya buildings were aligned with astronomical bodies , including the planet Venus , and various constellations . The Caracol structure at Chichen Itza was a circular multi

@-@ level edifice , with a conical superstructure . It has slit windows that marked the movements of Venus . At Copán , a pair of stelae were raised to mark the position of the setting sun at the equinoxes .

=== Triadic pyramids ===

Triadic pyramids first appeared in the Preclassic . They consisted of a dominant structure flanked by two smaller inward @-@ facing buildings , all mounted upon a single basal platform . The largest known triadic pyramid was built at El Mirador in the Petén Basin ; it covers an area six times as large as that covered by Temple IV , the largest pyramid at Tikal . The three superstructures all have stairways leading up from the central plaza on top of the basal platform . No securely established forerunners of Triadic Groups are known , but they may have developed from the eastern range building of E @-@ Group complexes . The triadic form was the predominant architectural form in the Petén region during the Late Preclassic . Examples of triadic pyramids are known from as many as 88 archaeological sites . At Nakbe , there are at least a dozen examples of triadic complexes and the four largest structures in the city are triadic in nature . At El Mirador there are probably as many as 36 triadic structures . Examples of the triadic form are even known from Dzibilchaltun in the far north of the Yucatán Peninsula , and Q 'umarkaj in the Highlands of Guatemala . The triadic pyramid remained a popular architectural form for centuries after the first examples were built ; it continued in use into the Classic Period , with later examples being found at Uaxactun , Caracol , Seibal , Nakum , Tikal and Palenque . The Q 'umarkaj example is the only one that has been dated to the Postclassic Period . The triple @-@ temple form of the triadic pyramid appears to be related to Maya mythology .

=== Ballcourts ===

The ballcourt is a distinctive pan @-@ Mesoamerican form of architecture . Although the majority of Maya ballcourts date to the Classic period , the earliest examples appeared around 1000 BC in northwestern Yucatán , during the Middle Preclassic . By the time of Spanish contact , ballcourts were only in use in the Guatemalan Highlands , at cities such as Q 'umarkaj and Iximche . Throughout Maya history , ballcourts maintained a characteristic form consisting of an ? shape , with a central playing area terminating in two transverse end zones . The central playing area usually measures between 20 and 30 metres (66 and 98 ft) long , and is flanked by two lateral structures that stood up to 3 or 4 metres (9 @.@ 8 or 13 @.@ 1 ft) high . The lateral platforms often supported structures that may have held privileged spectators . The Great Ballcourt at Chichen Itza is the largest in Mesoamerica , measuring 83 metres (272 ft) long by 30 metres (98 ft) wide , with walls standing 8 @.@ 2 metres (27 ft) high .

=== Regional architectural styles ===

Although Maya cities shared many common features , there was considerable variation in architectural style . Such styles were influenced by locally available construction materials , climate , topography , and local preferences . In the Late Classic , these local differences developed into distinctive regional architectural styles .

=== Central Petén ===

The central Petén style of architecture is modelled after the great city of Tikal . The style is characterised by tall pyramids supporting a summit shrine adorned with a roof comb , and accessed by a single doorway . Additional features are the use of stela @-@ altar pairings , and the decoration of architectural façades , lintels , and roof combs with relief sculptures of rulers and gods . One of the finest examples of Central Petén style architecture is Tikal Temple I. Examples of sites in the Central Petén style include Altun Ha , Calakmul , Holmul , Ixkun , Nakum , Naranjo , and

Yaxhá .

===== Puuc =====

The exemplar of Puuc @-@ style architecture is Uxmal . The style developed in the Puuc Hills of northwestern Yucatán ; during the Terminal Classic it spread beyond this core region across the northern Yucatán Peninsula . Puuc sites replaced rubble cores with lime cement , resulting in stronger walls , and also strengthened their corbel arches ; this allowed Puuc @-@ style cities to build freestanding entrance archways . The upper façades of buildings were decorated with precut stones mosaic @-@ fashion , erected as facing over the core , forming elaborate compositions of long @-@ nosed deities such as the rain god Chaac and the Principal Bird Deity . The motifs also included geometric patterns , lattices and spools , possibly influenced by styles from highland Oaxaca , outside the Maya area . In contrast , the lower façades were left undecorated . Roof combs were relatively uncommon at Puuc sites .

