Songs from the Sky

Indigenous Astronomical and Cosmological Traditions of the World

EDITED BY VON DEL CHAMBERLAIN, JOHN B. CARLSON AND M. JANE YOUNG

Ocarina Books

Center for Archaeoastronomy

ARCHAEOASTRONOMY

THE JOURNAL OF THE CENTER FOR ARCHAEOASTRONOMY

Volumes 12 & 13

Editors: Von Del Chamberlain, John B. Carlson, M. Jane Young

Assistant Editor: Clive Ruggles

Managing Editor: Constance McCluskey

Board of Advisory Editors:
Anthony F. Aveni
Richard Bradley
Johanna Broda
Michael Crowe
Ben R. Finney
Michael A. Hoskin
Stanislaw Iwaniszewski
David A. King
Edwin C. Krupp
Barbara Tedlock
Brian Warner
Xi Zezong

Layout and Design: Cinthia Radowich, Tania Ruiz

ISSN 0190-9940

Copyright © 1996 The Center for Archaeoastromy
All rights reserved.

For further details on back issues up to Volume 11, please contact John Carlson on <tlaloc@umd.edu>

This journal continues from Volume 14 as ARCHAEOASTRONOMY: The Journal of Astronomy in Culture. For further details and subscription information, contact:

Circulations Manager
Journals Division
University of Texas Press
Austin, TX 78713-7819
http://www.utexas.edu/utpress

Songs from the Sky

Indigenous Astronomical and Cosmological Traditions of the World

Published by:

Ocarina Books Ltd.
27 Central Avenue,
Bognor Regis
W Sussex PO21 5HT
United Kingdom
www.ocarinabooks.com

in co-operation with:

The Center for Archaeoastronomy
P.O Box "X"
College Park
MD 20741-3022
United States of America
+1 (301) 864 6637
www.archaeoastronomy.net

British Library Cataloguing-in-Publication data: A catalogue record for this book is available from the British Library.

ISBN 0-9540867-2-4

Copyright © 2005 The Center for Archaeoastromy & Ocarina Books Ltd
All rights reserved.

First published 2005

Printed and bound in the United Kingdom by AVS-Print, University of Leicester, Leicester LE1 7RH, United Kingdom

♾ This book is printed on acid-free paper

Cover photograph: Petroglyphs of two ancient Pueblo horned shield-bearing warriors gaze up at the clear New Mexico sky at Comanche Gap in the Galisteo Basin. Each has an eagle feather decorated four-pointed Great Star (Venus) Being to his left, an emblem of the Venus-regulated warfare cult of Greater Mesoamerica.

See the paper by Carlson. Photograph by Clive Ruggles

TABLE OF CONTENTS

Búzios Island:

Knowledge and Belief Among a Fishing and Agricultural Community at the Coast of the State of São Paulo

by Marcio D'Olne Campos

Abstract

Of European ethnic origin, 'Caiçaras' live in rural communities at the southern coast of Brazil. Low money circulation and simultaneous sea fishing and agricultural activities are the main features of their economy.

Different communities, particularly at the continent, received different levels of urban influences. At Búzios Island, Caiçaras are among the least influenced by urban life and present aspects of a local culture. This paper analyzes their knowledge in its relation to natural and social phenomena taking place mainly in the context of Earth and sky relations.

Experiential and indicial features relate to the construction of symbolic representations having Human Being as the mediator in these local constructions of knowledge, beliefs and techniques that are characteristics of Caiçaras cosmology. In this framework, this paper analyses natural and social phenomena mainly by the categories: time, space and place.

Introduction

Ethnoastronomical studies have generally concentrated their interest on indigenous populations. However, rural populations like the caiçaras, with a European ethnic origin, but with specific local cultural characteristics can be of much interest for such studies.[1]

Located not far from urban centers, but still geographically isolated, the Caiçaras present the marks of different contacts, previously with indigenous peoples and, more recently, with tourism development.

This paper considers knowledge and techniques as well as belief systems in Caiçaras daily life. Categories of time, space and place support this analysis, mainly through the modes by which time is represented in space.

Caiçara communities spread over the southern coast of Brazil, particularly in the states of Santa Catarina, Paraná and São Paulo. In the seventies the northern coast of São Paulo State was under the environmental impact of the Rio-Santos Road construction. Once the road was completed, it was followed by an aggressive period of land exploitation by real estate and tourist enterprises. These imposed drastic levels of cultural deprivation to most of the Caiçara communities located not too far from big cities like Santos and São Paulo.

