

Cosmo-Logics in Contemporary Lowland South America

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Abstract: This work is an attempt to introduce a comparison of the deep logics articulating cosmovisions and cosmologies among indigenous groups in the Lowlands of South America. We are particularly interested in describing the current state and recent past of these knowledge systems, but also connecting them to the distant past. We seek to leave aside an anecdotic comparative approach focused on isolated elements, and it is not our intention to build conjectural narratives of the links among these ways of conceiving the world. Instead, we wish to focus on analysing the common underlying logics that account for the organising principles of these cosmovisions and cosmologies, related to their relational and political nature. International works very often identify the South American Lowlands with Amazonia and here we would like to correct this and include examples from Patagonia on an equal footing with those from Chaco.

Keywords: cosmo-politics; cultural astronomy; deep “logics”; indigenous knowledge; South American Lowlands

General Considerations

Our ideas of the world need to be adapted not only to the non-human world they attempt to describe but also to the human world from and for which they were conceived. Thus, we become subjects and build cosmovisions, cognitive worlds deeply embedded in the societies where we live. Cosmovisions are not only a set of images, logics, metaphors, practices and ideas of the world, but also involve basic questions about the cosmos, the general attitudes we have about it and the value judgments and emotions that bind us together. Geertz (1957) popularised a distinction, that some other authors – for example

Redfield (1953, 84–87, 172) – had made previously, between cognitive aspects (“world-view”) and normative/aesthetic aspects (“ethos”), while simultaneously pointing out their profound interdependence. We prefer to emphasise their unity, maintaining the term “cosmovision” as encompassing both aspects (although retaining “ethos” when referring specifically to normative aspects of cosmovision). In this we follow not only a good part of the tradition of using the original term in German, *Weltanschauung* (Dilthey 1989 [1883]; 2019 [1911]), but also uses in English of “worldview” (Hiebert 2009) and of the Spanish “cosmovisión” (Cordeu 1998; López Austin 2015). The growing consensus on the deep role of embodied, emotional, aesthetic, normative and evaluative aspects in cognitive processes (Bourdieu 1972; Fuchs 2018) reinforces our conviction of the importance of this unified use (for more detail on the history of the term and our proposal for its use see López 2009a, in press).

The socially constructed nature of cosmovisions is concealed by their naturalisation, through which they become a shared common sense, the “that’s how things are” of a specific culture. On this basis and according to the type of social organisation, different ways will appear of constructing explicit theories that attempt to systematise the world: the cosmologies. Different societies will have all kinds of specialists and institutions devoted to the production of cosmological knowledge and all kinds of mechanisms to regulate and homogenise such knowledge. Cosmovisions and cosmologies are the polar opposites in a continuum of ways of building and organising the knowledge of the world, ranging from the most implicit “common sense” interpretations to the most explicit and formally developed systems. The distance between the two ends of this continuum largely depends on the way social work is distributed in the society under consideration.

The groups we will discuss here are human groups which, at the time of the arrival of the Europeans in South America, were mostly organised in relatively horizontal social structures; that is, not only was there a rather flat power structure but, in general, most social work was fairly evenly distributed. On the other hand, many of the societies in question had social institutions specifically assigned to preventing an over-accumulation of power, prestige, possessions or any other feature. This gives rise to a significant and constituent flow of cosmologies in these societies that suggests major possibilities of change in time and of spacial diversity. Therefore, it should not be assumed that geographical or linguistic proximity implies an identity of world perspectives. On account of the role of kinship relations in these groups’ political dynamics, the construction of cosmological traditions linked to kin groups is rather frequent. Hence, such expressions as “the *Mapuche* claim that...” are simplifications required due to space constraints. Notwithstanding this, a lack of homogenisation mechanisms does not mean isolation. In fact, the evidence clearly shows that the South American groups have been part of complex interethnic webs, not only in the interior of the “Lowlands” but between what today we know as “Lowlands” and “Highlands” (Renard Casevitz *et al.* 1988; Gow 2001, 301–302; Hornborg 2005; Jara 2014; López 2015). Examples such as the wide expansions of Caribbean (Magaña and Jara 1982), *Tupi-Guaraní* (Borges and Pedroza Lima 2009) and *Arawak* (Jara 2014) groups show us the crucial role that exchanges of people, goods and ideas played in the conformation of the skies of this region.

Furthermore, we should not forget that what the chronicles relate upon the arrival of the Europeans does not necessarily reflect a situation that had remained the same since human beings reached the continent. For instance, recent archaeological work suggests that, centuries before the Spanish conquest, pre-Columbian societies in the Amazonian region boasted a spatial scale, population density and social stratification much larger than that surveyed by the Europeans (Heckenberger *et al.* 2003; Hornborg 2005; Heckenberger *et al.* 2007). This should make us rethink the simple classification schemes that, in South America, have led to regarding the Highlands as synonymous with hierarchical societies and the Lowlands with small-scale chiefdoms and bands. We should be careful about concluding what types of social conditions might have existed in the distant pre-Columbian past for the production, dissemination, consumption and legitimisation of the cosmological discourse, and their influence on its characteristics.

Another key point is that, as far as we know, the societies under study were oral societies during that period. As noted by several authors (Goody 1968; Ong 1982), this not only implies a way of communicating ideas but a specific mode of producing them (Ong 1982). The regimes of truth and legitimacy, as well as the ideas of consistency and completeness, are totally permeated with this public, one-on-one and situational nature of the oral discourse. On the other hand, though, oral cultures in general and groups of hunter-gatherers in particular did not or do not engage in cosmological thinking for “practical reasons”. As was clearly stated by anthropology in the past (Lévi-Strauss 1966, 1–16), a search for organising and making sense of the world experience is a key driver of these groups’ cosmological thinking, just as it has been in state societies and those with a writing system. However, as noted for instance by Severi (2010), the absence of writing does not mean an absence of any other support system besides the human voice. Thus, paintings (on any kind of surface, including the human body), engravings, tattoos, sketches and drawings on the ground, dances, rhythmic patterns in all types of activities and structures and motifs in pottery, basketry and weaves all become thinking and memory support systems.

The European expansion made contact with South America in the last decade of the fifteenth century, with the third voyage of Christopher Columbus (who arrived at the mouth of the Orinoco in 1498 AD), and territorial occupation accelerated from the third decade of the sixteenth century. From that time, the sudden changes following the European conquest, the subsequent formation of national states and their contemporary global articulation were added to the inherent dynamism of South American populations. These huge and dramatic changes in the history of Lowland South American societies brought about by conquest and the pandemics they triggered resulted in massive population reductions, causing enormous economic dislocation and significant changes of social structure and modes of production. However, this does not amount to simple acculturation or to a sort of syncretic, heterogeneous and chaotic mix. Rather, during the last 500 years there has been a lengthy and complex process of creative resignification and reinterpretation (Sahlins 1985) of European cosmological logics and elements by South American groups (Rasnake 1988; Wright 2003b; Bouysse-Cassagne 2004; Capiberibe 2007; Gruzinski 2007), including ruptures but also significant continuities both in content and in logics, methods, criteria of truth, etc.

In order to analyse these processes, we need to complexify our perspective on modernity. Unless we get rid of the hegemonic idea of one single modernity understood as an autonomous fact happening in Europe and then simply transplanted to the rest of the world, South American dynamics cannot be properly understood. In this sense, we have to reconsider contributions from decolonial theory (Quijano 1988; Escobar 2005; Mignolo 2009) showing that modernity does not simply emerge from Europe but from and through the global European colonial expansion process starting in the fifteenth century. In this sense, coloniality is a component of modernity. In the same direction we should speak of modernity as an unfinished project (Asad 2003), and also of multiple modernities (Eisenstadt 2000) intricately articulated with the hegemonic modernities driven by a variety of European centres and institutions. The indigenous peoples of the region under analysis struggled against the different European and *criollo* modern projects with varying degrees of success, depending on the intensity of colonial pressure on their territories. When they were unable to wage a strategic battle to define the rules of the “game”, they fought tactically by resignifying modern projects and creating their own variations thereof (Altman 2017, 35–53), often with the hope of a future change of situation.

