

A eucalyptus in the moon: folk astronomy among European colonists in northern Santa Fe province, Argentina

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Abstract. In this paper, we present a study about cultural astronomy among European colonists who settled in the northern area of the Argentinean province of Santa Fe, which is part of the southern Chaco. These colonists arrived among waves of immigration occurring in Argentina in the second half of the 19th century and the first half of the 20th century. Ethnographic field research among these rural immigrants and their descendants revealed that a set of asterisms were distributed according to the origins of the different European communities and also according to their uses in agriculture, animal husbandry and meteorology.

Keywords. Argentinean Chaco, European immigrant colonists, cultural astronomy

1. Introduction

This paper describes the first study dedicated exclusively to the astronomical practices and representations of European immigrant colonists in the Argentinean Chaco. As such, it is within the framework of an enterprise being carried out by many researchers to thoroughly investigate cultural astronomy in the Chaco region. The aim is to build a more complete context for the study of how the astronomy of various *chaqueños* aboriginal groups related to the astronomical ideas of immigrants and *criollos* settled in this region.

As in many modern agricultural societies (Belmonte & Sanz de Lara 2001), the European immigrants in the research area had a considerable knowledge of the skies, which they transmitted orally and through practice, generation after generation. This paper also presents a record of these cultural practices.

Our investigation involved ethnographic field research in San Cristóbal, a small railway town of 15,000 inhabitants, and in Moises Ville, the first Jewish agricultural colony in Argentina, now a village with 1,500 inhabitants. Both are in the north of the Argentinean province of Santa Fe, in the department of San Cristóbal. This region belongs to what is called the Chaco Santafesino, in the south of Gran Chaco.

Indigenous groups already lived in the area when the immigrants arrived. These groups influenced the immigrants, often living amongst them. These *Guaycurúes* groups include the *Abipones* and *Mocovíes* who have inhabited the northern region of Santa Fe since the end of the 17th century, and continued to subsist by hunting and gathering, even after the arrival of the immigrants (Giménez Benítez *et al.* 2004).

For the earlier Spanish farmers, who had occupied large expanses of land for raising cattle, these indigenous groups had been a problem. The farms came into being immediately after the foundation of Santa Fe city, i.e. at the beginning of the 17th century, and continued until the beginning of the 19th century. When Argentina became independent, they passed on to families from Santa Fe. The workforce comprised both *criollos* and

African slave families, who practiced small-scale agriculture on ranches inside the farms (Gori 1988).

Between 1868 and 1872, what was called the ‘línea de fortines’—a line of forts or national security establishments extending the national frontier—was erected in order to consolidate the occupation of this region, which was part of the aboriginal territory (Ruggeroni 2006). This political situation prevailed just before the arrival of the immigrants in our study region. In this context, the term ‘colonization’ refers to a social process devised by the State in order to occupy the low-population areas by bringing in Europeans immigrants who would undertake agriculture and cattle raising. Waves of immigration took place from the mid-19th century until the mid-20th century.

The State hoped that the European immigrants would act as a ‘civilizing force’. The province of Santa Fe embraced this ideal from 1850 onwards and, for this reason, the government signed contracts with colonizing companies and private businesses who could promote emigration to Argentina (Gori 1988). At a later stage, both the colonizing companies and farmers came to see this wave of immigration as a profitable business, because the immigrants signed contracts with them in which the conditions for handing out the land were established, and the contractors received yet more land from the State in return for settling European families in the province (Gori 1958). Fig. 1 summarizes the power relationships that existed within the farming colonization system.

By examining the conditions of life for the colonists both before and after their immigration, we can better comprehend their understanding of the sky and the relationship between this and their farming practices at both stages. There were many kinds of immigrant (Gori 1958). The non-Jewish colonists were farmers or craftsmen back in Europe. They were all spontaneous immigrants and most of them came to Argentina to escape poverty, although there were some exceptions. Most of the Jewish colonists, on the other hand, were not farmers but professionals: merchants or, in some cases, *soifers*—scribes of sacred texts from the Torah. They separated themselves from the rest of society and lived in their own communities. They all escaped harassment. All the families approached in our research were immigrants selected by the Jewish Colonization Association.