Originally, Caiçara is the name of a fence indigenous people used to build by sticking stakes vertically in the ground wo that they touched one another. It later became the denomination of the people studied in this paper.

Inheriting modes of life, both from Portuguese and indigenous people, the Caiçaras live highly integrated with nature, without regular time-scheduled labor and in an almost purveyance economy. Their activities concentrate on fishing as well as low-scale agriculture of sugar cane, a few kinds of cereals and mainly manioc gardens with the consequent production of manioc flour. These features are typical of Caiçara culture (Mussolini 1980:226; Willems 1952:1).

By the beginning of the nineteenth century, coffee and sugar cane agricultural activities moved to the interior plateaus located near the São Paulo-Santos and Rio-São Paulo roads. Displacement of land use caused the Caiçaras to migrate to the interior. Such fact and the consequent decline of the old sea ports between Santos and Rio de Janeiro, caused the Caiçaras to seek better conditions of survival. In recent times, besides those that resisted to live on the coast, only a few groups of Caiçaras have conserved

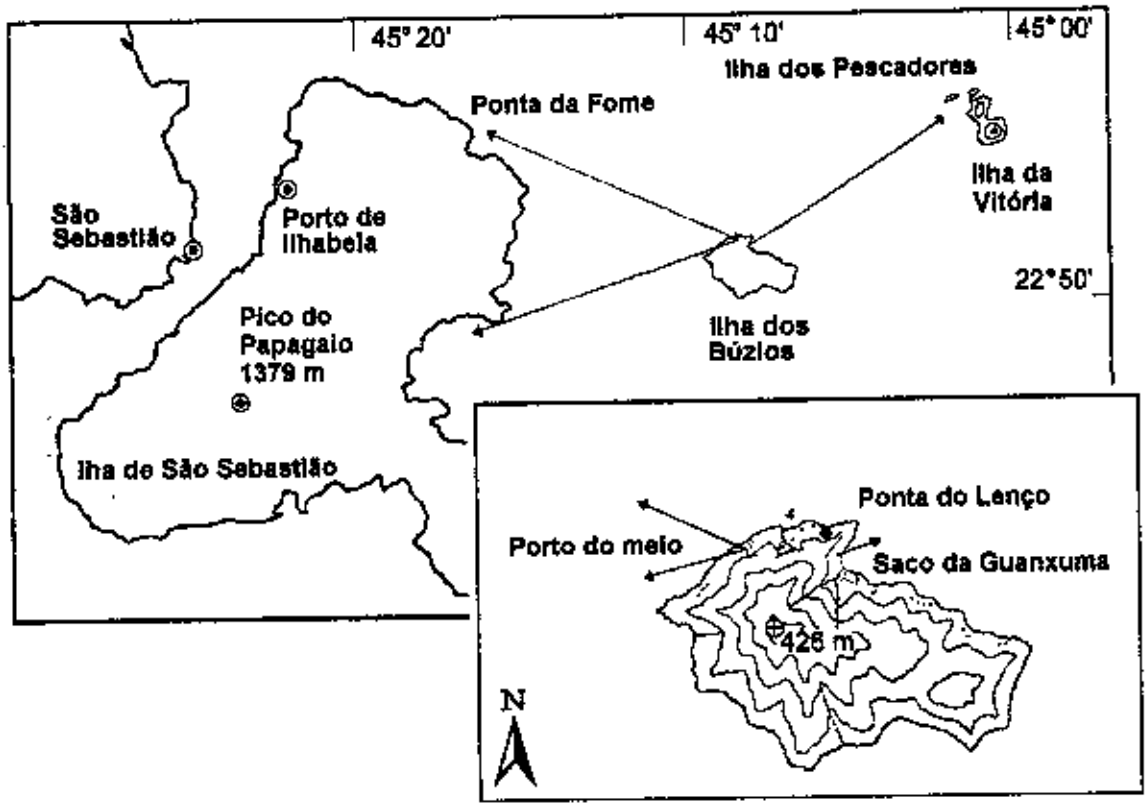

Figure 1: Buzios Island and the main geographic features related to the discussions in the text. The arrows indicate solstice alignments. The box for Búzios Island shows dots indicating the inhabited northern side of the Island. The black spot at Ponta do Lenço represents Pedra da Mina, the winter solstice alignment of the sunrise. Approximate scale in the main figure is 10 km for each 3 cm.

notable cultural traces inherited from Portuguese colonization as well as from Indians of the tupi-guarani group. Most of them live in some islands off the southern coast of Brazil. One of these is Buzios Island at the coast of the State of São Paulo.

