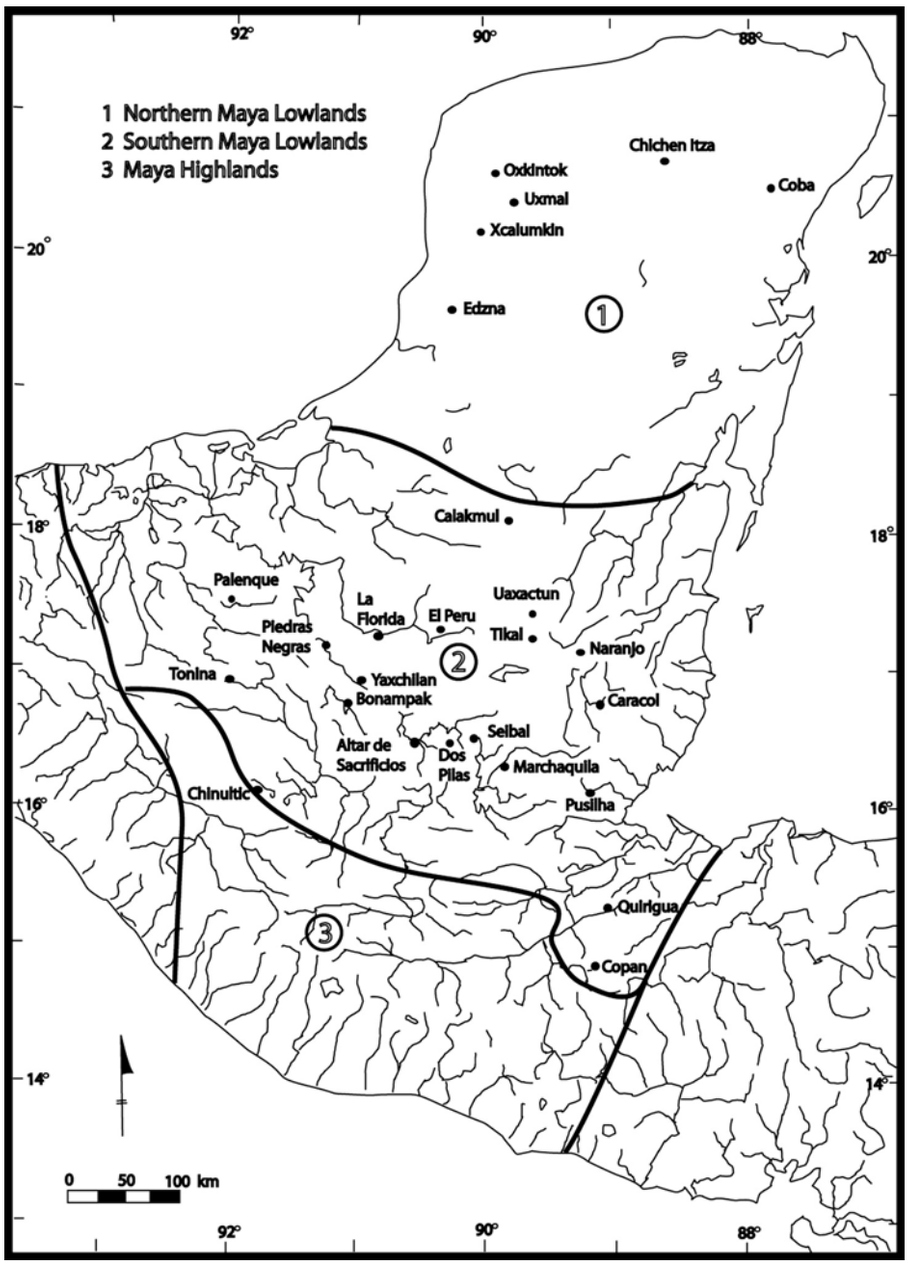
INTRODUCTION

The objectives of this book are to describe the methods and present the results of an investigation into the utilisation of sculpture by the Classic Maya as "signposting," as a means of signaling the function and the hierarchical division of ritual and administrative "spaces" in a city centre. Due to limitations in the breadth of literacy among the greater Maya (A.D. 250–900) population, imagery (as displayed on monuments and architecture) was used by the Maya elite as a supplementary communicative tool. Monumental art was used to signal, among other things, the "identities of sacred places and [their] function through sculptural composition . . . to people using them or coming into the spaces they addressed" (Schele and Mathews 1998: 27). Most often, attempts to understand the function and exclusivity of space within Classic Maya city centres have focused on the interpretation of architectural variation (i.e., points of restricted access implying public and private domains; see Harrison 1970; Andrews 1975; Pendergast 1992). Additional methods of inquiry have included epigraphic decipherment, ethnohistoric investigation, ethnographic analogy, and analysis of artefact residues and their distribution (e.g., Fash 1983; Schele and Mathews 1998; McAnany and Plank 2001).