===== Chenes =====

The Chenes style is very similar to the Puuc style , but predates the use of the mosaic façades of the Puuc region . It featured fully adorned façades on both the upper and lower sections of structures . Some doorways were surrounded by mosaic masks of monsters representing mountain or sky deities , identifying the doorways as entrances to the supernatural realm . Some buildings contained interior stairways that accessed different levels . The Chenes style is most commonly encountered in the southern portion of the Yucatán Peninsula , although individual buildings in the style can be found elsewhere in the peninsula . Examples of Chenes sites include Dzibilnocac , Hochob , Santa Rosa Xtampak , and Tabasqueño .

===== Río Bec =====

The Río Bec style forms a sub @-@ region of the Chenes style , and also features elements of the Central Petén style , such as prominent roof combs . Its palaces are distinctive for their false @-@ tower decorations , lacking interior rooms , with steep , almost vertical , stairways and false doors . These towers were adorned with deity masks , and were built to impress the viewer , rather than serve any practical function . Such false towers are only found in the Río Bec region . Río Bec sites include Chicanná , Hormiguero , and Xpuhil .

===== Usumacinta =====

The Usumacinta style developed in the hilly terrain of the Usumacinta drainage . Cities took advantage of the hillsides to support their major architecture , as at Palenque and Yaxchilan . Sites modified corbel vaulting to allow thinner walls and multiple access doors to temples . As in Petén , roof combs adorned principal structures . Palaces had multiple entrances that used post @-@ and @-@ lintel entrances rather than corbel vaulting . Many sites erected stelae , but Palenque instead developed finely sculpted panelling to decorate its buildings .

== Language ==

Before 2000 BC , the Maya spoke a single language , dubbed proto @-@ Mayan by linguists . Linguistic analysis of reconstructed Proto @-@ Mayan vocabulary suggests that the original Proto @-@ Mayan homeland was in the western or northern Guatemalan Highlands , although the evidence is not conclusive . Proto @-@ Mayan diverged during the Preclassic period to form the major Mayan language groups that make up the family , including Huastecan , Greater K 'iche 'an , Greater Q 'anjobalan , Mamean , Tz 'eltalan @-@ Ch 'olan , and Yucatecan . These groups diverged further during the pre @-@ Columbian era to form over 30 languages that have survived

into modern times . The language of almost all Classic Maya texts over the entire Maya area has been identified as Ch 'olan ; Late Preclassic text from Kaminaljuyu , in the highlands , also appears to be in , or related to , Ch 'olan . The use of Ch 'olan as the language of Maya text does not necessarily indicate that it was the language commonly used by the local populace ? it may have been equivalent to Medieval Latin as a ritual or prestige language . Classic Ch 'olan may have been the prestige language of the Classic Maya elite , used in inter @-@ polity communication such as diplomacy and trade . By the Postclassic period , Yucatec was also being written in Maya codices alongside Ch 'olan .

= = Writing and literacy = =

The Maya writing system is one of the outstanding achievements of the pre @-@ Columbian inhabitants of the Americas . It was the most sophisticated and highly developed writing system of more than a dozen systems that developed in Mesoamerica . The earliest inscriptions in an identifiably Maya script date back to 300 ? 200 BC , in the Petén Basin . However , this is preceded by several other Mesoamerican writing systems , such as the Epi @-@ Olmec and Zapotec scripts . Early Maya script had appeared on the Pacific coast of Guatemala by the late 1st century AD , or early 2nd century . Similarities between the Isthmian script and Early Maya script of the Pacific coast suggest that the two systems developed in tandem . By about AD 250 , the Maya script had become a more formalised and consistent writing system .