Description

Búzios' Island (23° 48' S, 45° 18' W) is at approximately 25 km directly east of the port of São Sebastião (Figure 1) . The Island is about 150 km from the cities of Rio de Janeiro and São Paulo. Two roads connect these cities by the interior and by the coast. From São Paulo, one can get to the port of Santos by a choice of two roads (Anchieta or Imigrantes) and then follow the Rio-Santos Road (BR-101) along the coast. The other is the Rio-São Paulo or President Dutra Road (BR-116) in the interior that follows the valley of the Paraiba River.

Búzio's population has not changed too much since the beginning of the century. The census of 1902 carried out by Euclides da Cunha[2] (1944:688) indicated 358 inhabitants. At present the population counts "about 220 individuals (44 families) distributed among eight hamlets situated on small harbors with canoe shelters" (Begossi et al. 1993). They settle only over the northern half of the island whose total surface is approximately 7.5 square kilometers. Some attraction to urban life could justify the 38% decrease in population. Once for instance, a fisherman lamented that young girls were always hopeful to marry boys on the continent and leave the Island.

Earth and Sky Relations: Knowledge and Beliefs

The oral traditions of the Caiçaras reveal various sorts of knowledge and beliefs related to a diversity of activities, many of them replacing a precarious official education of the children. Young boys and girls live in intimacy with the environment and the activities of their parents and constantly interact with memories told by the elders. Earth-sky relations appear to reckon time, to orient in space, as well as to elaborate symbolic aspects, all of them being

incorporated into their system of knowledge and social organization.

Two aspects of the Caiçara view of Earth-sky relations discussed here come from ethnographic data collected on various occasions from 1978 to 1983. One aspect associates beliefs about meteorites and some special stones found on the island. The other one has to do with the Sun's positions and their relation to fishing and tides relating to some cosmological ideas of the Caiçaras.

At Porto do Meio, 23 families are settled in one of the major agglomerates of Búzios. It has the only two shops of the Island. Like general stores – besides the very small amount of money that circulates among Buzianos whose purchasing power is extremely low – they sell or exchange goods. One of these shops belongs to Aristides, one of the eldest of the island. It sits just beside the house he lives in.

Aristides, who has an extensive network of kinship at Porto do Meio, shares his commercial activities in the shop by showing his collections of all sorts of objects and curiosities related to the Island lore to all who are interested. He has proven to be a very good storyteller.

Once he showed me a little polished oval stone that he keeps as something special saying it was a friend's gift. It seemed to be an old lithic tool, perhaps the head of a hammer or even some form of pestle used by the Tupinamba indigenous people.

He said it was a spark stone (*pedra de corisco*), one of the names given to thunderbolts, among many others, such as lightning stone (pedra de raio) fire stone (pedra de fogo), lightning teeth, God's ax or Saint Barbara's stone.[3] It is a world wide belief that such stones fall down to Earth during storms concomitantly with thunder and lightning. Also related to these beliefs are meteoric phenomena seen as wandering stars.[4]

During a storm, at the moment of the lightning, the falling stone is considered to be responsible for the thunder we hear. The Caicara believe that after the fall, the stone digs a hole into the ground and stops seven fathoms deep. Seven years later it reappears at the soil's surface. Aristides says the person who finds these stones often receives special powers.

With stone in hand, speaking as if it was a thunderbolt, Aristides mentioned one of its powers well known among the islanders. If we wind a fishing line over the stone and throw the whole in a fire, once taken out – even if the stone is burning red – the line will not seem to burn.

Independently, on that day and immediately after the talk with Aristides, his son Vicente reported the very same comments made by his father about the stones and the fishing line. During these two encounters, asking if anyone had done the experiment, Vicente said the father had done it, while the father had already said that he never did it, but that the friend who gave Aristides the stone had done it.

Aristides believes the line does not burn, not only because of his friend's information, but also because he says that his ancestors had done the experiment as well, obtaining the same result. They only describe these previous experiments, believing them, although they have never done it themselves.

Consider the displacement of this attitude of describing observations and experiments the describer has never done, in regard to the official educational processes. It is very common in teaching natural sciences to simply enunciate certain experiments that could confirm a well-stated theory. Very often, we teachers expect students to believe in experiments we describe, even though most of them were not executed or even observed by us. This suggestive analogy recalls the classic school in Greece subjecting observations of natural phenomena to a priori elaborated theories without the need to be verified by experience.