Figure 1. Immigrant family ‘colonized’ on a farm. We see, from right to left, the ‘colonized’ family, the farmer who owned the ‘colonized’ land, the subcontractor who was in charge of the contracting process, and finally the farmhand. Source: Author’s archive

All of the immigrants, once settled in Argentina, dedicated themselves to agriculture, cattle raising, and farming-related tasks such as the production of dairies and saddlery. Those who were not farmers in Europe were educated in these activities by staff hired by the colonizing companies or by other immigrants already settled. The immigrants who were settled in colonies had an organized life, the nature of which depended on the colonizing company and the communities present in each colony (Gori 1952).

For a better idea of the colonists' conditions of life we can analyze statistical data from the censuses carried out in the 19th century in farming colonies in Santa Fe province. Some of these data makes clear that in the early years the quality of life was very poor. Some 30% of the immigrants who settled in Santa Fe between 1880 and 1888 were illiterate. Almost throughout the second half of the 19th century, 80% of the colonists lived in *ranchos*, dwellings built of clay and straw. Another parameter indicating the quality of life in certain communities is the mortality index. In 1882, in the more developed colonies of Santa Fe, the child mortality rate was some two and a half times that of adults (Gori 1958). Women and children worked side by side with men in the ranches.

As regards the contact between the *criollos* and native groups, the colonists generally hired *criollos* as farmhands. While there are records indicating that the contact between colonists and aboriginals could be both peaceful and violent, the colonists usually hired aboriginals as well.

2. The ethnographic sample

Interviews were conducted with grandchildren and children of the first colonists and also with some of those colonists who themselves arrived in the final waves of immigration. Those interviewed in both localities form a representative sample of the settled communities. In San Cristóbal we interviewed descendants of Germans settled in Constanza Colony, Germans from Volga (i.e. descendants of the German settlers of the valley of Volga in Russia, a colonization promoted by various Tsars) settled in Alcorta Colony and also 'colonized' on farms, Italians from Piemonte settled in Elisa Colony and Santurce Colony and also 'colonized' on farms, Swiss settled in Ataliva and Portugalete Colonies, Swiss-Germans settled in San Guillermo Colony, Spaniards 'colonized' on farms, and Ukrainian and Polish Catholics settled in Moises Ville, Monigotes and Portugalete Colonies. In Moises Ville we talked with descendants of Jews from Lithuania, Russia, Ukraine and Romania, settled in Virginia, Moises Ville and Capivara Colony; Italians from Piemonte 'colonized' on farms before and after the foundation of Moises Ville; and also German Jews in Moises Ville Colony and Monigotes.

3. Analysis and results

In what follows we present the results of the analysis of the recorded interviews. We list the astronomical objects mentioned by the immigrant colonists, the names they give these objects, their uses, and the practices related to them.

3.1. *The sun*

The first colonists did not possess clocks, and so the sun played an important role in their lives as an indicator of the time of day. Germans, Swiss and Russian Jews used the variation in the length of the shadow formed by an object in a vertical position, while Lithuanian Jewish colonists used the sun's position in the sky. A family from Switzerland, established in Portugalete Colony, had a vertical sundial oriented to the North on a wall

outside their house, which was still standing until some years ago. This family had owned a large plot of land while they were in Europe and emigrated in 1870.

In Moises Ville, the Italians from Piemonte estimated the time by holding out a hand towards the sun and measuring the length of the shadow formed by their middle finger on their palm. In order to use this method, they had to take into account the season of the year. A descendant of the Lithuanian Jews also mentioned that some Italians from Piemonte had used this method and gave us the same description. Another tradition relating to the sun was cited by descendants of the Germans from Volga. It was an Easter custom. According to the informants, at sunrise on Easter Sunday, just as the first rays shone over the horizon, parents urged their children to observe the apparition of the Easter Bunny, who moved three times. First, as it was sitting, it moved its head backwards; then it stood up; and finally it ran away. The interviewees affirmed that they had seen this with their own eyes.

