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Astrological divination board made of ivory, probably used for magical and medical purposes, from Grand (Dép. Alsace-Lorraine, France), 2nd c. AD.
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ASTRONOMY AND POWER IN MESOAMERICA

IVAN ŠPRAJC

Abstract: The political relevance of celestial imagery and astronomically derived concepts in ancient Mesoamerica is evidenced in a wide variety of sources. Prehispanic codices often contain astronomical tables used by a priesthood intimately connected with the governing class, and early colonial documents allude to the astronomical expertise of particular Contact-period rulers. The iconography of sculpted monuments and decorative elements associated with elite residences and administrative buildings discloses a close relationship between rulers and certain celestial bodies, whose orderly behavior was believed to be responsible for a proper course of cyclical changes in the natural environment. Mythological narratives and, particularly, the Maya hieroglyphic texts and the accompanying iconography reveal that the kings personified not only the most important deities but also their celestial avatars. And finally, the architectural orientations, largely intended to pinpoint seasonal astronomical phenomena whose relevance can be understood in terms of their concomitance with agriculturally important moments of the tropical year, are most prominently and consistently incorporated in monumental buildings of civic and ceremonial cores of ancient cities throughout Mesoamerica.
Keywords: Mesoamerica, astronomy, astrology, written sources, architectural orientations, political ideology.

Introduction

In order to understand the role of astronomy in the mechanisms of power of ancient societies, we should recall, in the first place, its practical uses, which can account for both its antiquity and its importance as attested in early civilizations (see Van der Waerden 1974, 1; White, 1959). The celestial poles and directions in which the objects in the sky rise and set provide basic references for orientation in space, whereas the cyclical motions of celestial bodies allow orientation in time. The problem of the measurement of time has been defined as 'peculiarly one of astronomy' (Woolard and Clemence 1966, 326); moreover, various cyclical changes observable in the sky coincide with seasonal changes in the natural environment, but since the periodicity of celestial events is much more stable and exact, the observation of these regularities allowed ancient societies to predict annual changes in their environments and to regulate their activities in time. Therefore, the need for astronomical observations increased notably with the origin of agriculture. Since this form of subsistence requires an orderly scheduling of labors in the yearly cycle, astronomical knowledge offered adaptive advantages to the societies possessing better specialists in this field and, consequently, acquired great importance in early states: making subsistence strategies more efficient, it contributed to the legitimation of the power of the ruling class (see Aveni and Hartung 1986, 56; Broda, 1982; Iwaniszewski, 1989; Reyman, 1975; Šprajc 1996, 20-22).

This paper summarizes the available information revealing how the knowledge and beliefs derived from the observation of the sky were used for political purposes in ancient Mesoamerica. The term refers to the culturally defined geographical area corresponding to central and southern parts of modern Mexico and the northern part of Central America, where civilizations with a number of common cultural traits flourished from the 2nd millennium BC until the Spanish conquest in the early 16th century AD. The history of Mesoamerica is traditionally divided into three main periods or evolutionary stages. The earliest complex societies appeared during the Preclassic period (c. 2000 BC-250 AD) along the southern part of the Mexican Gulf coast, in central Mexico and in the Maya area in the Mesoamerican southeast. The greatest splendor, particularly notable in fine arts, architectural achievements and writing systems, was reached during the Classic (c. 250-900 AD), whereas the Postclassic period (c. 900-1519 AD) was characterized by intensified migrations, pronounced militarization and, particularly among the Maya, by increased political fragmentation.

Astronomy, priesthood and government

It is rather clear that celestial observations, closely related with calendrical matters, were systematically performed by the priestly class. Indirect evidence can be found in prehispanic manuscripts or codices, which contain a number of astronomical tables accompanied by figures and religious texts. Since literacy was not a commonly shared skill but rather a privilege of the elite (Brown, 1991), we can infer that the most sophisticated astronomical knowledge was possessed by the upper social class. It is also obvious that the codices, considering their largely religious contents, were produced and employed mainly by the priestly segment of the elite.