A primary objective of the present inquiry was to determine whether an analysis of the spatial distribution of sculpture within a Maya site would influence current proposals concerning elite-civic demarcation and area function maintained by ethnographic, ethnohistoric, artefactual, and epigraphic assessment. My intention was to apply a social dimension to the inquiry of "space" through the analysis of behaviour and symbolism represented on monumental art and architecture. It is argued that among the Maya "a full range of activities took place in residential compounds, including lineage festivals, administrative overseeing, manufacture, gathering of tribute, adjudications, child rearing, food preparation, and a hundred other enterprises" (Schele and Mathews 1998: 29). As noted by Tilley (1994: 10–11), the "spatial experience [should not be viewed as] innocent and neutral, but invested with power relating to age, gender, social position and relationships with others. Different societies, groups and individuals act out their lives in different spaces." I saw value in establishing whether imagery, as displayed on monumental art and architecture, could further contribute to our understanding of social order and control within important Maya sites. Cross-culturally, the utilisation of visual media to communicate to the broader masses has long been acknowledged. For the "Greeks, mythologic, heroic, or historic sculpture represented something which had a very vivid interest for everyone. Similarly . . . mediaeval monuments [and] statuary had a meaning perfectly understood by all; it was a means of instruction. The iconography of our great northern cathedrals is a veritable encyclopedia instructing the multitude through the eyes" (Viollet-le-Duc 1987: 214).

"Access analysis" of archetypal building groups, combined with the thematic–analytical investigation of fixed sculptural media (positioned within specific spatial contexts), has proven to be an effective method of assessing the role that imagery played in signaling the function and hierarchical division of bounded space. General questions that I sought to address in my inquiry were: (1) What was it that motivated the Maya elite to position sculpture where they did? (2) Is there specific imagery marking specific spaces? (3) Acknowledging the multidimensionality of meaning communicated by Maya sculpture, are there embedded within compositions clues as to how certain space was used and socially demarcated?



Map showing major sites in the Maya region. Mathews (1996: 3), reprinted with permission.

Region and Cultural Background

The modern states and countries that collectively comprise the Maya region are the Mexican states of Yucatan, Quintana Roo, Campeche, Tabasco, and Chiapas, as well as Guatemala, Belize, and the westernmost regions of Honduras and El Salvador. With a cultural tradition extending at least as far back as 2,500 years, the ancient Maya were successful farmers, traders, and builders of cities that maintained large populations of inhabitants. In the past, the people of Mesoamerica shared a common cultural tradition – more specifically, "definitions about how to grow and distribute food, what constituted government, and how the world worked, both on the mundane and the cosmological level" (Schele and Mathews 1998: 15). Speaking many of the languages spoken by their ancient predecessors, descendants of the ancient Maya (numbering in the millions) still live in traditional houses in close proximity to the cities once ruled by their ancestors (Mathews 1996: 2).

Shortly after 1,000 B.C. the Maya began to construct their cities in the lowland forests and the

highland mountains of Central America. The configuration of basic building groups in Maya centres mimicked, in their general layout and design, family compounds made from pole and thatch. Family compounds generally comprised a square central plaza surrounded on three sides by a platform surmounted by inward facing structures. Today, little survives of these residential structures that once occupied the peripheries of city centres. Their presence, size, and orientation, however, can be surmised from surviving earth mounds. Referred to as patio-groups, hundreds have been excavated. Patio-groups usually comprise two to six buildings that surround a central courtyard. Often arranged in clusters numbering between five and twelve, these architectural assemblages represent the basic building prototype in Maya settlement studies (Willey 1980: 255–256).

The Classic Period (A.D. 250–900) was characterised by the rapid growth of kingdoms, where ongoing conflict after the fifth century A.D. between city-states resulted in two great alliances comprising many of the smaller kingdoms of the Maya region. These great alliances were to be headed by two great "super-powers," Calakmul and Tikal (Schele and Mathews 1998: 17–18). Once the foci of ritual and administrative overseeing, some of the finest examples of major city centres of the period included Palenque, Yaxchilan, Bonampak, Tikal, Copan, and Piedras Negras. In the northern Maya lowlands, other Maya cites thrived towards the end of the Classic Period; included among these were Chichen Itza, Xcalumk'in, and the 'Puuc' cities of Uxmal, Kabah, Sayil, and Labna (see map of Maya region).

Architectural features commonly associated with major city centres include pyramidal temples, vaulted multiroomed palaces supported by single or multiterraced platforms, and the presence of one or more ball-courts. Artistic features commonly appearing in major centres include monolithic stelae and altars, most often positioned around plazas in the city's core. In addition, the larger Maya sites generally comprise several building groups connected by a network of causeways (Bullard 1960: 360–361), the longest of which may have provided access to smaller neighbouring sites. During the Classic Period, the western Maya lowlands also saw the rise of many subordinate centres, some of the largest of which were affiliated with sites like Yaxchilan (e.g., La Pasadita) and Piedras Negras (e.g., El Cayo).

