The Islandscape of the Megalithic Temple Structures of Prehistoric Malta

Tore Lomsdalen

Abstract: The exploration of the Mediterranean seascape goes back to the foragers of the early Holocene period around the ninth millennium BCE. However there is no secure evidence of human settlement in the Maltese Archipelago before the end of the sixth millennium BCE. Approximately one thousand years later, the unique style of megalithic structures that later became known as the Temple Period commenced. This period lasted about another millennium, then suddenly halted for no apparent reason, leaving no further trace than the monuments themselves. However, based on the extant material culture—artefacts, iconography and the orientation and location of the temples—there are indications that the Temple Period society may have participated in cosmology that integrates land, sea and sky. Using thick description, this paper will look at the extent to which prehistoric Maltese cosmology consisted of land, sea and skyscape—probably the three main components of an Islanders' cosmology.

1. Introduction

The aim of this paper is to examine if, and to what extent, land, sea and sky were integrated elements of a Maltese prehistoric cosmology. It will theoretically examine three main areas: firstly, how the early Sicilian seafarers could have arrived in Malta, seen in the context of the exploration of the Mediterranean sea basin which goes back to the foragers of the early Holocene period around the ninth millennium BCE;[1] secondly, how land and sea were the two most inevitable components of an islander's cosmology;[2] thirdly, to what extent did skyscapes provide an additional component of the prehistoric Maltese cosmology, as deduced from

[1] Graeme Barker, *The Agricultural Revolution in Prehistory: Why Did Foragers Become Farmers?* (Oxford: Oxford University Press, 2006), p. 335.
[2] Reuben Grima, 'An Iconography of Insularity: A Cosmological Interpretation of Some Images and Spaces in the Late Neolithic Temples of Malta', *Institute of Archeology* 12 (2001): p. 56.

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archaeological remains, archaeoastronomy and landscape.[3] The methodology will evaluate retrieved artefacts, iconography, depicted symbolism, images, and the architectural space and layout of the Neolithic monuments. Further, it will look into the cardinal orientations and alignments to celestial bodies of the monumental structures within a context of land, sea and skyscapes (the word 'skyscape' with reference to the introduction to the Skyscapes TAG volume) based on observations, astronomical calculations and a literary review.

There is no secure evidence of human settlement in the Maltese Archipelago before the end of the sixth millennium (5200 BCE) and archaeological findings do indicate they arrived from Sicily.[4] However, the types of boats or systems of navigation used for the approximately 80km sea crossings are unknown. During good weather conditions Mt Etna (3340m) and the Hyblean highland in the southeast of Sicily are visible from Malta and Gozo. The Maltese Archipelago may also be visible from the same geographical areas of Sicily; however, it is unlikely to be observable at sea level.[5]

The period when megalithic compounds were erected in Malta and Gozo, the two main islands of the Maltese Islandscape, is generally known as the Maltese Temple Period and chronologically lasts from about 4100 BCE to about 2500 BCE.[6] Whether or not the structures were temples or not is open for discussion; however, most scholars researching the monuments seem to accept them as temples and they probably did function, at least in part, as sacred places for worship.[7]

2. Early maritime activity in the Mediterranean basin

Mediterranean seafaring before the Neolithic period around the seventh millennium BCE constitutes a controversial issue; nevertheless, more recent and systematic research conducted in various parts of the

[3] Tore Lomsdalen, 'Is There Evidence of Intentionality of Sky Involvement in the Prehistoric Megalithic Sites of Mnajdra in Malta?' (MA Dissertation, University of Wales Trinity Saint David, 2013).
[4] David H. Trump, *Malta: Prehistory and Temples*, ed. Daniel Cilia (Malta: Midsea Books, 2002), p. 24.
[5] Frank Ventura, Seatravel, 2 September 2013. Personal communication.
[6] David H. Trump, 'Dating Malta's Prehistory', in *Malta before History*, ed. Daniel Cilia (Malta: Miranda Publishers, 2004), p. 230.
[7] Tore Lomsdalen, *Sky and Purpose in Prehistoric Malta: Sun and Moon at the Temples of Mnajdra* (Ceredigion, Wales: Sophia Centre Press, 2014).

Mediterranean basin gradually opens up a new understanding of late Palaeolithic and early Holocene sea travel.[8]

The earliest sea voyage ever reported refers to tools found in the Indonesian island of Flores, dated from more than 800,000 years ago; the signs of some sort of seafaring by pre-sapien hominids imply the crossing of an estimated 20km-deep water strait between Bali and Lombok.[9] In the Mediterranean, Fernando Pimenta suggests that several sea crossings appear in Sicily more than 30,000 years ago and, about 15,000 years later, in pre-Neolithic sites in Sardinia and Crete, indications of maritime activity across a sea-gap of about 15–20km.[10] Evidence of Mediterranean seafaring during the Younger Dryas (12,800–11,500 BCE) is found in the small amount of obsidian from Melos at the Franchthi cave in the Argolid, two locations separated by 120km and reachable by a 20–35km sea-gap crossing between islets.[11] The presence of obsidian, both on mainland Greece and Aegean island sites, suggests that these exploits included successful return journeys, possibly even a seafaring route.[12] The site Aetokremnos in Cyprus, an island that has never been linked to the mainland in recent geological time, shows human presence as well as the dwarf hippopotamus, dated back to the eleventh millennium BCE.[13] The distribution of prehistoric sites in Cyprus indicates an extensive coastal exploration; according to Cyprian Broodbank, 'the fact of repeated and seasonal activity hints at more than a one-off venue', either crossing from the Anatolian coast (65–69km) or the longer crossing from the Levant (about 100km).[14] The sea level at that point in time may have been up to