On the other hand, as noted by León-Portilla (1986, 13), the following early post-Conquest source from central Mexico, which presents a discussion between the first Christian missionaries and native dignitaries, clearly situates the Nahua astronomers among those who were in charge of the worship of gods, ritual performances and the study of painted books, as well as the counting of days and years:

> Y, he aquí, señores nuestros, están los que aún son nuestros guías, ellos nos llevan a cuestas, nos gobiernan, en relación al servicio de los que son nuestros dioses [...] los sacerdotes ofrendadores [...] Sabios de la palabra [...] los que miran, los que se afanan con el curso y el proceder ordenado del cielo, cómo se divide la noche [...] los que tienen a su cargo las pinturas. Ellos nos llevan, nos guían, dicen el camino. Los que ordenan cómo cae el año, cómo siguen su camino la cuenta de los destinos y los días, y cada una de las veintenas, [...] (Sahagún 1986, 139-141).

In the Codex Mendoza, painted in central Mexico soon after the Conquest, two priests are depicted, one observing the sky and the other one beating on a drum to announce the time of night (Aveni 2001, 19-20). The meaning of *Ah Kin*, 'he of the Sun', which was one of the titles used for Maya priests (Tozzer 1941, 27), also suggests that astronomical observations were among the most important tasks of the clergy.

Even if the study of celestial phenomena must have been an official duty of religious specialists closely connected with the ruling elite, there is evidence indicating that the rulers themselves were directly concerned with astronomical matters. It is well known that king Nezahualpilli, who reigned shortly before the Conquest in Texcoco, a polity lying east of its powerful ally, the Aztec capital of Tenochtitlan, was not only very much interested in promoting astronomical knowledge, but was himself a keen observer of the sky. The Spanish writer Fray Juan de Torquemada describes an enclosure he had on the roof of his palace, 'where he went by night attended by his astrologers to contemplate the heavens and the stars' (Aveni 2001, 17). And when the Aztec emperor Motecuhzoma saw a comet, which his astrologers and soothsayers neither had observed nor were capable of explaining its significance, he sent for Nezahualpilli, whose astronomical and astrological expertise is reflected in the account given by another Spanish chronicler, Fray Diego Durán (1995, vol. I, 535):

> El rey de Tezcuco le respondió: "por cierto, señor; grande a sido el descuido de tus vasallos los astrólogos y agoreros y adivinos, pues siendo ya tan vieja y tan antigua esa señal en el cielo, me digas agora eso como de cosa nueva [...] as de saber que ya a muchos dias que apareció en el cielo esa estrella con ese resplandor, la qual sale de oriente y se acaba en derecho de México y deste reyno todo [...]

Since the king of Texcoco goes on to explain the misfortunes presaged by the comet, which eventually materialized in the Spanish Conquest, the negligence he reprimanded was obviously a serious fault, not only of the careless priests, who were severely punished (Durán 1995, vol. I, 534), but also of Motecuhzoma himself: according to the chronicler Tezozomoc, the emperor had the obligation to get up at midnight to observe four constellations in certain parts of the sky (Reyes 1979, 37).

Paradoxically, while Motecuhzoma's image, as depicted in different reports, is certainly not one of a king profoundly conscious of his astronomical duties, the responsibilities that the Mesoamerican rulers had in this respect are illustrated by yet another piece of evidence related with the same monarch. Fray Toribio de Benavente o Motolinía (1971, 51), a Spanish friar who arrived in Mexico soon after the Conquest, writes that the Aztec feast of Tlacaxipehualiztli 'took place when the sun stood in the middle of [the Temple of] Huitzilopochtli, which was at the equinox, and because it was a little out of line, [King] Moctezuma wished to pull it down and set it right' (Aveni 2001, 236-238). This comment, as well as the map of Tenochtitlan attributed to Cortés, where the face of the Sun is shown between the twin sanctuaries of the Templo Mayor (Aveni 2001, Figure 84), suggest that the main temple in the Aztec capital was aligned to sunrise or sunset on a certain date. While we know that Mesoamerican civic and ceremonial buildings were largely orientated on astronomical grounds (see below), the fact that Motolinía's statement was corroborated specifically by the orientation measured on the remains of the Templo Mayor of Tenochtitlan (Šprajc 2000b, S24-26) confirms that Motecuhzoma's concern was, indeed, of an astronomical nature.