Thunderbolts relate to storms, thunder, lightning and meteors and as atmospheric phenomena, their relative distance and strangeness to us,suggesting celestial and so, sacred origins. As celestial, they easily relate to sacred domains and recall ancient mythological beliefs in the origins of iron as a celestial metal – male in origin – penetrating the female Earth (Eliade 1977:15, 21).

Aristides, as well as many other Buzianos, apparently continues to believe in the powers of the spark stones. It is sufficient to believe in the description of an experiment – magical, ritual – apparently never executed. Magical aspects appear symbolically as social mediators and it seems, in this case, that speech replaces performatic forms. A fishing line wound around a stone named "corisco" – a denomination for fire or lightning – would not reveal "new effects" when thrown into fire. Remember the metonymic processes of denomination in speech: the wound line, already not burned by the fire stone, would leave the fire in a state as perfect as before.

Another talk with Aristides cleared up our understanding of the Caiçara's understanding of Earth and sky. One day, someone visiting the island showed him the page of a newspaper with a photograph of an astronaut walking on the Moon. He told promptly said he did not believe any person could land on the Moon. Continuing this line of

thought he said: "I accept that they could be very near the Moon, but not that they have put their feet upon it. In that land of God, we are not permitted!"

It seems that the relation between the world the Caiçaras live in and the domain of God is non-reciprocal. The heavenly spark stones come here by the will of God. Caiçaras can touch and respect the stone, and they even permit themselves to light matches on it, an act that stresses the relation with fire. On the other hand, they cannot invade the sacred domains of God. Human Beings can approach it by any other means, except by physical contact. In a modern approach to the ancient world-view of the celestial dome, it seems here that an airplane could be "as near" the dome as an interplanetary spaceship, although never touching it. This can be a concept regarding scale for guiding some future work.

Our social institution of science promotes disjunctions such as between atmospheric and astronomic events, besides putting aside the sacred aspects. In the case of the Caiçaras and the scale problem treated here, those two disciplines' related terms should at least intersect. Meteor, from the Greek as a combination form, appears in Webter's Dictionary meaning "high in the air, astronomical phenomenon, thing in the heaven above." In the Caiçaras world-view there are often intersections between religious, natural and social domains. In an imagined Caiçara literacy, differences like Heaven and heaven, heaven and atmosphere, Earth and Earth, would hardly be necessary.

References to thunderbolts are frequent on the island. The importance given to those objects by the Buzianos seems to be significant as part of a whole group of beliefs contributing to the configuration of the social identity of the group. Although there are outstanding Caiçaras' local culture characteristics, there are too many domains of intersection among them – rural? – and us urbans. To understand these cultural boundaries remains a great question for us to tackle.

Leaving now the more mythological aspects of the caiçara view of Earth-sky relations, we will now discuss more empirically based aspects of knowledge construction. Knowing that, besides the Caiçaras' intimacy with nature, their activities diversify in agriculture and oceanic fishing, some original features appeal to discussion about their cosmogony.

Caiçaras Space and Time Reckoning

Caiçara's cultural adaptation to external influences is far more pronounced than in indigenous societies usually analyzed in ethnoastronomical studies. There are certain analogies in the way both groups conceive and represent space and time by relating heavenly bodies' phenomena and landscape features. In an island where there is no electric power and very few visitors come from the continent, information on our calendar and time keeping is still accessible through battery radio receivers. Nevertheless, through close acquaintance with the land and sea, the Caiçaras constantly rely on both: natural phenomena and information arriving through radio waves.

The Buzianos are aware by eyesighting, of the solstice alignments with little islands with the geographic features of bigger islands along the horizon. This is similar to the more elaborate solar calendar of the Hopi Indians of Northern Arizona (McCluskey 1982).

An elevated cape, Ponta do Lenço (Figure 1), separates two important hamlets at Buzios Island: Porto do Meio and Saco da Guanxuma.[5] This fact imposes different reference points to the inhabitants of each locality. Avelino, a skilled basketry craftsworker, is another Buziano who lives to the west near Porto do Meio. At the front of his house, Avelino pointed out some geographical features related to Sun movements on the horizon. The winter (June) solstice Sun rises over Ponta do Lenço at Buzios Island just alligned with the rock named "Pedra da Mina" (see dot in Figure1). It sets at Ponta da Fome in the Island of São Sebastião. For the sunrise of summer (December) solstice, Avelino refers to "behind the mountain," behind his back yard, although for the sunset he shows the Pico do Papagaio (1379 m) on the Island of São Sebastião.