3.2. Venus

Venus was named in all communities and colonies as *el lucero* and recognized as the brightest 'star'. It was associated with the sun's rising and setting, and for this reason was used to indicate the time to begin and end the daily farming tasks.

3.3. Asterisms and the night sky

The colonists created asterisms that permit us to understand their relationship with the new sky they encountered in the southern hemisphere. An asterism present in the astronomical culture of all the communities was Orion's Belt, named by all of them as *las tres marías* (the three Marys). For one family of Swiss-German origin, the time of year when this asterism reached the zenith early in the night was the time when a popular cactus fruit known as *tuna* (*Opuntia ficus-indica*) ripened. Another asterism common among all the communities was *la cruz del sur* (southern cross). It was used for orientation by Spanish colonists, Italians from Piemonte and Germans from Volga. The method used by the Germans from Volga consisted of observing the position of 'la cruz' early in the night and then again some hours later. South was identified as the intermediate direction between these two positions.

Some communities formed asterisms from parts of Orion. The Germans from Volga recognized the Belt together with Rigel as *el rastrillo* (rake). Using these same stars they also represented the biblical scene of Christ's resurrection (Matthew 28: 9–10). Rigel was named as *Cristo resucitado* (the resurrected Christ) and *las tres marías* represented *María, su hermana y su prima* (Mary, her sister and her cousin), who met Jesus as he came out of his sepulcher (Fig. 2). Interestingly, a difference exists here from the biblical story. In Matthew 28: 1, only Mary and Mary Magdalene, not three women, are named as having met the resurrected Christ as he came out of the sepulcher.

One 'colonized' Piemontese family assigned a name for each one of *las tres marías*. We were able to obtain just two names—*la niña* and *la pinta*—which probably allude to the ships of Columbus, a fact suggesting that the cosmological construction of heaven was very dynamic.

Another asterism in Orion, recognized by both the Spanish and Piemontese, was the *puñal del norte* (northern dagger), composed by the stars in the region of θ and ι Orionis.

Some asterisms were characteristic of certain families. A Lithuanian Jewish family, whose father was a scribe of sacred texts from the Torah, formed characters from the Hebrew alphabet. Another of this family's asterisms was *las tres estrellas del sur* (the three stars of the south), which was used for orientation. *El avestruz* (the ostrich) was an asterism named by a Piemontese family settled on a farm, and 'could be observed in the

