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REDISCOVERING THE MALTESE TEMPLE OF BORĠ IN-NADUR: AN ARCHAEOASTRONOMICAL PERSPECTIVE

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ABSTRACT

The Maltese island have megalithic temples of extraordinary interest for archaeoastronomy. In literature we find different works that involve most of its archaeological sites. The temple of Borġ in-Nadur, set on the top of a hill by the Marsaxlokk Bay in southern Malta, is less well known than the rest of the others, even though it started off as a major attraction for grand tourists and travellers in the Early Modern and Colonial periods. It was explored in the second half of the 1920s by a team of British archaeologists, led by Margaret Murray, who gradually uncovered the ruins of typical Maltese megalithic temple dated to the 3rd millennium BC. In 2011 the efforts of an international team of scholars brought to the publication of a general reassessment of the evidences about the temple of Borġ in-Nadur and the artefacts collected during its exploration, emphasizing its importance for the Maltese Temple Period. The new picture that emerged has reactivate the research around the Borġ in-Nadur temple attracting for the first time the interest of scholars in archaeoastronomy. The archaeoastronomical study of the Borġ in-Nadur's archaeological site is the first of its kind, as the archaeological remains were put into evidence in 2010, and pays particular attention to the temple. At the moment it is difficult to determine the exact plan of the entire temple, and therefore its axes, but the apsidal building and the main entrance are quite intact. Although this research is at its early stage of development, with regards to archaeoastronomical issues and features related with the temple of Borġ in-Nadur some preliminary considerations can be put forth.

KEYWORDS: Megalithism, prehistory, Malta, Borġ in-Nadur, ashlar masonry, solar cycle, orientations

1. INTRODUCTION

About 20 megalithic sites are known in Malta and Gozo and together they probably represent the most relevant tourist attraction of the archipelago and the backbone of the Maltese archaeological scientific literature. However, the temple of Borġ in-Nadur, set on the top of a hill by the Marsaxlokk Bay in southern Malta, is less well known than the rest, even though it started off as a major attraction for grand tourists and travellers in the Early Modern and Colonial periods. It was explored in the second half of the 1920s by a team of British archaeologists, led by Margaret Murray, who gradually uncovered the ruins of typical Maltese megalithic temple dated to the 3rd millennium BC.

The excavations uncovered a monumental sacred complex, characterised by a singular plan including a megalithic enclosure with different cult places. A large number of finds were unearthed, demonstrating the wealth of the community using the site. At that time, the conditions of the temple building were rather good. The preliminary reports of the explorations, published promptly in 1923, 1925, and 1929, were accompanied by a thorough drawn and photographic documentation including an accurate measurements of nearly all megaliths (Murray 1923; 1925; 1929).

2. FIGURES AND TABLES

The site of Borġ in-Nadur is set on a hill on the St. George Bay, and is comprised of two different settlements: the Bronze Age fortified village on the top of the hill (Tanasi and Vella, 2015) and the megalithic temple on the eastern slope that was in part reused and modified throughout the Tarxien and Borġ in-Nadur periods (Tanasi and Vella, 2011).

Murray's investigations revealed the following remains: an Apsidal Building, an Open Area or Main Enclosure, the Field Stones and a Double Chapel (Figure 1). The Apsidal Building is a four-apsed temple with a shallow niche at the end. It can be safely identified as a 'temple' on the basis of the similarities in ground plan with other sites. The megalithic set-up of the Open Area, then, could have defined the temple forecourt already in the Temple period. The arrangement is not dissimilar, in fact, to what artists recorded beneath the temple complex at Ġgantija, Gozo, in the nineteenth century. The Open Area or Main Enclosure lies outside the temple and a good part of the megalithic wall was uncovered by excavation. Its façade was marked by the sequence of four elements, a monumental main gate, a great menhir and a dolmen. Along the northern wall of the Main Enclosure, the fourth orthostat shows a large and perfectly circular artificial hole passing through it and a triangular niche with three half spherical sockets carved on the outer surface (Figure 2). Another smaller enclosure very poorly preserved, named Field Stones, was probably located to the North of the main complex, and a second apsidal building closed by a smaller precinct, called the Double Chapel, was explored to the South-East. Groups of objects including pottery sets, loom weights, and also an anthropomorphic baetylus idol, found in different areas of the Double Chapel and related to Bronze Age period may suggest cultic activities still active during the Bronze Age at least in this part of the complex.