More attentive and particularly elder Caiçaras living near Porto do Meio, are also aware of these special directions that reckon time. In another location to the east on the little bay of Saco da Guanxuma, we cannot see the Island of São Sebastião and, consequently, the sunset features used by Avelino. Franklin – unfortunately no longer among us – lived in Guanxuma for a long time. He used to assert and show that on Saint John's day (June 24) the Sun rises just in the bottom of the strait that separates Pescadores and Vitória Islands. This date is three days after the winter solstice and inaccuracy due to different observational sites by any of Franklin's neighbors in the hamlet, would be less than one day. Saint John's 24th is a special and happy choice, a day of feasts all over Brazil.

The Buzianos take concrete elements out of their daily displacements to represent the orbits of the Sun and Moon as seen from where they standby.[6] Thus there is an analogy between the heavenly tracks

of the celestial objects and the Caiçaras pathways on Earth or their navigation routes on the ocean.

For instance, Avelino is quite smart in correlating relative movements and positions of the Sun and Moon to predict tidal movements. He referred to the Sun's orbit as dividing the year in two periods. In the "long days of the summer" ("dias compridos") he says "the Sun navigates right here" (pointing to the zenith direction). Otherwise, in the "short days of the winter" ("dias curtos") it navigates "much lower than in the summer."

The Machinery of the Universe: Systemic vs. Empirical Models

While we learn to think of the universe as a unitary system, the Buzianos consider events individually valued and as part of their day-by-day observations – feet on ground and eyes up and down everywhere. In this context they organize systems that are not like ours, at least not unitary as we try to make them. Their symbolic view of celestial objects' movements frequently relates to their daily life and gives us interesting means to reflect about ours-theirs differences in formulating world-views out of different ways of perceiving and thinking.

With Oscar, another Caiçara living to the East of Guanxuma, I had very exciting conversations that seem to support these reflections. A good place for such chats was often the "casa da farinha" (flour mill), a separate structure near the main dwelling. Here the manioc flour mill is located together with the furnace to process manioc flour. Once I questioned Oscar about why they say the Sun has different tracks. He replied reporting an encounter, probably with a surveyor taking measurements at the Island:

"Once come here, a teacher telling me that the Sun and the Moon have only one trail. He even measured it with his instruments. I know that the Sun and Moon have many trails when they move in the heavens, they have more choices than I have when I go to work on my manioc field. That man was a little crazy! A dreamer, a student!" (laughs).

With the authority of knowledge, Oscar reveals prejudice against institutional knowledge and particularly against the use of a scientific instrument, dissociated from its cultural context and used to know about what he, Oscar, already knows.

During various conversations, I learned that the Buzianos perceived celestial bodies and corresponding movements particularly in a topocentric manner, and sometimes they thought in a geocentric manner. Nevertheless it is very common to observe – besides the topocentric – the use of some kind of "self-centered reference frame" as well as of surprising *ad hoc* assertions about world-views. Both are noteworthy and the two following examples will better clarify these underlying ideas.

As to their view of reference frames, let us recall the talk about the Sun's rising and setting points held with Avelino at Porto do Meio. Asked separately about what moved (Sun and Earth) in the different intervals of the day and the seasons, his assertion was that the Sun moves around the Earth producing day and night. He explained the oscillation between two solstice setting points (Figure 1) at the Ilha de São Sebastião by the Earth (horizon) oscillating horizontally around the local vertical axis (zenith-nadir). This oscillation produces the two solstice sunsets at Ponta da Fome and Pico do Papagaio. No matter how strange it may appear to us, this *ad hoc* hypothesis is quite consistent with what he lives and observes locally.

During a discussion in his flour mill, Oscar asserted that the world does not rotate. Luis, a teenage islander, abruptly interrupted Oscar by saying:

"The world rotates! Sure it rotates!" At that moment Oscar reacted violently to Luis' statement. Oscar considered it an absurdity. If the world really rotates, if on one day he goes to his manioc garden by one trail, the day after, the garden would have disappeared from the end of the trail taken the day before.

Let us look for ideas of self-centered reference frames in the history of science. This will help our insights on Oscar contesting Luis about the rotation of the Earth (or Earth). This world view is somewhat analogous with cosmogonies of Antiquity to Middle ages before Copernicus (16th century). The following quotation from Thomas S. Kuhn in *The Copernican Revolution* stresses the prevailing ideas of learned persons of those early periods:

> The idea that the Earth moves, seems initially equally absurd. Our senses tell us all we know, of motion, and they indicate no motion for the Earth. Until it's reeducated, common sense tells us that, if the Earth is in motion, the air, clouds, birds, and other objects not attached to the Earth must be left behind. ...Since, none of these effects is seen, the Earth is at rest. Observations and reasoning have combined, to prove it. (Kuhn 1976:43).