1

Defining the Maya built environment

1.1. Architecture, space, and cognition

Since ancient times, cities and towns have incorporated dominant architectural features as a means of signaling the priorities of civic and/or elite populations, as a way of making apparent the hierarchy of popular or imposed institutions, whether religious, governmental, or technological in nature. Often it has been architectural features, such as the degree of decoration displayed on buildings, combined with the relative size of functionally specific structures, that have been used as a way of signaling this order of priority, where building size has been especially important in communication over distance. Traditionally, the term "skyline" referred to a line in the distance where the earth and sky met. Today, the term has come to represent those buildings of a town or city visible at a distance on the horizon (Kostof 1991: 279). More often the prominent buildings influence how a city is perceived, signaling the prevailing social and/or political order of the time. For instance, in modern societies it is the secular architecture of enterprise that now dominates the landscape of most cities, where corporate skyscrapers now overshadow the religious architecture of churches and cathedrals (Kostof 1991: 280–294). In the ancient past, funerary monuments and temple architecture outshone all other forms, the most prominent being the Ziggurats of Mesopotamia and the temples and pyramids of Egypt and Mesoamerica.

It is argued that "environmental cognition is a vitally important part of the interaction between people and their physical surroundings" (Walmsley 1988: 22). Human beings both seek and create meaning from the landscape as a way of establishing some sense of order and security, raising questions as to what can and cannot be interpreted symbolically. For some time it has been acknowledged that "everything can assume symbolic significance" (Jaffé 1966: 232), whether natural objects like stones, plants, animals, mountains, wind, water, and fire, or things made by human beings such as houses, boats, and cars (Jaffé 1966: 232). It is through symbolic constructs that we as human beings assign meaning to a world that can and cannot be experienced directly. More specifically, "place naming, star naming, maps, myth and tale, the orientation of buildings, the spatial implications in dances and ceremonies, all facilitate the construction and maintenance of spatial patterns of the world in which the individual must live and act" (Hallowell 1977: 133).

In an environment shaped by the human constructs imposed upon it, much of the meaning communicated by the landscape comes from symbols contrived as regulatory mechanisms. For example, symbols may be used to signal function, accessibility, order of importance, acceptable behaviour in a particular environment, the intensity at which a given activity is performed, in addition to the relative significance of proximity (Walmsley 1988: 21–22). One function of symbols and rules encoded within the landscape is to articulate domains, for example, separating public and private localities and ensuring appropriate levels of inclusion, exclusion, interaction, and protection (Rapoport 1977: 289). In this sense, the built environment may be viewed as influencing how, in what context, and under what conditions individuals and/or groups interact and communicate with each other (Rapoport 1976: 19).

Spatial attributes are primarily understood in terms of the static and shifting relationships between objects contained within them, as the ability to perceive space relies on discerning the proximity of things in relation to other things. Spatial perception permits individuals to orient themselves, coordinate behaviour with others, as well as manipulate and transform their environment, whereas culturally constituted views of space permit people to

participate in a world that is commonly perceived and understood (Hallowell 1977: 132). The distribution of space in the built environment displays patterns because of the influence of culture; different cultures comprise different rules, which guide behaviour and subsequently affect the design and organisation of architectonic space. Rules affect the placement, distribution, and utilisation of architectural features assigned to the landscape; therefore, the built environment can be understood in terms of the rules encoded within it (Rapoport 1977: 14). The effect that culture has on spatial patterning is discernible when comparing the urban landscapes of different countries. For example, the layout of North American cities such as New York generally conform to a grid pattern, whereas cities such as Paris in France display a more hierarchical layout where streets radiate outward from an architectonic epicentre (Nanda 1994: 81). In both examples, navigating through a city would make more sense to those people who reside in it, as particular cultures determine what emphasis is placed on spatial relationships, in addition to the significance of objects and reference points used for spatial orientation (Hallowell 1977: 131).

Human beings view themselves, in addition to objects, as being "in" space; consequently, they function as points of reference from which the rest of the world is perceived. "What spatial orientation . . . involves is a constant awareness of varying relations between the 'self' and other objects in a spatial schema of traditionally defined points" (Hallowell 1977: 133). Subsequently, to be oriented in a world that extends beyond the senses, the individual must view himself or herself in relation to a greater spatial plan, perceiving the self relative to objects and things conceived rather than seen (Hallowell 1977: 134). Social, psychological, and cultural aspects are represented in spatial terms, in "the intervals, relationships and distances between people and people, people and things, and things and things . . . [that lie] at the heart of the built environment" (Rapoport 1977: 9). Accordingly, features that we assign to space become markers of human action, values, and experiences and it is culture that determines the way in which these markers are ordered and interpreted (Pearson and Richards 1994a: 4).