Since the knowledge of celestial events is useful for solving practical problems, particularly in agricultural societies, this must have been a very important reason for the Mesoamerican rulers' interests in astronomy, but it was not the only one. In view of the parallelism observed between the movement of celestial bodies and the alternation of seasonal changes in the natural environment, and because the intervals at which astronomical phenomena recur are much more constant and precise than those separating other cyclical natural events, the sky was considered, since time immemorial, to be the image of divine perfection and supreme order to which human and earthly order was subordinated. The ideas establishing causal links between the behavior of celestial bodies and whatever was occurring on the Earth resulted in a wide variety of myths and beliefs found all over the world, commonly labeled astrology. To a greater or lesser extent, daily life was, within all social classes, influenced by astrological concepts, but it was, again, the priesthood that had the major responsibilities. The contents of Mesoamerican codices are largely of an astrological nature, suggesting that the priests observed the sky not only with the purpose of determining suitable moments for activities of wider social significance, such as agricultural works, but also in order to monitor the events believed to cause harm to humanity. Eclipses and certain moments of the synodic cycle of Venus, for example, are known to have been particularly ominous, and this fact explains the presence of Venus and eclipse tables in prehispanic codices (see Aveni 2001, 173-196; Milbrath 1999, 111-117, 163-186): if the moments of potentially dangerous phenomena could be predicted, the appropriate ritual acts intended to prevent their negative influences could be performed on time. The astrological beliefs of this kind must have been maintained and even reinforced by the ruling elite, because they provided an additional instrument of domination: the ceremonies required by diverse circumstances and carried out by those in charge of the state cult must have been viewed no less indispensable than, say, agricultural scheduling.

But the leaders of Mesoamerican states were not only interested in monitoring the motion of celestial bodies; they also personified them.

Celestial identities of Mesoamerican rulers

Just as in many other archaic civilizations, in Mesoamerica the rulers acted as impersonators of the most important deities (see Frazer, 1922; López Austin, 1973), and since the latter very commonly had celestial avatars, the rulers were also associated with the most important heavenly bodies.

Early colonial written sources from central Mexico reveal quite eloquently the sovereign's god-like nature (Reyes García 1979, 35-37). A sixteenth-century Spanish historian mentions the oaths that the newly elected

Mexica *tlatoani* had to make during the accession ceremony carried out on top of the temple of the patron god Huitzilopochtli:

> El rey se levantaba entonces, echaba de aquel incienso en las brasas, y con gran mesura y reverencia sahumaba a Vitcilopuchtli y se sentaba. Llegaba luego el gran sacerdote y le tomaba juramento de palabra, y le conjuraba que tendría la religión de sus dioses, [...] que haría andar al sol con su claridad, llover a las nubes, correr a los ríos y a la tierra producir todo género de mantenimientos. Estas y otras cosas imposibles prometía y juraba el nuevo rey. (López de Gómara 1987, 434-435)

Motolinía (1971, 283), describing the same ceremony, mentions a similar exhortation directed to the new ruler: 'habeis de velar mucho en hacer andar al sol é á la tierra'. If the Aztec emperor was believed to be capable of controlling such important natural phenomena, he must have been viewed as an incarnation of a powerful deity. Both the circumstances of the ritual of investiture and other data suggest that he represented Huitzilopochtli (see Broda 1976, 39-40), the god of both warfare and the Sun.

We know that the lords of a number of Mesoamerican kingdoms commonly acted as impersonators of supreme deities, such as Quetzalcoatl in central Mexico and Itzamna in the Maya area (see Šprajc 1996, 76-106), whose names are often included in their royal titles (Garza, 2002; Houston and Stuart, 1996; López Austin, 1973; Martin and Grube, 2000; Nicholson, 2001; Sellen, 2002; Sharp, 1981, 16-17; Thiemer-Sachse, 1992). Both gods had their origins in an early Mesoamerican reptilian deity which evolved into a feathered serpent, a common representation of Quetzalcoatl, on the one hand, and into a two-headed dragon, which normally represented Itzamna, on the other. A close relationship between Quetzalcoatl and Itzamna is reflected in a number of attributes they shared: both were creators, presiding over water and fertility, incorporating an aspect of cultural hero (inventor of arts, calendar and writing) and having a special connection with rulers; and both were essentially sky deities (Šprajc 1996, 76-106). Since the bicephalic monster representing Itzamna is often depicted with a body in the shape of the so-called celestial band composed of astronomical signs, including the Sun, Moon and Venus glyphs, it is significant that the sky bands frequently decorate the images of Maya rulers, particularly the ceremonial bars they often hold in their hands. In agreement with this is the fact that Maya royal titles most frequently incorporated the names or appellatives of the gods that were, in some way, related with celestial phenomena (García Barrios 2007, 16-17; Grube 2002, 349).