The Catholic Church and colonial officials , notably Bishop Diego de Landa , destroyed Maya texts wherever they found them , and with them the knowledge of Maya writing , but by chance three uncontested pre @-@ Columbian books dated to the Postclassic period have been preserved . These are known as the Madrid Codex , the Dresden Codex and the Paris Codex . A few pages survive from a fourth , the Grolier Codex , whose authenticity is disputed . Archaeology conducted at Maya sites often reveals other fragments , rectangular lumps of plaster and paint chips which were codices ; these tantalizing remains are , however , too severely damaged for any inscriptions to have survived , most of the organic material having decayed . In reference to the few extant Maya writings , Michael D. Coe , a prominent archaeologist at Yale University , stated :

[O] ur knowledge of ancient Maya thought must represent only a tiny fraction of the whole picture , for of the thousands of books in which the full extent of their learning and ritual was recorded , only four have survived to modern times (as though all that posterity knew of ourselves were to be based upon three prayer books and ' Pilgrim 's Progress ') .

Most surviving pre @-@ Columbian Maya writing dates to the Classic period and is contained in stone inscriptions from Maya sites , such as stelae , or on ceramics vessels . Other media include the aforementioned codices , stucco façades , frescoes , wooden lintels , cave walls , and portable artefacts crafted from a variety of materials , including bone , shell , obsidian , and jade .

= = = Writing system = = =

The Maya writing system (often called hieroglyphs from a superficial resemblance to the Ancient Egyptian writing) is a logosyllabic writing system , combining a syllabary of phonetic signs representing syllables with logogram representing entire words . Among the writing systems of the Pre @-@ Columbian New World , Maya script most closely represents the spoken language . At any one time , no more than around 500 glyphs were in use , some 200 of which (including variations) were phonetic .

The Maya script was in use up to the arrival of the Europeans , its use peaking during the Classic Period . In excess of 10 @, @ 000 individual texts have been recovered , mostly inscribed on stone monuments , lintels , stelae and ceramics . The Maya also produced texts painted on a form of paper manufactured from processed tree @-@ bark generally now known by its Nahuatl @-@ language name amatl used to produce codices . The skill and knowledge of Maya writing persisted among segments of the population right up to the Spanish conquest . The knowledge was subsequently lost , as a result of the impact of the conquest on Maya society .

The decipherment and recovery of the knowledge of Maya writing has been a long and laborious process . Some elements were first deciphered in the late 19th and early 20th century , mostly the parts having to do with numbers , the Maya calendar , and astronomy . Major breakthroughs were made from the 1950s to 1970s , and accelerated rapidly thereafter . By the end of the 20th century , scholars were able to read the majority of Maya texts , and ongoing work continues to further illuminate the content .

= = = Hieroglyphic script = = =

The basic unit of Maya hieroglyphic text is the glyph block , which transcribes a word or phrase . The block is composed of one or more individual glyphs attached to each other to form the glyph block , with individual glyph blocks generally being separated by a space . Glyph blocks are usually arranged in a grid pattern . For ease of reference , epigraphers refer to glyph blocks from left to right alphabetically , and top to bottom numerically . Thus , any glyph block in a piece of text can be identified : C4 would be third block counting from the left , and the fourth block counting downwards . If a monument or artefact has more than one inscription , column labels are not repeated , rather they continue in the alphabetic series ; if there are more than 26 columns , the labelling continues as A ' , B ' , etc . Numeric row labels restart from 1 for each discrete unit of text .

Although hieroglyphic text may be laid out in varying manners , generally text is arranged into double columns of glyph blocks . The reading order of text starts at the top left (block A1) , continues to the second block in the double @-@ column (B1) , then drops down a row and starts again from the left half of the double column (A2) , and thus continues in zig @-@ zag fashion . Once the bottom is reached , the inscription continues from the top left of the next double column . Where an inscription ends in a single (unpaired) column , this final column is usually read straight downwards .

Individual glyph blocks may be composed of a number of elements . These consist of the main sign , and any affixes . Main signs represent the major element of the block , and may be a noun , verb , adverb , adjective , or phonetic sign . Some main signs are abstract , some are pictures of the object they represent , and others are " head variants " , personifications of the word they represent . Affixes are smaller rectangular elements , usually attached to a main sign , although a block may be composed entirely of affixes . Affixes may represent a wide variety of speech elements , including nouns , verbs , verbal suffixes , prepositions , pronouns , and more . Small sections of a main sign could be used to represent the whole main sign , and Maya scribes were highly inventive in their usage and adaptation of glyph elements .