The arrangements of architectural features in the built environment are affected by how people relate to each other in space, and are therefore subject to variation depending on behavioural context. Space articulated by architecture provides a "physical frame" to behaviour and allows architecture to be interpreted as arenas of "activity and performance of a range of social and cultural roles" (Arnold 2002: 135). Grahame (1997) points out that, in attempting to understand spatial layout in architecture, it becomes important to note that human beings are not simply located in space, but that they also have feelings towards space. Because of this emotional response to the environment, and the fact that social interaction occurs within it, space is constantly altered and transformed. It is through this process that structure is assigned to the world not only in a physical sense but morally, socially, and cosmologically, as it is through constructs derived through classification and categorisation that our sense of morality and social order are manifested and transformed.

It remains important to consider the relationship between space, social structure, and social consciousness; in this way the experience of architecture may be viewed as an interaction between subjective feeling and external influences (Arnold 2002: 134). There are three forms of knowledge that collectively control the way individuals perceive and react to their environments. They are: (1) operational knowledge, (2) responsive knowledge, and (3) inferential knowledge. Combined, these three forms of knowledge do two things: First, they facilitate movement, and, second, they provide a general frame of reference by which individuals understand and relate to their environment (Walmsley 1988: 21–22).

Operational knowledge relates to a person's understanding of the system or mode of operation in a given environment. By committing to memory such things as locations and physical attributes important to the functioning of an environment, one acquires this form of knowledge. In modern-day towns and cities, examples would include buildings, parks, and other features that, in addition to providing spatial contexts for activities (e.g., education, administration, and recreation), provide cues for the successful navigation around structured environments.

An individual's responsive knowledge comes as a result of reactions to distinctive features in the physical environment that stand out to differentiate elements – features such as the colour, size, and elaborateness of buildings – and the presence of communicative media, such as signs and billboards. Like operational knowledge, responsive knowledge provides cues that may assist in the selection of appropriate routes through an environment. To Walmsley (1988), knowledge of a place may also be derived from sounds and smells, which also fall under the category of responsive knowledge.

At the centre of inferential knowledge is the human being's ability to create systems of generalised categories to help organise and understand his or her environment. Inferential knowledge differs from both the operational and responsive forms in the sense that it is not derived from direct experience but rather through the individual's ability to extrapolate beyond what he or she has previously experienced and to probabilistically infer things that have

not been experienced directly. Walmsley (1988) uses the modern example to make his point, noting how prior experience with a central business district may allow an individual to survey the skyline of an unvisited city and discern the proximity of its central business district based on the proximity and height of certain buildings.

As a result of the three forms of knowledge just described (operational, responsive, and inferential), cities and towns come to be known in terms of the actions of the occupants, the images projected by the environment, and the systems of symbols and categories selected to order and classify features of the landscape (Walmsley 1988: 21–22). Contrast in architecture is important in providing identity to formal systems leading to mutual reinforcement where a duality of interdependence is attained by the tension of opposing characteristics. Examples of these paired oppositions include solid/void, dominant/subordinate, positive/negative, complex/simple, high/low, large/small, wide/narrow, and also public/private (von Meiss 1990: 44; see also Pearson and Richards 1994a: 24).

1.2. Classic Maya architecture and spatial planning

Maya cities were affected by a number of factors, principally social, economic, engineering, historical, and ideational influences (Ashmore and Sabloff 2002: 202; see also Ashmore and Sabloff 2003). In attempting to understand intent in the configuration of Maya architecture, discerning the weight that each influential factor has had on the arrangement of architectural features from site to site remains an ongoing problem, as it was a mix of factors that controlled the size, orientation, and general layout of architectonic space in Maya centres. For example, climate would have affected the choices made in the design and orientation of buildings – factors such as prevailing winds, ventilation, and maximisation of seasonal light (Aveni and Hartung 1986: 3). Furthermore, pressures caused by population growth would have affected the concentration and distribution of architectural features. For example, ancient Maya settlements in the Petén Region resemble modern industrial centres in the sense that increases in populations forced neighbouring cities and towns to coalesce. In such instances, breaks between settlements may completely disappear, whereas civic and political identities are retained (Bullard 1960: 371).

1.2.1. Topography and architecture

In most other parts of the world the spread of human settlement has often followed the contours of the landscape where the orientation and alignment of streets, buildings, and settlements follow the course of rivers, coastlines, and other natural features (Kostof 1991: 53–57). Acknowledging the influence that topography has on the alignment and distribution of architecture, it is clear that local topography would have affected the arrangement of architectural features in Maya city centres. The topography that characterises the Maya region is largely diverse, encompassing volcanic mountains bordering the Pacific coast and lowland tropical rainforests (Mathews 1996: 2). As a result, "the flood plains of Copán and Quirigua; the sloping banks of the Pasion River; the hills along the Usumacinta River; the mountainous shelf of Palenque; the alluvial plains of Comalcalco and the flat Northern Yucatan plain all offered different challenges to the ancient builder" (Pollock 1965: 389–390). Terrain that is steep or hilly limits options for the placement, orientation, and design of architectural features, diminishing the level of control that an architect and/or builder has over how a structure or a group of structures may be configured. Alternatively, in flat terrain where topographical constraints are less prevalent, one would expect the control over the design and configuration of architectural features to increase substantially.