Christian missions have had a major role in the contact processes between South American peoples and hegemonic modernities. For a long period of time, these missions were mostly Roman Catholic, although this name comprises a large variety of notions, methods and trends, depending on the historical context, which religious institutions were involved (e.g. religious orders, diocesan parish structure, societies of apostolic life, etc.), and whether the missions were led by clergy or laypersons. However, from the turn of the twentieth century, Protestant missions began to have a significant presence in the region. In fact, Evangelical churches, especially Pentecostal, have in recent decades become essential in the sociocultural dynamics of many groups in South America. There have also been other important spaces in which modernity has been articulated: slavery, reductions, forced labour, wage labour, military service, trade, etc. In addition, school, as an institution to standardise and legitimise knowledge, and the mass media (ranging from the radio to today’s mobile phones, newspapers and TV) are hugely influential. All these circumstances are affected by the process of historical configuration of the particular “national alterity matrices” (“*formaciones nacionales de alteridad*” – Briones 2005).

The South American Lowlands have been divided into a series of subregions (such as Tierra del Fuego and Patagonia, Pampa, Chaco, Central Amazonia, Northern Amazonia, the Caribbean and the Andean-Amazonian Piedmont). The ideas of indigenous groups in these areas are frequently grouped according to this spatial division. Usually this is presented as if each of these subregions constituted a kind of “cultural area”, with similar cosmovisions and cosmologies, but as discussed above, the relevant variables are so numerous that this assumption is often wrong. Therefore, we will opt for a different approach. We have identified a series of axes that characterise the deep “logics” that constitute significant paths to approach the similarities and differences among these groups’ notions. This choice does not mean we believe that they all share the same ideas about such core themes, but we do understand they are pertinent to questioning all these ways of experiencing, thinking about and acting upon the world.

Flexible and Contextual Models of the World

A key point for a general understanding of the cosmological models and cosmovisions of these groups is their conceptualisation of change and continuity. Likewise, and in this respect, we should consider the way in which these groups' categories and category frameworks tend to be strongly contextual and situational. With regard to the latter, there is a suggestive experience narrated by the Argentine anthropologist Pablo Wright (2008, 150–151) in his work on “maps of the cosmos” among the *Qom* of the Argentine province of Chaco. After long-haul fieldwork with shamanic specialists (*pi'xonaq*) in search of establishing a scheme of the *Qom* cosmos, Wright unexpectedly realised that there are countless *Qom* cosmograms depending on with whom one is talking, the topic of conversation, what aspects of reality one intends to examine and other situational variables. This is a very widespread feature among these groups, for instance among the Chaco *Moqoit* (López 2013) and among the *Mapuche* of Chilean and Argentine Patagonia (Bacigalupo 1997, 174; Pozo Menares and Canio Llanquino 2014, 31).

The psychodynamics strongly related to orality underscore the relevance of being an “authorised voice” to display the cosmological word, which takes us to the idea of the “elders”. However, “elder” is not a mere chronological mark but also a leadership mark, so that the scope of cosmological authority recognition is strongly conditioned by the mechanisms of exercising political power. In this sense, there are variations between band societies (Braunstein 1983), as many “typical Chaco groups” are, and chieftainships, as seen with many Amazonian groups (Heckenberger 2005). In addition, interaction with national states has often generated new types of leadership and political entities, such as “confederations”, “nations”, etc. Regardless of these variations, which should be considered in each case, one thing is clear: that cosmological knowledge may vary significantly from one place to another, even within the same linguistic or cultural group (Magaña 1988–1989; López 2009a; Pozo Menares and Canio Llanquino 2014, 39–44). This does not mean that changes go unnoticed or are inexistent, but that their conceptualisation is not that which we usually assign. Hence the great importance – even for understanding past notions – of studying the models of the cosmos in these groups' Christian reinterpretations (Altman 2015; López and Altman 2017). Bacigalupo (2004, 220, 222) shows, as regards the *Mapuche*, how the *machi* (female shamans) construct their own modernities (Altman 2017) and are seen as “traditional” even if incorporating elements from Catholicism or biomedicine.

This is also related to the use of flexibly defined categories that may be readjusted to give meaning to new circumstances. An example is the conceptualisation of mobile phones on the basis of the shamanic experience described by Chaumeil (1998) among the *Yagua* of the Peruvian Amazon, or the representation that Chaco *Moqoit* teachers make of the solar system school models based on their own model of the “world-tree” (*Nalliagdigua*). In each case, they seek the identity of certain underlying logics or properties (like long-distance communication or a dynamic and animate nature) rather than the identity of external appearances. These groups' specific modes of historical consciousness (Hill 1988), which to a large extent is related to psychodynamics typical of primary and secondary orality (Goody 1968; Ong 1982), imply the use of flexible models of the past that are readjusted to account for change. What others conceptualise as syncretic

processes or the abandonment of a “tradition” the *Mapuche* see as a continuity of the past (Bacigalupo 1997, 174; 2010, 19, 30; Pozo Menares and Canio Llanquinao 2014, 34).

Inhabited and Pluri-Intentional Worlds

An extremely pertinent central element to examine the cosmovisions and cosmologies of the South American “Lowlands” is that of the cosmos as an inhabited space-time, particularly inhabited by a large number of beings with intentions and appetites (Echeverri 2005), grouped into human and non-human societies. The cosmos is made up of and shaped by a network of all sorts of relations among these human and non-human societies (López 2016). In line with this, the human interest of knowing the cosmos is articulated by a cosmo-politics linked to the most adequate ways of managing one’s own and the group’s existence in a complex web of relations.

There are clear references to this attitude in the writings and statements of many contemporary indigenous intellectuals belonging to these groups. Thus, for instance, Orlando Sánchez, a *Qom* intellectual and leader from the province of Chaco, in Argentina, sees (Sánchez 2004, 3–5) the scientific endeavour as basically focused on understanding human ways of relating with (human and non-human) others, as we have pointed out elsewhere (López 2011, 80). Similarly, the *Yanomami* leader Davi Kopenawa shows us (Kopenawa and Albert 2015) that shamanic knowledge of the cosmos makes sense when used to keep right relations with the various beings that inhabit it, allowing humans to cooperate with the support of its structures and relations. From that perspective, he speaks to non-indigenous people about the dangers his knowledge foretells for the world’s overall state as a result of extractive practices. The *Carib*-speaking groups (a large number inhabiting parts of Panama, Colombia, Venezuela, Suriname, Guyana, French Guiana and a portion of northern Brazil) also claim that the main goal of acquiring knowledge is inquiring into how to establish the right exchanges with the other intentional beings in the cosmos (Halbmayer 2012a, 116–118). In this sense, as Bacigalupo points out for the *Mapuche* (Bacigalupo 2016, 22), knowledge of the cosmos is eminently of a subjective (insofar as it is linked to specific subjects of production and constitutes knowledge of the relations among these subjects and other historically and culturally situated intentional agents) and dynamic nature.

Multiple Worlds

One of the most popular terms used in the European tradition to refer to the world/cosmos is “universe”. This term places the idea of the unity of existing things in a central position. It derives from the Latin *universum*, the noun use of adjective *universus*, which means “turned into one”, “one”, “totality”. It was originally an adjective to refer to a set as a unit, in opposition to other terms that underscored the assemblage of parts (*cunctus*), or the whole (*totum*), or the idea of generalisation of each part within a set (*omnis*) (Pérez González 1985, 278–281). Cicero used this term to translate the Greek term “τὸν ὅλων” which means “all, whole, complete”, and encouraged its use as an equivalent to the Greek term “κόσμος”, usually translated into Latin as “*mundus*” (both highlighting the idea of

order, harmony and beauty) (Ernout and Meillet 1951, 747, 1323–1324). In general, the Greek term *κόσμος* is interpreted in the sense of the world as an ordered whole (Hardie 1985). Its oldest meanings are linked to the idea of order, government, arrangement and adornment (Hardie 1985; Finkelberg 1998). It is related to the verb *κοσμέω*, to organise [the troops], to arrange, to order (Chantraine 1968, 570–571). However, the links between these meanings and that of the world as a whole are debated (Finkelberg 1998).

