Mediterranean Archaeology and Archaeometry, Vol. 18, No 4, (2018), pp. 213-217

DOI: 10.5281/zenodo.1478686

THE UNINTENTIONAL WINTER SOLSTICE HIEROPHANY IN THE "SANTI ANGELI CUSTODI" CHURCH IN ROME AND ITS IMPLICATIONS

Vito Francesco Polcaro and Andrea Polcaro

INAF-IAPS, ACHe Centre of Ferrara University and CESAR, Rome, Italy
Dipartimento di Lettere, Perugia University, Italy

Received: 28/02/2018
Accepted: 04/06/2018
Corresponding author: A. Polcaro (andrea.polcaro@unipg.it)

ABSTRACT

The parish of the "Santi AngeliCustodi" ("Holy Guardian Angels") is a church in Rome, built between 1924 and 1925 by the architect Gustavo Giovannoni. The interior has a single nave with four side chapels, above which large windows open, and is decorated with numerous frescoes. One of these, located above the little side door on the left side of the nave, represents a Nativity.This fresco is directly illuminated by sunlight entering through the window, located above the Chapel to the right of the main church entrance, just at midday of the few days between the winter solstice and Christmas, when, since the founding of the church, the celebration of the Mass officiated by the Parish Priest begins.This coincidence may suggest that a voluntary hierophany has been searched. However, this lighting effect is very likely due to chance alone. In fact, the orientation of the church axis is due to the fact that the architect wanted it in line with the bridge that crosses the Aniene river and there is no documentation or testimonies of any specific criteria for indoor decorative painting. On the other hand, no importance in the celebrations has ever been given to the particular lighting effect of the fresco of the Nativity in the Christmas period. This case shows that the statistics is not sufficient to demonstrate the intentionality of a hierophany, in the absence of historical, archaeological or textual evidence: in fact, in this case, it was possible to establish that the lighting effect was not intentional just because it occurs in a modern monument, on which full documentation and testimonies of living witnesses are available.

KEYWORDS: Intentionality, Hierophany, Statistics, Archaeoastronomical methods

In *Memoriam*: Vito Francesco Polcaro (29/6/1945–12/2/2018)

1. INTRODUCTION

The parish of the "Santi Angeli Custodi" ("Holy Guardian Angels") is a church in Rome, located in the Monte Sacro district (Figure1).

It was built between 1924 and 1925 by the architect Gustavo Giovannoni, in the framework of the realization of the first modern settlement on the right bank of the Aniene river (Carpaneto, 2006), which not far away flows into the Tiber.

The building externally displays monumental forms, inspired by Roman architecture of the period between the 16th and the 17th century.

Figure 1. The "Santi Angeli Custodi" church

The interior has a single nave with four side chapels, above which large windows open (see Figure.2)

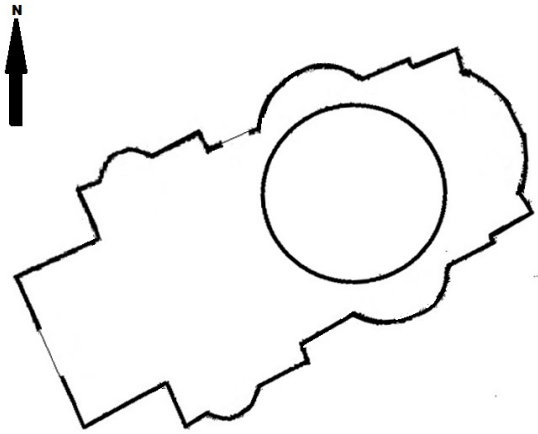

Figure 2. Plan of the Santi Angeli Custodi church

The church is decorated with numerous frescoes.

One of these, located above the little side door on the left side of the nave, represents a Nativity (see Figure.3)

Figure 3. The Nativity fresco over the small side door on the left side of the church

2. THE "HIEROPHANY" OF CHRISTMAS

This fresco is directly illuminated by sunlight entering through the window, located above the Chapel to the right of the main church entrance, on the few days between the winter solstice and Christmas, just at midday when, since the founding of the church, the celebration of the Mass officiated by the Parish Priest begins (Liritzis and Vassilioui, 2006 a, b).

