

CHAPTER 8

The crossroads of time



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In *The Invention of Culture*, Roy Wagner writes, “Time ... is ... our most important product. We make time ... Like space, time could never be perceived without the distinctions we impose upon it. But we have fortified ourselves with a welter of temporal systems and distinctions that would make a conscientious Mayan priest dizzy.” (Wagner 1981:75). Just like language would not be possible without the arbitrary distinctions we impose on the sound continuum (Sapir 1985), time, as Wagner cunningly remarks, is difficult to imagine without the arbitrary distinctions that we impose upon it. We feel more at ease when we think of time in terms of space. What, since at least the days of Newton, is understood by ‘time’ in urban Western cultures – the measurable duration of an event or of a succession of events – is often represented as a continuum or line that extends ad infinitum. Standard time, which was introduced at a conference held in Washington in 1884 to establish the prime meridian, was ‘absolute’ in Newtonian terms, and universal. It was perceived as a homogeneous whole (Kern 1983), it ‘flowed’ along a continuum or line, and its passage could be conveniently measured. It became, as Wagner points out, ‘the most precious product of culture’ (Wagner 1981:57).

Wagner has argued that, in the process of describing culture, anthropologists usually ‘invent’ it (ibid.). In this chapter we argue that the concept of ‘Maya time’ was ‘invented’, in the Wagnerian sense of the term, by a host of Western scholars, cultural outsiders – archaeologists, ethnolinguists and anthropologists – who in principle were reacting against the universality of the so-called linear notion of time. Departing from a discussion of how the concepts of ‘linear time’ and ‘cyclical time’ have been pervasively used to describe Western and non-Western notions of time in the anthropological

literature, we revisit some of the arguments that have been offered as evidence of a cyclical notion of time in Maya thought. We argue that we as anthropologists have ‘invented’ this crucial aspect of Maya culture, an invention that has served to preserve and legitimize the distance between ‘us’ (the West) and our concept of time, and ‘them’ (the ethnographic ‘other’) and their concept of time. We propose that Wagner’s concept of ‘intersectional time’ (Wagner 2013) can be used as a less essentializing alternative that seeks to problematize traditional ‘cyclical’ interpretations of ancient and modern Mayan understandings of temporality.

‘Linear’ versus ‘cyclical’ notions of time in the anthropological literature

Benjamin Lee Whorf (1941) argued that the concepts of time, space and matter are partly conditioned by certain grammatical patterns that are language specific. Thus, to the extent that languages differ substantially in their grammatical categories, speakers of different languages will have substantially different notions of time, space and matter. In order to illustrate this point, Whorf examined how notions of time were expressed in languages that were typologically very different from each other, contrasting Standard Average European (SAE) languages – in particular, he used examples from English – and Hopi, a Uto-Aztecan language. He argued that in European languages like English some temporal notions are expressed by the lexical category of nouns; this, according to Whorf, is related to a general tendency in Western thought towards objectification:

Such terms as summer, winter, September, etc. are with us nouns, and have little formal linguistic difference from other nouns ... [O]ur thought about the referents of such words hence becomes objectified.

(ibid.:142)

By contrast, in Hopi some temporal notions are expressed with phase terms. These are:

not nouns but a kind of adverb, to use the nearest SAE analogy ... There is no objectification, as a region, an extent, a quantity, of the subjective duration-feeling. Nothing is suggested about time except the perpetual ‘getting later’ of it. And so there is no basis here for a formless item answering to *our* time.

(ibid.:143, emphasis added)

For Whorf, in English time is conceived of as a 'thing' and therefore temporal notions are expressed with nouns, but such objectification of the concept of time is absent from Hopi phase terms. In addition, the tri-partite system of verb tenses characteristic of English and other European languages lends itself to a notion of time that is linear:

The three tense system of SAE verbs colors all our thinking about time. This system is amalgamated with that larger scheme of objectification of the subjective experience of duration ... [T]his objectification enables us in imagination to 'stand time units in a row' ... We can of course *construct and contemplate in thought* a system of past, present, future, in the objectified configuration of points on a line. This is what our general objectification tendency leads us to do and our tense system confirms.

(*ibid.*:144, original emphasis)

A crucial point emphatically made by Whorf is that there is nothing natural or universal about the Western notion of time, especially as defined in Newtonian mechanics and Kantian metaphysics. Newton was amongst the first to talk about the 'flowing' quality of time. He wrote that time 'flows equably' (Newton 1729:8). For Kant, the flow of time could be intuitively felt, and it was uni-directional, progressive and linear:

We represent the time sequence by a line progressing to infinity, in which the manifold constitutes a series of one dimension-only, and we reason from the properties of this line to all the properties of time.

(Kant 1967:77)

Inspired by Einstein's theory of relativity, Whorf argued against the universality of the Newtonian and Kantian notions of time:

I find it gratuitous to assume that Hopi thinking contains any such notion as the supposed intuitively felt flowing of 'time', or that the intuition of a Hopi gives him this as one of its data. Just as it is possible to have any number of geometries other than the Euclidean which give an equally perfect account of space configurations, so it is possible to have descriptions of the universe, all equally valid, that do not contain our familiar contrasts of time and space. The relativity viewpoint of modern physics is one such view, conceived in mathematical terms, and the Hopi is another and quite different one, nonmathematical and linguistic.

(Whorf 1941:58)

Newtonian space, time, and matter are no intuitions. They are receipts from culture and language. That is where Newton got them.

(*ibid.*:153)

This sophisticated and provocative theory of cross-cultural variation in notions of time has been sometimes harshly criticized (e.g. Gell 1975; Malotki 1983; Pinker 1994) and largely misunderstood. Whorf is sometimes claimed to have said that the Hopi did not have a concept of time.¹ For instance, Gell claims that according to Whorf, 'Hopi, by contrast [to SAE languages], does without the category of time at all' (Gell 1992:126). However, in the essays written by Whorf such a statement is never to be found. What Whorf did say about the Hopi notion of time, which he described as a subjective sense of 'becoming later and later' (Whorf 1941:143), is that it differed from what speakers of Indo-European languages call 'time', a formless mass noun which, like other mass nouns in English, denotes a certain kind of homogeneous continuum. That formless, homogenous and continuum-like quality of the English mass noun 'time' was not, Whorf argued, present in the Hopi concept of 'duration'.

A similar point to Whorf's, in fact, was also made by Evans-Pritchard with respect to the Nuer concept of time. In a much quoted passage, he argued:

Though I have spoken of time and units of time the Nuer have no expression equivalent to 'time' in our language, and they cannot, therefore, as we can, speak of time as though it were something actual, which passes, can be wasted, can be saved, and so forth. I do not think that they ever experience the same feeling of fighting against time or of having to co-ordinate activities with an abstract passage of time, because their points of reference are mainly the activities themselves, which are generally of a leisurely character. Events follow a logical order, but they are not controlled by an abstract system, there being no autonomous points of reference to which activities have to conform with precision. Nuer are fortunate.

(Evans-Pritchard 1940:103)

Evans-Pritchard was making the same kind of argument that Whorf had made for Hopi time. The Nuer had, according to Evans-Pritchard, two different sets of concepts related to temporal notions: he called these respectively 'oecological time' and 'structural time'. Oecological time was

1 Whorf is also claimed to have sometimes said that Hopi did not have verb tenses, a claim belied by his description of the tense and aspect systems of Hopi (Whorf 1936).

related to those notions of time that were 'reflections of their relations to the environment' (Evans-Pritchard 1939:189), for instance, the alternation of rainy and drought seasons, or between periods of village residence and camp residence, and what he called the cattle 'clock', maybe for lack of a better term. Evans-Pritchard argued that oecological time was cyclical: it was based on the repetitive alternation of different periods of time contained in an annual cycle. In order to measure and talk about periods of time longer than a year, the Nuer used 'structural time', which Evans-Pritchard defined as a system for reckoning time based on the distance between different age sets. Oecological time and structural time neatly complement each other – almost too neatly, perhaps – the former reflecting the relationship between the Nuer and their environment, and the latter their social and kinship relationships. In structural time, the argument goes, 'Time is thus not a continuum, but is a constant structural relationship between two points, the first and last persons in a line of agnatic descent' (ibid.:107). While articulating this ingenious structural-functionalist argument, Evans-Pritchard was also arguing against the universality of the Western notion of time as a 'continuum', or a line.

