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ASTRONOMY OF THE COASTAL CARIBS OF SURINAM

by

FABIOLA JARA & EDMUNDO MAGAÑA*

¿Cuál puede ser la fuerza de la materia que entre los animales dio al hombre el mirar levantado, mandándole que mirase hacia el cielo y que contemplase los astros?

Francisco DE VITORIA, *Relectio de Indis*.

The present paper deals with some of the many questions raised by Carib astronomy. Specifically, we will consider three main issues. The first one concerns the "nature" of the sky: what aspects of life do the Caribs consider when forming star-constellations? An analysis of its components is undertaken in order to determine the primary areas in need of exploration, and more generally to assess the overall functions of this astronomy. A second problem, related to the first, concerns the relevance of Carib social structure for understanding their astronomy. To answer this we carry out an analysis of the sexual connotation of the sky components. The third issue is whether Carib astronomy can be said "to perform" functions associated with subsistence activities. Sky components are classified according to their association with subsistence activities and the use of the objects represented in the sky are examined. Finally, the constellation origin myths are considered and briefly analysed in order to determine their underlying meaning. The question is whether the significance of these star myths is to be sought in the economy or in some other area of their culture.

Before proceeding, a brief methodological note is necessary. The notion of "Carib sky" includes all Carib stars and constellations recorded between the 16th century and 1980 (it does not reflect the present state of their astronomical knowledge (cf. Table 1).

* This paper is based on a field research in three Carib villages in Surinam between June and October 1980. A report of this research and the systematic identification of all known Carib stars and constellations was presented in the *Journal de la Société des Américanistes* (cf. MAGAÑA & JARA 1982a).

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TABLE I

*Carib stars and constellations*¹

	Before 1900	1907- 1908	1909	1931	1980
1. <i>Aka:mī yu:mī</i>					+
2. <i>Aku:ri yu:mī</i>		+			
3. <i>Akusiwei * yu:mī</i>		+			
4. <i>Arukuma *</i>		+	+	+	+
5. <i>Anu:wana yu:mī</i>					+
6. <i>Arapapa * yu:mī</i>		+			
7. <i>Asigao *, Asigao yu:mī</i>	+	+	+	+	+
8. <i>Asitjani * yu:mī</i>		+			
9. <i>Awa:ra yu:mī</i>		+		+	+
10. <i>Awarepuya * yu:mī</i>		+			+
11. <i>Awoyo * yu:mī</i>		+			
12. <i>Awo * yu:mī</i>					+
13. <i>Ipe:timbo, Ipe:ti²ma</i>	+	+	+	+	+
14. <i>Iaboura *</i>	+				
15. <i>Kaitu:si yu:mī</i>		+		+	+
16. <i>Kapi:wa yu:mī</i>		+			
17. <i>Kataru * yu:mī</i>		+			
18. <i>Knolo * yu:mī</i>		+			+
19. <i>Kuma:wari yu:mī</i>		+			
20. <i>Kumu:kumu yu:mī</i>		+			
21. <i>Kupirisi * yu:mī</i>		+		+	+
22. <i>Kure:wako yu:mī</i>		+			+
23. <i>Kuri:yara</i>	+				
24. <i>Kuruman *</i>	+				
25. <i>Kuru:mu yu:mī</i>				+	
26. <i>Ku:sa yu:mī</i>		+			+
27. <i>Ku:tai yu:mī</i>				+	+
28. <i>Maipuri yu:mī</i>	+	+	+		+
29. <i>Maiwi *</i>					+ ²
30. <i>Malirubana *</i>	+				
31. <i>Nu:no pī:ti</i>		+		+	+
32. <i>Omba:ta:po</i>		+	+	+	+
33. <i>Opo:no yu:mī</i>		+			+
34. <i>Orino ka-n-ay wena-po *</i>		+	+	+	+
35. <i>Paka:mu su:rari</i>					+ ³

1. For the spelling of Carib words, we follow HOFF (1968), KLOOS (1971) and TAYLOR (1977). Words with * are written according to AHLBRINCK (1931), PENARD & PENARD (1907) or to other authors due to lack of more accurate transcription.

Column "Before 1900" is based on literature previous to 1900 (see Bibliography); column "1907" on PENARD & PENARD 1907, 1908; column "1909" on ROTH 1915 [1908-1909]; column "1931" on AHLBRINCK 1931, and column "1980" on our own field research.

The sign + means "mentioned by".

Constellations are listed alphabetically as their order of succession remains uncertain.

2. CIRINO 1977, II: 32-34.

3. DE GOEJE 1943: 118.

TABLE I (cont.)

	Before 1900	1907- 1908	1909	1931	1980
36. <i>Paka:mu tu:riri</i>				+	
37. <i>Paka:mu yu:mĩ</i>		+		+	+
38. <i>Pio-kanamo *</i>	+				+
39. <i>Pitja * yu:mĩ</i>		+			
40. <i>Rakuman *</i>	+				
41. <i>Sáka-sáka * yu:mĩ</i>				+	+
42. <i>Savakou * yu:mĩ</i>	+	+			
43. <i>Sibirisi * yu:mĩ</i>	+				+
44. <i>Si:rito</i>	+	+	+	+	+
45. <i>Si:rito su:rari</i>		+	+	+	+
46. <i>Šuliu * yu:mĩ</i>	+	+		+	+
47. <i>Tuwi *</i>					+ ⁴
48. <i>Urayumari *</i>				+	
49. <i>Wara yu:mĩ</i>		+			
50. <i>Wa:yama:ka yu:mĩ</i>		+			+
51. <i>Waya:mu yu:mĩ</i>		+			+
52. <i>Wo:ko yu:mĩ</i>	+	+	+	+	+
53. <i>Yeyumari</i>				+	

4. CIRINO 1977, I: 18-19.

Sources : AHLBRINCK 1931 ; BARRÈRE 1743 ; BIET 1664 ; BRETON 1665 ; BRETT 1868, 1880 ; CHRÉTIEN [1725] ; COUDREAU 1893 ; DE LAET 1640 ; FERMIN 1769 ; HARTSINCK 1779 ; HARCOURT 1613 ; LA BORDE 1674 ; LAFITAU 1724 ; LA SAUVAGE 1763 ; MARTIUS 1867 ; PELLEPRAT 1655 ; PENARD & PENARD 1907, 1908 ; ROCHEFORT 1765 ; ROTH 1915 [1908-1909] ; STEINEN 1894 ; THÉVET 1575.