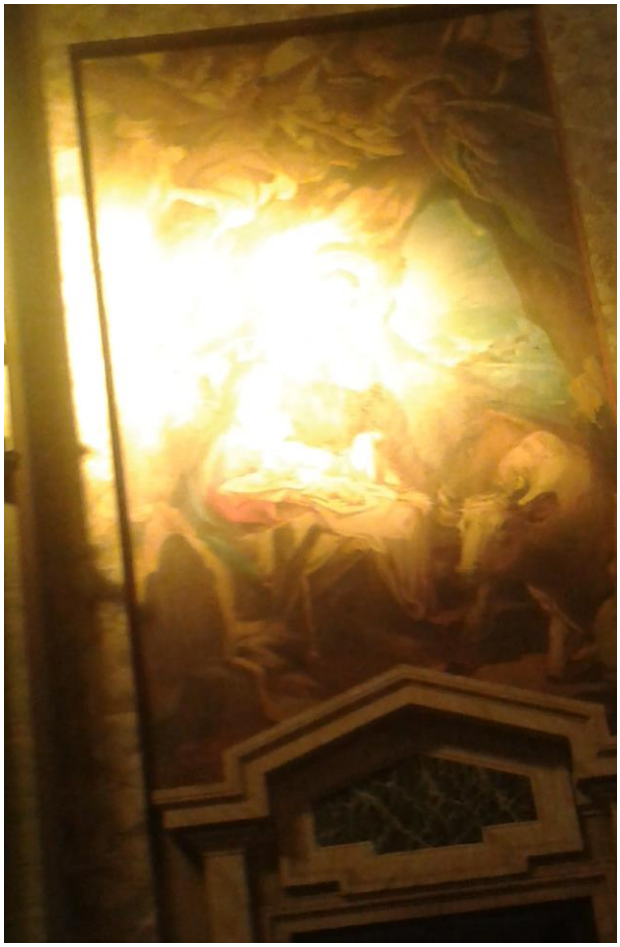

Figure 4. The Nativity fresco illuminated by Sun at noon near Christmas

This coincidence may suggest that a voluntary hierophany has been searched.

3. IS THIS HIEROPHANY INTENTIONAL?

Following Schaefer (2006), in order to claim the intentionality of the astronomical orientation of an artefact, three condition must be satisfied:

- The alignment must be statistically significant. The probability respect to the null hypothesis (random orientation) must thus be at least 3 σ in Gaussian statistics. However, 4 σ is better.
- Anthropological evidences have to connect the claimed astronomical orientation with a symbolic value of the culture that built the artefact.
- Clear archaeological proofs of intentionality must be present.

Concerning the statistical significance, again following Schaefer (2006), since most cultures (and for sure our one) know the cardinal directions and the ones of sunrise and sunset at solstices, in order to check the intentionality of a solar alignment we have to consider 8 azimuth direction over the horizon. Considering that each azimuth must be considered with an uncertainty of at least ±1° because of practical reasons, the 8 fundamental solar directions thus cover 16° over the 360° of the horizon, corresponding to 4.4%. A single alignment in azimuth of an artefact with one of the 8 fundamental solar directions has thus 16/360=1/22 probability of chance coincidence respect to the null hypothesis of random orientation, corresponding to 2.08 σ in Gaussian statistic.

However, we have to evaluate the probability that at the same time the Sun transit happens at a height equal, inside a ±1°, to the one defined by the angle under which the window is seen by the observing point corresponding to the fresco (see Figure 5).

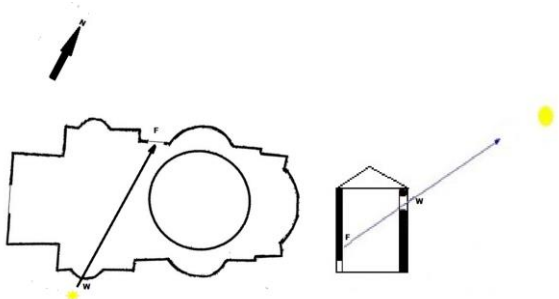

Figure 5. Alignment in azimuth and height with the position of the Sun of the Nativity fresco at noon of Christmas (F= fresco ; W=window).