Whorf and Evans-Pritchard were of course not the only scholars to talk about time in terms of the classical distinction between continuum-like or linear notions of time, and circular or cyclical notions of time. These spatial metaphors have been widely used by anthropologists (e.g. Barnes 1974; Bloch 1977; Dahl 1995; Geertz 1966; Gupta 1992; Hall 1976; Munn 1992) as well as philosophers (Nietzsche 1971, 2001) and scholars of religion (Eliade 1954). As Dahl points out, the basis of the linear model of time is

a causal mode of thinking ... in which the choice among alternatives causes certain effects to occur in the future. Western cultures, which share a linear orientation, are directed towards an end product, a result. This linear time conception is future oriented.

(Dahl 1995:201)

By contrast, circular or cyclical models of time have been described by some theorists as conceptions of time that seek to annul the irreversibility of time (Eliade 1954; Leach 1961). The linear notion of time is based on the idea of irreversible progress; thus events in this conceptualization are conceived as unique: once occurred, they do not repeat themselves, and a 're-setting' of events is not possible in linear, progressive time. In a cyclical view of time, however, the emphasis is on the repetition of certain events. In the anthropological literature, three recurrent themes are associated with ethnographic descriptions of cyclical time. First, the association of cyclical views of time with natural rhythms and agricultural cycles, and therefore with

peasant or farming communities (Dahl 1995; Evans-Pritchard 1940; Gurvitch 1964). Second, the recreation of cyclical views of time in ritual (Bloch 1977; Geertz 1966): the ritual itself exists in a time that is sacred and different from everyday, profane time (Durkheim 1915; Rappaport 1967; Turner 1974); or rituals may perform a reversion or 'undoing' of linear, forwards-running time (Gell 1975). Third, whereas linear time is sometimes associated with a view of uni-directional spiritual progress, cyclical time is associated with concepts of rebirth (Gupta 1992); the equation of death and birth is another common mechanism by means of which different cultures and religions seek to erase the irreversibility of time (Leach 1961).

Non-spatial models of time

Although the linear and circular spatial metaphors have been pervasively used to represent two substantially different ways of thinking about time, occasionally in the anthropological literature we find critiques of the linear/cyclical dichotomy, or attempts to describe alternative models of temporality that are not articulated in purely spatial (and geometrical) terms. Recently, some anthropologists have criticized descriptions of linear and cyclical time as essentializing categories (Gupta 1992).² An earlier, clever critique of the linear/cyclical dichotomy was articulated by Leach:

We ourselves, in our formulation of time, are too closely tied to the formulations of the astronomers; if we do not refer to time as if it were a coordinate straight line stretching from an infinite past to an infinite future, we describe it as a circle or cycle. These are purely geometrical metaphors, yet there is nothing intrinsically geometrical about time as we actually experience it. In a primitive, unsophisticated community the metaphors of repetition are likely to be of a much more homely nature: vomiting, or the oscillations of a weaver's shuttle, or the sequence of agricultural activities, or even the ritual exchanges of a series of interlinked marriages. When we describe such sequences as 'cyclic' we innocently introduce a geometrical notation which may well be entirely absent in the thinking of the people concerned. Indeed in some primitive societies it would seem that the time process is not experienced as a 'succession of epochal duration' at all; there is no sense of going on and on in the same direction, or round and round the same wheel. On the contrary, time is experienced as something

2 Along these lines, see also Fabian's famous critique of the whole field of the anthropology of time (not just of linear versus cyclical notions of time) as an instrument of neo-colonialism that has contributed to the reproduction of social distance between anthropologists and the communities they study (Fabian 1983).

discontinuous, a repetition of repeated reversal, a sequence of oscillations between polar opposites.

(Leach 1961:126)

Notwithstanding the evolutionist and ethnocentric language present in Leach's characterizations of what he calls 'primitive' and 'unsophisticated' communities (that is, small-scale and technologically less complex societies), Leach's point was to alert his readers to what seemed to him as ready-made, *a priori* categories for representing time. For the 'primitive' Greeks, he argued, time was not conceived 'as we ordinarily think of it – an endless continuum from past to future' (ibid.:129). Greek time is neither, according to Leach, cyclical or circular in nature, but rather it is conceived as a zigzag, an alternation or an oscillation between two polar opposites: 'a time that flows back and forth, that is born and swallowed and vomited up' (ibid.:129). Leach takes this idea one step further by using the metaphor of a pendulum to describe a notion of time that is neither linear nor cyclical, but based on the principles of alternation and discontinuity:

With a pendulum view of time, the sequence of things is discontinuous, time is a succession of alternations and full stops. The notion that time is a 'discontinuity of repeated contrasts' is probably the most elementary and primitive of all ways of regarding time.

(ibid.:134)

This is an intriguing idea, but one wonders to what extent this 'zigzag' and pendulum-like view of time is no more than another *a priori* category, one that in fact evokes powerfully his own analytical model for describing the alternation of *gumsa* and *gumlao* systems in highland Burma.

Other scholars have sought to overcome the linear/cyclical dichotomy by describing models of temporality that are 'present-oriented'. This claim has been made about hunter-gatherer societies like the Hadza (Bloch 1977; Meillassoux 1967) and sometimes about agricultural societies like the Malagasy of Madagascar (Dahl 1995). The latter have also been described as having an 'event-oriented' notion of time, according to which time is not constructed as a homogeneous, linear matrix where we locate events, but rather, as the events themselves: 'time is when something happens. It is an event' (ibid.:202). And the reverse is true: if nothing is happening, time is not 'passing'. Time only exists when the appropriate events naturally occur.³

3 In a sense, this phenomenon is similar to the one Basso (1996) described as the Western Apache concept of 'history', which is a way of describing past events

Bourdieu (1963, 1977) is another proponent of the idea that present-oriented, or more precisely, non-future-oriented peasant societies have non-linear and non-cyclical notions of time. He argues that Algerian peasants' notions of time are event-based and discontinuous. Algerian time is non-spatial, non-linear and non-measurable. Rather, it is made of separate 'islands of time' whose reference points are the events themselves, not their relative location on an abstract timeline:

Time stretches out, given a rhythm by the round of work and holidays and by the succession of nights and days. Time so marked is not ... as has often been shown, measured time. The intervals of subjective experience are not equal and uniform. The effective points of reference in the continual flux of time's passage are qualitative nuances read upon the surface of things ... Temporal points of reference are just so many experiences. One must avoid seeing here points of division, which would presuppose the notion of regular measured intervals, that is to say, a spatial conception of time. The islands of time which are defined by these landmarks are not apprehended as segments of a continuous line, but rather as so many self-enclosed units.

(Bourdieu 1963:69)⁴

The world view of Algerian peasants is not characterized, according to Bourdieu, by a teleological orientation, which is one of the crucial elements in the linearization of time. Algerians are deeply suspicious of any attempt to master the future, which 'belongs only to God' (ibid.:63). This does not mean, however, that they completely lack any sense of the future. The future is known to exist, but Algerian peasants are completely uninterested in it, and even if they were interested in it, they would not be able to predict it or do anything about it. It is in this sense that Bourdieu claims that Algerian peasants' lives are not future-oriented; their attitudes towards the future are better characterized as 'foresight'. Inspired by Husserl, Bourdieu described 'foresight' as a cultural value that sees the immediate future as part of the temporal horizon of the present, that is, as a 'potentiality' inherent in the present state of any given object or situation, rather than as a collection of abstract possibilities.⁵

that focuses on the events themselves, instead of focusing on the chronological, sequential connections between them.

4 Bourdieu's notion of the subjective discontinuity of time is also similar to Tahitians' experience of time, which goes through periods when it runs faster and slower (Levine 1997).