The history of Western cosmological (and also political, social and ethical) thinking is largely characterised by this interest in unity as a key aspect of being. In contrast, the cosmological models and cosmovisions of the South American Lowlands tend to favour a notion of individuals, spaces, times and the whole world as unsteadily coordinated multiplicities, as noted by Halbmayer (2012a) in the specific context of the *Carib*-speaking peoples. As stated by this author, each “unit” is in fact a partially encompassing or overlapping set, whose members may divide. In addition, its boundaries are vague and permeable, as its components may also belong to other “units” and even exist separately. Therefore, all “units” are unstable and should be permanently recreated and sustained. This is not only applied to the cosmos as a whole, but also to the different entities found therein, including territories and individuals. Humans and non-humans, as well as celestial bodies, are made up of multiple intentions and different body regimes (Magaña and Jara 1982; Tola 2009; López 2013) and are in constant exchange and negotiation with others. The incorporation and loss of “spiritual substances” or “intentionalities” is mentioned in many groups such as the Chaco *Qom* (Tola 2009) and *Moqoit* (López 2013), the *Caribes* of northern South America (Halbmayer 2012a, 119) and the Amazonian *Yanomami* (Kopenawa and Albert 2015).

The *Mapuche* “supreme god” is an example of this multiple nature, its relation with the dynamics of orality and the misunderstandings arising when a written culture attempts to account for models of this type. Foerster (1993, 29, 38–39) points out that in 1795 the Jesuit Juan Ignacio Molina was the first to speak about a *Mapuche* “supreme god”, linked to the sky and at the top of a hierarchical pantheon, which he called *Guenu-Pillán*, or “Spirit of the Sky”. The Capuchin Octaviano of Nizza later called this “supreme god” *Ngenechen*, and stated that this god resides in the Sun and sustains the existence of the world. This idea was reinforced by the Bavarian Capuchin missionaries who arrived near the end of the nineteenth century. In this context, the terms *Ngünechen* (literally: maker, sustainer and protector of the world and people), *Ngenmapun* (literally: master of the Earth) and even *Ngünenchen* (literally: deceiver of the people) would also be assigned to the “supreme god” as if they were alternative transcriptions of “Ngenechen” (literally: master of the people) (Bacigalupo 1997, 180, 198–199). However, as shown by Bacigalupo (1997), these are not all different names of the same entity or different transcriptions of a single term.

Bacigalupo argues that “Ngenechen” and “Ngenmapun” are post-conquest neologisms originating in the *Mapuche* description of their situation of vertical domination by the Europeans (Bacigalupo 1997, 197). She shows (Bacigalupo 1997, 197–198) that the role of creating an agent of the world and the people in fact lies with *Futa Newen* or “Great Spirit”, which can be benevolent or punishing, and which possesses a multiple nature very different from that of the Christian god. It is manifested as Sun (male), Moon (female) and stars (offspring). In this context, the pre-Columbian term “Ngünechen”, even if now

mostly seen as a “benevolent deity” (in part due to the influence of the Christian god as the source of legitimation in the non-indigenous world), is a sort of “civilising hero”, a manifestation of Futa Newen to protect humanity (Bacigalupo 1997, 198–199). It may also be seen as made up of all the “masters” or “custodians” of several species and domains, the *Ngen* (Bacigalupo 1997, 197). These are “Ngünechen’s constituent entities that may also become disaggregated and function as separate intentionalities. Ngünechen is both old and young, man and woman; that is, it is a complex being” (Bacigalupo 1997, 198, translated) whose multiple manifestations (as for example, Full Moon or “Old Woman”, “Young Woman”, “Father Sun”, Young Man Star) may become independent (Bacigalupo 1997, 191). Therefore, we should not be surprised that during the *Mapuche* prayers to the Sun and Moon – for instance during eclipses – they should call them using the four possible combinations of this classification by gender and age (Pozo Menares and Canio Llanquiao 2014, 56). In addition, *Ngünenchen* (deceiver) or *Wesa Ngünechen* (who “works” in reverse to Ngünechen), arises in certain contexts as opposition to the benevolent figure of Ngünechen (Bacigalupo 1997, 197).

In the same vein this flexibility means that the same interpretative framework cannot be applied to all the cosmological models in this region. One example of an approach that reflects this is the “Amazonian perspectivist” model proposed by Viveiros de Castro and his collaborators (Viveiros de Castro 1998), which extended previous ideas from Árhém (1990). In its origins, this was a model based on an ethnographic interpretation of three Amazonian groups (*Arawete*, *Wari*, *Juruna*), which was then generalised to the entire Amazon and then even to all the Amerindians. Its central concept is that for Amerindians the division between “human” and “animal” is not absolute, and there is not a single cosmos. Instead there are as many worlds as there are “social groups”. Each of them experiences themselves as “the humans” – and their food, drink, housing, clothing and behaviours as “human” – and see all the other “social groups” as “animals”. In this way, we experience ourselves as humans who eat animals and we see jaguars as animals that eat humans; but jaguars would experience themselves as humans and us as the animals that humans feed on. Despite what its promoters proclaim, this model does not apply to all Lowland South American groups (Wright 2016; López and Altman 2017; López 2019) and not even to all Amazonian groups (Brightman *et al.* 2010; Halbmayer 2012b; Ramos 2012; Turner 2009).

Worlds of Power

To many of these models of the cosmos it is of paramount importance to manage relations with especially powerful beings. The sky is usually characterised as a place inhabited by such beings, and their brightness is an expression thereof. Here power should be understood as a general capacity for acting and influencing the actions of others, expressed in many cases through the exchange of fluids, substances, objects, chants, dances or words that bear the intentions of the beings in question. Among the Chaco *Moqoit* this power is known as *quesaxanaxa* and it is the core of their own cosmo-politics (Giménez Benítez *et al.* 2004; López 2017b). Likewise, for the *Mapuche* the *newen* is a conceptualisation and praxis of power (Foerster 1993, 64–65; Bacigalupo 2010, 30), “a

broad notion [...] based on the relations with (dead or alive) human forces, animals, and places on nature” (Bacigalupo 2010, 9).

Among the Chaco groups, there is a very frequent relationship between power, sky and brightness (Dasso 1999; Giménez Benítez *et al.* 2004; López and Giménez Benítez 2008; Gómez 2011). The brightness of celestial bodies is often represented as a “feather headdress” like that worn by war leaders (Gómez 2011). For similar reasons, in many groups Sun and Moon are linked with brightly coloured birds or with their plumage (Urton 2016 [1987]). Among the *Mapuche* of Patagonia, the sky beings are part of the *Pulluames*, beings or forces that manifest themselves in exceptionally powerful events (Bacigalupo 1997, 176). Rivera Andía (2018, 25) points out that to the *Mapuche* the *millali* are places with newen or power related to the descent of object-entities from the sky. The *Mapuche* assign a specific category to the light of different celestial bodies: Küyen (Moon) has *ale*; *Wüñellfe* (morning star) has *alof*; *Wañlej* (stars), *at-ef*; and Antü (Sun), *añt-üt-ew* (Poza Menares and Canio Llanquinao 2014, 57). Both among the various Chaco groups (Giménez Benítez *et al.* 2002; López 2009b; Gómez 2011) and among the *Mapuche* of Patagonia (Poza Menares and Canio Llanquinao 2014, 73) star brightness is related to winter and frost but also to the abundance of the celestial plane. In both regions star brightness is represented as combustion or burning; and it is also told that the campfires of the sky beings are cold. In addition, the idea is present that the light-darkness cycle is reversed in the sky (Giménez Benítez *et al.* 2002; Wright 2008); this is also frequent among groups in other regions, for instance, the Amazonian *Yanomami*, to whom daytime in the *Xapiri* celestial world occurs when it is night-time on Earth (Kopenawa and Albert 2015, 111). According to Viveiros de Castro, for the *Arawete* their society would be composed of two halves: one terrestrial-human and another celestial-powerful beings (Viveiros de Castro 1992, 255).