[8] Cyprian Broodbank, 'The Origin and Early Development of Mediterranean Maritime Activity', *Journal of Mediterranean Archaeology* 19, no. 2 (2006).
[9] Fernando Pimenta, 'Astronomy and Navigation', in *Handbook of Archaeoastronomy and Ethnoastronomy*, ed. C. L. N. Ruggles (New York: Springer Science+Business Media, 2014).
[10] S. Chilardi et al., 'Fontana Nuova Di Ragusa (Sicily, Italy): Southernmost Aurignacian Site in Europe', *Antiquity* 70, no. 269 (1996).
[11] Catherine Perlès, *Les Industries Lithiques Taillés De Franchthi (Argolide, Grècce)* (Indianapolis: Indiana University Press, 1987), pp. 142–45; Pimenta, 'Navigation'.
[12] N. Laskaris et al., 'Late Pleistocene/Early Holocene Seafaring in the Aegean: New Obsidian Hydration Dates with the Sims-Ss Method', *Journal of Archaeological Science* 38 (2011).
[13] Broodbank, 'Maritime', pp. 208–9.
[14] Broodbank, 'Maritime', p. 209.

55m lower than at present, but was rising rapidly.[15] What kinds of sea-going vessels were used for these crossings is not known; however, preserved dugout canoes used by hunter-gatherers a few millennia later in north Africa and temperate Europe may be indicative.[16] According to Helen Farr, even though the sea level was lower, the presence of hunter-gatherers on Cyprus suggests that people had the necessary maritime technology and social organisation to undertake such open sea voyages.[17] In the early Neolithic there is evidence of a maritime pioneering colonisation in western Mediterranean Europe, as agricultural areas were formed by groups of seafaring colonists who moved along the coastline.[18]

According to Mark Patton one should distinguish conceptually between 'discovery and colonisation'.[19] In prehistory, humans who lived in the Mediterranean basin may have known of the existence of an island and could have visited it periodically without actually colonising it. However, Patton further maintains that, in many cases, a clear distinction between the two—based purely on the archaeological record—may be problematic. Furthermore, the coastline of the Mediterranean basin has changed significantly from the Pleistocene until today; at the Last Glacial Maximum (LGM)—radiocarbon-dated to 21,000–18,000 BCE—the Mediterranean coastline lay 120–130m lower than today's level, creating corridors and land bridges between regions which now are divided by water.[20] At the end of the LGM, Formentera was joined to Ibiza, Menorca to Mallorca, Sardinia to Corsica, the Maltese Archipelago and Egadi groups to Sicily, and Elba to the Italian mainland; many of the north and east Aegean islands formed part of a mainland area.[21] By 9000 BCE the

[15] Helen R. Farr, 'Island Colonization and Trade in the Mediterranean', in *The Global Origins and Development of Seafaring*, ed. Atholl Anderson, James Barrett, and Katie Boyle (Cambridge: McDonald Institute for Archaeological Research, 2010), p. 180.
[16] Sean McGrail, *Boats of the World: From the Stone Age to Medieval Times* (Oxford: Oxford University Press, 2001), p. 173.
[17] Farr, 'Colonization', p. 180.
[18] João Zilhão, 'Radiocarbon Evidence for Maritime Pioneer Colonization at the Origins of Farming in West Mediterranean Europe', *PANAS* 98, no. 24 (2001).
[19] Mark Patton, *Islands in Time: Island Sociogeography and Mediterranean Prehistory* (London: Routledge, 1996), p. 36.
[20] Cyprian Broodbank, *The Making of Middle Sea: A History of the Mediterranean from the Beginning to the Emergence of the Classical World* (London: Thames & Hudson, 2013), p. 90.
[21] Patton, *Islands*, p. 36.

Mediterranean coastline had basically reached its present level. Sea crossings before that epoch imply taking consideration of Palaeolithic geographical land and sea formations, whereas Holocene (end of the Pleistocene period, about 11,700 BCE) and Mesolithic (from about 9000 BCE) sea travellers would have been confronted with more or less the present coastline conditions.

Regarding possible determining factors for colonising an island, Patton has worked out a ratio between the surface area of the island and the distance from the mainland, calling it T/DR: a Target/Distance Ratio model, assuming that the islands with the highest biographic ranking are the most likely to be colonised first.[22] Patton further combines this with a visibility model of:

> A) Islands directly visible from land, like Sicily—the largest island in the Mediterranean and only about three km distant from mainland Italy (T/DR=56.3)—and Lipari (T/DR=0.7).
> B) Islands which can be reached without sailing out of sight of land. A large number of Mediterranean islands are classified in this category: Crete (T/DR=0.8), Cyprus (T/DR=1.7 from the Anatolian coast), Sardinia (T/DR=1.5) and the Maltese islands (T/DR=0.1).
> C) Islands which cannot be reached without sailing out of sight of land with only two islands listed: Pantelleria (T/DR=0.06) and Lampedusa (T/DR=0.03), both ratios measured from Sicily; however, in nautical miles they are closer to Africa.

Malta, Gozo, Pantelleria and Lampedusa are non-typical in the sense that they have a low ranking but were colonised early (sixth millennium cal. BCE—see next sections), while some islands with high ranking first registered human activity only in the fourth and third millennium cal. BCE, like Salimis (T/DR=200) in the Agro-Saronic Island, situated only 0.5km from the mainland.[23] These listings indicate that the prehistoric settlers considered other variables than size and distance to an island for colonisation. The relationship between available natural resources, specifically biological and/or minerals, and an island's capacity to support a human population, were probably determining factors for colonisation after first discovery. Trading potential of goods may have been an additional factor. Competition, wars and political conflicts may also have been a reason for defeated rivals to emigrate.

[22] Patton, *Islands*, pp. 43–48.
[23] Patton, *Islands*, p. 57.