These 53 components can be ordered according to five categories: objects or instruments, animals (fish, mammals [quadrupeds], birds), people (men, women), plants (trees, palms), and others.

Firstly, let us examine the kinds of objections that might arise from Table 1. It can be argued that: (i) the period covered by the table is too long, (ii) the data come from many different villages, and (iii) not all sources are equally reliable.

A consequence of (i) might of course be that the Carib sky appears erroneously enlarged due to changes in the denomination of stars and constellations, or to other factors. From (ii) similar consequences might result as it is possible that the same star or constellation appears under different names. With regard to (iii), the fact that not all the sources are equally reliable—due to diversity of interest, knowledge of the Carib language and/or of general astronomical subject matters among the various writers, ethnographers and informants—could lead to the faulty transcription of names and identification of stars.¹

Although it is true that the period taken into account is quite long, stars and

1. The analysis of these three methodological problems may of course be more refined, but for the purposes of this paper this general treatment seems sufficient to us.

constellations collected before 1900 are relatively few (14). Of these fourteen names, eight are still known among the continental Caribs (*Asiyao*, *Ipe:timbo*, *Maipu:ri yu:mĩ*, *Pio-kanamo*, *Sipiriri* or *Sibirisi yu:mĩ*, *Si:rito*, *Šuliu yu:mĩ*, *Wo:ko yu:mĩ*), and four can positively be assumed to be of the Island Caribs (*Kuri:yara*, *Kuruman*, *Malirubana*, *Rakuman*); only one remains to a certain extent unreliable (*Sibirisi yu:mĩ*).

The most extensive records made before 1980 were those of Penard & Penard (1907, 1908) and Ahlbrinck (1931); the villages they visited can be identified with a certain degree of accuracy. The Penard brothers visited the continental coastal Caribs of Surinam and other Carib and Arawak villages around Paramaribo which were later revisited by Ahlbrinck, though he travelled to other Carib villages as well. Another record was made by Roth in 1909 among the British Guiana Caribs, but all of the stars and constellations recorded there are also known in the coastal Surinam Caribs.

With regard to the Island Carib stars, it is known that contacts between Island and continental Caribs continued till the 17th century. Writing about the Island Caribs, Breton observed: "Ils font iusques à Cayenne & Surinames pour ioindre les Gallibis leurs alliez, soit pour trocquer leur denrées & en rapporter d'autres, soit pour faire un corps d'armée, & aller attaquer les Arroûages leur ennemis" (Breton 1665: 108; see also report of the relationship between the tribes of Dominique and the continental Galibi, *ibid.*: 229-233). It therefore seems fair to assume that the Island Caribs had if not the same constellations as the continental Caribs, then at least some in common with them.

The four Island stars in question were recorded by Pelleprat (1655), Breton (1665) and de La Borde (1674) who reported on the Island and the continental Caribs. On the other hand, these stars do not recur in sources from the 18th century on. *Iaboura* was noted by Breton in 1665, and while its meaning remains uncertain, many constellations mentioned by Penard and Penard could refer to it.

Whether the group of stars roughly corresponding to Scorpio, named *Paka:mu yu:mĩ* or *Sibirisi yu:mĩ*, is a truly Carib constellation or an incorporation of the Western Scorpio into Carib astronomy we can no longer ascertain (Magaña & Jara 1982a).

To conclude this section then, the groups considered within the category "Carib sky" can reasonably be confined to the coastal Caribs of Surinam. The most important records were made during this century and concern the same regions. This allows us to dissipate the doubts we had about the notion of Carib sky. We shall carry out various analytical groupings of the components of this sky so as to make out whether relevant information can thus be collected on the nature and functions of Carib astronomy. (List 1 gives the Carib names of stars and constellations with their translation.)