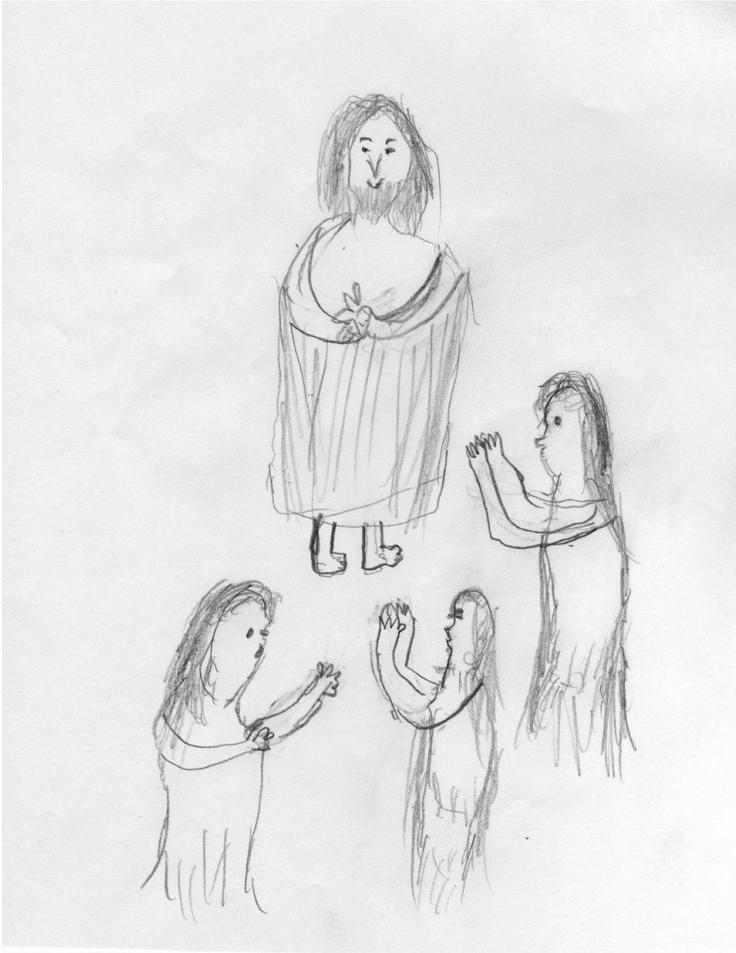


Figure 2. Drawing by one of the interviewees showing how the Germans from Volga understood the resurrection of Christ to be represented in the sky by Rigel and Orion's Belt.

first months of the year'. The idea of an ostrich in the sky also featured in the astronomy of aboriginal groups in this area.

3.4. *The Milky Way*

The Milky Way was recognized by all the communities, and most of them referred to it by that name, although there were some exceptions. The Germans from Volga, for example, knew it as *el castigo de Jacob* (Jacob's punishment). They named it thus because they saw the Milky Way as a *cadera quebrada* (broken hip) and it reminded them of the biblical story in which Jacob 'fought God and got his hip broken by Him'. Genesis 32: 25–33 describes Jacob's fight with an angel; this lasted an entire night and, since neither could win, the angel—personified as a man—hit Jacob's thigh and broke it.

Swiss-German colonists who settled in the San Guillermo Colony named the Milky Way *el camino de Tucuman* (the path to Tucuman). We have developed two hypotheses to explain this. The first is that the colonists who settled in San Guillermo named the Milky Way after a railway to Tucuman whose track had the same orientation as the Milky Way when observed during the summer, i.e. approximately from northwest to southeast. The railway was built in 1888, at the time when the rural immigrants' colonies were starting

to be founded. The second hypothesis is that *el camino de Tucuman* was a name given to the Milky Way by the *criollos* which was orally transmitted to immigrant colonists. The basis for this suggestion is that a pre-Hispanic route connecting Santa Fe city and Alto Peru passed through Tucuman (Fig. 3). This path continued to be used even after the colonial period (Ceruti 2006), and its orientation also matched, approximately, that of the Milky Way in the summer.

A possibility following from the latter hypothesis is that the Milky Way was used for orientation while following the path from Santa Fe to Tucuman, this being the reason why it was given this name by the *criollos*. However, this remains only hypothetical and more extensive ethnographic research in this area will be needed in order to substantiate the ideas we have just described.