= = = Writing tools = = =

Although the archaeological record does not provide examples of brushes or pens , analysis of ink strokes on the Postclassic codices suggests that it was applied with a brush with a tip fashioned from pliable hair . A Classic period sculpture from Copán , Honduras , depicts a scribe with an inkpot fashioned from a conch shell . Excavations at Aguateca uncovered a number of scribal artefacts from the residences of elite status scribes , including palettes and mortars and pestles .

= = = Scribes and literacy = = =

Commoners were illiterate ; scribes were drawn from the elite . It is not known if all members of the aristocracy could read and write , although at least some women could , since there are representations of female scribes in Maya art . Maya scribes were called aj tz 'ib , meaning " one who writes or paints " . There were probably scribal schools where members of the aristocracy were taught to write . Scribal activity is identifiable in the archaeological record ; Jasaw Chan K 'awil I , king of Tikal , was interred with his paint pot . Some junior members of the Copán royal dynasty have also been found buried with their writing implements . A palace at Copán has been identified as that of a noble lineage of scribes ; it is decorated with sculpture that includes figures holding ink

pots .

Although not much is known about Maya scribes , some did sign their work , both on ceramics and on stone sculpture . Usually , only a single scribe signed a ceramic vessel , but multiple sculptors are known to have recorded their names on stone sculpture ; eight sculptors signed one stela at Piedras Negras . However , most works remained unsigned by their artists .

= = Mathematics = =

In common with the other Mesoamerican civilizations , the Maya used a base 20 (vigesimal) system . The bar @-@ and @-@ dot counting system that is the base of Maya numerals was in use in Mesoamerica by 1000 BC ; the Maya adopted it by the Late Preclassic , and added the symbol for zero . This may have been the earliest known occurrence of the idea of an explicit zero worldwide , although it may have been predated by the Babylonian system . The earliest explicit use of zero occurred on monuments dated to 357 AD . In its earliest uses , the zero served as a place holder , indicating an absence of a particular calendrical count . This later developed into a numeral that was used to perform calculation , and was used in hieroglyphic texts for more than a thousand years , until its use was extinguished by the Spanish .

The basic number system consists of a dot to represent one , and a bar to represent five . By the Postclassic period a shell symbol represented zero ; during the Classic period other glyphs were used . The Maya could write any number from 0 to 19 using a combination of these symbols . The precise value of a numeral was determined by its position ; as a numeral shifted upwards , its basic value multiplied by twenty . In this way , the lowest symbol would represent units , the next symbol up would represent multiples of twenty , and the symbol above that would represent multiples of 400 , and so on . For example , the number 884 would be written with four dots on the lowest level , four dots on the next level up , and two dots on the next level after that , to give 4×1 , plus 4×20 , plus 2×400 . Using this system , the Maya were able to record huge numbers . Simple addition could be performed by summing the dots and bars in two columns to give the result in a third column .

= = Calendar = =

The Maya calendrical system , in common with other Mesoamerican calendars , had its origins in the Preclassic period . However , it was the Maya that developed the calendar to its maximum sophistication , recording lunar and solar cycles , eclipses and movements of planets with great accuracy . In some cases , the Maya calculations were more accurate than equivalent calculations in the Old World ; for example , the Maya solar year was calculated to greater accuracy than the Julian year . The Maya calendar was intrinsically tied to Maya ritual , and it was central to Maya religious practices . The calendar combined a non @-@ repeating Long Count with three interlocking cycles , each measuring a progressively larger period . These were the 260 @-@ day tzolk 'in , the 365 @-@ day haab ' , and the 52 @-@ year Calendar Round , resulting from the combination of the tzolk 'in with the haab ' . There were also additional calendric cycles , such as an 819 @-@ day cycle associated with the four quadrants of Maya cosmology , governed by four different aspects of the god K 'awil .