Among the Chaco *Moqoit*, the cold and humid climate associated with the sky is understood as the general original climate of the cosmos prior to its ordering to enable life, including a warm-dry-solar regime (Terán 1998, 251–252; López 2013, 110). Among the *Carib*-speaking *Pemon*, the human body’s life force is related to the Sun and understood as residing in different parts of the body (Halbmayer 2012a, 111). The *Tukano* speak of the “bright powers of celestial forces” (Reichel-Dolmatoff 1978, 3). Also, among the Amazonian *Yanomami*, star brightness is connected with the *Xapiri*, the powerful primeval ancestors of all the rainforest animals. The heads of these beings are described as covered with white feathers giving off a gleaming light that twinkles like the stars and which becomes brighter the older these beings are (Kopenawa and Albert 2015, 112–113, 116). The *Xapiri* have weapons in the shape of huge blades (*siparari*) and arrowheads made of shiny metal (“sky flakes”) that they search for at the end of the rainforest, where it meets the sky and the Sun disappears (Kopenawa and Albert 2015, 129–131). Closely based on Kopenawa’s ideas, Viveiros de Castro (2007) discusses the key role of brightness and luminosity in Amazonian cosmological notions, even if, as is often the case with his approaches, he does not analyse its relationship with celestial bodies (in other works he explicitly manifests his certainty of the secondary nature of celestial bodies’ conceptualisation in Amazonia [Viveiros de Castro 2005, 41] without putting forward any arguments; in our opinion this is a significant error). He points out that in these contexts light is relevant as an expression

of intensity, rather as the origin of the visibility of what is illuminated (which is in line with the power association already mentioned). On the other hand, he underlines the frequent bond in Amazonia between luminosity and transparency (the other link he establishes, between luminosity and “lightness” or lack of weight, does not seem to be so generalised among the South America Lowlands groups). Finally, he mentions the relevance of those objects that greatly increase brightness and reflection such as crystals, which had already been pointed out by Reichel-Dolmatoff (1982). Among groups in Chaco, a region with no rocks, other objects have played this role, such as the iron meteorites of Campo del Cielo for the *Moqoit* (Giménez Benítez *et al.* 2004; López 2017b).

Founding Skies

From the perspective of many Chaco groups, humanity in its current form could only have started when men’s ancestors forced the women to stay on the terrestrial plane, abandoning their original residence in the sky, which even today is considered an essentially female domain. This initial action of violent control over female celestial power, which included the possibility of sexual intercourse and human reproduction by breaking the teeth primeval women originally had in their vaginas, is the origin of the terrestrial human society (Tola 2009; Gómez 2010; López 2013). Control over this huge female-celestial power linked to fertility and reproduction – and also to voracity – is neither definite nor absolute. In order to maintain it, a series of restrictions are imposed on women’s behaviour, and women generally try to avoid contact with powerful places (such as lagoons and waterholes) during powerful moments of the female cycle (like pregnancy and menstruation). Also, the sky supports and is the foundation of the celestial plane because it is the source of water, which is essential for fertility (Giménez Benítez *et al.* 2002). However, this is not a general rule. Thus, to the *Arawete* – a *Tupí-Guaraní* group – the Earth would be associated with the feminine while the sky and its inhabitants with the masculine-warrior (Viveiros de Castro 1992, 258).

Among the *Mapuche* of Patagonia the sky is also essential as the foundation of the entire cosmos. In the beginning of the cosmos, there was only the “upper” or “primordial” world, *Wenumapu*, where the creating agent Futa Newen resides. According to the narratives, the terrestrial plane originated from ashes and land swept by the tears of celestial beings after quarrels on that plane; and as for human beings, men would come from the Sun and Moon, and women from the “morning star” (Bacigalupo 1997, 183–184). To the Amazonian *Tukano*, humans in primeval times were in close contact with the powerful celestial beings (Father-Sun, his Wife-Moon, the Storm) and with the masters of the species (in the same direction, for the *Selk’nam* from Tierra del Fuego, in the original times the sky was lower and closer to the Earth than nowadays [Giménez Benítez 2014]). Knowledgeable about all the rules and procedures for a good life, they taught the first humans (Reichel-Dolmatoff 1978, 2, 138–141). They also explored the Earth and made it fit to live in. Father-Sun identified the point in the terrestrial river where the power of *yajé* (the psychoactive plant) resided and it was there that he planted his stick-rattle-phallus. Down the stick slid the humans to the Earth, landing on the famous Nyí rock, located near the Meyú waterfalls and covered with pictograms that the *Tukano* of *Pirá-Paraná* interpret as the representation of Father-Sun in that situation.

To the *Yanomami* (Kopenawa and Albert 2015, 622), the beginning of today's cosmos is related to the fall of the old sky (*warō patarima mosi*) that led to the creation of the present Earth and the erection of the present sky (*hutu mosi*) – the idea of the falling of the old sky and the World Tree in the origin of the present world is also present among *Carib* groups (Magaña and Jara 1982) and *Moqoit* (López 2009a). In addition, the waters of the “underground river” of the lower world (*pëhëtëhami mosi*) were released by the creating being *Omama*. With his metal stick he dug a hole in the ground to give some water to his son, and this was the origin of the sky river, which feeds the dead and the terrestrial lakes and rivers (Kopenawa and Albert 2015, 82). All beings have a powerful and luminous “component” of themselves, which they call *utupe* (“image”), like a small bright and colourful humanoid. Shamans can see these *utupe* and interact with them, manifesting themselves in the same way (Kopenawa and Albert 2015, 610). These “image”-beings are the aforementioned *Xapiri*, and they come from primeval times. Sun (*Mothoka*) and Moon have these “powerful” dimensions, known as *Mothokari* and *Poriporiri* respectively. *Omama* created the Sun's dimension – and thus never dies – and his brother *Yoasi* created the Moon's –who, as she travels on her celestial canoe, gets old, dies and is reborn cyclically when her daughters bury her bones (Kopenawa and Albert 2015, 83–84). The “new sky” (*tukurima mosi*), which is very remote, transparent and fragile, is inhabited by beings that appear as flies, other insects and vultures (Kopenawa and Albert 2015, 124–125). The rain in the forest depends on the monkeys' “images” shaking the branches of the *Maa hi* tree, which grows at the end of the Earth and the sky, to make its flowers fall. This requires the keen and concerted effort of “image”-beings and shamans (Kopenawa and Albert 2015, 199). The “whites” were also created by *Omama* and live under the same sky, with the same Sun and Moon (Kopenawa and Albert 2015, 231). Apart from the rain, the Earth's fertility comes from *Omama*'s metal stick, buried under rocks at the headwaters of the rivers, which are located under the big tree that supports the centre of the old sky (Kopenawa and Albert 2015, 328).

Worlds Articulated by Motions

The flexible articulation of these worlds is centred on motion, which gives way to an organisation that, from a western perspective, would be conceived as space and time. The sky has a critical albeit not isolated role in this articulation. In fact, on account of its mobile and dynamic nature, the *Yanomami*, for instance, see it as threatening and in need of permanent intervention (Kopenawa and Albert 2015, 196). This sky is not conceived from a distance and total otherness, but from its bonds with the human domain and with the other regions of the cosmos. In this sense, what has already been said (Aveni 1981) about the critical role of the horizon should be understood, considering these perspectives of the sky. We believe, however, that it would be more appropriate to speak of the entire terrestrial landscape rather than of a horizon. The sky is not only related to the skyline silhouette of the top of trees, and usually it is not linked with the mathematical horizon of scholarly astronomers. It is the overall local landscape that becomes relevant for the celestial experience and conceptualisation. On many occasions this implies incorporating salient features of the local landscape into the cosmology (Jara 2014).

A central element, common to these forms of conceiving the cosmos – and to a large extent also shared by the Andean region groups (Urton 1981a) – is to see the Milky Way as a structuring element, together with its motion in relation to the local landscape and vis-à-vis the motions of the Sun and the Pleiades and Scorpius regions (Lévi-Strauss 1969, 217–218; López and Giménez Benítez 2008; López 2009b; Green and Green 2010; Jara 2014; Urton 2016 [1987]). The Milky Way is conceived as a dynamic flow (López and Giménez Benítez 2008; Green 2013; López 2013, 2016) and the use of images and metaphors expressing this flow is quite common: a **river** (Reichel-Dolmatoff 1978, 32; 1982, 195; López and Giménez Benítez 2008; Pozo Menares and Canio Llanquino 2014, 100–101; Kopenawa and Albert 2015; Gómez 2017, 321); a **whirlwind** (López 2009a, 219; Gómez 2017, 320–323); a **path** (Reichel-Dolmatoff 1982, 185; López and Giménez Benítez 2008; Pozo Menares and Canio Llanquino 2014, 26, 99; Gómez 2017, 320–323); a **tunnel** (López and Giménez Benítez 2008; López 2009a, 219); or a **tree** (Magaña and Jara 1982; López and Giménez Benítez 2008; Wright 2008). Some examples of these views of the Milky Way can be found in the figures below.