According to Patton, archaeological evidence shows that colonisation in the Mediterranean does not suggest a gradual and continuous process, but rather a 'punctuated equilibrium' with phases linked to significant economic developments, trade explosion and social changes.[24] In principle this may have been the case; however, the process of colonisation of an island may also have been gradual and involved several temporary visits before settlement.[25]

3. Colonisation in Prehistoric Italy and its Islandscape.

According to Robert Leighton, Italy (after France) has more direct fossil evidence for *Homo sapiens neanderthalensis* than any other European country, well represented both in Lazio and Calabria where early human presence goes back before 730,000 BP.[26] A skeleton from a *Homo heidelbergensis* more than 500,000 years old was found in Altamura in southeast Italy.[27] However, a continuous human presence in Italy seems to lack sustainable evidence. More dateable evidence from the Italian Epigravettian (late Upper Palaeolithic) phases appears in numerous sites and shows evidence of regional variations in hunting and gathering; a characteristic of this period is an increasing preoccupation with cave art, decorated artefacts and burials.[28] As Broodbank suggests, the Italian Neanderthals vanished long before 30,000 BCE.[29] By the later stages of the Upper Palaeolithic, Sicily was widely inhabited, as numerous sites show.[30]

When investigating the early Maltese Islandscape, it is important to see the archipelago's human presence in the context of the Italian Islandscape– Sicily in particular. Archaeological evidence indicates that the first settlers on Malta in the early sixth millennium BCE came from Sicily and lived in caves like the Pleistocene cave Ghar Dalam (180,000 years old) where Stentinello-type pottery has been found.[31] As mentioned previously, during the LGM Malta was terrestrially linked to Sicily; whether Sicily was directly linked with mainland Italy is unclear, as Broodbank states in his

[24] Patton, *Islands*, p. 62.
[25] Farr, 'Colonization', p. 182.
[26] Robert Leighton, *Sicily before History: An Archaeological Survey from the Palaeolithic to the Iron Age* (London: Duckworth, 1999), p. 22.
[27] Broodbank, *Middle Sea*, p. 96.
[28] Leighton, *Sicily*, p. 22.
[29] Broodbank, *Middle Sea*, p. 116.
[30] Leighton, *Sicily*, pp. 22-23.
[31] Nadia Fabri, *Ghar Dalam: The Cave, the Museum and the Garden*, Insight Heritage Guides (Malta: Heritage Books, 2007), p. 10.

2013 publication.[32] However, in a 2006 paper Broodbank claims that the 72m deep Messina strait survived, perhaps in a narrow or otherwise compromised form.[33] Corsica and Sardinia were also fused to create 'Corsardinia' with the shortest sea-gap to the Italian mainland of 15km at that time, compared to over 50km today.[34]

Corsardinia and Sicily, the two largest islands in the Mediterranean and closer to the mainland then they are today, are the first islands to produce definite signs of human presence going back to the Upper Palaeolithic (and possibly to the Lower Palaeolithic as well, although evidence for the latter has been challenged).[35] Elba has also produced Aurignacian material but was probably, at that time, a part of mainland Italy.[36] At the southern half of the Corsardinian block of the Corbeddu cave, a human phalanx sandwiched between stratigraphic levels is dated to 30,000 years ago; further confirmation of human presence comes from a newer find at Santa Maria de is Acquas in southern Sardinia, comprised of upper Palaeolithic chert and flint tools datable to the LGM (or even earlier).[37] The first human presences on Corsardinia appear to have been temporary ventures; definite signs of settlements in Corsica and Sardinia do not appear until the Mesolithic of the late ninth millennium BCE.[38]

Sicily shows a model of human presence similar to Corsardinia, in that early human habitations seem to be of periodic, not permanent, settlements. One site on Sicily may be much older than the rest; Fontana Nuova di Ragusa, a small rock-shelter in the southwestern part of the island, shows human occupation going back to the Aurignacian phase (31,700 BP to its uppermost level 40,000 BP). Humans appear to have arrived from the adjoining mainland and it is, according to Chillardi et al., the southernmost Aurignacian site in Europe.[39] The site resembles a temporary shelter and the occupants relied heavily for their nutrition on deer (over 90% of the excavated bones).[40] The Gravettian phase (about 25,000 BCE), which succeeded the Aurignacian phase, shows no sign of human occupation in Sicily; it is not until the Final Epigravettian (about

[32] Broodbank, *Middle Sea*, p. 121.
[33] Broodbank, 'Maritime', p. 206.
[34] Broodbank, *Middle Sea*, p. 121.
[35] Broodbank, 'Maritime', pp. 206–7.
[36] Broodbank, 'Maritime', p. 206.
[37] Broodbank, 'Maritime'.
[38] Broodbank, 'Maritime', p. 207.
[39] Chilardi et al., 'Fontana Nuova', p. 553.
[40] Leighton, *Sicily*, p. 24.

13,000 BCE) or Holocene era that numerous sites can be assigned with archaeological confidence.[41] Pleistocene fauna of dwarf elephants and hippopotami, swans and dormice of gigantic size were present in Italy, Sicily and Malta; such animal bones have also been found in the Pleistocene Maltese Ghar Dalam cave.[42]

When it comes to colonising the smaller islands around Sicily and the Aeolian group there seems to be more a lack of motivation than ability. These islands did not provide a substantial stock of game and wild animals, and had little to offer hunter-gatherers; however three Italian islands were an exception: Palmarola (located 10km off the cost of Lazio), Pantelleria and Lipari (visible from north-eastern Sicily at a distance of about 20km), which were all sources for the precious, naturally-occurring volcanic glass—obsidian.[43]