LIST 1. *Carib stars and constellations*

1. *Aka:mī yu:mī*, Constellation of the Trumpeter Bird
2. *Aku:ri yu:mī*, Constellation of the Aguti
3. *Akusiwei yu:mī*, Constellation of the Acuchi
4. *Arukuma*, Star of Arukuma
5. *Anu:wana yu:mī*, Constellation of the King Vulture
6. *Arapapa yu:mī*, Constellation of the Spoonbill Bird
7. *Asināo yu:mī*, Constellation of Asinao
8. *Asitjani yu:mī*, Star of the Priest
9. *Awa:ra yu:mī*, Constellation of the Awara Palm
10. *Awarepuya yu:mī*, Constellation of the Otter
11. *Awoyo yu:mī*, Constellation of the Deer
12. *Awo yu:mī*, Constellation of the Bush Dog
13. *Ipe:tīmbo*, *Ipe:tī'ma*, Constellation of the One-Legged Hunter
14. *Iaboura*, Constellation of the Stork
15. *Kaitu:si yu:mī*, Constellation of the Jaguar
16. *Kapi:wa yu:mī*, Constellation of the Capibara
17. *Kataru yu:mī*, Constellation of the Sea Turtle
18. *Knolo yu:mī*, Constellation of the Scarlet Macaw
19. *Kuma:wari yu:mī*, Constellation of the Heron
20. *Kumu:kumu yu:mī*, Constellation of the Kumu Palm
21. *Kupirisi yu:mī*, Constellation of the Sloth
22. *Kure:wako yu:mī*, Constellation of the Parrots
23. *Kuri:yara*, Constellation of the Canoe
24. *Kuruman*, Star of Kuruman
25. *Kuru:mu yu:mī*, Star of the Black Vulture
26. *Ku:sa yu:mī*, Constellation of the Crab
27. *Ku:tai yu:mī*, Constellation of the Four-Eyed Fish
28. *Maipu:ri yu:mī*, Constellation of the Tapir
29. *Maiwi*, Star of Maiwi
30. *Malirubana*, Star of Malirubana
31. *Nu:no pī:tī*, Star of the Wife of the Moon
32. *Omba:ta:po*, Constellation of the Face
33. *Opo:no yu:mī*, Constellation of the Muscovy Duck
34. *Oriño ka-n-añ wena-po*, The Road of the Women who Went to Fetch Clay
35. *Paka:mu su:rari*, Constellation of the Barbecue of the Sucker Catfish
36. *Paka:mu tu:riri*, Star of the Torch of the Sucker Catfish
37. *Paka:mu yu:mī*, Constellation of the Sucker Catfish
38. *Pio-kanamo*, Constellation of the Twins
39. *Pitja yu:mī*, Constellation of the Ani
40. *Rakuman*, Star of Rakuman
41. *Sāka-sāka yu:mī*, Constellation of the King Fisher
42. *Savakou yu:mī*, Constellation of the Little Heron
43. *Sibirisi yu:mī*, Constellation of the Scorpion
44. *Si:rito*, Stars of the Year
45. *Si:rito su:rari*, Constellation of the Barbecue
46. *Suliu yu:mī*, Constellation of the Water Boa
47. *Tuwi*, Star of Tuwi
48. *Urayumari*, Star (?)
49. *Wa:ra yu:mī*, Constellation of the Scarlet Ibis
50. *Wa:yama:ka yu:mī*, Constellation of the Iguana
51. *Wayamu yu:mī*, Constellation of the Turtle
52. *Wo:ko yu:mī*, Constellation of the Curassow Bird
53. *Yeyumari*, Star (?)

OBJECTS INSTRUMENTS	A N I M A L S		
	Fish	Quadrupeds	Birds
	<i>wo:to</i>	<i>tono:mĩ</i>	<i>tono:ro</i>
Canoe	<i>Asiñao</i>	Aguti	Trumpeter
Fish-Barbecue	Four-Eyed Fish	Acuchi	King Vulture
Torch	Sucker Catfish	Deer	Spoonbill
Barbecue		Otter	Stork
Clay Path		Bush Dog	Scarlet Macaw
		Jaguar	Heron
		Capibara	Parrot
		Sloth	Black Vulture
		Iguana	Muscovy Duck
		Land Turtle	Ani
		Tapir	King Fisher
			Little Heron
			Scarlet Ibis
			Curassow Bird

The category *tono:mĩ* roughly corresponds to the Western category of quadrupeds. *Tono:mĩ* includes four-footed land animals like jaguars, sloths, etc., as well as turtles and iguanas; it also includes water animals (*tu:nadano tono:mĩ*) like dolphins and manatees. The Caribs further distinguish between nocturnal and diurnal animals, *ko:kono tono:mĩ* and *kuri:tano tono:mĩ* respectively. It would seem that, besides four-legged animals, the category *tono:mĩ* includes those having skin and living on land. The otter, for instance, is said to be classified amongst the *tono:mĩ* because of its hide and likeness to the dog.

The Caribs classify these animals in two groups according to their origin : those which have always « been there » and those which are the results of transformations of human ancestors or other animals. For example, the manatee, the dolphin, and the white-lipped peccary are said to be the remote descendants of the Carib people, while the tapir was once a snake.

Tono:ro corresponds more or less to the category "Birds". The Caribs distinguish between birds which fly, *aurindano*, and those which do not, *aurinomupan*; *tono:ro* is the generic name for big birds, *waysi:ri* that for small ones. Bats and vampires are neither *tono:mĩ* nor *tono:ro* but *ieri tamoro*, perhaps due to the combination of a hide and wings. As in the case of *tono:mĩ*, *tono:ro* are also divided into those which have always been there and those which result from transformations.

arib sky

PEOPLE (<i>Kari'na</i>)		PLANTS	OTHERS
Women	Men	Trees	
		<i>we:we</i>	
<i>Iaiwi</i>	<i>Asitjani</i>	<i>Awa:ra</i> Palm	Scorpion
<i>rukuma</i>	<i>Ipe:timbo</i>	<i>Kumu:kumu</i> Palm	Crab
<i>u:no pi:ti</i>	<i>Kuruman</i>		Sea Turtle
<i>mba:ta:po</i>	<i>Pio-kanamo</i>		Water Boa
<i>i:rito</i>	<i>Si:rito</i>		
<i>iwi</i>	<i>Rakuman</i>		

Wo:to corresponds to the category "Fish". *Ku:sa* is the generic name for crabs.

Under "Others" we put sea turtles, crabs and the water boa. However, in Carib terms, each of them should represent a single type: they are neither *wo:to* nor *tono:mi*. The same holds true for scorpions.

As we can see in our Diagram, animals are by far the largest group of sky components (32), with birds making up the largest subset (14). Quadrupeds account for eleven items, fish for three; four independent subsets appear as well (crabs, sea turtle, water boa, and scorpion). People constitute the second largest category (11), instruments the third (5), and trees the smallest (2). (For want of information, *Urayumari* and *Yeyumari* have not been taken into account.) Thus the Carib sky is overwhelmingly crowded with birds and four-footed animals (25) while only three fish are present. Among the plants only two palms are represented. This gains significance when we consider that, in Carib economy, agriculture and fishing are two main subsistence activities—hunting (of game and birds) not being nearly as frequent.