The basic unit in the Maya calendar was one day , or k 'in , and 20 k 'in grouped to form a winal . The next unit , instead of being multiplied by 20 , as called for by the vigesimal system , was multiplied by 18 in order to provide a rough approximation of the solar year (hence producing 360 days) . This 360 @-@ day year was called a tun . Each succeeding level of multiplication followed the vigesimal system .

The 260 @-@ day tzolk 'in provided the basic cycle of Maya ceremony , and the foundations of Maya prophecy . No astronomical basis for this count has been proved , and it may be that the 260 @-@ day count is based on the human gestation period . This is reinforced by the use of the tzolk 'in to record dates of birth , and provide corresponding prophecy . The 260 @-@ day cycle repeated a series of 20 @-@ day @-@ names , with a number from 1 to 13 prefixed to indicate where in the cycle a particular day occurred .

The 365 @-@ day haab was produced by a cycle of eighteen named 20 @-@ day winals , completed by the addition of 5 @-@ day period called the wayeb . The wayeb was considered to be a dangerous time , when the barriers between the mortal and supernatural realms were broken , allowing malignant deities to cross over and interfere in human concerns . In a similar way to the tz 'olkin , the named winal would be prefixed by a number (from 0 to 19) , in the case of the shorter wayeb period , the prefix numbers ran 0 to 4 . Since each day in the tz 'olkin had a name and number (e.g. 8 Ajaw) , this would interlock with the haab , producing an additional number and name , to give any day a more complete designation , for example 8 Ajaw 13 Keh . Such a day name could only recur once every 52 years , and this period is referred to by Mayanists as the Calendar Round . In most Mesoamerican cultures , the Calendar Round was the largest unit for measuring time .

As with any non @-@ repeating calendar , the Maya measured time from a fixed start point . The Maya set the beginning of their calendar as the end of a previous cycle of bak 'tuns , equivalent to a day in 3114 BC . This was believed by the Maya to be the day of the creation of the world in its current form . The Maya used the Long Count Calendar to fix any given day of the Calendar Round within their current great Piktun cycle consisting of either 20 bak 'tuns . There was some variation in the calendar , specifically texts in Palenque demonstrate that the piktun cycle that ended in 3114 BC had only 13 bak 'tuns , and other inscriptions seem to have used an exceptional cycle of 13 + 20 bak 'tun in the current piktun . Additionally , there may have been some regional variation in how these exceptional cycles were managed .

A full long count date consisted of an introductory glyph followed by five glyphs counting off the number of bak 'tuns , kat 'uns , tuns , winals , and k 'ins since the start of the current creation . This would be followed by the tz 'olkin portion of the Calendar Round date , and after a number of intervening glyphs , the Long Count date would end with the Haab portion of the Calendar Round date .

= = = Correlation of the Long Count calendar = = =

Although the Calendar Round is still in use today , the Maya started using an abbreviated Short Count during the Late Classic period . The Short Count is a count of 13 k 'atuns . For this reason , there is no direct correlation between the Long Count and the European calendar . The most generally accepted correlation is the Goodman @-@ Martínez @-@ Thompson , or GMT , correlation . This equates the Long Count date 11 @.@ 16 @.@ 0 @.@ 0 @.@ 0 13 Ajaw 8 Xul with the Gregorian date of 12 November 1539 . Epigraphers Simon Martin and Nikolai Grube argue for a two @-@ day shift from the standard GMT correlation . The Spinden Correlation would shift the Long Count dates back by 260 years ; it also accords with the documentary evidence , and is better suited to the archaeology of the Yucatán Peninsula , but presents problems with the rest of the Maya region . The George Vaillant Correlation would shift all Maya dates 260 years later , and would greatly shorten the Postclassic period . Radiocarbon dating of dated wooden lintels at Tikal supports the GMT correlation .

= = Astronomy = =

The famous astrologer John Dee used an Aztec obsidian mirror to see into the future . We may look down our noses at his ideas , but one may be sure that in outlook he was far closer to a Maya priest astronomer than is an astronomer of our century .