Liparian obsidian dated to the Mesolithic era was found at Perriere Sottano, near Catania on Sicily; however, no settlement is documented before the Early Neolithic.[44] By that time Liparian obsidian was distributed around the Italian peninsula, Malta, across the Adriatic to the Tremiti Islands, Palagruža, Sušac, and to Dalmatia. According to Farr, seafaring can be seen to have been a booming activity as obsidian from Pantelleria circulated to Lampedusa, Malta and Tunisia; obsidian from Palmarola and Sardinia was distributed in the Tyrrhenian and France.[45] Flint came, to a large extent, from Sicily and pottery was mainly of the Stentinello type. Imported obsidian found in Malta seems to be more of the Lipari type; however some specimens also come from Pantelleria.[46] Pantelleria—about 80km off the Tunisian coast and 110km from Sicily—was at least visited, if not settled in the Early Neolithic, as its obsidian is found in Malta, Sicily and North Africa.[47] More surprising is the Early Neolithic settlement on the much smaller island Lampedusa, 210km from Sicily and 130km from Tunisia, attested to by finds of engraved pottery, resembling Stinetinello ware.[48] Stentinello-type pottery has also been reported in Tunisia.[49]

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[41] Leighton, *Sicily*, pp. 25–26.
[42] Leighton, *Sicily*, p. 17; Trump, *Malta*, p. 56.
[43] Leighton, *Sicily*, p. 28; Helen R. Farr, 'Seafaring as Social Action', *J Mar Arch*, no. 1 (2006): pp. 86–87.
[44] Leighton, *Sicily*, p. 33.
[45] Farr, 'Colonization', p. 182.
[46] Leighton, *Sicily*, p. 73.
[47] Leighton, *Sicily*.
[48] Leighton, *Sicily*, p. 74.
[49] Leighton, *Sicily*.

The Neolithic, apart from important changes in subsistence strategy—going from hunting-gathering to sedentarism-agriculture—was a time of exploration, trading and exchanging goods, seafaring and island colonisation; this most likely demanded new designs for boats and rafts which were probably equipped with basic sails.[50] Iconographic and archaeological evidence of prehistoric boats in the central Mediterranean is scarce. The earliest known Italian boat is an oak log boat found on the submerged Neolithic site of La Marmota on the southern side of Lake Bracciano, 35km north of Rome; in addition to log boats, indigenous reed boat-building traditions existed in central Mediterranean areas.[51] The cognitive horizons of Neolithic peoples stretched well beyond their farmsteads; their fight for nutrition and daily survival was transmuted into new research and exploration of the wider spheres of economic, political, social, and ritual behaviour patterns and activities.

Seafaring is a skill which requires knowledge on a number of different levels.[52] It requires spatial and temporal awareness; cognitive understanding of land, seascape and the perception of surroundings is vital, especially when traversing open water or when visibility is bad. A land journey can be broken up into phases and days, but in open sea crossings, where there is no island to make a stopover, then seafaring is an immediate, uncompromising and dynamic venture. Success depends on careful planning, nutrition, the crew's skills and knowledge, and a keen awareness of all the mortally dangerous risks involved. A leader and master navigator, who may have been in charge of the voyage, would need close collaboration with the rest of the crew.

Pimenta lists a number of possible non-instrumental navigator's skill sets, which include, among other things, steering by the stars, keeping course by the Sun, ocean swells, and the wind.[53] Birds' flying patterns, cloud formation, drifting objects and changes in water coloration could serve as other non-instrumental tools when sailing out of sight of land. The moon, tides, ocean currents and methods of keeping track of time—calendars and seasonal markers associated with navigation—are related to the solar year and were directly or indirectly derived from the sun's annual motion.[54] Pimenta further maintains that different societies in different

[50] Leighton, *Sicily*.
[51] Farr, 'Colonization', p. 183.
[52] Farr, 'Seafaring', p. 92.
[53] Pimenta, 'Navigation'.
[54] Pimenta, 'Navigation'.

parts of the world, on land or at sea, developed different orientation systems, equally successful with or without material maps.[55] Especially in non-literate civilisations, transference of knowledge from one generation to another played a key role in all social organizations, either related to land, sea or skyscapes.

Obviously in a much later civilisation, the Vikings' transmission of natural sea navigation methods was essential oral knowledge passed down from father to son. The Vikings brought caged birds with them on open sea crossings. Whenever they lost direction or sight of land, they let the birds free as they would instinctively fly to the nearest land or Islandscape. Apparently the Vikings did not use the compass, wind-vanes or any other instruments; however the use of celestial bodies and knowledge of crude astronomic orientation for deep-sea navigation do seem to have been part of their way-finding at sea.[56] However rudimentary, barbarian or illiterate the Vikings may have been, their natural navigational abilities may go back to prehistoric sea crossing periods.

The importance of having conducted pioneering sea voyages, experienced new land and people, and bringing back valuable goods and merchandise with lives at stake may have given travellers higher social importance and ranking than others in their community. Farr poses the correct question to which we do not know the answer: 'would these people have gained increased status within their village?'[57] This kind of social segmentation and classification does not fit well into the traditional view of a Neolithic social narrative which seems to be based on non-stratified, agricultural groups.[58] Nevertheless, this issue will be elaborated upon in the next section: namely, that the motivating factor behind the construction of the unique Neolithic temples in Malta may actually have been rooted in a chiefdom society with a specific religious and/or sociological aim and driving force.[59]

[55] Pimenta, 'Navigation'.
[56] George Indruszewski and John Godal, 'Maritime Skills and Astronomic Knowledge in the Viking Age Baltic Sea', *Studia Mytholoogica Slavica* 9, no. 15–39 (2006): pp. 15–16.
[57] Farr, 'Colonization', p. 187.
[58] Farr, 'Colonization'.
[59] Colin Renfrew, *Before Civilization: The Radiocarbon Revolution and Prehistoric Europe* (London: Pimlico, 1973), p. 170.