The negative effect that topography might have on the distribution of architecture is often minimised by what has been described as "amendments to the landscape" (Kostof 1991: 55), where land was forced, through a process of modification, to abide by the architectural plan imposed on it. These modifications have included the leveling and terracing of hills for either farming or the erection of buildings, the clearing of forests, reclamation of swamps, the diversion of rivers, and the construction of elevated platforms. One expression of higher architectonic control may be that a settlement appears less organic in form and more regimented in its overall configuration, although a direct correlation cannot be drawn between regular and irregular architectural planning and horizontal or undulating terrain. Kostof (1991: 55) reminds us that the banks of the Nile at Thebes "hosted a lively tangle of the residential quarters, while the tossed topography of the western slopes was the setting for formally planned units (the mortuary temples)."

1.2.2. Building materials and construction techniques

Because of varied accessibility to raw materials, construction differed from region to region, affecting the general appearance of surviving architecture. For example, in the southeastern lowlands, sandstone, rhyolite, and marble were quarried and used at sites such as Quirigua, whereas trachyte was used at Copán (Sharer 1994: 631). In the

Maya highlands, pyramids were built with rammed earth and in the lowland region with stone rubble (Schele and Mathews 1998: 17). At Comalcalco in Tabasco, limestone was not readily available, so consequently fired brick and shell were used as an effective alternative (Hammond 1982: 249). Other locally acquired building materials included tuff, sandstone, slate, and dolomite. By mixing lime mortar and rock, an effective adhesive was concocted.

Transportation of quarried stone was undertaken using manpower; beasts of burden were not exploited by the Maya. It is probable that the Maya used a combination of ropes, rollers, and ramps to transport and maneuver heavier stone blocks into position (Pollock 1965: 396–397). Most often dry stone rubble was used as a fill to support superstructures; soil or dressed stone was then placed over the mass. The exploitation of rich limestone beds in the northern, southern, and central lowlands by ancient builders has provided archaeologists with some of the best extant examples of Maya masonry architecture and art. Plaster produced from the burning of the limestone was also used to embellish architectural features with sculptured elements, in addition to smoothing the interior and exterior of buildings as well as surfacing plazas and courtyards (Pollock 1965: 386–389; Sharer 1994: 631).

Many of the stone structures present in Maya city centres, whilst they varied geographically, were surveyed to a relatively high degree of accuracy. The Maya considered any structural angle between 80 and 100 degrees to be a right angle and a slope of 3 degrees or less to be horizontal or flat. Some of the devices used in the planning and construction of buildings and associated sculpture were the lever, the plumb bob, and the water level (Hammond 1982: 249). The symmetry of buildings, as well as the sculpture that adorns them, is one of the first things striking the observer when viewing Maya architecture. Symmetry in architecture and sculptural design was controlled by using a cord as a measuring device. First, a section of cord was cut to a particular body length (e.g., shoulder to outstretched hand); this cord was then used as a unit of length to mark out a square to the required dimensions. Through a process of halving and stretching this cord to determine the portions of the square, this basic shape could be accurately divided or expanded to derive shapes with "golden mean" proportions (Schele and Mathews 1998: 35). To ensure the balanced and harmonious appearance of buildings and their sculptured surfaces, the Maya used this simple but elegant method of measurement.

A common characteristic of Classic Maya masonry architecture is the confined nature of interior spaces (Sharer 1994: 634). One reason for this was technological – the corbelled vault was a common component in Maya architecture that provided no structural support to the structures in which they appeared (Pollock 1965: 402). The corbelled vault was constructed by stacking successive courses of stone inward until they met at the top where a final capstone was placed. Unlike a "true arch," in a corbelled vault, adjacent stones do not support each other, providing a powerfully incorporated whole. Consequently, the configuration is weaker, relying on massive walls to support the vault. For this reason, the widths of rooms within most Maya masonry buildings rarely exceeded 3 metres, and structures often do not exceed more than one storey (Sharer 1994: 634–637).

1.2.3. Regional variations in Maya architecture

Whilst acknowledging similarities in architectural traditions throughout the ancient Maya world, there are some regional differences that should be outlined here briefly. There are four principal styles that characterise Classic Maya architecture; these are the Petén architectural style, the Usumacinta architectural style, the Southeastern Lowland architectural style, and the Puuc architectural style (Sharer 1994: 637–639; see also Andrews 1975: 30–32).