Kuhn's historical reference as well as his critical relativism in his book favor reflections about our prejudices against popular or tribal knowledge. In

Oscar's talk we face other world views which very nearly approximate, or at least compare, to ancient views and paradigms proclaimed by the knowledgeable scientific authorities of that time revealed by the citation. An ancient and supplanted paradigm of our so-called "occidental society of scientific tradition" can be a coherent theory of value for a "primitive" society and in a different place or environment. At this point we can take inspiration from Hanson's general thoughts about ways to see the world and its phenomena: to just see simple, to see how, to see what, to see like. In sum, all of these ways of seeing must lead the observations to be coherent with a body of established knowledge in definite historic and sociocultural contexts (Hanson 1958).

Other aspects, sometimes subjective for natural sciences, can bring light to the present discussion by another quotation from Thomas Kuhn:

> Fragments of cosmologies similar to the Egyptian can be found in all those ancient civilizations, like India and Babylonia, of which we have records. Other crude cosmologies characterize the contemporary primitive societies investigated by the mode rn anthropologist. Apparently all such sketches of the structure of the universe fulfill a basic psychological need: they provide a stage for man's daily activities and the activities of his gods. By explaining the physical relation between man's habitat and the rest of nature, they integrate the universe for man and make him feel at home in it. Man does not exist for long without inventing a cosmology, because a cosmology can provide him with a world-view which permeates and gives meaning to his every action, practical and, spiritual. (Kuhn 1976:6)

This citation suggests interesting questions related to the non-dichotomy between Heaven and heaven together with some aspects discussed in what follows.

Discussion

It is important to think about how to be aware of knowledge and belief systems elaborated differently by different peoples and environments. It is worth is thinking about how empirical evidence and systems of representation combine in different layers of the social and cultural stratification of knowledge. In this case we must be attentive to different modes of theory construction and particularly to different

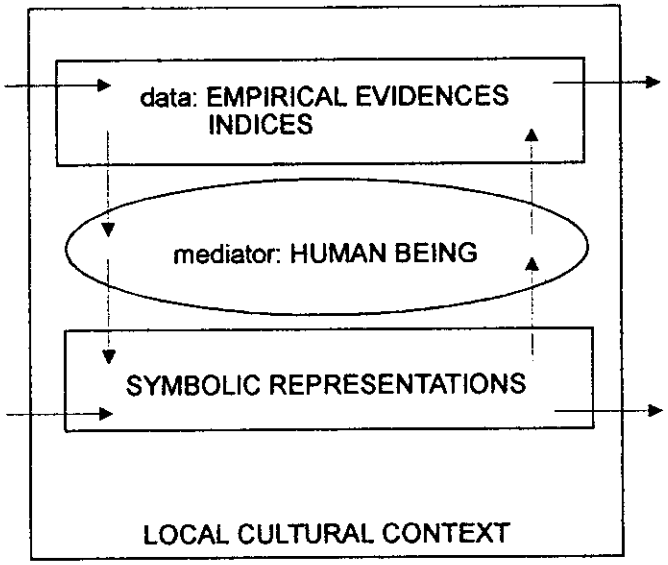

Figure 2: A systems idea of a local cultural context in interaction with other cultural systems. Human Being appears as the mediator for the dynamic relations among data (mainly indices) and the consequent symbolic representations that integrate the construction of knowledge.

methods of observation of natural phenomena. As these differences manifest through the integration of each one in its cultural and natural context, to approach this question regarding systems of representation is of fundamental importance. A local cultural context establishes itself by the mediation by Human Beings of a cyclic expliciation of data and consequent elaboration of symbolic representations (Figure 2). This acts like a system where data and/or representations can enter or leave to or from distinct sociocultural systems. Data are almost never only empirical evidences but mainly indices (Ginzburg 1989:143-179) similar to those that physicians and detectives work with.

Recalling Aristides, he insisted on the impossibility of man's landing on the Moon. For us, on the contrary, a photograph is a broadly accepted empirical evidence. Aristides, even accepted in other contexts, shows that a photograph as empirical evidence conflicts strongly with his system of representation. It would even put disorder in his basic dual vision of the sacred and the profane.