5 Husserl developed a model of subjective time consciousness based on the idea that the present is not like a 'knife' that 'cuts' or divides time into past and future;

All these non-spatial metaphors for notions of time are attempts to overcome the linear/cyclical dichotomy that had become pervasive in the literature on the anthropology of time. Nevertheless, these critiques have not yet been fully articulated in Mesoamerica, and especially in the Maya area, which instead has become a preferred locus for the ethnographic description of 'cyclical' notions of time.

Words for time

The overwhelming majority of sources that talk about 'the Maya concept of time,' be these scholarly or in more popular publications, have sought to present a model of temporality that is inherently cyclical.⁶ One of the key pieces of evidence for the alleged cyclicity of Maya temporal thought is the linguistic reconstruction of the Proto-Maya root for the word 'time,' **kinh*. This argument was first advanced by León Portilla (1973). Comparing words for time in a number of Mayan languages, he reconstructed the Proto-Maya root **kinh*, a semantic complex that, according to him, means 'sun-day-time.'⁷ He argued that the movement of the sun, and, by extension, days as units of time and time itself were understood by the Maya as cyclical processes:

If in their thought the day was a solar presence, time was the limitless succession of all solar cycles. Thus *kinh* spontaneously acquired its most ample meaning: duration that cannot be expressed because it has no limits, time, the sum of all possible solar cycles.

(ibid.:20)

For León Portilla, the Maya notion of time was cyclical, events repeated themselves throughout eternity and could be predicted by an elite of priests:

rather, it has a certain thickness to it. It is made of 'percepts,' which are perceptions in real, present time; 'retentions,' which are parts of immediate experience that get carried out in the next percept; and 'protentions,' anticipations of near experiences that also form part of the temporal horizon of the now (Husserl 1964).

- 6 Against the vast majority of Mayanists who have argued that the Maya concept of time is predominantly cyclical, Bricker (1966) and Thompson (1985) argued that it is predominantly linear. Other scholars have sought to escape the dichotomy of cyclical versus linear time, mainly by arguing that both conceptions were and continue to be present in Maya thought (Farriss 1987; Tedlock 1992).
- 7 See also Thompson's definition of the word *kin* that appears in glyphs and codices: 'This word means day or sun, and also time in a general sense' (Thompson 1985:143).

‘since *kinh* is essentially cyclic, it is most important to know the past in order to understand the present and predict the future’ (ibid.:54).

This argument is echoed in some ethnographies of modern Maya communities. For instance, describing the Tzeltal concept of time, Nash argues:

the abstract noun for time, *k'alal*, is derived from the word for day, *k'al* ...
Time past, is a general state of being in which the ancestors lived. The future is at best a recapitulation of the past.

(Nash 1970:311)

This argument is based on the assumption that in cyclical notions of time, the past and the future are equivalent (Dahl 1995). Thus knowledge of the past – history – becomes knowledge of the future – prophecy (Farriss 1987). Gossen (1974, 1979) has also argued for an explicit connection between the ancient concept of **kinh*, as described by León Portilla, and a predominantly cyclical notion of time among the Tzotzil of San Juan Chamula, whose entire world view revolves around the concept of a solar deity.

At this point we would like to introduce another example from Chol, a Western Mayan language, which is one of the thirty modern descendants of Proto-Mayan. The modern Chol are a population of approximately 200,000 slash-and-burn agriculturalists, who live in the state of Chiapas in south-east Mexico. The word for ‘sun-day’ in Chol is *k'iñ*. However, it is not clear that *k'iñ* necessarily translates or is equivalent to the abstract mass noun ‘time’ that most Indo-European languages have.

A word for ‘time’ has, however, entered the Chol lexicon via borrowing: in conversational Chol, monolingual and bilingual speakers (the latter also speaking Spanish) commonly use the Spanish loanword *tyeñpo*. Another word that is commonly used to refer to time is (*y*)*orajlel*, a borrowing from the Spanish *hora*, ‘hour’. *Yorajlel* means literally ‘its hour’, ‘its moment’ or ‘its period’, and it is used in a variety of contexts, for example, to refer to the seasons: *yorajlel k'iñtyuñil*, ‘the period/time of heat’, ‘dry season’; *yorajlel ja'al*, ‘the period/time of rain’, ‘rainy season’. It can also be used to refer to punctual moments, for instance, the moment of one’s death: *ta'ix kotyi yorajlel* means ‘its/his/her time has come’. The loanword *oraj*, without the third person absolutive suffix *i-/(y-)* and the nominalizer *-el*, is sometimes used to refer to a specific time, or to ask what time it is. The preferred expression for asking ‘what time is it?’ is *bajche' oraj*, which actually means ‘how is the time’ or ‘what is the time like’, not ‘what time is it’. Although the loanwords *tyeñpo* and *oraj* are nowadays incorporated into the Chol lexicon, the fact that these are not native terms, but instead were borrowed from Spanish, already tells us

something about the foreign origins of the concept of ‘time’, as it is conceived by Western societies, in Chol language and culture.

Just as Evans-Pritchard had pointed out that there was no single word in the Nuer language that translates as ‘time’, but there were different words to refer to different ‘time units’, in Chol there is no single ‘original’ word that neatly translates the abstract concept of time as a substance-like continuum, but there are many different terms for talking about different temporal units, including terms for the different parts of the day, as shown in Table 8.1.

<i>k'iñ(il)</i>	day
<i>abälel</i>	night
<i>xiñk'iñil</i>	midday
<i>xiñabälel</i>	midnight
<i>säkañ</i>	in the early morning, at dawn
<i>ik'añ</i>	in the twilight, when it's getting dark
<i>semañaj, waxk'iñ</i>	week
<i>uj</i>	month
<i>yorojlel/yorajlel</i>	season, moment (abstract)
<i>yorajlel k'iñtyuñil</i>	dry season
<i>yorajlel ja'al</i>	rainy season
<i>ja'</i>	year

Table 8.1 Temporal units in Chol Mayan (Rodríguez 2014).

The basic temporal units in Chol are the alternation of day and night (*k'iñ* and *abälel*), the month (*uj*), which also means ‘moon’, and the year (*ja'*), which literally means ‘water’ or ‘rainy season’, and thus equals the completion of a cycle of dry and rainy seasons, or a solar year. The word for week, *semañaj*, is, like *oraj*, a late borrowing from Spanish. A week is also sometimes referred to as *waxk'iñ*, a recently coined neologism that means ‘seven days’.

In light of these data, it is possible to revisit the translation of the Proto-Maya root **kinh* as ‘sun-day-time’. It is indubitable that many Maya languages nowadays have a word for ‘sun-day’ that descends from the Proto-Maya root **kinh*. What is a little bit more questionable, at least according to the thin evidence provided by León Portilla, is the extent to which the semantic field of **kinh* can indeed be extended to encompass a concept such as the one conveyed by the formless mass noun ‘time’. The root **kinh* may have meant ‘sun-day’, and maybe ‘set of days’ or even ‘succession of days’, but probably not ‘the sum of all possible cycles’ (León Portilla 1973:35). Furthermore, there is simply no evidence that **kinh* was ‘essentially cyclic’, as León Portilla claimed (ibid.:54). Maybe **kinh* was considered as a repetitive action or process, or

maybe as a complete unit of time. In fact, if a certain Whorfian argument were allowed, 'completed' versus 'non-completed' is a grammatical category for which predicates are inflected in most Mayan languages; 'cyclic versus non-cyclic' is not.