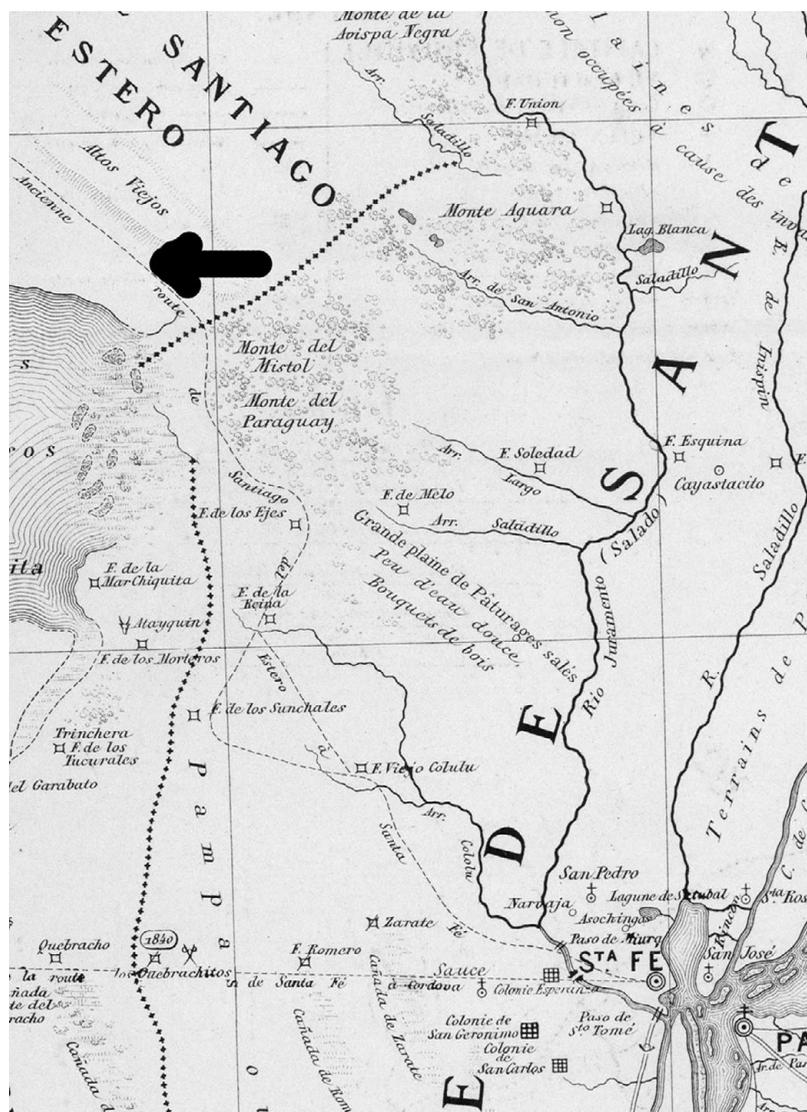


Figure 3. Map designed in 1865. The arrow shows the area of interest and the path that in this region is oriented from northwest to southeast. Source: David Rumsey Map Collection, www.davidrumsey.com

3.5. *The Pleiades*

The Pleiades also featured in the astronomical knowledge of some communities. The Spanish and Piemontese called them *los siete cabritos* (the seven little goats). For the Germans from Volga, they were *las siete hermanas* (the seven sisters) as well as *la gallina y sus pollitos* (the chicken and its chicks). The first of these names, according to our informants' testimonies, originated from the Bible.

3.6. *The moon*

Before considering the role of the moon in the life of immigrant colonists, we will list some of the names given to the lunar phases by each community. For the Piemontese, the *luna buena* (good moon) was the appropriate lunar phase for doing certain tasks. For nearly all the communities, in every colony, the *luna vieja* (old moon) was the full moon and the *luna nueva* (new moon) was the first day of the waxing crescent. For the Jewish Germans in Monigotes colony, however, the *luna grande* (big moon) was the full moon and the *luna chiquita* (small moon) was the first days of the waxing phase. The *luna achicándose* (diminishing moon) was the waning phase for the Russian Jews in Moises Ville. The German from Volga in Alcorta Colony named the full moon *luna alta* or *luna vieja* (high moon or old moon) and the waning phase *luna pasante* or *luna bajando* (passing moon or descending moon). This concept of 'passing moon' or 'descending moon' is also present among the aboriginal groups in Chaco. The Piemontese in Moises Ville called the appearance of the waxing crescent *luna naciendo* (moon being born).

Most of the immigrants took the phase of the moon into account when undertaking various farming tasks. Some of these tasks were only carried out at specific lunar phases. Similar customs have been noted among farmers in Europe (Iwaniszewski 2006). These were transmitted orally and through practice. Some farmers who are descendants of immigrants maintain these practices even today.