4. Colonization of the Maltese Islandscape

According to Trump, attempts to establish that an island settlement took place prior to 5000 BCE are pure guesswork, although he maintains that people were sailing and trading in the Mediterranean by 8000 BCE, well before farming was introduced to the area; therefore, earlier colonisation of Malta 'was by no means impossible'.[60] As Reuben Grima says, 'The story of discovery, exploitation and settlement of the small islands (referring to the Maltese Islandscape) by humans is impossible to separate from that of the exploration, and to some extent the mastery, of the seas around them'.[61] Unlike Pantelleria and Lampedusa, which are not visible from any mainland whatsoever, Malta and Gozo are among the most remote islands in the Mediterranean which, while not directly visible from any mainland, on clear days, Sicily's Mount Etna can just about be seen on the horizon from Malta; also, in theory, both islands are inter-visible.[62] The distance between Sicily and Malta is about 50 nautical miles, but in a real sea voyage this could extend to over 70 nautical miles.[63] Observations made from the Sicilian southern coastlines over a longer period of time with optimal atmospheric conditions, together with meteorological circumstances such as orographic cloud formations of the Maltese Archipelago, could have given the early Neolithic observer a considerable amount of knowledge about the possible existence and position of an island.[64]

An elevated point of the Hyblaean hills in the southeast of Sicily, which rises to over 300m within 10km of the sea, has a visibility of more than 50km out to sea and could serve as a detecting area for identifying the Maltese Islandscape. Grima concludes that careful observation in Sicily could, in principle, detect the Maltese Islandscape without putting to sea.[65] The Maltese islands are lost from sight at sea level less than 50km north of Gozo and the Rabat-Dingli uplands, rising to 250m, are theoretically visible up to about 60km away from the sea; however for a navigator crossing from Sicily it would only come into view after the north of Gozo,

[60] Trump, *Malta*, pp. 23–24.
[61] Reuben Grima, 'The Prehistoric Islandscape', in *The Maritime History of Malta: The First Millennia*, ed. Charles Cini and Jonathan Borg (Malta: Salesians of Don Bosco and Heritage Malta, 2011), p. 11.
[62] Ventura. Personal communication, 2 September 2013.
[63] John Cox, 'The Orientations of Prehistoric Temples in Malta and Gozo', *Archaeoastronomy* 16 (2001): p. 35.
[64] Grima, 'Islandscape', p. 14.
[65] Grima, 'Islandscape', p. 15.

indicating Gozo as the most likely navigational way-point, a position it has retained in modern times for seafarers coming from the north.[66]

As Pantelleria and Lampedusa were colonized contemporaneously, if not slightly before Malta, it seems plausible that Neolithic Sicilians also mastered navigational expertise for crossings between Sicily and Malta, rather than depending purely on visibility. Archaeological evidence such as flint, obsidian and Stentinello-type pottery indicate direct sea crossings between Pantelleria, Lampedusa, Malta and Sicily, implying a network of exchanging goods and trade during the Neolithic.[67]

Some prehistoric peoples' possible navigational skill sets were mentioned previously. In the case of using astronomy for sea crossings from Sicily to Malta, John Cox suggests the first-magnitude star, Fomalhaut, as an attractive candidate; it passed through south at about midnight in the middle of June in the Temple Period and that the summer may be the height of the sailing season (Fig. 1).[68]

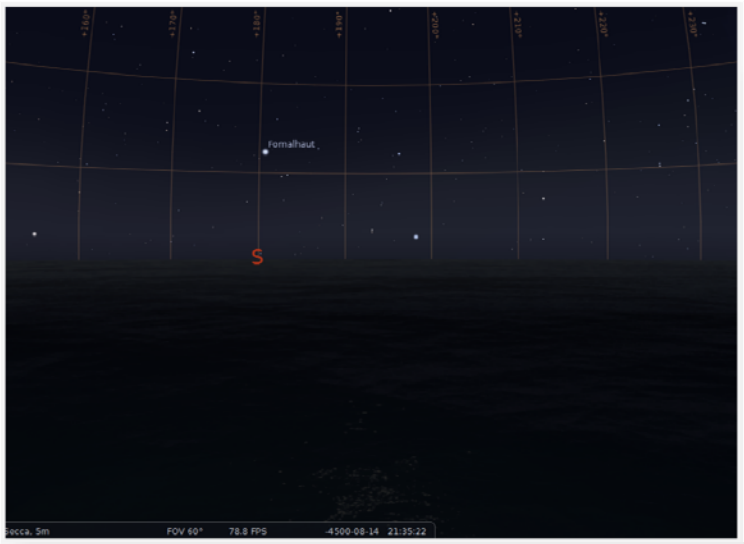

Fig. 1. Sky map seen from Santa Croce on the southeast shore of Sicily looking south on 14 August at 21:35, 4,500 BCE where Fomalhaut is clearly seen at about 180° south. Map, T. Lomsdalen.

[66] Grima, 'Islandscape', p. 16.
[67] Leighton, *Sicily*, p. 74; Grima, 'Islandscape', p. 13.
[68] Cox, 'Orientations', p. 33.

Figure 2 shows that, by sailing due south (azimuth 180°) from Santa Croce on the southeast shore of Sicily, the sea vessel will inevitably hit the Maltese Archipelago. Current, wind and weather conditions off the Sicilian Channel may have created considerable difficulty in keeping a small boat which was either rowed or sailed on a steady course.[69] During the day, to find the cardinal direction of south, the sun at midday may have given the sailors an indication.[70] Mental maps of a sequence of memorised images or a chain of events could be recollected; to be orientated within an external coordinate, it is necessary to create a logical form of spatial knowledge so that perceptual information and images can be matched with it.[71] In the case of navigation this includes not only knowledge of landscape and seascape, currents, prevailing winds and wave formations, but also of lunar cycles, star courses and navigational lore to enable speed, drift and heading to be reckoned. As Farr concludes 'It is no wonder therefore that seafaring has been described as a specialist occupation'.[72]