While both Itzamna and Quetzalcoatl (as well as Kukulcan, the Postclassic Maya version of Quetzalcoatl) were associated with the sky in general, they also had a more specific relationship with the planet Venus (Milbrath 1999, 177-186; Šprajc 1996, 76-106). It thus does not come as a surprise that also the rulers commonly claimed a special connection with this celestial body. Possibly the best known example of it is found in the story about Topiltzin Quetzalcoatl, lord of Tula, which was the capital of the most powerful Early Postclassic state in central Mexico. In the famous myth–which may well be based on some historical facts, but conflates different individuals carrying the highest god's name into a single character–the legendary Toltec king, upon being forced to abandon the throne and leave the city, is transformed into the planet Venus (Nicholson, 2001). Even more explicit is the evidence from the Maya area. In a hieroglyphic text from Quirigua, Guatemala, a king of that polity appears to be declaring a familial relationship with Venus (Closs, 1994). In some of the numerous Maya reliefs representing royal persons, a Venus symbol is placed in the ruler's headdress. In a palace at Tonina, Chiapas, Mexico, one of the sites that symbolize the decline of the Classic Maya in the late first millennium AD, a throne was found decorated with a giant Venus glyph elaborated in stucco (Šprajc 1996, 102-106, Figure 3.10, Plate 7). It has also been argued that the planet was linked to the founders of some Maya lineages (Milbrath 1999, 196-197). At Uxmal, Yucatán, Mexico, a lord called Chac ruled around 900 AD; the decoration of the façade of his residential building, traditionally known as the Governor's Palace, incorporates various Venus-related iconographic elements, including hundreds of Venus glyphs placed in the cheeks of the masks of the rain god Chac (Šprajc, 1993a; 1993b; 1996). While we know of a number of other Maya rulers whose titles included the name of Chac (García Barrios, 2007; Martin and Grube, 2000; Rivera Dorado and Amador Naranjo 1994, 35-36; Sharp 1981, 16-17), the Mesoamerican rain gods, in general, were associated with Venus (Milbrath 1999, 197-209). The conceptual relationship of the planet with rain deities, as well as with supreme gods who, like Quetzalcoatl and Itzamna, held absolute power over water and fertility and actually integrated minor deities, is but one aspect of the broader Mesoamerican rain, maize and fertility symbolism in which Venus, particularly its evening manifestation, had a prominent role. As argued elsewhere, this conceptual complex must have been based on the agriculturally significant seasonality of the easily observable extremes of the evening star: the northerly extremes are always reached between April and June, which means that they announce, or coincide with, the onset of seasonal rains necessary for planting, while the southerly extremes, occurring from October to December, mark the end of the wet season and the time of harvest (Šprajc, 1993a; 1993b; 1996).

The associations with Venus claimed by the Maya rulers are also evident in the contents of monumental hieroglyphic inscriptions, in which the records of dynastically important events, such as enthronements, or captures and battles with royal protagonists, frequently include symbols referring to Venus. An analysis of the dates of these events has revealed a statistically significant correlation with characteristic positions of Venus, particularly with the morning and evening star's first and last appearances (Aveni and Hotaling, 1994; Milbrath 1999, 187-196). The fact that most of these

dates fall within the periods of visibility of the evening star agrees with a prevalent importance of the latter aspect of Venus, indicated by other data and mentioned above. For some rulers an astrologically correct timing of crucial events in their lives seems to have been particularly important. Such was the case of the famous Pacal, who ruled in the 7th century AD in the powerful city now known as Palenque, in the Mexican state of Chiapas: the dates of his birth (probably contrived) and accession correspond to the first appearances of the evening and morning star, respectively (Milbrath 1999, 193).

The Mesoamerican rulers identified themselves with various deities and, consequently, with different celestial objects. A number of Maya kings had the name of the Sun god Kinich in their titles, and they are often represented with solar attributes (Baudez, 1985; Colas, 2003; Garza, 2002; Houston and Stuart, 1996; Martin and Grube, 2000; Milbrath 1999, 83-87). A king of Palenque even had a special relationship with the planet Jupiter (Lounsbury, 1989). It is quite likely that significant positions of bright planets were relevant for timing politically important events (Aveni and Hotaling, 1994; Milbrath 1999, 218-248).