Some reflections on Carib society may enable us to further understand the composition of the Carib sky. In this society there is a well marked and strongly connoted sexual division in all domains of life. Men hunt and fish; women culti-

vate the gardens and gather seasonal fruit of trees and palms. Indeed these activities convey sexual connotations, although they are sexually neutral in some respects : for instance, only men hunt, although women may accompany them; in the provisional camps men build for these occasions, women roast or smoke the game brought by men. Men fish with bows and arrows, knives, harpoons and nets but they may also use lines. Women, on their part, may also go fishing but never with bows and arrows nor harpoons; they use lines, baskets or their hands when damming the streams to make them run dry. They plant the gardens, look after and harvest them, but clearing the woods as well as cutting and burning trees are male occupations. Women predominantly gather wild fruits but men occasionally do so.

Activities involving the use of cotton and clay, such as the manufacture of hammocks, leg-bands and pottery, are reserved for women. Activities involving the use of wood, bone and basketry, such as the manufacture of bows, arrows, seats and baskets, are reserved for men. Women skin the game and cook it, while men use the hide to make drums, the bones and teeth to make flutes or necklaces, etc. From the fruits they gather, women extract colour pigments, condiments, oils, etc., but some plant materials are gathered by men who make utensils, such as blowers from the young leaves of the *awa:ra* palm, roofs from palm leaves, etc. Metal, which has only been introduced after contact, does not have a definite sexual connotation. Women use it to make manioc graters and men manufacture arrow-points with it.

Objects and activities in Carib society thus have a general sexual connotation, and we shall attempt to classify the components of the Carib sky accordingly (*cf.* Table 2).

TABLE 2
*Sexual connotation of the Carib sky**

♂	♀	♂♀
1, 2, 3, 5,	4, 29, 30,	9, 20, 26,
6, 7, 8, 10,	31, 32, 34,	43, 44
11, 12, 13,	35, 45, 47	
14, 15, 16,		
17, 18, 19,		
21, 22, 23,		
24, 25, 27,		
28, 33, 36,		
37, 38, 39,		
40, 41, 42,		
46, 49, 50,		
51, 52		
37	9	5

* Once again the two stars missing are *Urayumari* (48) and *Yeyumari* (53).

Sexual connotation has been attributed to sky components on the basis of their association with men or women² and on the basis of the sex attributed to stars and constellations. This distribution could have been made by emphasizing the objects belonging to sexually neutral domains, for example, by allocating all fish to women and men. This would not greatly vary the overall picture (we would obtain 34 components for men instead of 37, and 9 for men/women instead of 5, women remaining unchanged with 9). Out of the nine "women stars" only three are objects associated with female activities; six being so classified according to the sex attributed to the stars and constellations.

We may conclude that the Caribs have patterned their sky by referring mainly to the zoological world out of which those species associated with men's activities have been selected. We should further note that plants, products or instruments more exclusively associated with women's activities, are not involved in the elaboration of Carib astronomy. The Carib sky lacks manioc, cotton trees, graters, rasps, pots, etc.

This predominance of male components in the Carib sky pattern does not mean that astronomy is an exclusively masculine field. Women and men alike participate in the transmission of astronomical knowledge and star-lore. However, the structural features of South American tribal societies, that is, segregation by sex in almost all aspects of life, acquire a specific character in Carib society. In the past, Carib men obtained women from other tribes, notably from the Arawaks, by means of kidnapping or war, while nowadays inter-marriage is a very common practice. It might be assumed that Carib and Arawak astronomy and mythology are very similar (Brett 1868; Penard & Penard 1907; Van Coll 1907; Roth 1915 [1908-1909]). Indeed women still recall the "other" names (the Arawak ones) corresponding to the Carib constellations. The Carib sexual connotations of the sky have thus been further strengthened by historical developments.

Any approach of men and women in tribal societies infers to their various

2. This requires some elaboration. "Association with" is a very general and vague notion. Surely almost all instruments and animal and plant species could be associated with men and women alike. However these associations take place in different contexts. Game is hunted by men but cooked by women, wood utensils are made by men and used by women. It has to be decided in which way sky components can be said to be associated with one sex or another. A given animal species, understood as "meat" would be associated with women as they cook it; as "game" it would be associated with men as they hunt it. On the other hand, the rising of constellations "announces" the mating and/or hunting season of the animal species they represent and in this way initiates activities that must be undertaken by men. The knowledge of animals is an almost exclusively male domain — or rather a hunter's domain. Besides, all game is cooked and prepared exactly the same way, thus making a specific announcement superfluous with respect to female culinary activity. In short, the representation of animal species in sky components is not associated with cooking.

modes of productions.³ Thus, we shall proceed to a distribution of Carib stars and constellations according to this latter variable (Table 3), before considering the overall functions of Carib astronomy.

TABLE 3

Distribution of sky components according to subsistence activities

Fishing	Hunting	Agriculture	Gathering
7, 23, 27, 32, 35, 36, 37	1, 2, 3, 5, 6, 10, 11, 12, 13, 14, 15, 16, 18, 19, 21, 22, 25, 28, 33, 38, 39, 41, 42, 45, 49, 50, 51, 52	44	9, 17, 20, 26, 34
7	28	1	5

Component 32 is the Constellation of the Face (♀), said to announce the fishing season, while 13 is the Constellation of the One-Legged Hunter (♂) and announces the hunting season. The heliacal rising of 44, the Stars of the Year (Pleiades), mythologically portrayed sometimes as seven girls, sometimes as seven hunters, announces the beginning of a new agricultural cycle. As a result of uncertainties in the sources, some stars and constellations do not appear here (Magaña & Jara 1982a).⁴

Table 3 confirms the insight we had already gained from the analysis of the sexual distribution of the sky components: only six of them are linked to female modes of production. However, the fact that thirty-five components are associated with men's economic activities does not shed any specific light on the concrete functions of Carib astronomy, i.e. its relation to economy.⁵

3. Women are the "agriculturalists", men the "hunters" or "fishers". This structural arrangement of tribal societies is sometimes strengthened by historical developments, as when inter-marriage occurs and men and women are divided not only by the specific activities they carry out, but also by the fact that they come from different tribes. For an application of this view to the analysis of myth, see MAGAÑA & JARA 1980.