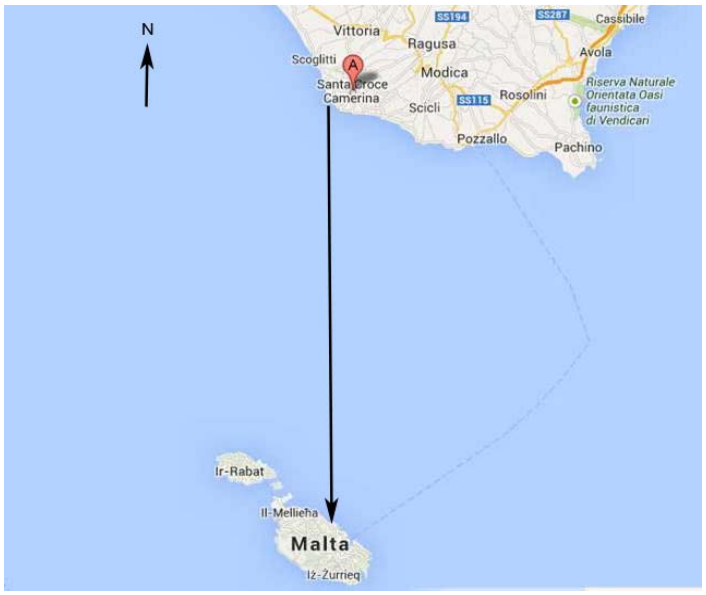

Fig. 2. Possible sailing direction from Sicily to Malta.

[69] Cox, 'Orientations', pp. 33–36.
[70] Pimenta, 'Navigation'; Farr, 'Seafaring', p. 92.
[71] Farr, 'Seafaring', p. 93.
[72] Farr, 'Seafaring'.

According to Simon Stoddart et al., current archaeological evidence suggests that early Maltese immigrants arrived from the north and colonised a previously unoccupied archipelago; in fact, the colonization of Malta and Gozo could have been seasonal in its occurrence.[73] John Robb suggests that the passage from Sicily to Malta under Neolithic navigational conditions, either rowing or sailing small boats or canoes, would be feasible in one to three days.[74] Robb's suggestion was, in fact, proved valid by Patrick Brydone's trip in 1780; with two companions, three servants and several hired boatmen, he sailed from Sicily to Malta in a small, oar-propelled boat.[75] At a little after 9:00pm the boat embarked from Sicily, at about 2:00am discovered the island of Malta and, in less than three hours more, reached the city of Valletta. This experimental sea voyage demonstrated that one can row and sail a small oar-propelled craft from Sicily to Malta in less than 24 hours. Unfortunately, Brydone does not mention what kind of navigational system was used for the crossing.

Another experiment in physical inter-visibility between Gozo and Sicily was carried out between July and September 1900 by the Regia Commissione Geodetica Italiana under the direction of the engineer Federico Guarducci.[76] Light signals were sent by means of a lamp from Gozo to the three stations in Sicily; the reply, also by means of light signals, was received from the three stations in Sicily. It is recorded that the signal from Etna, the farthest station, was as bright as a third magnitude star. The calculations gave the distances between the stations and the longitude of Malta was determined from the connection by means of triangulation with Castanea. According to Frank Ventura headlights from cars and streetlamps can be seen on Sicily from Gozo under the right atmospheric conditions.[77] Based on this experiment and observation, the theory that Neolithic peoples may have used bonfires as a navigational aid is plausible, if impossible to prove.

The early immigrants would have maintained close contact with Sicily and beyond as certain raw materials, such as obsidian and ochre which do

[73] Simon Stoddart et al., 'Cult in an Island Society: Prehistoric Malta in the Tarxien Period', *Cambridge Archaeological Journal* 3, no. 1 (1993): p. 6.
[74] John Robb, 'Island Identities: Ritual, Travel and the Creation of Difference in Neolithic Malta', *European Journal of Archaeology* 4, no. 2 (2001): p. 187.
[75] Patrick Brydone, *A Tour through Sicily and Malta: In a Series of Letters to William Beckford* (1806; repr. London: Forgotten Books, 2012), pp. 177–79.
[76] Frank Ventura, *L-Astronomija F'malta* (Malta: Pin, 2002), p. 177. Translated from Maltese to English by Ventura.
[77] Ventura, *Visibility*.

not occur naturally on Malta, are found in the Early Neolithic records.[78] As for Maltese exports, no recognisable objects have yet been identified elsewhere.[79] Robb argues that Malta may have been a sort of trade cul-de-sac, a terminal point in a chain of circulation and re-working of art and ceremonial objects that resulted in a continual importation of primary goods.[80] When it comes to the red ochre which was frequently used in Neolithic burial practices, recent research reveals a high quantity of red ochre on Malta from the Temple Period.[81]

The question of what the Maltese Islandscape could offer the first settlers and why it was selected for immigration will not be extensively discussed in this paper. However, as already mentioned, rivalry and wars between chiefdom territories in Sicily could be a plausible cause. Exploration of new territories could be another, even if, according to Stoddart et al., Malta and Gozo had little to offer (compared to Sicily) but isolation and poverty of resources.[82] The topographic characteristics would have been no different in prehistory than today; thus, in the period of the first colonisation settlers were presented with an open landscape with little forest.[83] Nevertheless, the island may have been somewhat better covered with soil, offering more abundant natural vegetation than at present.[84] Due to the fragile terrestrial environment and lack of natural resources, this may have prevented colonisation of the Islandscape before the development of a full agriculture and domesticated animal husbandry.[85] If Malta were at all to have received immigration by the Neolithic hunter-gatherers, the transition period to sedentarism and agriculture would most likely have been very short, due to the lack of wildlife for hunting. Domestic animals for breeding were all imported from overseas, most probably Sicily.