In each of the different cultural contexts, what should be the meaning of an observational instrument or of empirical evidence? In Oscar's talk about the Sun's tracks, he mentioned an instrument that probably was a theodolite. This mention, indirectly, seems to criticize institutional knowledge that views a unified universe on the contrary to the local way

Oscar elaborates cosmology. The learned man who tried to convince Oscar the Sun had only one track (orbit) "even measured it with the instruments". Oscar, for his part, denied credibility to a measurement taken with a superfluous device, no better than his eyes.

Something that we take as a measurement, could simply correspond to a strange ritual without importance in Oscar's view. For us the instrument is of fundamental importance insofar as we are in need of measuring – even "producing" – an event to build a demonstration in a scientific theory.

Geographic features like Ilha da Vitoria and Pedra da Mina, are all "instruments" or sighting devices. They work very well in the respective contexts of Franklin and Avelino, for estimating the beginning of the winter. At this time the schools of mullet (tainha) attract the attention of the Caiçaras all over the coast. Mullet fishing involves all the community in organized and ritualized activity: the mullet encirclement (cerco da tainha). The cycle of the mullet lasts for three months. It begins in May with the "released mullet" (tainha solta). The blowing of the SW winds in June and July announces the gathering of the mullets in schools of "running fish" (peixe de corrida) going north. Finally, "in August the mullet is (named) "peixe de arribada", inasmuch as, stopping at its arrival point, no more goes up, and begin to come back South ..." (Mussolini 1980:265).[7]

Although radio broadcasts give the Caiçaras some calendar information, it is culturally important for them to use their time reckoning devices. These devices appear quite integrated into their habitat and sometimes take on deeper significance. For instance, the Buzianos have many family ties with people living on the Ilha da Vitória; in this case, the use of that Island as a landmark takes on another dimension: affectivity.

Let us focus on the way they represent phenomena. Avelino established relations between the Sun's daily path and the shifting of its setting points between the June and December solstices. Avelino says that the "flat Earth" oscillates in a horizontal plane, changing points of the setting Sun respectively, between Ponta da Fome and the Pico do Papagaio. Supposing that my first question induced him to propose this model, it still should be an *ad hoc* hypothesis consistent with his empirical evidences. Even if he had already formulated it by his reflections, it is worth noting that his assertion is in apparent harmony with his system of representation.

Conclusions

Kuhn says in the previously cited quotation (1976:6) that "other crude cosmologies" pertain to the "primitive societies investigated by the modern anthropologist." What about the somewhat "hidden" cosmologies that exist — out of the scientific institution — in our so-called "occidental society of scientific tradition?" Could they conflict with the explicitly scientific cosmologies of our own society?

In these days we note a strong tendency in our society to regain a more natural way of life, stressing the search for a high degree of intimacy with nature. Very often this nature is hardly part of our daily life, particularly when we live in the heart of agglomerations of skyscrapers.

Nowadays we observe a search for mythology and rituals to compensate our disjunction with nature. This search is manifested by various attitudes and mixed feelings in our society. Examples are: various forms of Sun worship, a revival of interest in Astrology, vegetarianism, incorporation of native elements in architecture, correlations between Moon phases and agriculture, and the assumption of oriental ways of life. As stated at the beginning of this paper, some cultural proximity between societies such as Caiçaras and ours offers insights for the perception of differences in ways of reading the world and knowledge construction processes.[8]

Ethnoastronomy can give hints for such questions, since it studies not only the symbolic, but also data from the empirical evidence of natural phenomena. In this case it can reveal internal tensions of a society concerning harmonies and conflicts between observation and knowledge of nature on the one hand, and systems of representation on the other (Figure 2). Although such tensions are present in all cultures, in our own they provoke stronger impact. There is among us the insistence on truth and the consequent isolation of empirical data from its subjective – cultural and psychological – aspects; thus we deny the complexity of ways to treat them in a systemic interdisciplinary form.

On employing the suggestions discussed above we could begin to discover how much our beliefs, mythology and rituals, influence our objective scientific knowledge. By doing so we will put our symbolic representations in dialogue with our empirical data. This could reveal our "other crude cosmologies."

Would it not be interesting if we were to study ourselves from an ethnoastronomical perspective? Ethnoastronomy, after all, is one of our disciplines, not theirs.

Acknowledgement

I express my gratitude to the Buzianos for kindness and hospitality, as well as for what I have been learning with them. I am grateful to Dr. Michael Hall, from the History Department (UNICAMP), for friendly discussions during this work.