FIGURE 1 Left: the Milky Way is seen as a great vortex of wind, of the same type as the whirlwind, which is a passage that connects the cosmos' layers (drawn by a *Moqoit* child, Chaco, Argentina, 2013). Right: the Milky Way as a cosmic tree through which shamans ascend during initiation, finding there various powerful beings with whom they must try to establish pacts; if they do not succeed they will be knocked down from it and die (drawn by Ángel PitaGat, *Qom* expert in shamanic knowledge, Formosa, Argentina, 1989 [Wright 2008, courtesy of the author]).

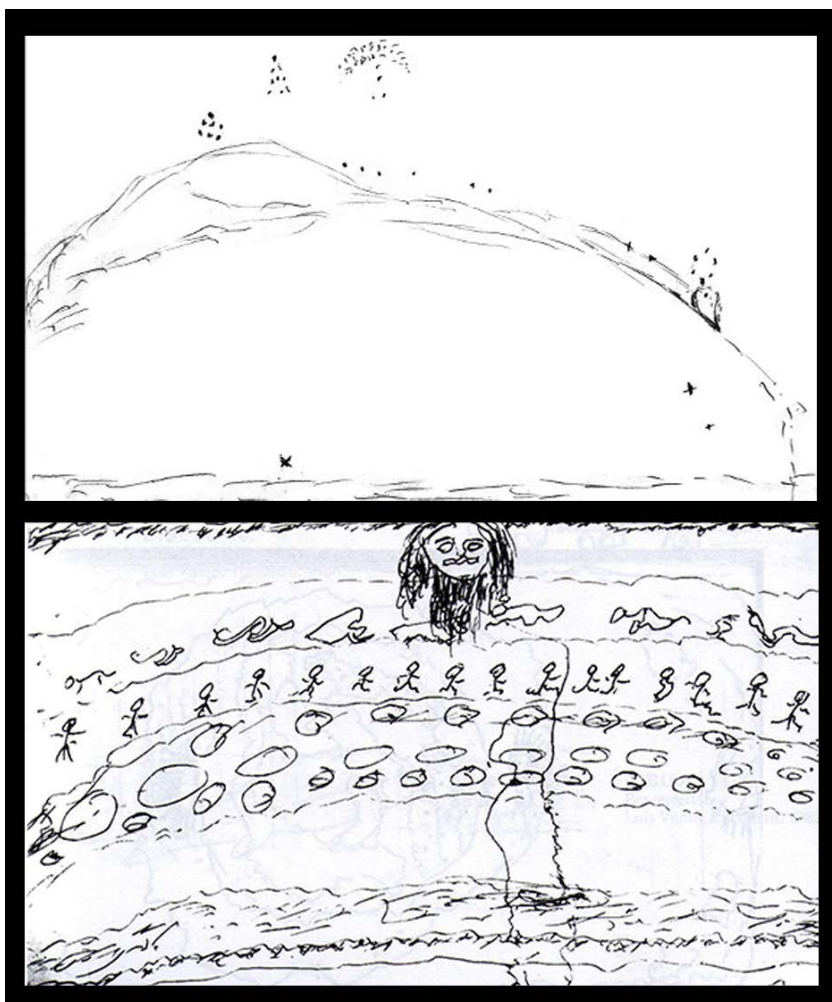


FIGURE 2: Top: the Milky Way as a path in the sky – in the form of a great arc – inhabited by powerful beings which are also asterisms. In the centre of the image is the enormous Mañic (*Rhea americana*, drawn by the dark spots on the Milky Way), while from left to right are *Lapilalaxachi*, *La Virjolé*, *Mapiqo'xoic*, *Nasalagani*, *Pohe*, *Naqayiarolqaii*, *Pioxo* and *Lachishinaxanaxat*. Below these, from left to right are *Nete'ese* and *Temal*. The horizontal line at the bottom of the drawing is *'laua*, the land of humans (drawn by Marcos Gómez, *Moqoit* leader, Chaco, Argentina, 2002). Bottom: the Milky Way as a path travelled by various beings (illustrated by this drawing of “the skies” by Ángel PitaGat, *Qom* expert in shamanic knowledge, Formosa, Argentina, 1987 [Wright 2008, courtesy of the author]).

The Milky Way appears as the most important means of connecting the cosmos, but it not the only one. The worlds we mention are connected in multiple ways, crisscrossed by a giant network of interconnecting channels, some more fixed than others but none of them rigid. Thus, among the *Mapuche* (Skewes and Guerra 2016, 69–70), trees – especially hollow trunks – cracks in stones and the axis between the depths of lakes and the summits of volcanoes are other means of cosmic communication. For the *Moqoit*, water

wells are the openings of tunnels linking with other levels in the cosmos, just as dust devils are visible manifestations of a myriad of other tunnels (López and Giménez Benítez 2008; López 2016). The *Yanomami* speak of “gleaming paths that unroll from the ends of the sky and undulate” towards the future shaman (Kopenawa and Albert 2015, 147). Vapours going up, like smoke, cooking fumes, fog or excrement steam, may lead to the sky (Pozo Menares and Canio Llanquino 2014, 126).

As mentioned, asterisms in the Pleiades and Scorpius regions are a major part of this structuring element. Their heliacal rising is especially relevant, and generally the Pleiades plays the key role here. With regard to the Sun’s motion, of special significance are the solstices, particularly the June solstice among the *Moqoit*, *Qom*, *Guaraní* and *Mapuche* (Giménez Benítez *et al.* 2002; López 2009b; Pereira Quiroga 2014; Pozo Menares and Canio Llanquino 2014, 84–86, 111). Among several groups, for example the *Barasana* (Reichel-Dolmatoff 1982, 190), the Pleiades is seen as a sort of nocturnal equivalent of the Sun. The fact that the points where the Sun’s path goes across the Milky Way are in the vicinity of the Pleiades and Scorpius is key for this three-fold bond; as a result of it, the heliacal risings of asterisms in these areas, the solstices and the extreme positions of the Milky Way remain connected.

The annual motions of the Milky Way with regard to the local landscape often play a key role in the conceptualisation of the yearly cycle and the regions of the cosmos and for that reason with fertility (Giménez Benítez *et al.* 2002; López and Giménez Benítez 2008). In many cases, images and metaphors connected with processes of human and social fertility are used to describe the motions (Urton 2016 [1987]): they are frequently referred to in terms of “rising or ascending”, “going across” and “entering or falling”. Many groups – *Moqoit*, *Barasana* – refer to a “new path” and an “old path” (Hugh-Jones 1982, 185, 189–193; López 2013, 109), or to a “big river” and a “recumbent river”, as seen with the *Mapuche* (Pozo Menares and Canio Llanquino 2014, 100–101). These sections are joined at the end and beginning of the yearly cycle and are supposedly “guided” in their rising by asterisms in the Pleiades and Scorpius regions. The Milky Way as a central structuring element is often reflected in the special relevance of the nearby asterisms (Urton 2016 [1987]), and in the fact that the narratives about them many times mention their arrangement in that central element as a structuring principle, as is the case of the *Moqoit* (López and Giménez Benítez 2008) and *Barasana* (Reichel-Dolmatoff 1982, 185–188). In fact, most *Mapuche* asterisms are located near the Milky Way and rise and set roughly within the arc of possible Sun rising and setting points (Pozo Menares and Canio Llanquino 2014, 82). A similar trend is observed among the Chaco groups (López and Giménez Benítez 2008) and the Amazonian *Barasana* (Hugh-Jones 1982, 185).

There are also frequent links between the Milky Way and the Rainbow in the Lowlands, conceived both in connection with water and its cycle and with the big water serpents. Similar connections are also found in the Andean world, at least in part due to contacts between this region and the Lowlands as an area of shamanic power (Urton 1981b, 115–116), as well as frequent relations between the Milky Way, Rainbow and Sun (Urton 1981b, 125). This bond is articulated with the night/day pair. In addition, according to Lévi-Strauss (1969, 246–247), many groups from the Guianas down to Chaco relate the

Rainbow specifically to the Milky Way's dark areas. Such images are normally connected to those of the Milky Way as a river, being part of a water cosmic circuit, as among the *Barasana* (Reichel-Dolmatoff 1982, 195) and the *Yanomami* (Kopenawa and Albert 2015, 82).