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[78] Robb, 'Identities', p. 187.
[79] J. D. Evans, 'Island Archaeology in the Mediterranean: Problems and Opportunities', *World Archaeology* 9, no. 1 (1977): p. 20.
[80] Robb, 'Identities', p. 188.
[81] Nicola A. Montalto et al., 'The Provenancing of Ochres from the Neolithic Temple Period in Malta', *Journal of Archaeological Science* 30, no. 1–9 (2012).
[82] Stoddart et al., 'Cult', p. 5.
[83] Reuben Grima, 'Landscape, Territories, and the Life-Histories of Monuments in Temple Period Malta', *Journal of Mediterranean Archeology* 21, no. 1 (2008): p. 40.
[84] John D. Evans, *The Prehistoric Antiquities of the Maltese Islands: A Survey* (London: The Athlone Press University of London, 1971), p. 3.
[85] Stoddart et al., 'Cult', p. 5.

5. Temple Period Maltese Cosmology

Today's cosmologists ask the same questions that people have asked for thousands of years.[86] Among those are questions involving the sky. Nicholas Campion links cosmology with astronomy when he suggests that 'the sky is an essential part of human existence. Landscapes do not exist without skyscapes'.[87] Human behaviour may be guided by the belief that life on earth is an imitation of celestial events, and temples are often considered a microcosm of the universe which incarnate and express cosmological beliefs.[88] The recognition of the cyclicality of celestial movements and the deliberate marking of them makes ancient astronomies observable in the ethnographic and archaeological record.

5.1. Land and Seascape

According to Grima the location of the temples in Malta and Gozo, which were often built on south-facing slopes, appears to have been important to their builders.[89] A relationship to the sea seems to prevail, with a marked preference for locations with maritime connectivity, suggesting that the temples might have been a ceremonial gateway between land, sea and the outside world. This may well have been the framework of an islander's cosmology; Grima defines cosmology as the totality of a belief system.[90]

Stoddart et al. propose the possibility that the Maltese temples were orientated northwest towards Islandscapes of ancestral origins like Sicily, and towards Pantelleria and Lipari as sources of exotic products brought into Malta. However, he does not exclude an alternative interpretation of orientations based on the idea that priests inside the temples may have elaborated a protective and exclusive astronomical lore derived from

[86] J. McKim Malville, *A Guide to Prehistoric Astronomy in the Southwest* (Boulder, CO: Johnson Books, 2008), p. 3.
[87] Nick Campion, 'Locating Archaeoastronomy within Academia', in *Skyscapes: The Role and Importance of the Sky in Archaeology*, ed. F. Silva and N. Campion (Oxford: Oxbow Books, 2015), pp. 59–75.
[88] David H. Kelly and Eugene F. Milone, *Exploring Ancient Skies: An Encyclopedic Survey of Archaeoastronomy* (New York: Springer, 2005), p. 2.
[89] Reuben Grima, 'Landscape and Ritual in Late Neolithic Malta', in *Cult in Context: Reconsidering Ritual in Archaeology*, ed. David A. Barrowclough and Caroline Malone (Oxford: Oxbow Books, 2007), pp. 36–40.
[90] Tore Lomsdalen, 'Is There Evidences of Intentionality of Sky Involvement in the Prehistoric Megalithic Sites of Mnajdra in Malta?', Appendix II.

observations (being southeast) over the shoulders of their congregations who were outside.[91]

Malone maintains that in many cases the temple entrances face a specific direction–usually towards the southeast, south or southwest—and 'that orientation (polarity) clearly makes reference to the celestial world as well as the local topography'.[92]

Grima asserts that 'the specific contexts of an island environment, the ever-present elements of daily experiences are land, sea, and sky', and that travelling in an archipelago environment involves constant interplay with land and sea.[93] Features such as 'valley, river, mountain', as a part of a specific landscape, may be codified into a cosmological scheme. Placing ritual centres such as the prehistoric Maltese temples, with a specific relationship to elements in the topography, positions them in a cosmological scheme of universal significance.[94] Images related to a maritime environment are often located around the courtyards within the temples, while iconography reflecting a terrestrial environment is located within certain temple apses; this suggests a cosmological domain of land and sea, as Grima concludes 'perhaps the two most inevitable components of an islander's cosmology'.[95] Ethnographic evidence suggests that interaction with cosmological representation is not a passive sensory experience of a perceived reality, but an active implementation in the creation of order and meaning in experience and perception.[96]

The figurative representation of Maltese Temple Period art invites interpretations of beliefs, myth, ritual practice, style and experience. There are different anthropomorphs mainly symbolising human figures, warm-blooded domestic zoomorphs, and monstrous 'other world' creatures, partly real and partly imaginary; some may represent metaphors of life, death and other worlds, perhaps worlds within worlds. Malone concludes that 'they imply a multi-facetted and many-layered cosmological experience', such as underworlds and cold contrasted with sky/heavens and

[91] Stoddart et al., 'Cult', pp. 16–17.
[92] Caroline Malone, 'Metaphor and Maltese Art: Explorations in the Temple Period', *Journal of Mediterranean Archaeology* 21, no. 1 (2008): p. 88.
[93] Reuben Grima, 'Monuments in Search of a Landscape: The Landscape Context of Monumentality in Late Neolithic Malta' (PhD Thesis, University College London, 2005), p. 247.
[94] Grima, 'Landscape', p. 248.
[95] Grima, 'Landscape', p. 249.
[96] Grima, 'Landscape'.

warmth.[97] Animal representations, wild and domesticated, imaginary or actual, furred, feathered, cold- or warm-blooded, inhabit different layers of a potential cosmos: below the ground, in the sea, on land and in the sky/heaven, implying an integrated cosmological belief system.[98]