Ancient and modern calendric systems in the Maya world

Another piece of evidence commonly used by advocates of cyclical time in Maya culture(s) comes from epigraphic representations of the time-reckoning systems used by the classic Maya, some of which continue to be used in modern times. The ancient Maya shared with many other pre-Columbian civilizations of Mesoamerica a system for reckoning time that consisted of a combination of several intermeshing calendars – which have often been described with the non-neutral term 'cycles'.⁸

The oldest and more widespread calendar in Mesoamerica is an interval of 260 days that consists of a combination of twenty different day names with a numerical coefficient of one to thirteen. In the Maya area, this cycle is known as *tzolkin*, which literally means 'the count of days' in Yucatec. The *tzolkin* is also called by Western scholars 'sacred round'. The origins of this cycle have been widely debated, but nowadays there seems to be some consensus that it was related to the period of human gestation. It was used – and continues to be used – for divination purposes. A second system for time reckoning also widespread among Mesoamerican cultures is a period of 365 days divided into eighteen months of twenty days each, plus one extra month of five days.⁹ This cycle, based on the solar year, is known as *haab* in the Maya area.¹⁰ In this calendar, each of the twenty days of a month is denominated by its numerical position within the month and the name of the month itself. For instance, days in the Mayan *haab* are named '1 Pop', '2 Pop' and so on. The third calendric system found all over Mesoamerica, known as the 'calendar round', is a permutation calendar based on a combination of the 260 day divinatory calendar and the 365 day solar calendar. So, for example, a date in the Mayan calendar round would be expressed with the name of a day in the

8 For instance, the Mexica, the people of Teotihuacan (possibly speakers of a Totonacan language), the Mixtecs, Zapotecs and Otomi, among others (Caso 1967; Miles 1952).

9 This month is known in some Maya areas as *uayeb* and it was and is considered a delicate, or unlucky time, when people should stay at home and not roam around streets.

10 *Haab* is also the colloquial Yucatecan term for a solar year, including a modern calendar year. The *haab* is also known as *macewal k'i* in the highlands, which means 'common days'.

tzolkin, followed by the name of a day in the *haab* – for example, ‘1Ahau 18 Uo’. It would take a total of fifty-two years for the same combination of days ‘1 Ahau 18 Uo’ to recur.

In addition to these three calendar systems (the *tzolkin*, the *haab* and the ‘calendar round’), the Ancient Maya also developed the ‘long count–’,¹¹ an era-based calendar that counted the days that had accumulated since the beginning of the then current era, which fell on the ‘calendar round’ date 4 Ahau 8 Cumku – 11 August 3114 BC in the Gregorian calendar. The end of the ‘long count’ era in which the Ancient Maya lived came on 21 Dec December 2013. Their ‘long count’ calendar ‘cycle’, in other words, was about 5,000 solar years long. This means that, unlike the dates of the ‘calendar round–’ or its components, dates in the Maya ‘long count’ would not recur in the lifetime of any individual, or even in the history of any known place or people. Dates might recur in discourses that referenced cosmological time-scales (Rice 2007; Schele and Freidel 1990; Thompson 1985).

Knowledge of this intricate calendar system was lost in some areas of the Maya world during the conquest and the subsequent colonial period, but it was secretly kept in others. The Guatemalan highlands is the most conservative area in terms of survivals of ancient calendric knowledge and practices. There, modern Maya communities continue to use several of the cycles described above, or parts of them. The Ixil, Mam and Pokomchi used the *tzolkin*, the 260 day ‘sacred round’, and the *haab*, the 365 day solar year (see Colby and Colby 1981; Lincoln 1942; Miles 1952; Tedlock 1992). Among the Jacaltecos, prayer-makers, shamans and soothsayers still used the twenty day names of the *tzolkin* along with the *haabil* or solar year in the 1920s, but knowledge of the names of the months had been lost. Possibly one of the best studied communities of the Guatemala highlands are the Quiché, who still used the *tzolkin* for divinatory purposes in the late twentieth century (Bunzel 1967; Tedlock 1992).

In the central and northern areas of the Maya area, knowledge of ancient calendrics was retained to a much lesser degree, probably because in these regions the calendars were controlled by an elite of priests, whereas in the southern area this knowledge was much more widespread and therefore much more difficult to eradicate by the Spanish missionaries (La Farge and Byers 1931). In the highlands of Chiapas, the Tzotzil, Tzeltal, Chol and Tojolabal do not use any version of the *tzolkin* for divinatory purposes (Miles 1952; Vogt 1969). The Tzotzil and Tzeltal, however, have been reported to use a system

11 Coe argues that the ‘long count’ was also widespread in other areas of lowland Mesoamerica, but ‘it was carried to its highest degree of refinement by the Maya of the Central Area’ (Coe 2005:63).

of eighteen twenty-day months, plus an extra month of five days, a survival of the *haab* (Gossen 1974, 1979; Villa Rojas 1988). No survival of any of the aforementioned calendars has been reported so far in the Chol area. In the lowlands of the Yucatán Peninsula, nowadays people mostly use the Gregorian calendar to reckon time, and all knowledge of ancient calendrics has been lost.

It has been widely claimed that the concept of time underlying the pre-Columbian *tzolkin*, *haab* and ‘calendar round’ systems, which have been retained by all these modern Mayan groups, is inherently cyclic (Farriss 1987; Gossen 1974; León Portilla 1973; Rice 2007; Schele and Freidel 1990).¹² However, it is important to keep in mind that ‘sacred round’ and ‘calendar round’ are not native terms but names given by Western scholars to these calendric systems. Furthermore, in spite of the fact that in most textbooks these three systems are visually depicted as intermeshing cogwheels, from the Preclassic to the Postclassic period there does not exist a single pictorial or written example of any of these temporal cycles that shows calendar dates arranged in a circular fashion.¹³ In fact, dates, which are of course abundant in the hieroglyphic texts inscribed in stelae, monuments and codices, are written and read in paired columns from top to bottom and left to right. As for posterior representations of these cycles, for instance the famous ‘*katun* wheels’ of colonial manuscripts,¹⁴ it is also important to bear in mind that these appear either in books written by Western missionaries (e.g. Landa 1941) or in some of the Chilam Balam books, a collection of miscellaneous documents written by an elite of Maya scribes, who had been trained in alphabetic writing by Catholic missionaries. By the time that these books were written, the Maya populations of the Yucatan had been colonized for almost three centuries; it is therefore problematic considering these ‘*katun* wheels’ as pristine representations of the ancient Maya notion of time (Tedlock 2010).

A new metaphor for the Maya concept of time: Wagner’s model of intersectional time

Wagner has recently proposed a model for rethinking the ancient Maya notion of time based on a more precise reading of ‘long count’ dates (Wagner

12 The ‘long count’ is interpreted as a linear system by some scholars (Farriss 1987) and as a cyclical system by others (Coe 2005; Schele and Freidel 1990).

13 In this matter there is one possible exception, a small sculpture of a turtle excavated in Mayapan, which belongs to the Late Postclassic. The turtle has something similar to a ‘pre-Hispanic *katun* wheel’ carved in its carapace (Taube 1988).

14 These are pictorial representations of a period of time that comprises thirteen *katuns* (each *katun* equals 7,200 days).

2013). The units of the 'long count' were *kin*, *uinal*, *tun*, *baktun* and *katun*. As discussed above, *kin* is the word for 'sun-day' in many Maya languages. A *uinal* is a month of twenty days (*kins*). Eighteen months (*uinals*) make a *tun* (360 days), twenty *tuns* make a *katun* (7,200 days) and twenty *katuns* make a *baktun* (144,000 days).

Any 'long count' date is composed of a set of at least five signs – one for each 'long count' unit (*kin*, *uinal*, *tun*, *katun* and *baktun*), preceded by a numerical coefficient plus a 'calendar round' date. Thus a traditional reading of a 'long count' date tells us how many units of time have passed or accumulated since day 'zero' of the current creation. The following is an example of a 'long count' date from the Dresden Codex: '9.9.9.16.0 1 Ahau 18 Uo' (Schele and Freidel 1990:83). A traditional reading of this date is given in Table 8.2.

9 *baktuns* = 1,296,000 days
 9 *katuns* = 64,800 days
 9 *tuns* = 3,240 days
 16 *uinals* = 320 days
 0 *kins* = 0 days

or 1,364,360 days have passed or accumulated since day
 zero of the current cycle of the Long Count, reaching the
 position "1 Ahau 18 Uo" in the Calendar Round.

Table 8.2 A traditional reading of the 'long count' date 9.9.9.16.0 1 Ahau 18 Uo.