Maya buildings varied regionally because of variations in local trends as well as differences in historical and artistic traditions. Petén-style architecture of the central lowlands is characterised by massive platforms that supported heavy structures with small interior spaces, in addition to single entrances and huge mosaic roofcombs. The geographical extent of this regional style is not well defined, although it probably stretches as far as Calakmul to the north and the modern border of Belize to the east. Characteristics of the Usumacinta architectural style are lighter roofcombs and structures with multiple doorways positioned on natural rises or hills. This architectural style encompasses sites such as Yaxchilan, Piedras Negras, and Bonampak, as well as Palenque; however, Palenque architecture represents a technological development in this style. The inclusion of medial walls shared by parallel vaulted rooms combined with inward sloping mansard roofing permitted the supporting walls of structures at Palenque to be less massive (Sharer 1994: 637–638). A consequence of this design was that it permitted the interior of buildings to be made wider and more open, also allowing the number of entrances to be increased (Miller 1999: 38).

Copán, the most southern of all Maya sites (Miller 1999: 49), characterises the southeastern architectural style with its monumental staircases and elaborate Early Classic stucco sculpture. During the Late Classic Period,

less emphasis was placed on stucco modeling at Copán, being replaced by a form of mosaic sculpture that was finished in plaster. Both Quirigua and Lubaantun would probably fall within this style (Sharer 1994: 638; see also Hammond 1975 and Miller 1999: 48–54).

Finally, Late Classic Puuc style architecture of the northern lowlands, which peaked between A.D. 771 and A.D. 790, is characterised by structures consisting of either single or multiple entrances surmounted by a small plain roofcomb. Typically, the exterior of Puuc-style buildings was covered by a veneer of limestone masonry adhered to a concrete mass (Kowalski 1998: 404). Some of the finest examples of Puuc-style architecture are found at sites such as Uxmal, Kabah, and Sayil (Kowalski 1998: 401–402). Little stucco sculpture is associated with Puuc-style architecture; generally the lower halves of Puuc buildings are plain, with the upper portions of the building displaying most of the decoration (Kowalski 1998: 404). The buildings are often decorated with highly elaborate stone mosaics; the designs include masks, serpents, stepped fret patterns, lattice and columnar designs, as well as various other geometric patterns (Greene Robertson 1994: 209). This style of architecture is thought to have been emulated by Post Classic sites such as Tulum and Mayapan (Sharer 1994: 638–640).

The goal of the ancient Maya builders and architects was not solely to articulate interior spaces but also to maximise the effect of the structures when observed externally. The decorated exteriors of buildings functioned as backdrops and stages for ritual processions, dances, and performances. In contrast, the less-decorated interiors of many buildings were domains where the gods resided. Architects decorated buildings in two main ways, either with carved stone or with modeled plaster. The most common surfaces to be decorated were the terraces of pyramids, staircases and associated balustrades, building platforms, bearing walls, door jambs, lintels, entablatures, and roofcombs. Building surfaces that were most often heavily decorated were those that would have faced a prospective audience (Schele and Mathews 1998: 40). At Palenque in Chiapas, public sculpture appears most frequently on piers, eaves, entablatures, and roofcombs, whereas balustrades and substructural terraces were decorated less frequently. Architectural decoration appearing at Tikal in Guatemala is located primarily on entablatures and roofcombs; sculpture is rarely found on terraces and pyramidal substructures. At Copán in Honduras, sculpture appears most commonly on the corners of buildings, entablatures, roofcombs, stairways, and speakers' platforms. At Bonampak and Yaxchilan, sculptors focused primarily on decorating stairways, entablatures, and roofcombs (Schele 1998: 479–480).

1.2.4. Sociological and cosmological influences on site plans

The ancient Maya used specific strategies in their site plans, where "the arrangement of ancient Maya buildings and arenas emphatically express[ed] statements about cosmology and political order" (Ashmore and Sabloff 2002: 201). Among the factors that influenced the distribution of architectural features in Maya centres were: (1) the Maya belief in the multilayered heaven and the Underworld, in addition to the gods and ancestors that reside in both realms; (2) the connection between heaven and the Underworld as expressed by the movements of the sun and other celestial bodies such as the moon and Venus; (3) "vertical connectors," such as mountains, "sky bearers" (*bacabs*), and cave portals to the Underworld; and (4) the division of the world into the four cardinal points, including the centre point, and their corresponding colours (Ashmore 1992: 174). Factors such as these were manifested architecturally by the Maya in the arrangement of buildings and associated architectonic space, as expressed in: (1) the north–south axis of city centres; (2) the divergent functions of structures assigned to both ends of the axis, more specifically Underworld associations for southern structures and celestial–supernatural associations for northern buildings; (3) the presence of eastern and western building groups forming a triadic configuration with the northern architecture; (4) the presence of a ballcourt that functioned as a mediator between northern and southern axis architecture; and (5) the use of roads and causeways to connect and integrate all architecture physically and symbolically (Ashmore 1992: 174; see also Ashmore 1986: 36).