As regards the Sun, both its daytime and yearly motions are relevant. In addition to the solstice extremes already mentioned, in the tropical areas the passing of the Sun through the zenith and the east–west axis are of relevance, again for instance among the Colombian *Barasana* (Reichel-Dolmatoff 1982, 183–184). The Sun's motion organises space-time and is related to structures in the terrestrial plane, such as the course of rivers among the *Barasana* (Reichel-Dolmatoff 1982, 184) and of the winds among the *Moqoit* (Giménez Benítez *et al.* 2006).

The Pleiades' yearly cycle, with its periods of invisibility and visibility, is of great importance, especially the dates near its heliacal rising (*Mapuche, Moqoit, Qom, Guaraní, Caiapó, Bororo, Tupinambá*, etc. [Fabian 1992; D'Olne Campos 2006; Borges and Pedroza Lima 2009; López 2009b; Gómez 2011; Pozo Menares and Canio Llanquinao 2014]), heliacal setting (*Barasana* [Reichel-Dolmatoff 1982, 200]) or heliacal rising and morning heliacal setting (*Wayana* and *Tarëno* [Magaña 1988–1989]). The moment of the Pleiades culmination just before sunrise is also relevant among certain groups (D'Olne Campos 2006; Gómez 2008, 200–201). Groups distributed in wide territories can change from one to another of these moments to adjust the cycle of the Pleiades to each local climate cycle (Magaña 1988–1989; Jara 2014). Some recent processes of state recognition and regulation have resulted in fixing Gregorian "start-of-year dates" for indigenous groups, originating from reinterpretations of this calendrical marker (López 2011; Pereira Quiroga 2014). The Pleiades is usually compared in this context to asterisms in the Scorpius region (Reichel-Dolmatoff 1982, 200; Fabian 1992; López 2009a, 236–237, 272–273, 345–346; Urton 2016 [1987]), and in a minor opposition it is usually in tension with asterisms in the nearby region of Orion (Magaña 1988; Fabian 1992; López 2009a; Urton 2016 [1987]).

Another common element among the South American groups is that they have in general at least three types of asterisms: those made up of stars, those formed by bright areas (such as Magellanic clouds) and those formed by dark areas of the Milky Way. In this sense, the association between a huge group of dark areas – from the Coal Sack to the Scorpius region – and a large celestial bird, often a *Rhea americana*, is very frequent (Fabian 1992; Borges 1999; Giménez Benítez *et al.* 2002; Pedroza Lima *et al.* 2013). Many of the asterisms related to dark areas in the Milky Way are connected to animals, and it has been suggested that the first visibility of each could be linked to local seasonal calendars of the hunting seasons of these species (Urton 2016 [1987]). However, it is important to avoid reducing all their meaning to this, since there is much evidence that these celestial animals are also associated with powerful beings and related to ascents into the sky and the pacts of shamans (López and Giménez Benítez 2008; López 2013); they also could have classificatory relevance (Urton 2016 [1987]).

These celestial space-time divisions are connected with terrestrial space-time partitions. It is frequent to find four compartments, as among the *Moqoit* (Giménez Benítez *et al.* 2006) and *Mapuche* (Pozo Menares and Canio Llanquinao 2014, 31). However, these

divisions have been repeatedly generalised and rigidified excessively (Foerster 1993, 67–69; Pozo Menares and Canio Llanquinao 2014, 31), when in context they are often combined with other classification principles (Foerster 1993, 60–63). In several contexts a comparison between a vertical and a horizontal organisation of the cosmos has been propounded, as among the *Mapuche* (Foerster 1993, 62–63). Among the groups of the *Tupí-Guaraní* family, this has been the object of much debate. Some authors (Cadogan 1959; Nimuendaju 1978) claim that the series of vertical layers is key for the cosmology of these groups, especially the sky–Earth opposition (Viveiros de Castro 1992, 83–87), while others take the view that verticality is a product of Christianisation (Wagley 1977; Ruiz 2018). As already discussed, the contextual nature of these groups’ cosmograms (Wright 2008, 17, 145–149, 150–151) indicates that researchers should not take a rigid stance in these discussions. Kopenawa’s testimonial (Kopenawa and Albert 2015, 617, 622, 670) accounts for the relevance of the dynamism and history of these classifications: the terrestrial plane is the “old sky”, which fell at the beginning of the present time. The two skies are not simply two “levels”: one is the “present sky” (*hutu mosi*) and the other, the “new sky” (*tukurima mosi*), is the germ of the cosmos’ future sky.

The spatial arrangement of territory (Giménez Benítez 2014), villages (Lévi-Strauss 1963, 143–154; Franchetto and D’Olne Campos 1987; Hugh-Jones 1988; Fabian 1992; D’Olne Campos 2006) and houses (Reichel-Dolmatoff 1975; Hugh-Jones 1988) is often connected to the structuring of the skies. The solstices and the “equinoctial” axis – in general the “spatial” equinox (Ruggles 2017 [1997], 129–130), as among the Colombian Kogi (Reichel-Dolmatoff 1975) – are among the more frequent directions used.

Something similar occurs with regard to the temporal aspects of the cosmos’ structure. Bacigalupo (2016, 16) points out that the experiences of *Mapuche* shamans (*machi*) combine “linear” and “cyclical” times, temporal dislocations, multiple temporalities and human and non-human agency. There are many references to stars and asterisms guiding parts of the day. Also among the *Mapuche* (Pozo Menares and Canio Llanquinao 2014, 75–94; Fu 2016), *Wüñellfe* is a bright star seen on the eastern horizon shortly before dawn, guiding the path of the rising Sun. It can be Venus in the morning but also Jupiter, Saturn or Sirius. On the other hand, *Yepún*, the night-time guide, which leads the stars, fulfils its task by rising at sunset in the east, culminating at midnight, and setting at dawn. It is usually Jupiter, Arcturus, Sirius or another bright star seen in the east at sunset, or even entire groups of stars – normally the Weluwitraw male asterisms (Orion’s belt and sword) between December and January – and *Luwan*, the male *guanaco* (between Scorpius’s tail and Sagittarius), between May and June. Similarly, among the *Tikuna* of the Amazon region, the “Worecū stars” that determine the temporality of female initiations appear to be linked to Jupiter, Saturn and Mars, but their identification is strongly contextual (Faulhaber and D’Olne Campos 2019). These multiple and contextual identifications between mythical beings and features of the sky are frequent among South American groups. This is the case, for example, of *La Virjolé* among the *Moqoit* – located in both a Taurus and Capricorn area – (López 2009a), or that of *Kwa’nyip* among the *Selk’nam*, linked to both Antares and Betelgeuse (Giménez Benítez 2014).

The sky's features correlate with different weather phenomena and those of plant and animal life which vary according to each region's characteristics. This has important implications for the production cycles of agricultural, hunter-gatherer and fisher groups. The links between these cycles exceeds the focus of this paper, although we do here point out the importance of understanding the astronomical cycles involved as part of a complex system of cycles – astronomical, climate, biological, productive and social – that must be interpreted together (López 2009b, 2021; Gómez 2011; Silva Sinha 2019; Thomazi Cardoso 2020). The heliacal risings of various asterisms are frequently connected with these kinds of phenomena, as happens with the zenith passage in some groups of the tropical regions (Magaña and Jara 1982; Fabian 1992; Giménez Benítez *et al.* 2002; Roe 2005; Green and Green 2010, 6; Pereira Quiroga 2014; Thomazi Cardoso 2020). In this sense, it is interesting to observe the contrast between the *Tukano* and *Arawak* groups (Jara 2014). In northern South America, in the Guianas region (Magaña 2005; Green and Green 2010, 5) and among the *Tukano* in northern Brazil (Thomazi Cardoso 2007) different rain periods are correlated with certain asterisms. In the Chaco region, the Pleiades and its different positions in the sky are related to the frost period and the start of fruit ripening (Giménez Benítez *et al.* 2002; Gómez 2008, 2011, 2017; López 2009b; Pereira Quiroga 2014). In general, these are not exact dates, but more or less extensive periods of time in which astronomical signs are correlated with signs in other dimensions of the world (Fabian 1992; López 2017b).