However, according to Wagner, such a reading misses one fundamental point: that a reading of 'nine' in the first of the five-place day sign (that is, 9.9.9.16.0) indicates that we are presently in the 'ninth' *baktun* of the thirteen *baktuns* that comprise this 'long count' cycle. Similarly, a reading of 'nine' in the second of the five-place day sign would indicate that we are presently in the ninth *katun* of the eighth *baktun* 'of the current Long Count, and so on down the line' (Wagner 2013:132). Figure 8.1 illustrates how any given day sign can be interpreted and read as a set of intersectional positions in which each unit intersects twice, once with the unit above it, and once with the unit below it.

Therefore, 'the Long Count, comprised of six cycles, requires 5 intersections to provide an accurate tabulation of its progression for any given day, a proper "day sign" to the Mayan way of thinking' (ibid.:132). If this model is applied to the 'long count' date 9.9.9.16.0 1 Ahau 18 Uo, shown in Table 8.2, the reading should register the intersectional nature of each position, as shown in Table 8.3. As Wagner points out:

instead of representing the respective cycles of the Mayan Long Count as wheels or circles, we ... represented them as straight lines meeting at a

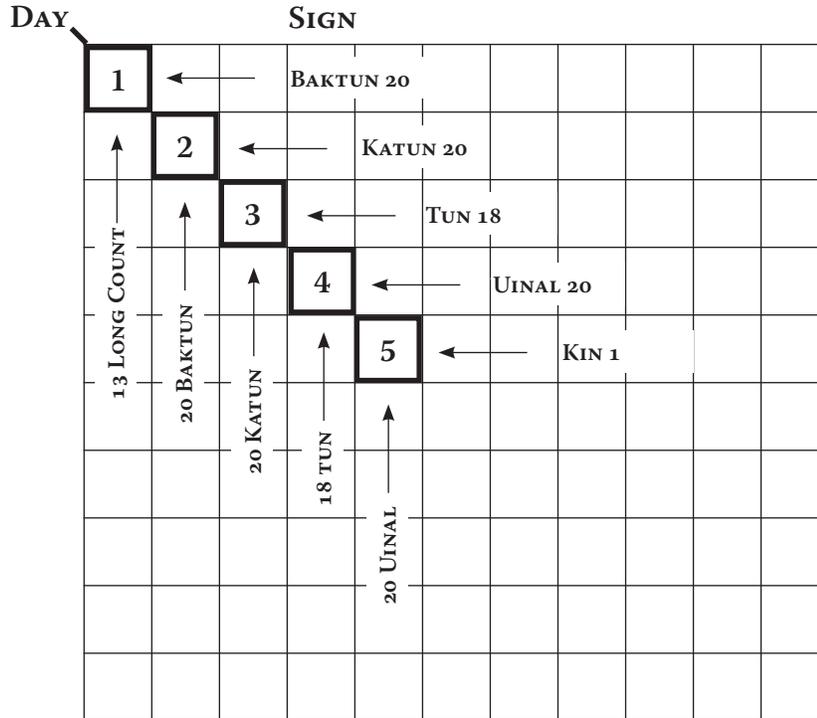


Figure 8.1 Wagner's model of intersectional time (Wagner 2013:131).

corner, or fold ... Thus time, for the ancient Mayans, did not exist in the cycles themselves, but only in the *intersections* of the cycles.

(ibid.:132, original emphasis)

'The date is:

the 8th *baktun* of the Long Count,

the 14th *katun* of the 8th *baktun*,

the 3rd *tun* of the 8th *baktun*

the 1st *uinal* of the 3rd *tun*

the 12th *kin* of the 1st *uinal*

reaching the position '1 Ahau 18 Uo' in the Calendar Round.'

Table 8.3 Wagnerian reading of the 'long count' date 9.9.9.16.0 1 Ahau 18 Uo.

As Figure 8.1 shows, Wagner's concept of 'intersectional time' can be visually represented by lines 'which meet at a corner'. Intersectional time is neither in the so-called cycles, nor in the lines themselves, but in the 'corners' or 'intersections.' Just as lines and circles are metaphors created by the Western imagination, both of which conform to Western notions of time, we ought to be able to find some metaphors or images closer to the Maya

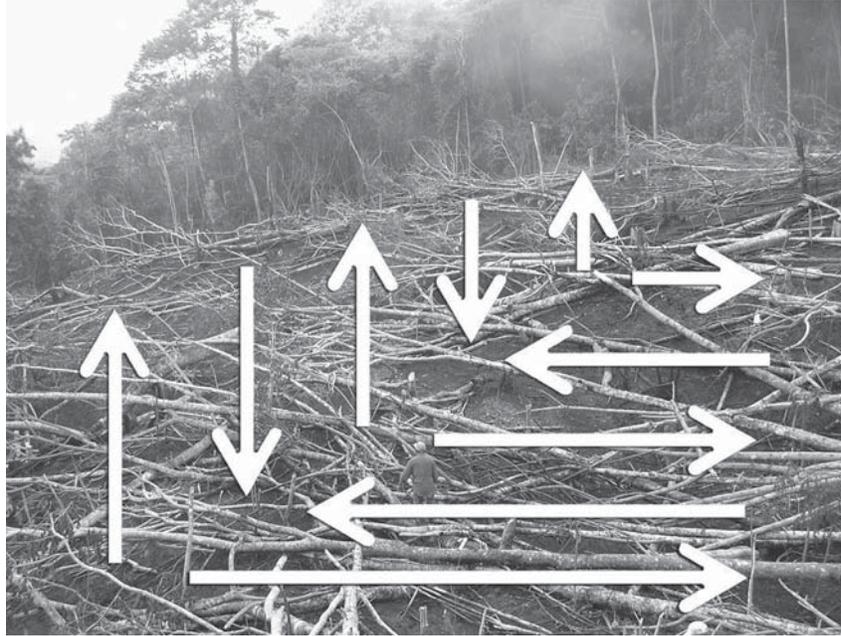


Figure 8.2 *The planting of a milpa.*

ethnographic reality that conform to this idea of time as something that happens in the intersections, corners or folds. Tedlock has proposed a couple of these metaphors: ‘The movements made by a person writing or reading a table’ or ‘those of a weaver stringing a loom or crossing warp threads with weft threads’ (Tedlock 2010:229). Tedlock’s beautiful metaphors to a certain extent remind us of Leach’s ‘zigzag’ and ‘pendulum’ representations of time (Leach 1961). Inspired by these suggestions, in Figure 8.2 we propose another metaphor for the concept of intersectional time, based on the pattern followed in the planting of a cornfield.

The planting of a milpa (cornfield) is usually done by following multiple pathways that meet at an intersection. These multiple pathways move back and forth between two points, following two different directions. If the owner of the milpa has managed to get enough men to help him with the planting, he usually divides the men into two groups. One group moves up then down and down then up, while the second moves right to left and left to right. Thus each group, covering a triangular area, meets in the intersections, producing a pattern that resembles that of ‘straight lines meeting at a corner, or fold’ (Wagner 2013:132). This back and forth between two points also resembles the back and forth of a weaver stringing a loom, as Tedlock (2010:229) suggests, or even Leach’s (1961) pendulum-like model of time. But, unlike the movement of a pendulum, which is uni-dimensional, the pattern created by a group of men

seeding a milpa is bi-dimensional. We certainly do not wish to reinvent Maya time, but at least we think that this metaphor inspired by Chol Maya everyday life may be closer to their temporal representations than the clichéd images of wheels, cogs and circles.

An intersectional, event-based notion of time

Wagner's interpretation of ancient Mayan calendrics offers a sophisticated alternative to the 'innocent geometrical metaphors' which have been commonly used to describe the 'Maya' notion of time. But can this model of intersectional time be applied to modern understandings of temporality? In this section we describe the systems for time reckoning currently used by the Chol Mayans.

The modern Chol are speakers of a Western Mayan language descended from the language in which the great hieroglyphic inscriptions of the Classic period (AD 250 to AD 900) were written: Cholan (Campbell 1984; Justeson and Campbell 1997). Speakers of ancient Cholan used the *tzolkin*, *haab*, 'calendar round' and 'long count' systems for reckoning time and left scores of dates in hieroglyphic inscriptions on monuments and stelae. Nevertheless, no survival of any of these systems for time reckoning has so far been reported among the modern Chol (Rodríguez 2014).