Clearly, by claiming a relationship with the most prominent heavenly bodies, the Mesoamerican rulers reaffirmed their divine nature and, thereby, additionally sanctioned their power.

Architectural alignments and political ideology

A substantial amount of information on the uses of astronomy in ancient Mesoamerica is materially preserved in architectural vestiges. Systematic archaeoastronomical studies have revealed that many important buildings were orientated to astronomical phenomena observable on the horizon, particularly to sunrises and sunsets on certain dates (Aveni, 2001; 2003; Aveni and Hartung, 1986; 2000; Galindo, 1994; Šprajc, 2001a; 2001b; Tichy, 1991). While the earliest orientations refer to solstitial sunrises and sunsets–probably because the solstices, marked by easily perceptible extremes of the Sun's movement along the horizon, must have been the most elementary references for orientation in time–in later times more complicated orientation principles began to prevail. Recent studies in central Mexico and the Maya area have shown that the alignments allowed the use of observational calendars composed of calendrically significant and, therefore, easily manageable intervals: the intervals separating the sunrise and sunset dates recorded by orientations at a particular site tend to be multiples of 13 or 20 days, i.e., the basic periods of the Mesoamerican calendrical system.

The correspondence between the most frequently recorded dates and the crucial moments of the cultivation cycle suggests that the observational schemes, reconstructed for a number of sites, served for predicting important seasonal changes and for an efficient scheduling of the corresponding agricultural and associated ritual activities (Aveni and Hartung, 1986; Aveni et al., 2003; Šprajc, 2001b; 2008; Šprajc et al., 2009). It should be recalled that the Mesoamerican calendrical year of 365 days, due to the lack of intercalations, did not maintain a perpetual concordance with the tropical year of 365.2422 days; direct astronomical observations were, therefore, always necessary. The orientations, marking critical and canonized moments of the year of the seasons, not only allowed their determination by means of direct observations; if the observational schemes were composed of elementary periods of the formal calendrical system, it was relatively easy to *anticipate* the relevant dates (which was important because cloudy weather may have impeded direct observations on these dates), knowing the structure of a particular observational calendar and the mechanics of the formal one. Particularly important for these purposes must have been the 260-day count, in which the cycles of 13 and 20 days were intermeshing, so that every date had a name composed of a number from 1 to 13 and a sign in the series of 20. Given the structure of this calendrical count, the sunrises and sunsets separated by 13-day intervals and their multiples occurred on the dates with the same numeral, while the events separated by periods of 20 days and their multiples fell on the dates having the same sign (Šprajc, 2001b).

Even if the observational function of architectural orientations indicates their relationship with practical needs, the alignments cannot be understood in purely utilitarian terms. It is well known, for example, that the Mesoamerican architectural orientations, in spite of exceptions found in certain periods and areas, tend to be skewed clockwise from cardinal directions (Aveni 2001, 233; Aveni and Hartung 1986, 10; Šprajc, 2001a; 2001b; Tichy, 1991), which means that the orientations referring to the Sun and exhibiting this skew recorded sunrises in autumn and winter and sunsets in spring and summer. This peculiarity, considering it cannot be compellingly explained in practical or observational terms, must have been based on the symbolism related to the world directions: the south-of-east/north-of-west skew of orientations implies that the dates recorded on the eastern and western horizon fell mostly in the dry and wet seasons, respectively, and this is precisely what the Mesoamericans most probably intended to achieve. There is evidence indicating that the dry season was conceptually related to the eastern and the rainy season to the western side or part of the universe. The symbolism and directional associations of the Sun, Moon and Venus are particularly revealing: the Sun, presiding over the east, was related with heat, fire and drought, whereas the Moon and Venus, primarily its evening manifestation, were associated with the west and, on the other hand, with water, maize and fertility. A large amount of data supporting this conclusion, as well as the observational facts that may have accounted for these concepts, have been extensively discussed elsewhere (Šprajc, 1993a; 1993b; 1996; 2004a). It is thus highly likely that one of the most pervasive features of architectural and urban planning in Mesoamerica had a cosmological rationale.