Gendered Worlds

The models of the cosmos found among South American Lowland groups frequently include references to a gender polarity, applied both to beings and to space and time domains. The classification purpose of this polarity may be related to desire, reproduction and role and task distribution (Hugh-Jones 1982, 198), but is often also concerned with kinship (Urton 2016 [1987]) – that is, in these groups, with politics. As an example of this, Urton (2016 [1987]) notes that among the *Apinayé* people in Brazil, the Sun and his sister Moon are the origin of the northern and southern moieties of their villages.

However, as with other classification principles among these groups, the gender categories operate in a processual and strongly context-dependent way (Hugh-Jones 1982, 198). For this reason, the gender assignments given to celestial bodies in the Americas are unstable and commutable; they depend on the specific roles or functions assumed by the celestial bodies in a given situation and in conjunction with other concurrent oppositions (Lévi-Strauss 1976, 216–217, 221). Among the *Mapuche*, for instance, any of the different celestial bodies are invoked in prayers as Young Man, Young Woman, Old Woman and Old Man (Bacigalupo 1997, 191; Pozo Menares and Canio Llanquiao 2014, 56, 84). This accounts for their completeness as powerful agents. But, in particular contexts, specific gender aspects of some celestial entity can be activated – frequently in contrast with another of the celestial beings – like when Moon is conceived of as the Sun's mother and wife (Foerster 1993, 163) or when the two of them are viewed as "twins", brother and sister, husband and wife or "companions" (Urton 2016 [1987]). These kinds of contrasts have consequences at other classificatory levels; in particular, Lévi-Strauss

(1986) had already pointed out that the analogy and opposition relations between Sun and Moon in the Americas lead to considerations on the nature of the light they generate. As an example of that, in the *Mapuche* case, specific terms exist for the kind of light or heat generated by the Sun, the Moon, the morning star and the stars (Pozo Menares and Canio Llanquiao 2014, 57). Also, the *Mapuche* make distinctions between the plurality of nocturnal lights and the Sun's uniqueness during daytime (a point that should be carefully analysed, as many groups are clearly aware that the Moon, and even some other celestial bodies like Venus, can be and are even regularly seen during the day).

A consequence of the gender assigned to celestial entities is their role in discourses on the regulation of sex and fertility among humans. This is frequent in reference to the Sun and the Moon. One example of this is found among the *Tukano* (Reichel-Dolmatoff 1978, 1–4, 149–150), who conceive the Sun as a giver of energy, linked both to fecundity and resource sustainability. His grandson's brightness, an expression of this energy, has a narcotic effect on humans, which is described as an orgasm. This effect continues today in the consumption of the *yajé* beverage made from his body. Another example is the connection, in many South American groups, of the spots on the Moon with asocial (incestuous) and/or unproductive sexual behaviours and their consequences (Urton 2016 [1987]).

However, the gender attributions given to celestial entities are related to elements that go far beyond the regulation of sexual behaviour and human fertility. Two important mythic narratives are good examples of how the articulation of such beings' gender roles relates to human life in a broad sense. In one of these narratives, the Sun and Moon are brothers and the founders of today's human order. This story has great significance among the *Tupí-Guaraní* groups (Metraux 1932; Cadogan 1959; Samaniego 1968; Nimuendaju 1978; Bartolomé 1991; de Mello *et al.* 2011; de Mello 2014), and is also quite extended in Amazonia (Metraux 1932; Lévi-Strauss 1976, 217). It also makes connections between key issues in the organisation of these societies: kinship, cannibalism, incest, jaguars, eclipses, the New Moon, the Pleiades and the rain calendar (Combes 1991). The gender identity and the kinship relations of the main characters are crucial in this narrative. Although the term "twins" has been used by many ethnographers to title the story, the relationship between them is not clear (see discussions by Nimuendaju [1978] and Combes [1991]) and it varies. In some versions, the mother is pregnant with both at the same time, but the boys do not have the same father. In others, one of the brothers is born later, or is even created by his elder brother. Therefore, they are not identical twins, or not even twins at all. Combes (1991) notes that some versions give the Moon an ambiguous gender role that leads to identifying the Moon with their dead mother, so reintroducing a gender polarity between Moon and Sun. In almost all the versions, the difference between a demiurgic and "elder/more powerful" brother and a tricksteric and "younger/less powerful" brother is of great relevance for the narrative.

The other mythic narrative concerns the marriage of a despised human and a celestial being, a story of great popularity in Chaco and Patagonia (also present in North American groups). This mythical motif tells us about the relationship between the fecundity of the sky and the abundance for the humans on Earth, and its link with the division of

genders. This myth also talks about the tensions around kinship relations and residency principles, and reciprocity as a social regulatory principle. Some variations involve an initial cohabitation on Earth characterised by the human's envy, which was followed by cohabitation in the sky, where the human was unable to adapt. The human then returned to Earth, either dead or alive depending on the version. Lévi-Strauss (1963, 225–227) analysed some of these contrasts and inversions in different narratives of this kind in the Americas. In particular, there is gender inversion in the main characters between Chaco (López 2009a, 206–207) and Patagonia (Poza Menares and Canio Llanquino 2014, 71, 127–129), which includes the inversion of the human's final status upon returning to the Earth (dead/fertile).

The complexity of this type of links illustrates that the assignment of gender to celestial beings in South American groups is organised according to classificatory oppositions in which gender is a marker that functions in conjunction with many others (kinship, residence, reciprocity, commensality, humanity, power, abundance, fecundity, etc.). Therefore, only a joint consideration, in each case, of all these connections can clarify the role that these gender assignments fulfill. Also, this may change for the same group according to the specific context of enunciation. That is why it is so important not to essentialise or decontextualise this type of classification.

Communicated Worlds

The multiple connected worlds we are discussing, where relations between entities give shape to the cosmos' texture, are above all worlds in communication. This communication takes place through encounters (López 2017a) that involve travelling along multiple ways, first and foremost the Milky Way. The Milky Way is not only described as a river, path or tunnel but also as a tree that shaman initiands should climb (López 2005; Wright 2008). In some cases, certain ritual devices act as visible embodiments of this tree, such as the *rewe* or ritual ladder of the *Mapuche* machi (Bacigalupo 2016, 21). It is a tough ascent that various powerful beings attempt to prevent (Wright 2008; Poza Menares and Canio Llanquino 2014, 24). We have already mentioned other ways to access the sky apart from the Milky Way, but for some groups it is even possible to reach the ends of the world by land, where the sky's shores or "coasts" are found (Kopenawa and Albert 2015). An example of this are the *Guaraní* migrations in quest of *Yvy Marã'ey*, the "land without evil" (Borges 2015; Ruiz 2018, 189–208), which also imply self-perfection to achieve *aguyje* or virtue. In other versions, this virtue requires a lightening of the body that would lift it to the celestial plane (Nimuendaju 1978, 123).

Access to these paths requires power greater than that of ordinary humans. Psychoactive substances are one way of addressing this limitation, and among Chaco groups their use seems to have been much more frequent in the past – examples include the use of *cebil* (*Anadenanthera colubrina*) among the *Wichi* (Arenas 2003, 64) and of wild tobacco among the *Moqoit* (López 2009a, 84, 207–209; Scarpa and Rosso 2011). Amazonian groups use other substances, such as the aforementioned *yajé* among the *Tukano* (Reichel-Dolmatoff 1978, 3–4), or *yãkoana* among the *Yanomami* (Kopenawa and Albert 2015, 150). Dancing or repetitive chants (frequent among the Chaco groups) may replace or accompany the

consumption of these substances. Among the *Yanomami*, it is necessary not only to drink *yākoana* and sing but also to stare up at the starry sky in order to see the sky beings and paths (Kopenawa and Albert 2015, 150, 420). Their connection with the sky is much more complex than a simple “observation of sky objects”. It is the construction of a relation with the sky beings. For this reason, this connection is disturbed not only by the crescent of light pollution that prevents gazing at the stars, but also by the introduction of unusual noises and television screens by non-indigenous people. These new factors distract humans and diverts sky beings from their paths to the Earth, creating an obstacle for accessing these dimensions of the cosmos (Kopenawa and Albert 2015, 398). Sleep, seen as a dimension of the cosmos where humans have access to a greater power (Wright 2008), can also enable access to the sky (Foerster 1993, 56; Kopenawa and Albert 2015, 89–90).