The waxing phase was considered the best time to plant vegetables that developed upwards (such as lettuce, corn, cabbage and parsley) by the Poles, Ukrainians, Piemontese and Germans from Volga. The waxing crescent was considered by the Swiss, Swiss-Germans and Germans from Volga to indicate the best time to slaughter animals, since at this time the animal 'had less blood'. The Swiss observed that during the waxing phase they could find moth larvae, whereas they could not do this when the moon was waning.

At full moon the Poles, Ukrainians, and Piemontese did not undertake any tasks, but they understood it to be the period when animals reproduced. According to the testimony of a woman whose parents were Polish and Ukrainian, a Piemontese suggested to her father that they should couple his mare with their stallion during full moon in order to get a male foal. This clearly suggests a concept of vitality and virility related to the size of the moon's shining surface. A similar idea was also common among the *Guaycurués* groups from the Argentinean Chaco. The full moon was also related to reproduction by the Germans from Volga, who made sure that their chickens would lay eggs during full moon in order to produce chicks strong enough to break the egg's shell all at once.

The Poles, Ukrainians and Germans from Volga considered the waning phase the best time to seed vegetables that developed under the earth (such as potatoes, yams and beets)—a view that is also common among rural Slavic peoples in Europe (Moszynski 1967)—as well as the best time to transplant vegetables, so that 'the roots would develop faster'. In all the colonies, Alfalfa (*Medicago sativa*) was planted during the waning phase by the Poles, Ukrainians, Piemontese, Swiss, Russian Jews, Spanish and Swiss-Germans. They did this having observed that the animals who fed on Alfalfa planted during the waxing phase got flatulence. The Germans, Swiss, Piemontese and Spanish felled trees

for firewood during the waning phase so that it ‘would not spoil’, and also castrated and slaughtered their animals at this time, so that ‘the meat would not spoil as fast’. The descendants of Jewish immigrants mentioned that some of these practices were typical of *criolla* and Piemontese communities.

As regards the use of the moon, we can conclude that there is a perceived relationship between the growth of vegetables and the variation in the moon’s shining surface, with the full moon being linked to greater biological activity. It also seems that there is a link between vegetables that grow upwards from the ground and the moon being in the ascendent, and between vegetables that grow downwards into the ground and the moon being in the descendent. This might have arisen because the waxing moon is seen at a higher position in the western sky each day around sunset, while the waning moon gets progressively lower in the eastern sky each day around sunrise, thus generating the idea of an ascending and descending moon.

Our study has also shown that the immigrant colonists used the moon for meteorological purposes. The Piemontese in Moises Ville had a method of predicting rain based on the moon’s visibility at certain times. If the moon was observed on the first day of the waxing crescent, it was not ‘knocked over’, and it would not rain during the next twenty days. (‘Knocked over’ refers to the angle of the line joining the crescent moon’s ‘horns’—the illuminated tips of the crescent at the ends of the terminator points.) On the other hand, if the waxing moon was seen for the first time at a certain height above the horizon at the moment of sunset, it was ‘knocked over’, and this would indicate rain. Two things stand out here: the concept of verticality that makes reference to the moon’s height above the horizon as an indicator of rain, and the idea of the waxing moon as a recipient that contains water which, if it is stood upright, will tip out. The Poles and Ukrainians in Portugaleta Colony would predict a rainy period if they observed the waning crescent moon opening out towards the northern part of the sky (i.e. nearly horizontal), or if there were ‘circles’ around the moon. The period when it is possible to see the ‘horns’ of the waning moon pointing to the north is during the summer, which is a time of higher rainfall in this region. ‘Circles’ around the moon arise from light refraction due to a high level of humidity in the atmosphere, which does indeed indicate a higher probability of rain.

The natural environment of the colonies was expressed in the sky. The Jewish Colonization Association, the colonizing company that founded the Jewish colonies approached by us, was in charge of distributing eucalyptus among the colonists, so that they could plant it in both their ranches and in the urban area of each colony. A Lithuanian Jewish family ‘colonized’ a decade after the foundation of Moises Ville colony interpreted the group of spots on the surface of the moon as a eucalyptus. This demonstrates clearly that the process of asterism creation is not culturally static.