The Maya made meticulous observations of celestial bodies , patiently recording astronomical data on the movements of the sun , moon , Venus , and the stars . This information was used for divination , so Maya astronomy was essentially for astrological purposes . Maya astronomy did not serve to study the universe for scientific reasons , nor was it used to measure the seasons in order to calculate crop planting . It was rather used by the priesthood to comprehend past cycles of time , and project them into the future to produce prophecy . The priesthood refined observations and recorded eclipses of the sun and moon , and movements of Venus and the stars ; these were

measured against dated events in the past , on the assumption that similar events would occur in the future when the same astronomical conditions prevailed . Illustrations in the codices show that priests made astronomical observations using the naked eye , assisted by crossed sticks as a sighting device . Analysis of the few remaining Postclassic codices has revealed that , at the time of European contact , the Maya had recorded eclipse tables , calendars , and astronomical knowledge that was more accurate at that time than comparable knowledge in Europe .

The Maya measured the 584 @-@ day Venus cycle with an error of just two hours . Five cycles of Venus equated to eight 365 @-@ day haab calendrical cycles , and this period was recorded in the codices . The Maya also followed the movements of Jupiter , Mars and Mercury . When Venus rose as the Morning Star , this was associated with the rebirth of the Maya Hero Twins . For the Maya , the heliacal rising of Venus was associated with destruction and upheaval . Venus was closely associated with warfare , and the hieroglyph meaning " war " incorporated the glyph @-@ element symbolising the planet . Sight @-@ lines through the windows of the Caracol building at Chichen Itza align with the northernmost and southernmost extremes of Venus ' path . Maya rulers launched military campaigns to coincide with the heliacal or cosmical rising of Venus , and would also sacrifice important captives to coincide with such conjunctions .

Solar and lunar eclipses were considered to be especially dangerous events that could bring catastrophe upon the world . In the Dresden Codex , a solar eclipse is represented by a serpent devouring the k 'in (" day ") hieroglyph . Eclipses were interpreted as the sun or moon being bitten , and lunar tables were recorded in order that the Maya might be able to predict them , and perform the appropriate ceremonies to ward off disaster .

= = Religion and mythology = =

In common with the rest of Mesoamerica , the Maya believed in a supernatural realm inhabited by an array of powerful deities . These deities needed to be placated with ceremonial offerings and ritual practices . At the core of Maya religious practice was the worship of deceased ancestors , who would act as go @-@ between for their living descendants in dealings with the denizens of the supernatural realm . The earliest intermediaries between humans and the supernatural realm were shamans . As the Maya civilization developed , the ruling elite codified the general concepts held by Maya society , and developed them into religious cults that justified their right to rule . In the Late Preclassic , the pinnacle of this process was the combination of ultimate political and religious power in the divine king , the k 'uhul ajaw . Although it is difficult to reconstruct the belief system through archaeology , some indicators of ritual practice do leave physical traces . These include dedicatory caches and other ritual deposits , shrines , and burials and their associated funerary offerings . In addition , Maya art , architecture , and writing all assist in the reconstruction of ancient Maya beliefs ; these can be combined with ethnographic sources , including records of Maya religious practices made by the Spanish during the conquest .

The Maya viewed the cosmos as highly structured ; there were thirteen levels in the heavens , and nine levels in the underworld ; the mortal world occupied a position between the heavens and the underworld . Each level had four cardinal directions associated with a different colour . Major deities had aspects associated with these directions and colours ; north was white , east was red , south was yellow , and west was black .

Maya households interred their dead underneath the floors of their houses , with offerings appropriate to the social status of the family . There the dead could act as protective ancestors . Maya lineages were patrilineal , so the worship of a prominent male ancestor would be emphasized , often with a household shrine . As Maya society developed , and the elite became more powerful , Maya royalty developed their household shrines into the great pyramids that held the tombs of their ancestors .