But first, a caveat with respect to the phrase 'Mayan notion of time' is in order. The term 'Mayan' is applied to thirty different Mayan languages currently spoken. Needless to say, even though there are certain cultural elements and linguistic traits that are shared by most Mayan groups, there is just as much variation between these languages and cultures as there is between, for instance, Indo-European languages. We do not wish to claim that the model discussed here is applicable to any other Mayan group, and thus the following description is not intended as another empty generalization of 'the Mayan notion of time'. What we pursue here is an interpretation of the current time-reckoning systems used by one Mayan group – the Chol – which intentionally tries to avoid falling in the trap of spatial, or 'geometrical' models, to use Leach's term. We believe that Wagner's model of intersectional time offers such a possibility, and at the same time explains the apparent 'gap' between ancient Cholan and modern Chol time-reckoning systems. In what follows we argue that whereas the particular calendars (*tzolkin*, *haab*, 'calendar round' and 'long count') have not been kept by the modern Chol, the notion of time as an intersectional, event-based system is present in the systems for time reckoning currently used by the Chol Mayans. There are also regional differences, linguistic and cultural, between different areas of the Chol world, especially between the Chol *municipios* of Tumbalá, Tila and Sabanilla.¹⁵ The

¹⁵ A *municipio* is a territorial unit, more or less equivalent to a county.

ethnographic data discussed in this section were collected in the *municipio* of Tila, which is one of the most conservative areas in terms of language use and religious traditions among all the territories currently occupied by the Chol (Hopkins and Josserand 2001, Josserand and Hopkins 2005).

There are three systems of time reckoning that are simultaneously and complementarily used by the Chol Mayans of Tila: the Gregorian calendar, the ceremonial calendar and the agricultural calendar. The Gregorian calendar was an early instrument of proselytization in the Maya area (La Farge and Byers 1931). It is mostly used for civil purposes, and it is associated with activities and institutions that have something to do with the state – like schools and governmental offices – and with the Catholic faith: part of the rationale for imposing the Gregorian calendar in the evangelized regions was to establish Sunday as the day to attend mass. As explained above, in modern Chol the names of days of the week and months have been incorporated from Spanish and the Gregorian calendar.

Whereas the Gregorian calendar is associated with the civil and strictly Christian religious spheres, the Chol ceremonial calendar stipulates dates for the celebration of an important set of religious rituals that are inherently syncretic (Hopkins and Josserand 2001). In Tila, the most important celebration of the year is that of the Lord of Tila (6 to 15 January). This festivity honours the patron saint of the community, a black Christ that has been at the centre of a pilgrimage cult since at least 1695 (Josserand and Hopkins 2007; López 2013).¹⁶ The celebrations of Holy Week (the last week of March or first week of April) and Corpus Christi (around 18 June, or the first Thursday after Trinity Sunday) in Tila also abound with parades and rituals in honour of the Lord of Tila. During the festival of the Holy Cross (1 to 4 May), offerings are performed at a shrine on top of one of the mountains surrounding Tila, which has a cross in it. People also visit a nearby cave that has the miraculous image of the Lord of Tila crystallized in a stalagmite. During All Saints (30 October to 3 November), food and music are offered to the dead, and rituals are performed in their honour. The set of annual festivities concludes with the feast of the Virgin of Guadalupe (12 December) and Christmas (24 and 25 December).

The third temporal system comprises a set of agricultural activities that shape the rhythm of Chol life throughout the year. It is known as *ñoj cholel*, which literally means ‘important or abundant milpa’, although in

16 The Black Christ of Tila is a syncretic deity that incorporates features of the Christian Jesus and the Maya earth lord, *Witso'* in Chol, who lives and is venerated in caves. It is also associated with the cult of other black deities like the Lord of Esquipulas in Guatemala (Josserand and Hopkins 2007).

Spanish it is usually translated as *milpa de año*, or yearly milpa.¹⁷ It begins with the preparation of the fields, which is usually done around February, and depending on the condition of the field it may involve the felling of big trees (such as when the field has been fallow for some time), the controlled burning of the fields and the removal of the old stalks. Sowing is usually done around May, at the end of the dry season, just before the first rains begin. Approximately one week after sowing, some people choose to re-seed the fields, with maize or beans and squash. The next few weeks are characterized by intense weeding of the field, as the plants need to be cleared of weeds in order to grow properly. Agricultural activities are interrupted in June and July, the months of heavy rains, when the plants are growing and not much can be done in the fields. Activity is resumed in August, when the plants produce the first young ears of maize, or *elotes*. These sweet *elotes* are very valued, and some of them are collected for immediate consumption, though most are left to mature on the plant so they can be collected later during the main harvest. The next activity consists of bending the maize plant upon itself in order to protect the still maturing cobs from the rains. The harvest is usually done at the end of September or in October, and in November people store and thresh the cobs.

As Figure 8.3 shows, the ceremonial and agricultural calendars form an integrated system, and the rhythm of festivities and activities is also partly determined by the alternation of the rainy and dry seasons. During the festivity of the Holy Cross, which is usually around the time of sowing, some of the rituals performed are to petition rain (Hopkins and Josserand 2001). No major celebrations of the ceremonial calendar are performed during the months of heavy rains, and activity in the milpa fields is minimized during that period as well. During these months (June and July) the Chol work on their homes, for instance, making necessary repairs to roofs and walls. During the festivity of All Saints, which usually coincides with the harvest season, abundant food is prepared, which is ritually offered to the deceased at family altars and consumed by family members. The consumption of abundant food continues during the festivities dedicated to the Virgin of Guadalupe and Christmas, and the dry season ceremonies culminate with the celebration of

17 Note that the translation in Spanish mentions a temporal unit, *año* (year), which is absent in Chol. *Ñoj* is an intensifier, meaning ‘very’, or in this particular context it can be translated as ‘important’ or ‘abundant’, and Chol speakers use the term *ñoj cholel* to distinguish it from another secondary, less important agricultural cycle: *sijoñ* or *tornamilpa*. *Sijoñ* is the optional planting of some extra maize during the month of November.

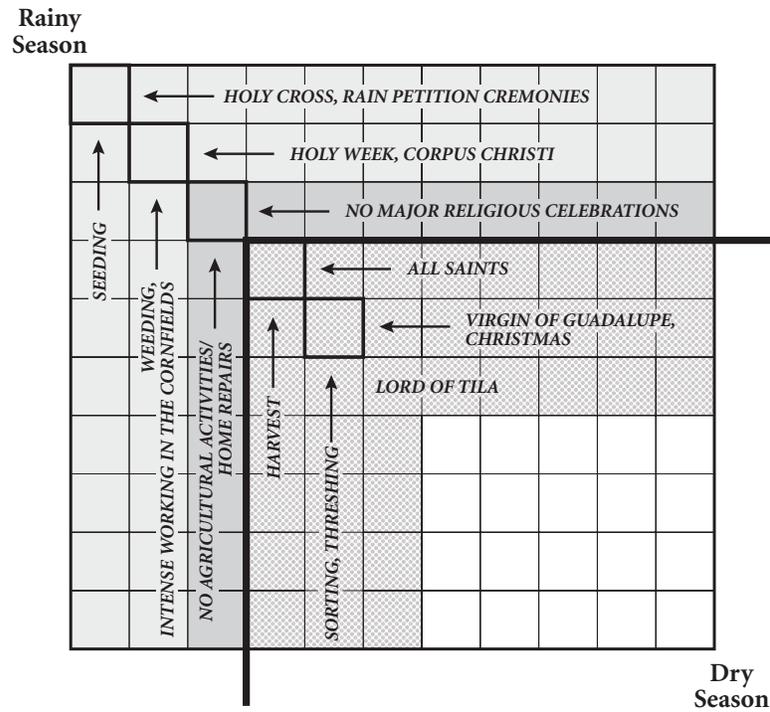


Figure 8.3 Agricultural activities and festivities in Tila.

the Lord of Tila, which acts like a pivot between the festivities of the dry and rainy seasons.