Ritual chants or prayers are means of conveying human words to the sky beings. Some examples are the daily sunrise and sunset rituals that many *Mbya Guaraní* communities (Ruiz 2018) perform in honour of the Sun, as well as the morning prayers of *Moqoit* elders to the Sun (Giménez Benítez *et al.* 2006, 61) and of the *Mapuche* to *Wüñellfe* (Pozo Menares and Canio Llanquinao 2014, 69). The sequence of chants is frequently a cosmographic action in itself (Pozo Menares and Canio Llanquinao 2014, 57, 116–117).

The contemporary indigenous dialogue with the sky is permeated with knowledge and devices of contact with the “celestial” from non-indigenous origins, especially connected to the diverse and profound indigenous reformulations of the Christianity that was brought by the missionaries. In some cases (Gow 2001) this could mean replacing the old celestial interlocutors and the methods of contacting them with non-indigenous “cosmo-political devices”. In most cases, it is a matter of incorporating and interpreting these other humans’ experiences with the celestial in order to have a wider array of options (such as holy objects and images, possessions, ecstasies, etc.), which are always reinterpreted locally (Altman 2015). This means making their own interpretations and value judgements of non-indigenous knowledge and practices about the sky (Wright 2002, 2003a, 2003b; Citro 2004; Ceriani Cernadas 2005, 2013, Ceriani Cernadas and Citro 2005; López 2009a; Altman 2010, 2011, 2016, 2017, López 2011; Kopenawa and Albert 2015; López and Altman 2017).

In the groups analysed, a certain degree of personal power that allows some degree of communication with non-human powerful entities is considered essential for the constitution of any human being. In this context, there are individuals specialised in this type of contact because they have an especially great level of power and, associated with that, a more extended series of body regimes and a particularly deep knowledge of the cosmos. These specialists are true cosmonauts and diplomats (Viveiros de Castro 2002, 358), devoted to the control of an “economy of alterity” (Bacigalupo 2016, 13). These tasks involve the management of personal and community relations with powerful beings, usually by reaching “alliances” (Foerster 1993; Wright 2010; Kopenawa and Albert 2015; López 2017a). These specialists are cosmologists and cosmographers not by mere theoretical speculation, but through first-hand experience.

Interpreted Worlds

As indicated, the key in these relational and communicated cosmoses lies in that everything happening in the world must be interpreted, as a potential sign, clue or trace of the intentions and appetites of the beings around us (López 2017b). Hence, these cosmovisions are cosmic hermeneutics that seek to understand the intentions underlying what is observed and experienced. This is achieved through reasoning and the memory of past events applied to new experiences, especially those of shamans. Everything out of the ordinary is seen as a manifestation of power that needs to be understood, and its causing agent identified. Thus, there are different discourse genres that code and convey this knowledge, such as the *Mapuche* genres of *njütram* (a true account: of something witnessed in person, of old teachings or of what everyone usually speaks), *piyam* (accounts of ancient things, where the evidence is not very reliable so that there is some uncertainty as to their truth) and *pewma* (dreams). The *njütram* genre traditionally implies a debate between two elders about the topics in question (Pozo Menares and Canio Llanquino 2014, 120–121, 126, 144).

The individual experiences of the specialists have a high likelihood of personal variation. However, there are in general some social institutions that regulate the interpretation of experiences. In the first place, the opinions and recollections of the elders refer back to ancient knowledge and traditions as sources of legitimacy; in turn, these are preserved, at least in part, in different memory-supporting materials such as *Tukano* graphic design (paintings, petroglyphs, landscape traits) and the metaphors, names and images they use to describe the visionary flight, as well as their chants and dances (Reichel-Dolmatoff 1978, 152). All this is key to giving meaning to the experiences of the powerful, including those occurring after consuming psychoactive substances. They act as footprints, artefacts and traces of life in primeval times (Reichel-Dolmatoff 1978, 2, 151). The mythic narratives and the narratives of the elders' experiences codify these regulations not only with regard to their content but also to their structure and pace.

Worlds at Stake

Of the signs that are searched for in the cosmos, some refer to the danger of the world being struck by a cataclysm. Since pre-Columbian times these groups have had narratives about the signs of a possible global cataclysm that are now associated with cataclysms originating in today's world order. A variety of cataclysmic motifs appear in the region: floods; a world fire; the fall of the Sun or the sky, or objects from the sky; darkness; and the excessive weight of so many generations of dead people, as among the *Arawete* (Viveiros de Castro 1992, 63), etc. As seen among the *Yanomami*, the cosmic balance is always unstable and requires continuous human action to maintain it. The first humans tried to underpin the sky with wooden poles (Kopenawa and Albert 2015, 194–197), which is similar to the *Moqoit* attempts to stop the Sun from falling by using wooden poles (Guevara 1969 [1764], 65). Their failure caused the collapse of the previous sky and plunged the first humans into the underworld. Thus, according to the *Yanomami*, the present sky is supported by iron poles. Notwithstanding this, its support needs the

permanent and concerted effort of powerful beings and human specialists (Kopenawa and Albert 2015, 194–197).

The European conquest, and the sudden changes following, increased interest in these motifs and led to situations that were interpreted as signs of a forthcoming change of era. Sometimes this cosmic change has been expected as a sign that indigenous groups will regain the autonomy lost to hegemonic modernity. In some cases this implies the disappearance of the whites and going back to the old ways of life, which to some *Mapuche* would occur at the beginning of the year, at the June (austral winter) solstice (Foerster 1993, 139–140); in other cases, it consists of taking the “whites’” possessions as their legitimate owners. Some examples are the cosmological ideas expressed during the uprising against exploitation in the Argentine Chaco in the first half of the twentieth century (Cordeu and Siffredi 1971; Salamanca 2010). Many times this is still expected today (López and Giménez Benítez 2008, 22; López 2017b).

A series of phenomena typical of late contemporary capitalism, such as climate change, deforestation and epidemics are seen from the same perspective. This leads specialists to discuss the signs they observe in the world and their conversations with powerful beings. The actions of Davi Kopenawa, a *Yanomami* intellectual, on the international arena (Kopenawa and Albert 2015, 335–336) are precisely intended to explain to the non-indigenous the need to put an end to deforestation and mining in the rainforest, which exposes materials (oil and minerals) of celestial origin (hence the name of *mareaxi* or *xitikarixi* given to the shiny metal, like the stars) that made up the skeleton of the old sky whose back is today’s Earth (Kopenawa and Albert 2015, 357–362). These are “hot” materials filled with dangerous illnesses; therefore, they should remain buried and covered by the forest humidity. Exposing them may cause a world fire. In addition, excavations may uncover the metal roots of the sky and destroy them, thus making it fall.

Final Remarks

The cosmovisions and cosmologies of the South American Lowlands as we know them constitute a rich, dynamic and vibrant set of human experiences, reflections and practices related to the sky. Their dynamic nature forces us to be cautious regarding generalisations about the pre-Colombian past on the basis of current situations or even of situations dating back to colonial times. New archaeological findings suggest that greater contrasts might have existed in the past among the forms of social organisation of this region’s inhabitants, which would undoubtedly be reflected in their ideas of the sky.

These groups’ knowledge of the sky, as with any human group, is linked to the particular social modes where this knowledge is produced: thus there is a strong tendency to heterogeneity in space and time and to a low stratification of knowledge. Historical and ethnographic evidence account for a world conceived in eminently relational terms, where units are the temporary result of different efforts and intentions. They are social worlds, whose texture and shape is moulded by the relations among the different groups inhabiting them, their desires, interests, alliances, kinships and conflicts. Hence, they are worlds deeply permeated with power: its creation, exercise, circulation and dissolution.

It is critically important to understand that this relational, social and political nature should guide our research into the world models found in this region. We have thus shown the key relevance of the connection between the local landscape and the motions of the Milky Way, the Sun, the Pleiades and the region of Scorpius. Furthermore, we have seen how both changes and continuities relating to the European expansion in the region should be taken into account. As such, the South American skies should be approached through studies that combine ethnography and historical and archaeological perspectives. Comparisons between different groups and regions should be made, taking account of the deep logics and articulations present in each context, rather than just isolated elements.

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