This conclusion is in agreement with opinions expressed formerly by different researchers. Several authors have

argued that the ancient Maya architecture and urbanism reflects cosmological concepts and directional symbolism, and that such principles of site planning were used by Maya rulers to express and reinforce their status within the political order they controlled (e.g., Ashmore, 1989; 1991; Ashmore and Sabloff, 2002; 2003; Rivera Dorado 2001, 113-140). Indeed, since the repeatedly occurring directions are most consistently incorporated in the monumental architecture of civic and ceremonial urban cores, i.e., in the buildings whose construction was evidently commissioned by the political elite, it is clear that both practical uses of astronomical observations and the ideas about the structure and functioning of the universe formed a very important part of ideology of the ruling class. The astronomically orientated buildings are largely temples; however, considering what Carrasco (1985, 72) labeled 'institutional fusion of economical, political and ceremonial activities' in Mesoamerica, the design and layout of structures whose functions were mainly or even exclusively religious undoubtedly reflects the ideology of power.

On the other hand, the astronomical alignments are also incorporated in a number of constructions whose characteristics indicate quite clearly that they were built primarily for residential or administrative, rather than religious, purposes. In some cases, Teotihuacan being the most prominent example, the whole urban core is laid out in conformity with the astronomical orientations of the main temples (see Šprajc, 2000a; 2001b). Although in such cases the orientations of most buildings were not based on direct observations and were, therefore, neither precise nor observationally functional, they certainly indicate the importance, in social and political terms, of incorporating an astronomically-based alignment in secular structures.

Even more indicative are examples of monumental but essentially non-religious buildings that were, *per se*, orientated on astronomical grounds. Such is the case of the Acropolis of Xochicalco, a Late Classic site in central Mexico: the orientation of this high status residential compound, which occupies the most elevated part of the site, exhibits the orientation pertaining to one of the most widespread alignment families in Mesoamerica (Šprajc 2001b, 258-275). While there are other similar examples in central Mexico, the astronomical orientations of structures that appear to have had predominantly secular functions seem to be even more common in the Maya area, where an additional and possibly related peculiarity can be observed: even the buildings whose formal characteristics suggest they were not intended primarily or exclusively for performing religious ceremonies, but rather served as elite residences or for activities associated with government and public events, very frequently exhibit a plethora of decorative elements with patently religious significance. The presence of such iconography combined with the astronomical orientations of these buildings can be interpreted as reflecting the aforementioned merging of religious and secular authority, as well as the outstanding importance of astronomically-derived concepts in the Maya worldview, in general, and political ideology, in particular.

One illustrative example is the already mentioned Palace of the Governor at Uxmal, which is orientated to the northerly extremes of Venus as evening star (for a different interpretation see Aveni 2001: 283-288). Even if few similar cases are known in Mesoamerica, the idea that this building was intentionally orientated to Venus has strong iconographic support. More than 350 Venus glyphs are still visible in the decoration of the Palace's façade. Since the northerly extremes of the evening star always occur from April to June, heralding the beginning of the rainy season, it is particularly significant that Venus glyphs are placed in the cheeks of the masks of the rain god Chac. Furthermore, the Chac masks are arranged in groups of five, whereas eight stylized double-headed serpents are set in the decoration above the central doorway, and the numeral eight in Maya dot-bar notation appears above the eyes of the Chac masks at both northern corners of the Palace; five and eight are, obviously, Venus numbers *par excellence*, considering the commensurability, well known to the Maya, of five synodic periods of the planet and eight calendar years (Šprajc 1993a, 45-47; 1996, 170-178).

The orientation of the Governor's Palace cannot be regarded as particularly useful in practical terms. Venus extremes, since they are not annual phenomena and do not occur constantly on precisely the same dates of the tropical year, are rather unsuitable for accurate measurement of time. However, since the orientation to these phenomena is incorporated into what is probably the finest building of Uxmal, it must have had enormous symbolic significance. Indeed, the Governor's Palace was built around 900 AD by the ruler named Chac, under whose reign Uxmal reached its greatest splendor (Kowalski, 1987). Aside from the very name of the ruler, the faces of the god Chac decorating his residence and having Venus signs suggest that this personage, in accordance with the practice mentioned in the previous section and common among the Maya kings, pretended to be an incarnation of the rain deity as well as of his celestial manifestation. If Venus, whenever it was visible as evening star reaching its northernmost position, was believed to bring about the rainy season, then the House of the Governor can be viewed as a monumental materialization of the direction that must have been sanctified, because it marked the phenomena whose timely occurrences, conditioning annual climatic changes that were crucial for a successful agricultural cycle, were vital for subsistence. We can also imagine that lord Chac, by orientating his residence to the relevant position of the rain god's celestial avatar whose power he assumed or shared, displayed in a singular way his divine identity and, consequently, his kingly responsibility for a proper development of natural cycles and for maintaining the ideal cosmic order, which guaranteed the survival of his subjects.