Supernatural forces pervaded Maya life , and influenced every aspect of it from the simplest day @-@ to @-@ day activities such as food preparation , to trade , politics , and elite activities . Maya deities governed all aspects of the world , both visible and invisible . The Maya priesthood was a closed group , drawing its members from the established elite ; by the Early Classic they were

recording increasingly complex ritual information in their hieroglyphic books , including astronomical observations , calendrical cycles , history and mythology . The priests performed public ceremonies that incorporated feasting , bloodletting , incense burning , music , ritual dance , and , on certain occasions , human sacrifice . During the Classic period , the Maya ruler was the high priest , and the direct conduit between mortals and the gods . It is highly likely that , among commoners , shamanism continued in parallel to state religion . By the Postclassic , religious emphasis had changed ; there was an increase in worship of the images of deities , and more frequent recourse to human sacrifice .

= = = Human sacrifice = = =

Blood was viewed as a potent source of nourishment for the Maya deities , and the sacrifice of a living creature was a powerful blood offering . By extension , the sacrifice of a human life was the ultimate offering of blood to the gods , and the most important Maya rituals culminated in human sacrifice . Generally only high status prisoners of war were sacrificed , with lower status captives being used for labour .

Important rituals such as the dedication of major building projects or the enthronement of a new ruler required a human offering . The sacrifice of an enemy king was the most prized offering , and such a sacrifice involved decapitation of the captive ruler in a ritual reenactment of the decapitation of the Maya maize god by the Maya death gods . In AD 738 , the vassal king K 'ak ' Tiliw Chan Yopaat of Quiriguá captured his overlord , Uaxaclajuun Ub 'aah K 'awiil of Copán and a few days later he ritually decapitated him ; The decapitation of an enemy king may have been performed as part of a ritual ballgame reenacting the victory of the Maya Hero Twins over the gods of the underworld . Sacrifice by decapitation is depicted in Classic period Maya art , and sometimes took place after the victim was tortured , being variously beaten , scalped , burnt or disembowelled . The Hero Twins myth recounted in the Popol Vuh relates how one of each pair of twins was decapitated by their ballgame opponents .

During the Postclassic period , the most common form of human sacrifice was heart extraction , influenced by the method used by the Aztecs in the Valley of Mexico ; this usually took place in the courtyard of a temple , or upon the summit of the pyramid . Depending upon the exact ritual , sometimes the corpse would be skinned by assistant priests , except for the hands and feet . The officiating priest would then remove his ritual attire and dress himself in the skin of the sacrificial victim before performing a ritual dance that symbolised the rebirth of life . Archaeological investigations indicate that heart sacrifice was practised as early as the Classic period .

= = = Deities = = =

The Maya world was populated by a great variety of deities , supernatural entities and sacred forces . The Maya had such a broad interpretation of what was sacred that identifying distinct deities with specific functions is inaccurate . The Maya interpretation of deities was intrinsically tied to the calendar , astronomy , and their cosmology . The importance of a deity , its characteristics , and its associations varied according to the movement of celestial bodies . The priestly interpretation of astronomical records and books was therefore crucial , since the priest would understand which deity required ritual propitiation , when the correct ceremonies should be performed , and what would be an appropriate offering . Each deity had four manifestations , associated with the cardinal directions , each identified with a different colour . They also had a dual day @-@ night / life @-@ death aspect .

Itzamna was the creator god , but he also embodied the cosmos , and was simultaneously a sun god ; K 'inich Ahau , the day sun , was one of his aspects . Maya kings frequently identified themselves with K 'inich Ahau . Itzamna also had a night sun aspect , the Night Jaguar , representing the sun in its journey through the underworld . The four Pawatuns supported the corners of the mortal realm ; in the heavens , the Bacabs performed the same function . As well as their four main aspects , the Bacabs had dozens of other aspects that are not well understood . The

four Chaacs were storm gods , controlling thunder , lightning , and the rains . The nine lords of the night each governed one of the underworld realms . Other important deities included the moon goddess , the maize god , and the Hero Twins .

The Popol Vuh was written in the Latin script in early colonial times , and was probably transcribed from a hieroglyphic book by an unknown K 'iche ' Maya nobleman . It is one of the most outstanding works of indigenous literature in the Americas . The Popul Vuh recounts the mythical creation of the world , the legend of the Hero Twins , and the history of the Postclassic K 'iche ' kingdom . Deities recorded in the Popul Vuh include Hun Hunahpu , the K 'iche ' maize god , and a triad of deities led by the K 'iche ' patron Tohil , and also including the moon goddess Awilix , and the mountain god Jacawitz .