4. These are *Arukuma*, *Asitjani yu:mĩ*, *Kuruman*, *Maiwi*, *Malirubana*, *Nu:no pĩ:ti*, *Sibirisi yu:mĩ*, *Šuliu yu:mĩ*, *Tuwi*, *Urayumari*, *Yeyumari*. These stars and constellations cannot be classified in this table.

5. The discussion of the functions of Carib astronomy stems of course from the old debate concerning the nature and function of the intellectual activities of tribal people. The 19th century notions that reduced tribal thought to a more or less vain effort to understand the workings of nature by a kind of specific "mental activity" corresponding to a surpassed

The rising of every constellation announces either the fishing, hunting and gathering seasons of animal and vegetal species or the mating seasons of animal species. However, there remains to be disclosed the connection between the rising of constellations and the performance of specific activities involving the species represented and/or announced. Table 4 lists sky components according to the use of these species.

TABLE 4
*Distribution of sky components according to the use of the species
announced/represented*

	Hunted/Fished/Gathered			Eaten	Manu- factured
Trumpeter Bird	+				+
Aguti	+			+	+
Acuchi	+			+	+
King Vulture					
Spoonbill Bird	+				+
Asiqao Fish		+		+	
Awara Palm			+	+	+
Otter					
Deer	+			+	+
Bush Dog					
Stork					
Jaguar	+				+
Capibara	+			+	+

stage in "human evolution", tended to disregard the particular content and meaning of specific mythical systems as well as specific ethnographic contexts. Certain types of "imaginative processes" recurred with the regularity of law pertaining to phases of "human mental evolution" (TYLOR 1871: 282; LANG 1884: 125).

Another related view was that which postulated that the "primitive's mental activities" were merely limited to solving problems faced in subsistence. "Ce qui leur manque, c'est d'appliquer ordinairement leur esprit à d'autres objets qu'à ceux qui tombent sous les sens, ou de poursuivre d'autres fins que celles dont ils aperçoivent l'utilité immédiate" (LÉVY-BRUHL 1921: 34). Lévy-Bruhl, who did not however completely agree with this statement, went on to write: "[missionaries have affirmed] que les primitifs observés par eux ne pensaient jamais et ne voulaient penser qu'à un nombre restreint d'objets, nécessaires à leur subsistance, à leur bétail, au gibier, au poisson, etc." (*ibid.*: 40). This same trend in anthropology has been discussed by LÉVI-STRAUSS (1962).

Another debate making up part of the background of this paper is that which has emerged around Lévi-Strauss' approach that tribal thought, "la science du concret", has, as its first objective, the satisfaction of intellectual exigencies (*ibid.*: 16).

The development of astronomy is generally linked to agriculture, navigation, State or class societies, and to the formation of a sacerdotal class. This paper purports the view that it can also be thought of as linked to purely cognitive and symbolic functions.

TABLE 4 (cont.)

	Hunted/Fished/Gathered			Eaten	Manu- factured
Sea Turtle			+	+	
Scarlet Macaw	+			+	+
Heron					
Kumukumu Palm			+	+	+
Sloth					
Parrot	+				+
Black Vulture					
Crab			+	+	
Four-Eyed Fish		+		+	
Tapir	+			+	+
Muscovy Duck	+			+	
Pakamu Fish		+	+		
Ani					
King Fisher					
Little Heron					
Scorpion					
Water Boa					
Scarlet Ibis					
Iguana	+			+	
Turtle	+			+	+
Curassow Bird	+			+	+

Of the thirty-four animal and plant species represented in the sky, twenty-one are hunted/fished/gathered, seventeen eaten, and no more than four are used only in manufacture. Some animals and birds are hunted as pets even if they are a culturally edible species—in this case, they are seldom eaten. For example, birds are domesticated for their feathers but most of the time for no other apparent utilitarian reason. However, some species are eaten but not by anyone. Thus, shamans never eat macaws and others avoid doing so because macaws happen to be associated with human beings (in the myth of the origin of women, the first woman was a macaw). Some people, in the course of transitional periods, such as in the latest stages of pregnancy or in couvade, eat certain species—even as low-ranking as the four-eyed fish—which are consumed only in the last resort. In the case of the sea turtle, only its eggs are gathered and eaten. Finally, parts of the hunted and fished species are used to manufacture instruments, tools, and other goods: bones are carved into flutes, teeth serve as necklaces or graters, feathers are commonly wreathed into crowns, etc.

Thus, only seventeen species portrayed by the Carib sky are directly important for subsistence. Of the remaining seventeen stars and constellations six are either taken to announce fishing and hunting seasons and opening the agri-

cultural cycle, or are otherwise associated with subsistence activities. These are: the Constellation of the One-Legged Hunter that announces the hunting season, the Constellation of the Face that announces the dry fishing season, the Constellation of the Barbecue of the Sucker Catfish, the Constellation of the Twins who are hunters, the Stars of the Year with which the agricultural cycle begins, and the Constellation of the Barbecue. In other words, of the fifty-one components of the Carib sky (*Urayumari* and *Yeyumari* excluded) twenty-three (of which 17 portray eaten species and 6 announce the beginning of the seasons) may be considered as associated with subsistence activities. However, the fact that these stars and constellations appear along with other components in several "clusters" (*tono:mĩ*, *tono:ro*, etc.) leads us to believe that their stated economic functions do not completely exhaust their content. This is borne out by the fact that almost half of the components do not have any directly apparent function related to subsistence. In addition, the following considerations must be taken into account.

Firstly, as we have already seen in the analysis of the sex connotation of Carib sky components, certain important items relating to subsistence activities are not included at all, such as the manioc plant, the cotton tree, pepper, yams, wild fruit, etc. It might also be added that while some men's products such as canoes and barbecues are included, certain women's utensils such as hammocks and pots are not.