It is important to note that although the Gregorian calendar is used in conjunction with the ceremonial calendar, it does not determine the rhythm of the *ñoj cholel* (yearly agricultural calendar). The months in which each agricultural activity takes place, are not, by any means, set in stone. There are local variations depending on the specific situation of each community and its climate,¹⁸ while there is also individual variation based on personal preferences and risk calculations at the moment of sowing. Choosing the appropriate moment to sow one's milpa entails a complex calculation, because it must be done at the end of the dry season, but the exact date of the first rains is difficult to calculate with precision. Some people prefer to sow earlier during the dry

18 The lower regions of the Chol area are warmer, and the higher regions are colder, which has an impact on the time that it takes maize to mature: it takes longer in the coldest regions.

season to ensure that the plants will grow stronger, while others prefer to sow later to ensure that the plants will have enough water.¹⁹

The *ñoj cholel* or *milpa de año* is an event-based temporal system: it is the completion of one activity or time period that determines when the next activity will begin, rather than the abstract passage of time linked to the months of the Gregorian calendar. References to these borrowed months are always secondary. Although no Chol in their right mind would think of planting their milpa in August, when one asks what the appropriate month to sow is, the answer sometimes comprises two months 'April and May', or one Chol person may say, 'I sow in April', and another may say, 'I sow in May'. But when asked what is the appropriate time to sow (and when no reference to a month of the Gregorian calendar is solicited), most people will answer 'just before the first rains come' or 'at the end/completion of the dry season'.²⁰ In other words, the activities that comprise the *ñoj ch-olel* are perfectly attuned to the rhythm of the dry and rainy seasons, and once the date of sowing has been chosen, that will act as the benchmark for the rest of agricultural activities: a person sowing in April will collect the first *elotes* during the last days of July or the first weeks of August, whereas a person sowing later in May will collect his *elotes* at the end of August or even during the first weeks of September.

Thus the Chol agricultural calendar is, in a sense, like Nuer oecological time, a system in which people's

points of reference are mainly the activities themselves ... Events follow a logical order, but they are not controlled by an abstract system, there being no autonomous points of reference to which activities have to conform with precision.

(Evans-Pritchard 1940:103)

19 There are both advantages and disadvantages to sowing earlier and later. Sowing during the rainy season has the advantage of securing water for the plant, but it is also thought that plants sown in the rainy season are not properly rooted. They tend to grow up fast, the Chol say, but the plant is weak. Planting during the dry season ensures that the plant will grow up properly rooted and will not be thrown down by the winds, but if the sowing is done too early before the first rains come, the plant may die of drought. Therefore, the ideal moment for sowing is just at the end of the dry season, to ensure that the plant will grow up properly rooted, and just before the beginning of the rainy season, to ensure that the plant will have enough water to survive.

20 For the Ch'orti' Mayans of Guatemala, this period is often called *tiempo de las tortillas con sal* (time of salty tortillas). It is a critical moment, a time without food, and by extension without culture (Mariano Juárez 2013).

Just as any day sign for the classic Maya consisted of a set of intersectional positions, for the modern Chol the passage of time is marked by a succession of ‘intersections’ between the agricultural and ceremonial calendars. Time so conceived, rather than being measurable duration by means of motion, as it is in Newtonian mechanics, is event-based and intersectional, and it does not conform to the abstract logic of any geometrical system, be it linear or cyclical.

Lines, circles and the ethnographic ‘other’

One of the central goals of the first ethnographies that documented ‘exotic’ cultural notions of time was to reject the universality of the Newtonian-Kantian notion of linear time. In these first ethnographies, which deliberately sought to describe very different ways of thinking about time, a cyclical notion of time became the preferred model for representing alternative understandings of temporality, thus establishing a basic dichotomy between ‘Western-linear’ versus ‘non-Western-cyclical’ notions of time. A second generation of students of time became increasingly displeased with the linear/cyclical dichotomy, and attempted to use other non-spatial metaphors for describing non-Western notions of time, which, they argued, represented more accurately indigenous notions of time than the geometrical terms ‘line’ and ‘circle’. Some anthropologists have taken this critique one step further, claiming that ‘cyclicity’ has been yet another instrument for the essentialization and the ethnographic invention of the ‘other’ (Fabian 1983; Gupta 1992).

This critique has not yet been articulated in Mesoamerica, especially in the Maya area, which instead became a preferred locus for the ethnographic description of cyclical notions of time. With few exceptions, most Mayanists have argued that a cyclical notion of time was predominant in Maya thought. One commonly cited piece of evidence for the alleged cyclicity of Maya temporal thought comes from the reconstruction of the Proto-Mayan root **kinh* which has been claimed to mean ‘sun-day-time’ (León Portilla 1973). Nonetheless, as we have argued, although there is solid indication that **kinh* must have meant ‘sun-day’, translating this reconstructed word for the abstract mass noun ‘time’ – commonly found in Indo-European languages – entails a certain leap of interpretation. Along the same lines, some of the ancient Mayan systems of time reckoning (mostly the *tzolkin*, the *haab* and the ‘calendar round’) have been almost unanimously assumed by scholars to reflect ‘cyclical’ conceptions of time. These scholars, like the first generation of anthropologists who studied time, were eager to recreate a notion of time that was essentially different from the Western one. However, there is no real evidence in the documents that have survived from the pre-Columbian

period that suggests that the ancient Maya visualized or thought about time in cyclical terms.

A new interpretation of how these time-reckoning systems may have been conceived by the Classic Maya has been proposed by Wagner (2013). His model of intersectional time offers a provocative and sophisticated alternative to the widespread representations of the calendar ‘cycles’ as circles or systems of intermeshing wheels. This model has also inspired new metaphors for representing Maya understandings of temporality which intentionally seek to avoid the reproduction of essentializing categories like lines and circles. The pathways created by groups of men planting a cornfield may be one of these new metaphors. Whereas lines and circles are innocent ‘geometrical metaphors’ (Leach 1961:126) that reflect an etic conception of time, the planting of a milpa may be a more appropriate emic metaphor for both ancient and modern Maya understandings of temporality. Wagner’s model of intersectional time also offers a fresh alternative that explains the internal logic of the modern system for reckoning time used by the Chol Mayans of Tila. Future studies will address whether this new model is also shared by speakers of other Mayan languages. At the very least, it should stimulate researchers to find new metaphors closer to the ethnographic reality of other Mayan cultures than the oversimplified and generalizing models commonly found in linguistic, epigraphic, historical and ethnographic descriptions of the notion of time that these cultures possess.

References

- Barnes, R.H. 1974. *Kédang: A Study of the Collective Thought of an Eastern Indonesian People*. Oxford: Clarendon Press.
- Basso, K.H. 1996. *Wisdom Sits in Places: Landscape and Language among the Western Apache*. Albuquerque: University of New Mexico Press.
- Bloch, M. 1977. ‘The past and the present in the present.’ *Man* 12 (2):278–92.
- Bourdieu, P. 1963. ‘The attitude of the Algerian peasant towards time.’ In *Mediterranean Countrymen*, (ed.) J. Pitt-Rivers, pp. 55–72. Paris: Mouton.
- 1977. *Outline of a Theory of Practice*. Cambridge: Cambridge University Press.
- Bricker, V.R. 1966. ‘El hombre, la carga y el tiempo.’ In *Los Zinacantecos: un pueblo tzotzil de los altos de Chiapas*, (ed.) E. Vogt, pp. 355–70. Mexico City: Instituto Nacional Indigenista.
- Bunzel, R. 1967. *Chichicastenango: A Guatemalan Village*. Seattle: University of Washington Press.
- Campbell, L. 1984. ‘The implications of Mayan historical linguistics for glyphic research.’ In *Phoneticism in Mayan Hieroglyphic Writing*, (ed.) J. Justeson and L. Campbell, pp. 1–16. Albany, NY: Institute for Mesoamerican Studies.