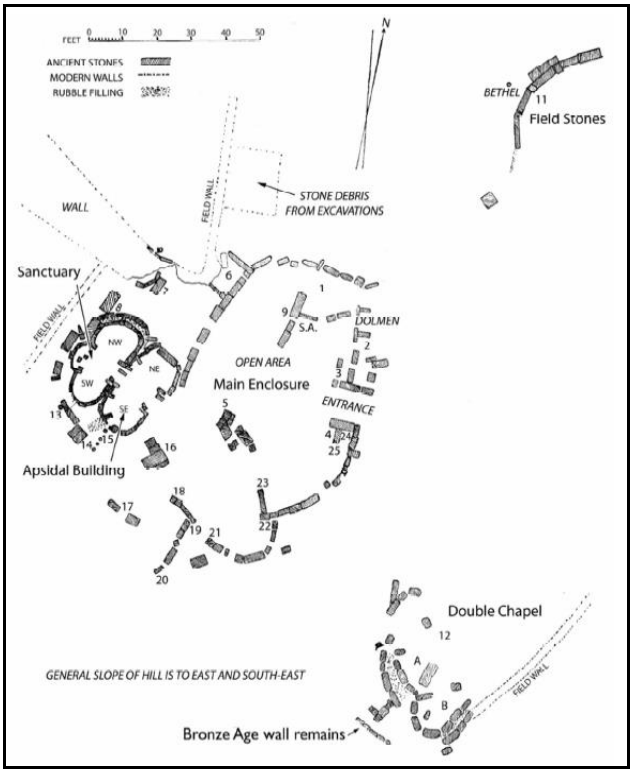

Figure 1. General plan of Borġ in-Nadur temple (Tanasi and Vella, 2011).

In the past 80 years, for different reasons this site was forgotten and generally neglected with the result that the current conditions of the entire archaeological area are unfortunately rather poor.

Due to the phases of occupation subsequent to Temple period, many megalithic elements were removed from their original positions and completely de-functionalized and decontextualized. That especially affected baetyluses, menhirs and the so called notched stones.

This has jeopardized the interpretation of the general organization of the complex and as a consequence, Borġ in-Nadur has not been included in any tourist itinerary and its role in Maltese prehistoric has been always considered marginal.

Figure 2. The fourth orthostat of the outer wall of the Main Enclosure (photo authors).

Against this scenario, in 2011 the efforts of an international team of scholars brought to the publication of a general reassessment of the evidences about the temple of Borġ in-Nadur and the artefacts collected during its exploration (Tanasi and Vella, 2011), emphasizing its importance for the Maltese Temple Period. The new picture that emerged has reactivate the research around the Borġ in-Nadur temple attracting for the first time the interest of scholars in archaeoastronomy, a discipline which has recently proved to have a fertile field of application in prehistoric Malta (22th SEAC Conference, Malta 21-27 September 2014). In particular, the production of a virtual interactive reconstructive model in 3D computer animation of the temple has resulted instrumental for the reactivation of the research about this monument (Tanasi and Stanco, 2013). The temple has been rebuilt using the measurements provided in Murray's reports, while all the other structures were reconstructed using dimensions recorded on site or through comparisons with other temple sites (Figure 3). The reconstruction work has been completely carried out using the Blender 3D suite (http://www.blender.org), an open source cross-platform software for modelling, rendering, animation, postproduction, creation, and playback of interactive 3D contents. The 3D model was not intended to reconstruct in elevation the missing parts of the temple but was aimed at rediscovering digitally what was found by the archaeologists nearly 80 years ago. In order to add realism to the digital replica, a study of light sources was carried out, simulating a complete cycle of the sun on mid-summer day through the use of the Radiance raytracer (http://radsite.lbl.gov/radiance).

Figure 3. Virtual interactive model of the Borġ in-Nadur temple (Stanco and Tanasi, 2013).

3. ARCHAEOASTRONOMY IN MALTA

The Maltese island have megalithic temples of extraordinary interest for archaeoastronomy. In literature there are several works about such sites. Among them, it must certainly be remembered the contributes of Agius and Ventura (1981) and Foderà Serio et al. (1992). Agius and Ventura's was the first work considering the possible astronomical alignments of the Maltese temples. The study applied a maximal approach: for axis of the temple it was considered just what was clearly a feature of the construction, even if it was not a true axis of symmetry.

Table I. The table shows azimuth and declinations of the temples' axis (Agius and Ventura, 1981).