Secondly, the most important items for subsistence derived from hunting and fishing are not included: the peccaries (*pĩingo* and *paki:ra*) and the monkeys among the four-footed animals, the *tinamu* among the birds, and the *ai:mará*, *tunare* and *piranha* among the fish.

Thus, it is fair to assume that Carib stars do not primarily perform functions associated with economic activities, nor that they are particularly significant in terms of economics. They are primarily associated on the one hand with native zoology (32 components represent animal species) whose foundations may be seen as relatively independent of subsistence necessities, and with mythology on the other, the more important constellations having a mythic origin.

Let us examine those constellations having origin myths, and consider whether an analysis of these myths can be relevant. The following list includes all stars and constellations about which an origin myth is known.

LIST 2. *Constellations having an origin myth*

4. *Arukuma*
8. *Asitjani*
9. *Ipe:timbo*
24. *Kuruman*
28. *Mai:pu:ri yu:mĩ*
29. *Maiwi*

31. *Nu:no pī:tī*
32. *Omba:ta:po*
34. *Oriño ka-n-aŋ wena-po*
38. *Pio-kanamo*
40. *Rakuman*
44. *Si:rito*
45. *Si:rito su:rari*
46. *Šuliu yu:mī*
47. *Tuwi*
52. *Wo:ko yu:mī*

Of these sixteen stars and constellations, we shall deal only with those whose myths appear most important in Carib mythology. The stars and constellations 8, 24, 29, 40, and 47 are no longer known (Magaña & Jara 1982b). The following are the most significant mythic groups:

- a (*Ipe:timbo/Maipu:ri yu:mī/Si:rito/Si:rito su:rari*)
- b (*Si:rito/Si:rito su:rari/Maipu:ri yu:mī*)
- c (*Šuliu yu:mī/Si:rito*)
- d (*Wo:ko yu:mī/Pio-kanamo*)

Besides these groups other star myths of the utmost importance in Carib thought are those of *Omba:ta:po*, and to a lesser extent that of the origin of the Clay Path, *Oriño ka-n-aŋ wena-po*. Let us now turn to a brief analysis of the myths related to these constellations.

Of the stories associated with certain of the unknown stars it might be said that they do not represent myths at all. This is very clear in the case of *Asitjani yu:mī*. The event narrated in this myth took place in historical times. Concerning the other unknown constellations only very short fragments have been recorded (*Arukuma*, *Kuruma*, *Rakuman*) and no analysis is therefore possible. The stars of which extended myths are known and which are taken into account here are the following: *Ipe:timbo*, *Maipu:ri yu:mī*, *Omba:ta:po*, *Oriño ka-n-aŋ wena-po*, *Pio-kanamo*, *Si:rito*, *Si:rito su:rari*, *Šuliu yu:mī*, *Wo:ko yu:mī*.

Myths narrating the origin of the constellations are, like all the other Carib myths, in no way religious, neither are they secret, the guarded domain of shamans, ritual supervisors, or men. Their telling is associated neither with rituals, nor with any other specific activity: persons able to hear these myths are in no way selected. Star myths can be told at any time of day or of the year and on any occasion. No special drug or hallucinogenic is required, nor any special attitude on the part of the teller. All the mythical events are said to have happened at a time "when anything was possible". While some of the myths have several versions, others do not vary or only slightly. Thus for the most part, versions recorded in the 19th century do not greatly differ from those recorded in the 1930's, nor from those we heard in 1980. Some myths are no

longer told or recalled. Generally speaking, although the characters, "materials" and sequences of myths may vary, their structure remains unchanged.⁶

A succinct summary of the myths in question follows:

Ipe:timbo 1.—A tapir seduced the wife of Serikoai, a hunter. One day when Serikoai was climbing a pear tree the woman cut his leg and ran away with the tapir who became her lover. The man recovered and set out to follow them. Finally he caught up with them, killed the tapir and ate it while the woman kept running away refusing to live with him. Reaching the horizon the woman flew up to the sky and was followed by the shadows of her lover and her husband. They became constellations. The wife became *Si:rito* (the Pleiades), the tapir became *Maipu:ri yu:mī* (the Hiades) and the man became *Ipe:timbo* (part of Orion) (Brett 1880: 191-200). The hunter took with him the barbecue on which he had roasted his wife's lover *Si:rito su:rari* (parts of Pegasus).

Ipe:timbo 2.—A man was tied to a hammock or to a pole by his brothers-in-law and was left the whole night in the rain. Afterwards he took revenge on his wife, roasting her and arranging for her to be eaten by his mother-in-law. His crime was discovered. He escaped but his brother-in-law caught up with him and cut his leg. He went to the sky with his barbecue and became the constellation *Ipe:timbo* (several variants of this version have been recorded; see Penard & Penard 1908, II: 39-43; Ahlbrinck 1931: 371-372; Kloos 1971: 230; Cirino 1977, II: 35-36; Magaña & Jara 1982b).

Si:rito 1.—Seven brothers went hunting a tapir. They chased it for a whole year. Finally they caught it and roasted it. When back to the village, they decided to leave for the sky since their sisters did not have the meal ready. They took with them the tapir's head and the barbecue. They became *Si:rito*, the tapir's head *Maipu:ri yu:mī*, and the barbecue became *Si:rito su:rari* (Ahlbrinck 1931: 443-444).

Si:rito 2.—There were seven girls. They were staying all by themselves in the village because their parents had gone to the fields to prepare the gardens. A hurricane came and carried off the girls to the sky. They became *Si:rito* (Magaña & Jara 1982b).

Si:rito 3.—In the beginning, the Creator made seven stars and put them in the sky. A snake appeared and ate them. The Creator made new stars. The snake tried to eat them again but could not, either because it was already full, or because daylight came. They all were fixed as stars (*ibid.*).