Respect to the null hypothesis of chance orientation, this probability is equal to 2/90, corresponding, in Gaussian statistics, to ~2.5 σ (Curti et al., 2009). Since these two events are manifestly independent, the alignment in azimuth and height with a significant solar direction has thus a conditional probability of chance coincidence of 3.25 σ.

The statistical test is therefore satisfied (albeit with a small margin).

The eventual anthropological significance is manifest. Since the beginning of the Christianism, the Sun light is a symbol of Christ. Many Christian churches of all epochs present hierophanies in the day of Christ's Birth, able to produce a great suggestion: suffice to remember the bright light effects that develop on Christmas Day in the Scrovegni Chapel in Padua and in the Capitular Room of Chiaravalle della Colomba Abbey (Piacenza). Furthermore, in our case, the celebration of the noon Mass officiated by the Parish Priest is by far the most attended one in the SS. Angeli Custodi church.

The last point to be checked is the presence of proofs of intentionality. In our case, dealing with a fresco painted less than 50 years ago, it is enough to ask to people who were there at that time.

And here was the surprise!

The Church of the Saint Guardian Angels is entrusted since its foundation to a religious order, the "Caracciolini" Fathers. The parish also houses the General Curia and the accommodation of the novices of this order. The present Parish Priest, Father Mario Aceto, was a novice at the time when the fresco was painted. He has witnessed the painting of the fresco and knew by person the painter, Aronne Del Vecchio, who later became an assiduous follower of the Parish.

Father Mario was astonished when I showed him the images of the light effect on the fresco in the Christmas Day: the painter never spoke about that and nobody has ever noticed this effect during the last 50 years. Father Mario is sure that the painter did not choose the location of the fresco by anticipating these effects, but only because the space above the church secondary entrance was the last remaining free from decorations. He also remember that the fresco was painted in the spring of 1968 and he is sure that the painter had no idea that part of that wall would be illuminated by the Sun at noon of Christmas.

Furthermore, the orientation of the church axis is only due to the architect choice to design the whole area as a single architectural complex. It was thus oriented as the axis of the new bridge built on the Aniene River to give access to the new district (Rendina, 2000), and the position of the windows is simply the obvious consequence of this choice.

Therefore, there is no doubt that the light effect that occurs on the fresco over Christmas is only due to chance.

4. CONCLUSIONS

This case teaches us that Statistics alone does not give us proof of the intentionality of an alignment.

It only gives us the probability that the alignment under consideration is random. Even when this probability is low (in the case of the church of the Santi Angeli Custodi fresco this probability is 1/990), this does not exclude that the alignment found could be due to chance.

Of course, when this probability becomes extremely low (that is, when the evidence reaches 4 or 5 ∫ or more), we can reasonably advance the hypothesis of intentional alignment. However, in absence of further proofs, this remains only a hypothesis.

This case also demonstrates that anthropological analogies can not be extrapolated out of their social, historical and environmental context, because social organization has a significant impact on the attitude of mankind to astronomical phenomena, as it has on every other aspect of the world's vision.

Actually, in the case that we discussed, it is significant that nobody has ever noticed this apparent Christmas hierophany. This clearly shows that the relationship between the sacred, the Sun and the light, very strong in the early Christianism and still present for centuries, is now lost, due to the changes in social context.

The present scarce consideration for astronomical events can of course be also connected with the scarce visibility of the sky in modern cities. But this implies that the environment may also have different effects on the relationship between humans and sky: even in ancient cultures, it is thus difficult to believe that the relationship with sky may be the same for populations inhabiting arid places, dense forests, mountains or foggy plains

In conclusion, the main proof of an intentional astronomical content in a cultural asset is the archaeological and historical one.

Thus Archaeoastronomy cannot be considered as an autonomous discipline, if we don't accept that it is an "auxiliary science for archaeology", of course a very useful one.

ACKNOWLEDGEMENTS

I thank the Parish Priest of the Santi Angeli Custodi church, Father Mario Aceto, for the precious information concerning the history of the church and of the Nativity fresco.

REFERENCES

Carpaneto, G. (2006) Quartiere XVI. Monte Sacro, in L. Carpaneto et al. (eds) I rioni e i quartieri di Roma, Roma, Newton & Compton Editori.