Temple		Axis[a]	Azimuth	Declination	
Bugibba		1 - 2	201°[b]	-49.5°	S[e]
Hagar Qim	I	3 - 4	128.7°	-30.5°	R
Hagar Qim	I	4 - 3	308.7°	30.5°	S
Hagar Qim	I	5 - 6	297.8°	23.3°[d]	S
Hagar Qim	I	7 - 8	0.8°	54.4°[d]	R
Hagar Qim	I	9 - 10	213°[c]	-42.8°	S
Hagar Qim	I	11 - 12	255 °[c]	-12.1°	S
Hagar Qim	II	13 - 14	186.0°	-53.7°	S
Ta' Hagrat	I	15 - 16	130.6°	-29.4°[d]	R
Ta' Hagrat	II	17 - 18	172.7°	-48.7°[d]	R
Ggantija	I	19 - 20	128°[b]	-29.9°	R
Ggantija	II	21 - 22	133°[b]	-33.5°	R
Kordin	I	23 - 24	149.6°	-44.3°	R
Kordin	II	25 - 26	199°[c]	-50.0°	S
Mnajdra	I	27 - 28	92.7°	0.0°[d]	R
Mnajdra	II	29 - 30	138.1°	-38.1°[d]	R
Mnajdra	III	31 - 32	207.2°	-46.1°	S
Tal-Qadi		33 - 34	76°	11.3°	R
Skorba	I	35 - 36	134.9°	-33.3°	R
Skorba	II	37 - 38	168.5°	-50.1°[d]	R
Tarxien	I	39 - 40	200.2°	-49.5°	S
Tarxien	II	41 - 42	230.1°	-31.3°	S
Tarxien	II	43 - 44	142.0°	-39.7°	R
Tarxien	III	45 - 46	198.7°	-50.1°	S
Tarxien	IV	47 - 48	170°[c]	-52.9°	R
Xrobb il-Ghagin		49 - 50	140°[b]	-38.4°	R

(a) Refer to the plans for identification of the axes;
(b) Estimated from published plans;
(c) Estimated from plans whose reliability was checked against measurement;
(d) The altitude of the horizon and refraction taken into consideration;
(e) R = rising and S = setting positions

Out of 26 azimuths, there was a clear concentration of 20 of them between 128° and 230°, between SE and SO, while the remaining 6 showed no patterns (Table I). In their analysis of the data, the authors of the first work considered the rising and setting positions of the Sun at solstices and equinoxes

and of the Moon at standstills. Moreover they studied the alignment of a number of temples towards the rising or setting positions of some bright stars: Sirius, α Crucis, α Centauri and β Centauri, α Lyrae and α Ursa Majoris.

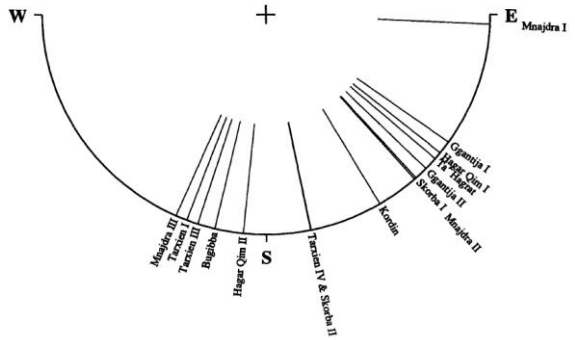

Figure 4. The orientations' diagram with the azimuth of the temples' axis (Foderà Serio et al., 1992).

In the work of Foderà Serio et al. (1992), it was applied on the contrary a minimal approach: for axis of the temple it was considered just what was an unequivocal axis of symmetry. In this case just 15 azimuths were measured (Figure 4), and the authors took into account mostly the possible alignments of the temples at sunrise or setting positions of some bright stars: Sirius, Canopus, α Crucis, β Crucis and γ Crucis, α Centauri and β Centauri, and The Pleiades.

4. ARCHAEOASTRONOMY AT BORĠ IN-NADUR: PRELIMINARY ANALYSIS

Due to the scarcity of previous data, the archaeoastronomical study of the temple of Borġ in-Nadur is the first of its kind and obviously the study is in its infancy. Without a proper survey and technical analysis on-site, it is difficult to determine the exact plan of the entire temple and in particular its axes, although but the Apsidal Building and the main entrance are quite intact. From an initial examination with satellite data, it was found that the azimuth of the apsidal building is 125°, then framed in the angular range determined by Agius and Ventura (1981), while the azimuth of the main entrance is 107°. The temple of Borġ in-Nadur has several characteristics that make it unique, as the many standing stones and the peculiar location of the dolmen in the wall of the Main Enclosure.

The first step in the research agenda will be a fieldwork already scheduled for late spring 2016, aimed to acquire all the missing technical data and to start comparing them with those already available for the other megalithic temples.

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