Omba:ta:po.—A great-grandmother, hungry and tired of waiting for her daughter and son-in-law, took some fish from the latter's fish-trap. When

6. The elements of myth are not constant—their relative permanence depends upon the materials to which different societies have access, on the previous use of these materials, etc. Only the relations are constant. This and other related methodological problems are discussed in MAGAÑA 1982.

later on, he discovered it, he became angry. As he was a shaman he told the water-spirit about the trick. The next day he sent his mother-in-law to get the fish-trap out of the river. She went as ordered and while gathering the fish, she was attacked by *pataka* fish and eaten. Only her head was left; she went to the sky and became the Constellation of the Face (Ahlbrinck 1931: 336; other similar versions in De Goeje 1943: 102; Kloos 1971: 229; Magaña & Jara 1982b).

Oriño ka-n-añ wena po.—Women went to the sky to fetch clay. On their way back they were caught in a storm and they all died. Their foot-prints remained in the sky (Ahlbrinck 1931: 347; Cirino 1977, II: 38; Magaña & Jara 1982b).

Pio-kanamo.—A woman was impregnated by the sun with twin children, Pia and Makunaima. One day she went to look for her husband. She arrived accidentally at the house of Kono(bo)-aru, the rain frog, who was the jaguar's mother. When the jaguar returned home he killed the woman and found the two unborn children. He decided to keep them. In a month's time they were full grown adults. The grandmother sent them to shoot the powies telling them that it was this bird which had killed their mother. So they did, day after day. Upon seeing that he was going to be shot, the last of the powies told them that it was the jaguar which had killed their mother (Roth 1915 [1908-1909]: 133-134).

This is an episode of a long myth recorded by Roth which ends with the transformation of Makunaima into the constellation of *Si:rito*. However, we recorded a fragment of the original myth where the twins became the Constellation of the Twins, *Pio-kanamo* (Alpha and Beta Centauri), and the powies the constellation *Wo:ko yu:mī* (the Southern Cross) (Magaña & Jara 1982b).

We have already seen that the rising of some of these constellations announces the proximity of the seasons: *Ipe:timbo* announces the hunting season, *Omba:ta:po* the dry fishing season, and *Si:rito* the agricultural cycle. They are therefore associated in a general way with subsistence activities. However, it is obvious that the significance of myths must be sought beyond that level.

As Kloos (1971: 226-233) has observed, many Carib myths revolve around the conflicts between affines. This is especially true of the constellation origin myths. Let us briefly take up this point.

In the myth of the origin of *Omba:ta:po*, a mother-in-law and a son-in-law are opposed. In recent versions the son-in-law has completely disappeared. In the myth of the One-Legged Hunter there are several kinds of conflicts: between a man and his wife, between a man and his wife's lover, and between a man and his wife's family (his mother-in-law and his brothers-in-law). In the myth of *Si:rito*, sisters are opposed to brothers, and brothers or sisters are opposed to their parents. In the myth of the twins, two brothers oppose their mother, their stepfather and their grandmother.

Generally speaking then, we can specify three sensitive areas of relationships

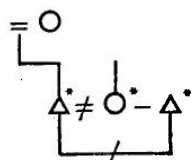
where conflicts may arise: (i) between men and women, (ii) between affines, and (iii) between relatives. Although the context for (i) and (ii) is more or less the same, (i) must be considered separately as well. In Carib society a husband lives with his wife's family. Historically—and also as a theoretical possibility inherent in Carib marriage arrangements—the wife might be from another tribe with which there are friendly relations, or simply from another village. However, in the case of Carib men marrying Arawak women, it is the women that go to their husbands' villages. Another exception of course is when women are taken by force. The relationship between men and women is thus characterized by the fact that they are primarily thought of as strangers to each other and that, in Carib society at least, relation with strangers are potential sources of conflict. The same tension characterizes the relationship between a man and his wife's family. Avoidance rules are applied to in-law's relationships.

While conflicts between relatives have a different character, they share the same context as (i). In the myth of *Si:rito*, the seven brothers are angry with their sisters because the latter have not carried out their women's tasks. The conflict stems obviously from problems with the sexual division of labour. In the myth of *Pio-kanamo*, the twins oppose their father, known to them as their stepfather, because he has killed their mother. Carib myths which reflect the conflictual relationships between women and men and between in-laws, perform symbolic functions.

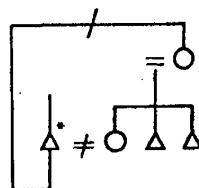
The following diagrams show the different kinds of conflicts described in the origin myths of the main constellations in the several known variants and versions.

To conclude: (i) The largest segment of the Carib astronomical universe is that which is occupied by the animal subset, therefore associating this universe with Carib zoology. The composition of the sky is related to the zoological classification system. (ii) The Carib sky is a male-connoted one, objects associated with women being incorporated to a negligible extent. (iii) The components of the Carib sky are mainly associated with hunting, although an analysis of the functions attributed to these stars and constellations reveals that they are not primarily linked with subsistence activities. (iv) An analysis of constellation origin myths reveals that these myths revolve around sensitive areas in Carib society concerning the relationships between men and women and between in-laws. Therefore, Carib astronomy must be thought of as performing symbolic and classificatory functions; thus, it is a fertile ground for hypotheses.