It has been proposed that "if anything operated to regulate the arrangement of temples, stairways, platforms, ballcourts, and pyramids [in Maya centres] they were religious in nature" (Fuson 1969: 497). One thing that influenced the distribution and orientation of architecture was astronomical alignment; more specifically, the path of the rising and setting sun as well as acknowledgment of true north, as marked by the celestial pole star (*Xaman Ek*). Solar and celestial observation resulted in the construction of buildings and building groups that were oriented with the four cardinal directions, in addition to buildings that were designed to mark the position of the rising sun during specific times of the year. Structures that collectively comprise Group E at Uaxactun were configured to mark the position of the rising sun during equinox and the summer and winter solstices. To observe these events required standing on the observatory pyramid to the west and facing three minor structures positioned to the east (Fuson 1969: 498–499).

The planet Venus must have also been influential in the design and distribution of Maya architectonic space, given that temples and platforms were dedicated to the planet (Fuson 1969: 502). Referred to as *Noh Ek* (great star) or *Xux Ek* (wasp star), Venus was an important celestial object among the Maya. Thought to be a god, Venus has been identified with *Kukulcan* (also known as Quetzalcoatl), the patron god of rulership (Miller and Taube 1993: 142). Both Venus and the sun were also believed to be manifestations of the Hero Twins as described in the creation mythology of the *Popol Wuj* (Schele and Freidel 1990: 115; Sharer 1994: 288). The Day 1 *Ajaw* was also used in reference to the Venus god, and *Yax* represented the month of the deity (Fuson 1969: 502–503).

Among the contemporary Maya, the perception of their world "embodies an interaction between two kinds of spatilisation" (Hanks 1990: 335), which creates a conceptual division between cardinal directions and cardinal places (Hanks 1990: 300). These two forms of spatial arrangement are reflected in the directional organisation of space (a linear notion of space that is relative to a position or the perspective of an actor) and in locative organisation (an absolute rather than perspectival notion of space that is orthogonal in nature, not linear–successive) (Hanks 1990: 335). In many cultures, particularly important to the orientation of buildings were the cardinal directions; the most important of which was the east – the direction from which the sun rose into the heavens. Even today, structures are oriented or aligned to either optimise or minimise the effect caused by the path of the sun throughout the year (Pearson and Richards 1994b: 15).

Maya buildings were positioned intentionally to align with the cardinal directions (Ashmore 1986: 36). Beyond viewing the cardinal directions as a coordinate system, Maya cosmology views the directions north, south, east, and west as locations, referring to them as *tukantí'itzil ká'an, tukantí'itzil lú'um*, meaning "at the four corners of the sky, at the four corners of the earth" (Hanks 1990: 299). (Note: The words in italics have been changed from Hanks's 1990 orthography to that used in this study). The modern Maya conceive these locations to be joined by lines (east to south to west to north) establishing a perimeter, rather than perceiving them linearly as two overlapping perpendicular lines (joining north to south and east to west). In addition, the Maya also believe that there is a fifth cardinal position referred to as the *chuúmuk* that marks the middle or centre point of the perimeter square. "Whether it is a small domestic space, a municipal one, the top of an altar, a corn field, or the entire world, its four corners plus centre define its schematic totality" (Hanks 1990: 299–300).

The Maya view "domestic space [as] . . . a direct embodiment of cultural order" (Hanks 1990: 315). The use of perimeter lines to connect north, south, east, and west locations allows (1) conceptual divisions to be made between what is perceived as inside/included and outside/excluded and (2) directional distinctions to be made, such as inside/inward and outside/outward (Hanks 1990: 302). Today, the Maya homestead has a specific type of spatial arrangement where the centre, combined with the four corners, forms a unitary whole. This *haál* ("perimeter") functions to separate the inner/private space from the outer/public space. Nonresidents wishing to enter a homestead first acknowledge the outer boundary with an announcement of their presence – this is referred to as "respecting the *nah*" ("house"); there they must wait for permission before crossing the perimeter boundary (Hanks 1990: 324). Activities such as cooking, eating, storage, and sometimes bathing take place in the *k'oób'en* ("kitchen"), whereas sleeping, dressing, and the receiving of guests occur in the *nah* (Hanks 1990: 333–334). In the traditional *xá'anih nah* ("palm roof house"), the rounded ends (*moy*) of the interior are cordoned off with curtains converting them into private spaces where residents may sleep, dress, and bathe unobserved (Hanks 1990: 324–326).