A tradition linked to the full moon that was present in all the colonies was the apparition of the werewolf—the classical myth of a man who, during the nights of the full moon, changes his appearance and behavior, becoming a wolf. However, all the interviewees maintained that this tradition was borrowed from the *criollos* who lived in the colonies.

3.7. Meteors

Meteors were named in all communities as *estrellas fugazes* (ephemeral stars). Russian Jews had a tradition relating to the meteors whereby, if someone saw a meteor, they would say ‘it is not for me!’ This shows that meteors were regarded as bad omens.

4. The point of view of the final immigrant colonists

The colonists approached by us who represented the final wave of immigration had lived in rural communities back in Europe. They had no astronomical knowledge or interest in the skies, as was evident from the fact that they had not noticed any difference between the new southern sky and their native northern sky. They conceptualized the astronomical practices characteristic of their communities as 'beliefs'. Nonetheless, as they came into contact with other colonists, especially the Italians, they started to incorporate some of their cultural practices relating to the moon.

5. Conclusion

The presence of immigrants with different kinds of previous contact with the sky and with different agricultural practices generated a variety of new relations with the celestial realm after they arrived in South America. The contact between the new colonists with different origins and the *criollos*, who settled both before and after the new colonists' arrival in this area, also contributed to the new relationship with the sky. It made possible the development of common astronomical practices and common representations of certain asterisms among the communities, examples being the use of the sun's shadow to tell the time during the day, *las tres marías*, *la cruz del sur*, the Milky Way, and the naming of lunar phases and their relationship to cycles of activity in everyday life. On the other hand, some astronomical practices that had been used in Europe, such as those of the Slavs relating to the moon, continued to be utilized and even spread in South America. In addition, some concepts were shared with the *Guaycurúes* groups from Chaco, such as the importance of the Milky Way, *la cruz del sur*, the idea of an ostrich in the sky, and some correlations between lunar phases and everyday cycles of activity. Finally, it is clear that the process of asterism creation continued actively in all the colonies.

References

- Belmonte Avilés, J. A. & Sanz de Lara Barrios, M. 2001, *El Cielo de los Magos: Tiempo Astronómico y Meteorológico en la Cultura Tradicional del Campesinado Canario*, La Marea, La Laguna.
- Ceruti, C. N. 2006, Movimientos poblacionales en el chaco santafesino. Una visión arqueológica. *Folia Histórica del Nordeste*, 16, 21–37.
- Giménez Benítez, S. R., López, A. M. & Granada, A. 2004, Suerte, riqueza y poder. Fragmentos meteóricos y la presencia de lo celeste entre los mocovíes del Chaco. In J. B. M. Boccas, J. Broda & G. Pereira (eds), *Etno y Arqueo-Astronomía en las Américas. Memorias del Simposio ARQ-13: Etno y Arqueoastronomía en las Américas, 51° Congreso Internacional de Americanistas*, Santiago de Chile, pp. 1–3.
- Gori, G. 1952, *La Pampa sin Gaucho: Influencia del Inmigrante en la Transformación de los Usos y Costumbres en el Campo Argentino en el Siglo XIX*, Editorial Raigal, Buenos Aires.
- Gori, G. 1958, *El Pan Nuestro: Panorama Social de las Regiones Cerealistas Argentina*, Editorial Galatea, Buenos Aires.
- Gori, G. 1988, *Inmigración y Colonización en la Argentina*, EUDEBA, Buenos Aires.
- Iwaniszewski, S. 2006, Lunar agriculture in Mesoamerica. *Mediterranean Archaeology and Archaeometry* 6(3), 67–75.
- Moszyński, K. 1967, *Kultura Ludowa Słowian. T. 2, cz. 1: Kultura Duchowa*, Książka i Wiedza, Warsaw.
- Ruggeroni, D. A. 2006, *Historia de la Fundación de Reconquista*, Municipalidad de Reconquista, Secretaría de Cultura y Educación, Reconquista, Santa Fe.