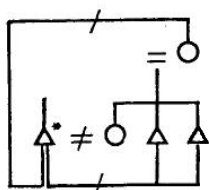
Some final comments should be added to these conclusions. To begin with, very little research was made on the subject of South American tribal Indian astronomy. The few works available date from the first three decades of this century and a theoretical appraisal of Indian astronomy is almost completely lacking. In fact, the most important contribution in this respect is that of Frazer (1912). In his brief essay "The Pleiades in Primitive Calendars", he

lpe : timbo

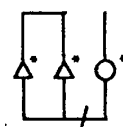
(Brett 1880 : 191-200)



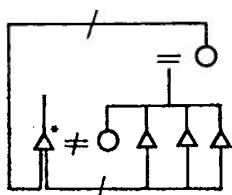
(Penard & Penard 1907, I : 60-62)



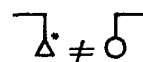
(Penard & Penard 1908, II : 39-43)



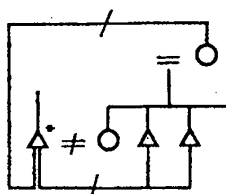
(Roth 1915 [1908-1909] : 134-135)



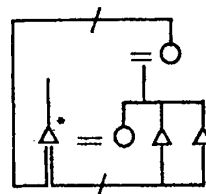
(Ahlbrinck 1931 : 371-372)



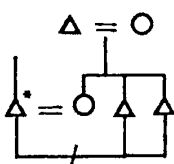
(De Goeje 1943 : 39)



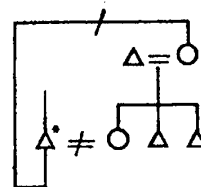
(Kloos 1971 : 230)



(Cirino 1977, II : 35-36)



(Magaña & Jara 1980)



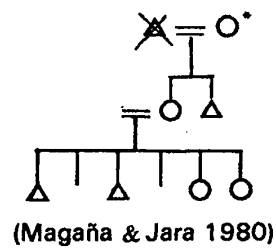
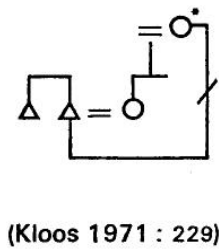
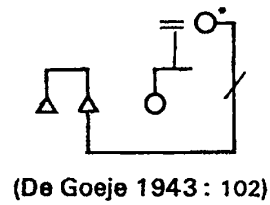
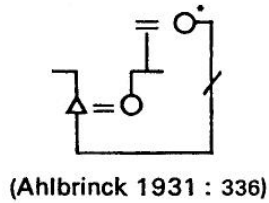
(Magaña & Jara 1980)

The lines mean relationship ;

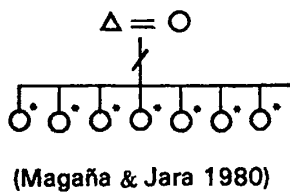
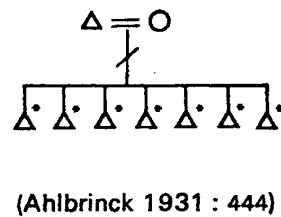
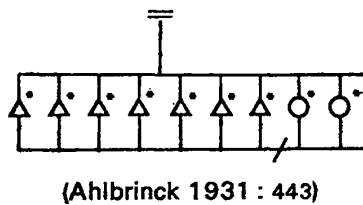
/ or ≠ means conflicts ;

* means transformation

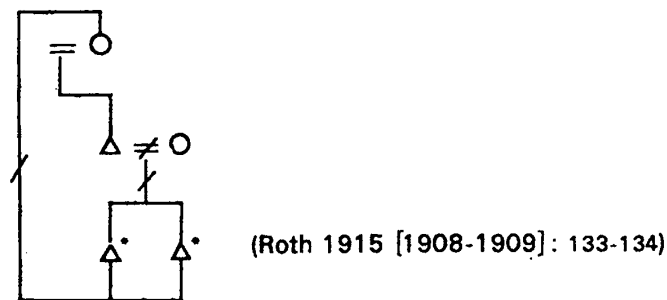
Omba : ta : po



Si : rito



Pio-kanamo



emphasized the importance of this constellation for agriculture. "The reason for the association seems to be the coincidence of the rising or setting of the constellation with the commencement of the rainy season; since men must very soon have learned that the best, if not the only season to sow and plant is the time of the year when the newly-planted seeds or roots will be quickened by abundant showers" (*ibid.*: 318).

Later studies by other ethnologists have since relied heavily upon the conviction that this association between subsistence activities and the rising or setting of constellations exhausts the meaning of Indian astronomical systems. Also, those constellations clearly associated with economic activities have been paid more attention.⁷

Our analysis shows that this association is of lesser importance than is generally thought. Only a few Carib constellations appear to be directly related to subsistence activities and even in these cases the association should not be over-emphasized. The exploration of fields other than economics have proved to be much more meaningful, as was revealed through social structure and kinship, classificatory systems, and mythology. Research on the symbolic functions of astronomy must yet be undertaken.

7. This is evident from the works on Quechua and Aymara astronomies (*cf.* EARLS 1979).

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Abstract

Fabiola JARA & Edmundo MAGAÑA, *Astronomy of the Coastal Caribs of Surinam*.—The authors discuss the old but still current theory stating that the functions of astronomy are mainly connected to economics. An analysis of the animal species used by the Caribs in drawing up their constellations shows that only a few of them are of some importance for subsistence activities and that the main animal and vegetal species—in terms of economics—are not represented as constellations. Previously it has been shown that out of the approximatively fifty constellations recorded since the 16th century, no less than thirty-two represent animal species. In order to elicit the relationship between astronomy and social structure, the sexual connotations of astronomical components are considered. Finally, a brief analysis of several star myths indicates that conflicts between affines are determining for an explanation of the mythic origin of the constellations.

Résumé

Fabiola JARA & Edmundo MAGAÑA, *Astronomie des Caribes de la côte du Surinam*. — Les auteurs discutent la théorie, ancienne mais toujours d'actualité, selon laquelle les fonctions de l'astronomie sont essentiellement liées à l'économie. Une analyse des espèces animales figurées dans les constellations caribes révèle que seules peu d'entre elles ont un rapport aux activités de subsistance et que les espèces animales et végétales les plus importantes — du point de vue économique — ne sont pas représentées parmi les constellations. Auparavant, il avait été montré que sur environ cinquante constellations remarquées depuis le xvi^e siècle, pas moins de trente-deux représentent les espèces animales. Pour expliciter la relation entre astronomie et structures sociales, l'article souligne les connotations sexuelles des composantes astronomiques. Enfin, une brève analyse de divers mythes stellaires indique que les conflits entre affins jouent une grande part dans l'origine mythique des constellations.