In common with other Mesoamerican cultures , the Maya worshipped feathered serpent deities . Such worship was rare during the Classic period , but by the Postclassic the feathered serpent had spread to both the Yucatán Peninsula and the Guatemalan Highlands . In Yucatán , the feathered serpent deity was Kukulcan , among the K 'iche ' it was Q 'uq 'umatz . Kukulcan had his origins in the Classic period War Serpent , Waxaklahun Ubah Kan , and has also been identified as the Postclassic version of the Vision Serpent of Classic Maya art . Although the cult of Kukulcan had its origins in these earlier Maya traditions , the worship of Kukulcan was heavily influenced by the Quetzalcoatl cult of central Mexico . Likewise , Q 'uq 'umatz had a composite origin , combining the attributes of Mexican Quetzalcoatl with aspects of the Classic period Itzamna .

= = Agriculture = =

The ancient Maya had diverse and sophisticated methods of food production . It was believed that shifting cultivation (swidden) agriculture provided most of their food , but it is now thought that permanent raised fields , terracing , intensive gardening , forest gardens , and managed fallows were also crucial to supporting the large populations of the Classic period in some areas . Indeed , evidence of these different agricultural systems persist today : raised fields connected by canals can be seen on aerial photographs . Contemporary rainforest species composition has significantly higher abundance of species of economic value to ancient Maya in areas that were densely populated in pre @-@ Columbian times , and pollen records in lake sediments suggest that maize , manioc , sunflower seeds , cotton , and other crops have been cultivated in association with deforestation in Mesoamerica since at least 2500 BC .

The basic staples of the Maya diet were maize , beans , and squashes . These were supplemented with a wide variety of other plants either cultivated in gardens or gathered in the forest . At Joya de Cerén , a volcanic eruption preserved a record of foodstuffs stored in Maya homes , among them were chilies and tomatoes . Cotton seeds were in the process of being ground , perhaps to produce cooking oil . In addition to basic foodstuffs , the Maya also cultivated prestige crops such as cotton , cacao and vanilla . Cacao was especially prized by the elite , who consumed chocolate beverages . Cotton was spun , dyed , and woven into valuable textiles in order to be traded .

The Maya had few domestic animals ; dogs were domesticated by 3000 BC , and the Muscovy duck by the Late Postclassic . Ocellated turkeys were unsuitable for domestication , but were rounded up in the wild and penned for fattening . All of these were used as food animals ; dogs were additionally used for hunting . It is possible that deer were also penned and fattened .

= = Maya sites = =

There are hundreds of Maya sites spread across five countries : Belize , El Salvador , Guatemala , Honduras and Mexico . The six sites with particularly outstanding architecture or sculpture are Chichen Itza , Palenque , Uxmal , and Yaxchilan in Mexico , Tikal in Guatemala and Copán in Honduras . Other important , but difficult to reach , sites include Calakmul and El Mirador . The principal sites in the Puuc region , after Uxmal , are Kabah , Labna , and Sayil . In the east of the Yucatán Peninsula are Coba and the small site of Tulum . The Río Bec sites of the base of the peninsula include Becan , Chicanná , Kohunlich , and Xpuhil . The most noteworthy sites in Chiapas

, other than Palenque and Yaxchilan , are Bonampak and Toniná . In the Guatemalan Highlands are Iximche , Kaminaljuyu , Mixco Viejo , and Q 'umarkaj (also known as Utatlán) . In the northern Petén lowlands of Guatemala there are many sites , though apart from Tikal access is generally difficult . Some of the Petén sites are Dos Pilas , Seibal , and Uaxactún . Important sites in Belize include Altun Ha , Caracol , and Xunantunich .

= = Museum collections = =

There are a great many museums across the world with Maya artefacts in their collections . The Foundation for the Advancement of Mesoamerican Studies lists over 250 museums in its Maya Museum database , and the European Association of Mayanists lists just under 50 museums in Europe alone .