While buildings resembling the Governor's Palace of Uxmal, in spite of being laden with religious iconography, disclose rather clearly their primary purpose, it is often difficult or impossible to reliably ascertain a structure's functionality exclusively on the

basis of its architectural characteristics. Probably the most illustrative examples can be found in the Maya Late Classic Río Bec style architecture, named after an archaeological site in the central lowlands in the Yucatan peninsula and characterized by buildings whose evidently residential nature, amalgamated with an overload of religious symbolism embedded in their profuse decoration, indicates their dual function and suggests, as Andrews and Gendrop (1991, 15) observe, that 'the normally separate functions of "Church" and "State" were combined into a single entity and assumed by a single person (or family or clan) as a way of legitimizing their divine authority, and hence their political control'. The term 'temple-palace', commonly used in Mesoamerican archaeology and reflecting the ambiguity of information relevant for determining the function of the buildings to which it is applied, can thus be accounted for, to a considerable extent, by the very complexity inherent in the structure of government in prehispanic societies. The orientations of various Maya buildings of this kind in the Río Bec area have been shown to belong to the alignment groups commonly found in Mesoamerica and are arguably based on astronomical considerations (Šprajc, 2004b).

The astronomical alignments, just like other types of evidence, clearly show that practical uses of astronomy were embedded in ritual and intimately related to the social organization, religion and political ideology of Mesoamerican societies. The apparently immutable and perfect order observed in the sky, obviously superior to the one reigning on the earth, must have been the primary source of deification of heavenly bodies, whose cyclic behavior thus was not viewed as being simply correlated with seasonal transformations in the natural environment but rather as provoking them. If we assume, therefore, that timely occurrences of these changes were believed to be conditioned by the arrival of celestial bodies, such as the Sun and Venus, to specific points on the horizon, the architectural alignments reproducing directions to these phenomena may well have been intended to secure, in accordance with principles of magic, their regular sequence. The astronomical orientations of important civic and ceremonial buildings suggest that this was a major concern of the rulers, who as men-gods pretended to be responsible for the proper functioning of the universe (see Šprajc 2005, 211-212).

Conclusions

Mesoamerican astronomy had a complex social role. According to a number of sources, the most sophisticated astronomical knowledge was possessed by the priestly class closely associated with the ruling elite. However, both prehispanic vestiges and early colonial documents suggest that also the rulers themselves were deeply concerned with what was occurring in the sky.

Astronomical interests of those holding political power come as no surprise. In both Mesoamerican and other ancient civilizations, whose subsistence was based on intensive agriculture, the ability to predict important seasonal changes in the natural environment was of paramount importance; in the absence of a calendar accurately reproducing seasonal cycles, reliable predictions could only be based on astronomical observations performed by specialists familiar with cyclical celestial phenomena and their concomitance with annual climatic variations. Considering that a more efficient distribution of activities in the agricultural cycle increased productivity and secured survival to a larger population, the astronomers-priests' professional skills must have been vital for a successful economy and smooth functioning of the existing social and political system.

However, the study of celestial regularities, rather than being a strictly scientific or technical endeavor isolated from the rest of ideas and activities and aimed at solving practical problems only, was deeply intertwined with religious beliefs and ceremonial activities. The celestial order, apparently invariable and perfect, came to be considered superior to the terrestrial and human order, giving rise to the myths and beliefs according to which the events on the earth depended on the phenomena observed in the sky. With the origin and development of social stratification, such beliefs were modified and incorporated into the ideology that was elaborated, declared and imposed by the ruling elite, with the purpose of sanctioning and maintaining the existent social order. The rulers were responsible for performing rituals that guaranteed a proper development of natural cycles and the preservation of the ideal cosmic order. Advances in astronomical knowledge made the achievement of these objectives more effective, as they allowed the most appropriate moments for every ceremonial act to be determined with greater precision. Moreover, reliable predictions of celestial events and the corresponding astrological auguries contributed to the legitimation of power, justifying the privileges enjoyed by the rulers and their collaborators dedicated to priesthood, astronomy and calendar.

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