- Caso, A. 1967. *Los calendarios prehispánicos*. Mexico City: Instituto Nacional Indigenista.
- Coe, M.D. 2005. *The Maya*. London: Thames and Hudson.
- Colby, B.N. and L. Colby. 1981. *The Daykeeper: The Life and Discourse of an Ixil Diviner*. Cambridge, MA: Harvard University Press.
- Dahl, Ø. 1995. 'When the future comes from behind: Malagasy and other time concepts and some consequences for communication.' *International Journal of Intercultural Relations* 19(2):197–209.
- Durkheim, É. 1915. *The Elementary Forms of the Religious Life*. London: Macmillan.
- Eliade, M. 1954. *The Myth of the Eternal Return*. New York: Pantheon Books.
- Evans-Pritchard, E.E. 1939. 'Nuer Time-Reckoning.' *Africa* XII:189–216.
- 1940. *The Nuer*. Oxford: Clarendon Press.
- Fabian, J. 1983. *Time and the Other: How Anthropology Makes Its Object*. New York: Columbia University Press.
- Farriss, N.M. 1987. 'Remembering the future, anticipating the past: history, time, and cosmology among the Maya of Yucatan.' *Comparative Studies in Society and History* 29(3):566–93.
- Geertz, C. 1966. *Person, Time, and Conduct in Bali: An Essay in Cultural Analysis*. New Haven: Yale University Press.
- Gell, A. 1975. *Metamorphosis of the Cassowaries: Umeda Society, Language and Ritual*. London: Athlone Press.
- 1992. *The Anthropology of Time: The Cultural Constructions of Temporal Maps and Images*. Oxford: Berg.
- Gossen, G.H. 1974. *Chamulas in the World of the Sun: Time and Space in a Maya Oral Tradition*. Cambridge, MA: Harvard University Press.
- 1979. 'Temporal and spatial equivalents in Chamula ritual symbolism.' In *A Reader in Comparative Religion: An Anthropological Approach*, (eds.) W.A. Lessa and E.Z. Vogt, pp. 116–29. New York: Harper and Row.
- Gupta, A. 1992. 'The reincarnation of souls and the rebirth of commodities: representations of time in "East" and "West".' *Cultural Critique* 22:187–211.
- Gurvitch, G. 1964. *The Spectrum of Social Time*. Dordrecht: Reidel Publishing.
- Hall, E.T. 1976. *Beyond Culture*. Garden City, NY: Anchor Press.
- Hopkins, N. and Jossierand, K. 2001. 'Cholrituallanguage,' Foundation for the Advancement of Mesoamerican Studies: www.famsi.org/reports/94017/94017Jossierando1.pdf (accessed 28 September 2017).
- Husserl, E. 1964. *The Phenomenology of Internal Time-Consciousness*. Bloomington: Indiana University Press.
- Jossierand, K. and Hopkins, N. 2005. 'Lexical retention and cultural significance in Chol (Mayan) ritual vocabulary.' *Anthropological Linguistics* 47 (4):401–23.
- 2007. 'Tila y su cristo negro: historia, peregrinación y devoción en Chiapas, México.' *Mesoamérica* 28(49):82–113.

- Justeson, J. and Campbell, L. 1997. 'The linguistic background of Maya hieroglyphic writing: arguments against a "highland Mayan" role.' In *The Language of Maya Hieroglyphs*, (eds.) M.J. Macri and A. Ford, pp. 41–67. San Francisco: Pre-Columbian Art Research Institute.
- Kant, I. 1965 [1787]. *Critique of Pure Reason* (trans. and ed. N.K. Smith). New York: St. Martin's Press.
- Kern, S. 1983. *The Culture of Time and Space, 1880–1918*. Cambridge, MA: Harvard University Press.
- La Farge, O. and Byers, D.S. 1931. *The Year Bearer's People*. New Orleans: Tulane University.
- Landa, D. de. 1941. *Relación de Las Cosas de Yucatan: A Translation*. Cambridge, MA: Harvard University Press.
- Leach, E. 1961. 'Two essays concerning the symbolic representation of time.' In *Rethinking Anthropology*, pp. 124–36. London: Athlone Press.
- León Portilla, M. 1973. *Time and Reality in the Thought of the Maya*. Boston: Beacon Press.
- Levine, R. 1997. *A Geography of Time: The Temporal Misadventures of a Social Psychologist, or How Every Culture Keeps Time Just a Little Bit Differently*. New York: Basic Books.
- Lincoln, J.S. 1942. *The Maya Calendar of the Ixil of Guatemala*. Washington: Carnegie Institution.
- López, S. 2013. 'Santos familiares y brujos: análisis de creencias y disputas sociales en dos relatos choles.' *Entre Diversidades* 1(1):34–75.
- Malotki, E. 1983. *Hopi Time: A Linguistics Analysis of the Temporal Concepts in the Hopi Language*. Berlin: Mouton.
- Mariano Juárez, L. 2013. 'El hambre en los espacios de la cultura: visiones indígenas maya ch'orti.' *Revista de Antropología Iberoamericana* 8(2):209–32.
- Meillassoux, C. 1967. 'Recherche d'un niveau de détermination dans la société cynégétique.' *L'Homme et la Société* 6(1):95–106.
- Miles, S.W. 1952. 'An analysis of modern Middle American calendars: a study in conservation.' In *Acculturation in the Americas*, (ed.) S. Tax, pp. 273–84. Chicago: University of Chicago Press.
- Munn, N.D. 1992. 'The cultural anthropology of time: a critical essay.' *Annual Review of Anthropology* 21(1):93–123.
- Nash, J.C. 1970. *In the Eyes of the Ancestors: Belief and Behavior in a Maya Community*. New Haven: Yale University Press.
- Newton, I. 1952 [1937]. *Mathematical Principles of Natural Philosophy* (trans. A. Motte). Berkeley: University of California Press.
- Nietzsche, F.W. 1971 [1891]. *Thus Spoke Zarathustra*. New York: Viking Press.
- 2001 [1882]. *The Gay Science*. New York: Cambridge University Press.
- Pinker, S. 1994. *The Language Instinct*. New York: Morrow.

- Rappaport, R.A. 1967. *Pigs for the Ancestors: Ritual in the Ecology of a New Guinea People*. New Haven: Yale University Press.
- Rice, P.M. 2007. *Maya Calendar Origins: Monuments, Mythistory, and the Materialization of Time*. Austin: University of Texas Press.
- Rodríguez, L. 2014. 'Time in language, gesture and thought: a case study in Chol Mayan', PhD thesis. Charlottesville: University of Virginia.
- Sapir, E. 1985. *Selected Writings of Edward Sapir in Language, Culture and Personality*. Berkeley: University of California Press.
- Schele, L. and Freidel, D. 1990. *A Forest of Kings: The Untold Story of the Ancient Maya*. New York: Harper Collins.
- Taube, K.A. 1988. 'A prehispanic Maya katun wheel'. *Journal of Anthropological Research* 44(2):183–203.
- Tedlock, B. 1992. *Time and the Highland Maya*. Albuquerque: University of New Mexico Press.
- Tedlock, D. 2010. *2000 Years of Mayan Literature*. Berkeley: University of California Press.
- Thompson, J.E.S. 1985. *Maya Hieroglyphic Writing*. Norman: University of Oklahoma Press.
- Turner, V.W. 1974. *Dramas, Fields, and Metaphors: Symbolic Action in Human Society*. Ithaca, NY: Cornell University Press.
- Villa Rojas, A. 1988. 'The concepts of space and time among the contemporary Maya'. In *Time and Reality in the Thought of the Maya*, (ed.) Miguel León-Portilla, pp. 113–59. Boston: Beacon Press.
- Vogt, E.Z. 1969. *Zinacantan: A Maya Community in the Chiapas Highlands*. Cambridge, MA: Harvard University Press.
- Wagner, R. 1981. *The Invention of Culture*. Chicago: University of Chicago Press.
- 2013. 'Keeping the secret of culture from itself: the science of perspectivism', unpublished manuscript.
- Whorf, B.L. 1936. 'The punctual and segmentative aspects of verbs in Hopi'. *Language* 12(2):127–31.
- 1941. 'The relation of habitual thought and behavior to language'. In *Language, Culture, and Personality: Essays in Memory of Edward Sapir*, (ed.) L. Spier, pp. 75–93. Chicago: University of Chicago Press.