Among the Maya, domestic space is often used for ritual activities where cardinal spaces are formulated diagrammatically on an altar, analogous to that which defines the perimeter of domestic environments (Hanks 1990: 335). In major ceremonies, such as *heétz lú'um* ("fix earth"), *tz'áa tzaák* ("get rain") ceremonies, there are two principal stages, namely (1) *he'ik b'èel* ("opening the road") and/or *k'axik mèesa* ("binding [the] altar") and (2) *wach'ik mèesa* ("untie [the] altar") (Hanks 1990: 336). To open the road is to provide access to spirits who reside at different locations in the vertical and horizontal universe. Summoned by the shaman, these spirits are brought to the place of performance in a specified order, beginning with the east and moving counterclockwise (north is the next direction, followed by west, south, and then, last, the centre). The spirits are then bound to the quadrilateral altar according to their cardinal locations. In the ritual process of "untying," the spirits are returned to their original places of origin in a clockwise order starting with the east, followed by south, west, north, and then the centre (Hanks 1990: 336–338). There is also a linear orientation to such rituals that corresponds to an east–west axis. Observers/participants in domestic and agricultural ceremonies stand behind the shaman on the west side of the altar facing east; the gods positioned to the east face west. "The process of lowering the spirits through prayer combines successive with orthogonal,

as well as centred with absolute, orientations . . . just as their placement at the four corners plus the centre anchors the cardinal directions, their simultaneous union defines totality" (Hanks 1990: 338).

Today, the Maya shamans' conception of the universe is as a sphere suspended in a void, where the earth forms a horizontal quadrilateral layer vertically positioned at the midpoint of that sphere. Marking the highest point in the heavens is the sun, the rotation of which, in addition to the moon, defines the edge of a sphere; this edge represents the limits of reality – beyond this boundary is only nothingness (Hanks 1990: 304). Above the quadrilateral earth are seven layers, or atmospheres, which the Maya refer to as *yoók'ol kàab'*, meaning "above earth." Beneath the earth layer (*'lú'um'*) is a body of water on which the earth rests; below this level is the Underworld referred to as *metnal* ("hell"). In current mythology, the Maya believe that spirits are located throughout the multileveled universe (Hanks 1990: 305–306).

1.3. Common forms in Maya architecture

While acknowledging the presence of regional variations in architecture at different Maya centres, certain reoccurring forms have been identified at many sites in the northern, southern, and central lowlands. Some of the more common structural forms include palaces, ballcourts, plazas, courtyards, shrines, causeways, temples, and tombs (Andrews 1975: 37–51; Hammond 1982: 43; Sharer 1994: 630–631; Webster 1998: 6; Schele and Mathews 1998: 23–37).

1.3.1. Palaces

The term *palacio* ("palace") was first used by eighteenth-century explorers and writers to describe Maya multiroomed structures perceived to be elite-residential in nature. The term *palace* was also used to create a descriptive distinction between multiroomed structures and the more elevated single-roomed structures referred to as "temples" (Christie 2003b: 2–3). A distinction has long been made between Maya palace and temple architecture: Palaces are defined as "large, range-type, vaulted masonry multi-roomed structures, or as architectural groups composed of several such . . . structures surrounding small plazas [courtyards] or patios" (Kowalski 2003: 204). In contrast, temples are defined as "smaller structures with more restricted interior space constructed in more inaccessible locations atop high pyramidal substructures" (Kowalski 2003: 204; see also Pollock 1965; Andrews 1975).

For some time there has been general criticism concerning the assigning of such overarching terms to describe Maya architecture. Oversimplistic terms, such as *palace* and *temple*, effectively group together architectural forms that show considerable variation whilst implying functions that may be incorrect or inappropriate (Webster 1992: 140). For example, Satterthwaite (1935), on excavating the Palace at Piedras Negras, noted that there was no apparent relationship between the term *palace* and the function of the building group. Today, because of advances in settlement studies and other archaeological inquiry, there is consensus among scholars that palace-type structures would have had several functions, primarily religious, political, and residential in nature (Christie 2003b: 5).

An important question remains as to whether elite dignitaries lived in the elaborate centres or whether they occupied less permanent structures outside the core of their cities. "During Classic times, the evidence seems to indicate an association of residential and other functions within palace structures" (Liendo Stuardo 2003: 194). There are several criteria that one must consider in determining the presence of elite-residential architecture in Maya centres; among these are spatial indicators, such as building size and complexity, as well as the presence of items reflecting elite ideology, such as luxury or exotic goods. Other things that should be considered are the proximity of architectural features in relation to the central precinct, as well as relative accessibility of buildings (Guderjan et al. 2003: 19–20).

Whereas the lesser elites probably resided in close proximity to the city centres, the greater civic populations lived on the periphery of city centres in pole-and-thatch houses built on raised platforms around central courtyards (Pollock 1965: 381–382). It has long been argued that "the Maya nobility . . . lived on the outskirts of the city [centres], and [that] the peasant and the working population lived far away in small scattered settlements" (Thompson 1954: 313). Although more recent settlement studies indicate that a wholly concentric model represents an oversimplification of spatial organization in Maya society (see Chase 1992b: 133 and Barnhart 2001), ethnohistorical reference to Chichen Itza does support a proposal of societal demarcation among the Maya expressed architecturally and spatially. Diego de Landa was the first to recognise the hierarchical distribution of space in towns and settlements (Christie 2003b: 3).

> In the middle of the town were their temples with beautiful plazas, and all around the temples stood the houses of the lords and the priests and then (those of) the most