Curti, E. et al. (2009) The "Petre de la Mola" megalithic complex on the Monte Croccia (Basilicata), in M. Rappenglűck (ed.), Proceedings of the SEAC 17th annual meeting, 25-31 October 2009, Alexandria, Egypt, B.A.R., London, in press.

Liritzis, I. and Vassiliou, H. (2006a) Does sunrise day correlate with eastern orientation of Byzantine Churches during significant solar dates and Saint's day name? A preliminary study. *Byzantinische Zeitscrift* (K.G. Saur Munchen, Leipzig) 99, 2, 523-534.

Liritzis, I. and Vassiliou, H. (2006b) Further solar alignments of Greek Byzantine churches. *Mediterannean Archaeology & Archaeometry*, Vol.6, No.3, 7-26.

Rendina, C. (2000) Le Chiese di Roma, Roma, Newton & Compton Editori.

Schaefer, B.E.(2006) Case Study of Three of the Most Famous Claimed Archaeoastronomical Alignments in North America, in Todd W. Bostwick and Bryan Bates (eds) Viewing the Sky through Past and Present Cultures, Proc. of Oxford VII International Conferences on Archaeoastronomy, Pueblo Grande Museum Anthropological Papers no. 15, pp. 71-77

In *Memoriam*: Vito Francesco Polcaro (29/6/1945–12/2/2018)

Vito Francesco Polcaro in Gela, Sicily

Born at the end of the Second World War in Lauria, a small city in Basilicata, Southern Italy, Vito Francesco Polcaro was an astronomer of great passion, with many scientific interests. After three MA degrees (Mechanical Engineer, Aerospace Engineering, and Mathematics) he started his career at the Italian Center of National Research in 1970, where he remained until the end of his life at the INAF-IAPS Institute of Rome. He dedicated many years of his scientific career to Astronomy, first of all as an aerospace engineer for the development of propulsion systems for satellites and then as an astrophysicist for the study of massive stars and supernovae. During his life, he participated in many international research projects that earned him several acknowledgments from NASA, ESA and other international space agencies.

Since I was a child, I remember his deep interest in archaeology and cultural heritage. He demonstrated these to me during the many cultural trips we made to Rome, the city where he spent most of his life. But his interest in the history of science and in prehistory was also very strong. In 1988, during a congress he attended in England, we visited Stonehenge together, and he was struck by the connection between the stars and the megalithic architecture of the site. He began to ask himself the main question underlying all of his research: why was humanity so strongly attracted by the sky since the beginning of prehistory? As a scientist, he approached the topic carefully, following a strong scientific method. For this reason, he joined SEAC – a society that already had long experience in the field of Cultural Astronomy, and the aim of connecting astronomers and astrophysicists with archaeologists and historians. In this framework, he was very active in linking his Italians colleagues with European scientific communities, and contributed to the development of the Italian Society of Archaeoastronomy.

He started to be directly involved in Cultural Astronomy with his research on the Ulugh Beg Observatory in Samarkand, published in 1998. He then moved directly to Archeoastronomy, measuring the orientations of many ancient buildings, especially in Italy. He cooperated with several Italian and European scholars on the study of the astronomical orientation of Christian churches and several ancient structures. But it is in the Prehistory of Southern Italy, his beloved homeland, where his researches in archaeoastronomy have had the greatest impact. In particular, he contributed to the acknowledgment of several megalithic structures in Basilicata, Puglia, and Sicily as monuments of archaeoastronomical interest, to be studied and preserved. The valorization of these kinds of megalithic structures in Italy, often located in wonderful natural locations, was his main purpose for research during his last years, making them accessible to the public as an important common cultural heritage.

Finally, and in this short space, it is impossible to fully achnowledge the life of Vito Francesco. It is equally impossible to speak about his long social commitment, his effort for the nuclear disarmament in the world, and his work for the younger generation, fighting with all his strength in order to help his scholars and pupils to find employment in research.

But I want to especially point out that in all of his research and scientific activities, and from the human perspective, he has always behaved with strong integrity and intellectual honesty until the last days of his life, and, as his only son, I am really proud of that.