Notes

1. This is an expanded and revised version of a communication presented at The First International Conference on Ethnoastronomy, September 5-9, 1983 at the Smithsonian Institution, Washington, DC. Its title was "Earth Sky Relations in Búzios Island, A Caiçara Community Near the São Paulo Coast." Although this text is based mainly on fieldwork developed at Búzios Island during 1978 and 1982, these data still sustain the features discussed here. This analysis will also give support to an update of Búzios Island's social context that the author wants to consider in a future work.

2. Euclides da Cunha (1866-1909) is a famous Brazilian writer, journalist and engineer whose main work is *Os Sertões*. He wrote this report in 1902 under contract with the Brazilian government who planned to establish a penal colony on that island. The plan was not accomplished.

3. Saint Barbara is the patroness of artillery men. According to the legend (7th century), the pagan Dioscorus, her father, executed her for having professed Christianity. After the execution, upon his return home, lightning struck Dioscorus and reduced him to ashes.

4. Discussions and references to beliefs and mythology related to lightning and meteors appear in Eliade (1977) and Cascudo (1972).

5. The meanings of porto, saco, ponta and pico are respectively: harbor, little bay (sac), cape or peninsula and peak.

6. The term 'apparent' is inappropriate for various reasons. In reality what matters is the reference frame of the observation we are using. Besides equatorial mountings of telescopes that could give us the impression of being geocentric, the usual way is to be looking at the heavens with feet on the ground. In this 'topocentric' frame, we should always ask ourselves if we see things only in appearance, considering real what we calculate heliocentrically.

7. The idea expressed in this citation that assimilates 'going north' with 'going up' is not exactly local. It originates in the diffusion by western society of a globe where the north always points up. A master of science thesis, *Children and their Worlds: Sky, Earth and Sea in the Vision of Child of the Caiçara Community of Camburi (SP)*, reveals a great diversity of influences and its origins in Caiçara children's cosmologies. Sônia Claretto (1993) emphasizes, through children's drawings and discourse, the imprints of the north-up representation. Some children draw globe schemes with them standing up in interior shelves in a circle. North American countries lie on a shelf above where Brazilians live. This representation keeps children in the southern hemisphere from falling down out of the globe's surface.

8. The idea of "reading of the world" is well discussed in various texts of the Educator Paulo Freire. In reference to cultural differences, see the dialogue: "Reading the Word . . . Reading the World" (Freire and D'olne Campos 1991).

References

Begossi, Alpina, H. F. Leitão Filho and P. J. Richerson
1993 Plant Uses in a Brazilian Coastal Fishing Community (Búzios Island). *Journal of Ethnobiology* 13 (2): 233-256.

Cascudo, Luís da Câmara
1972 *Dicionário do Folclore Brasileiro*. Instituto Nacional do Livro (Ministério da Educação e Cultura), Brasília.

Clareto, Sônia Maria
1993 *A Criança e seus Mundos: Céu, Terra e Mar no Olhar de Crianças na Comunidade de Camburi (SP)*. Unpublished M. S. Dissertation, Department of Mathematics, Universidade Estadual Paulista, Rio Claro (SP).

Cunha, Euclides da
1944 Ilha dos Búzios, *Anais do Nono Congresso Brasileiro de Geografia*. vol.V, Rio de Janeiro.

Eliade, Mircea
1977 *Forgerons et Alchimistes*. Flammarion, Paris.

Freire, Paulo and Marcio D'Olne Campos,
1991 Leitura da Palavra... Leitura do Mundo. *o correio da UNESCO*. 19 (2): 4-9.

Ginzburg, Carlo
1989 *Mitos, Emblemas e Sinais: Morfologia e História*. Companhia das Letras, São Paulo.

Hanson, Norwood Russel
1958 *Patterns of Discovery*. Cambridge University Press, Cambridge.

Kuhn, Thomas S.
1976 *The Copernican Revolution*. Harvard University Press, Cambridge.

McCluskey, Stephen C.
1982 Historical Archaeoastronomy: The Hopi Example. In *Archaeoastronomy in the New World*, edited by Anthoni Aveni, pp. 31-55. Cambridge University Press, Cambridge.

Mussolini, Gioconda
1980 *Ensaios de Antropologia Indígena e Caiçara*. Paz e Terra, São Paulo.

Willems, Emilio
1980 *Buzios Island: a Caiçara Community in Southern Brazil*. J. J. Augustin Publisher, Locust Valley, New York.