Malta is still a major stopover for seasonally migrating birds.[99] Bird representations, factual or imaginary, are universally identified with flight, especially with spiritual flight and shamanistic trance, taking people through various cosmic levels, making all the cosmos accessible through the art of transformation.[100] Another group represented in Temple Period art are cold-blooded creatures such as fish, snails, lizards and snakes, which traditionally represent the underworld or the sea.[101] These creatures move between levels of a tiered cosmos and may represent both death and revivification as lizards are associated with sun-seeking and snakes shedding their skins represent a transformation process, mediating between physical and spiritual worlds.[102] Malone suggests that Maltese Temple Period art implies a many-layered cosmos, each layer inhabited by different species/characters.[103] According to Robb, the Maltese temples stood at the conjunction of two systems of cosmological distinctions, 'mediating the above-ground living world and the below-ground ancestral world'.[104] Within this cosmology the distinction between Maltese and 'other' would have occurred through the experience of both temple ritual and overseas travel. The temples may have dominated Maltese cosmological geography and their rise may have involved the construction of a new cosmological value system linked to geographical knowledge and the evolution of a new Islandscape identity based on cosmology.[105] As Mircea Eliade states, stone *is*, always remains itself and strikes man with

[97] Malone, 'Metaphor', p. 92.
[98] Malone, 'Metaphor', p. 97.
[99] Malone, 'Metaphor', p. 100.
[100] David Lewis-Williams and David Pearce, *Inside the Neolithic Mind: Consciousness, Cosmos and the Real of the Gods* (London: Thames & Hudson, 2005), p. 67.
[101] Malone, 'Metaphor', p. 100.
[102] Lewis-Williams and Pearce, *Neolithic Mind*, pp. 191–92.
[103] Malone, 'Metaphor', p. 105.
[104] Robb, 'Identities', p. 191.
[105] Robb, 'Identities', p. 192.

what is possessed of irreducibility and absoluteness, revealing to man the nature of an absolute existence, beyond time, invulnerable to change.[106]

5.2. Skyscape

The discipline of archaeoastronomy often mingles with the study of prehistory. Clive Ruggles defines archaeoastronomy as 'the study of human perceptions and actions relating to the sky', whereas Kim Malville emphasises that the challenge is to understand the ancient sky watchers and to be able to see the heavens through their eyes.[107] Stanislaw Iwaniszewski suggests 'celestial bodies and phenomena were mentioned in myths and songs, depicted in art, and manipulated as meaningful symbols in rituals and beliefs'.[108]

In the previous discussion temple locations were mainly viewed in relation to Islandscape topography and cosmological influences associated with land and seascape. Mario Vassallo, on the other hand, addressed temple locations cosmologically by observing the relationship between sunrise and sunset positions with the topography of the horizon. He concluded that at sixteen out of twenty-four temple sites the winter solstice sun rises at the foot of the first hill to the south of the temple; at five others the sun rises at the point where land and sea meet.[109] Through this study Vassallo implies a universal incorporation of a three-dimensional cosmology into the architectural layout and constructional intentions of the temples, namely land, sea, and skyscapes.

There are substantial indications that prehistoric societies' awareness of astronomical phenomena influenced human behaviour. The first hypothesis of a possible relationship between temples and skyscapes came from J. G. Vance, who published his theories in 1842, especially regarding Hagar Qim, but also referring to Mnajdra.[110] Vance suggests that the high north-

[106] Mircea Eliade, *The Sacred and the Profane: The Nature of Religion* (Orlando: Harcourt, Inc., 1959), pp. 155–56.
[107] Clive Ruggles, 'Heavenly Power in Worldly Hands: Ancient Sky Perceptions and Social Control', in *Public Lecture* (Gilching, Germany: European Society for Astronomy in Culture [SEAC], 2010); Malville, *Prehistoric*, p. 3.
[108] Stanislaw Iwaniszewski, 'The Sky as a Social Field', in *Archaeoastronomy and Ethnoastronomy: Building Bridges between Cultures*, ed. Clive L. N. Ruggles (Lima, Peru: Cambridge University Press, 2011).
[109] Mario Vassallo, 'The Location of the Maltese Neolithic Temple Sites', *Sunday Times*, 26 August 2007, pp. 44–46.
[110] J. G. Vance, 'Description of an Ancient Temple near Crendi, Malta', *Archaeologia* 29 (1842): pp. 231–33.

eastern vertical pillar at Hagar Qim was raised for the purpose of tracing with greater accuracy the motions of different planets.[111] Vance further claims that the temple was never roofed, as the compound was an ideal spot for worshipping the heavenly bodies and paying 'homage to the sun, moon and stars, to dedicate separate temples to each of the two great luminaries, of a like form and contiguous'.[112] By these statements, Vance not only implies an astronomical but also a cosmological connotation to the temples; he further states that decorated slabs next to an altar in Hagar Qim were 'designed to symbolize either the sun or the moon, as being the two great causes of nutrition and generation, or the whole globe of the earth in its widest extent'.[113]

Zammit related the temples to astronomy when, in 1929, he suggested that the pits dug out of a horizontally positioned slab at the entrance to the Tarxien Temple represented an image of the stars of Crux (Southern Cross), a constellation clearly visible from Malta in that period.[114] Luigi Ugolini also indicated, in 1934, a possible relationship between the orientations of the temples and celestial bodies.[115] He also suggests that the Tal-Qadi Stone demonstrates a possible Neolithic 'la astra astrologica', assumingly meaning a piece, sheet, slab, or chart with astronomical or astrological symbolism.[116] From then until 1975 little or nothing happened on the archaeoastronomy front until Gerald Formosa discovered and photographically documented summer solstice sunrise and sunset alignments at Hagar Qim.[117] In the 1980s and 1990s Agius and Ventura analysed possible astronomical alignments of the Maltese temples and measured the central axis orientations of twenty-four temples on Malta and Gozo with a theodolite.[118] Their findings conclude 'it is clear that they are highly non-random', as they were all within less than a quadrant of arc,

[111] Vance, 'Description of an Ancient Temple near Crendi, Malta', p. 231.
[112] Vance, 'Description of an Ancient Temple near Crendi, Malta', pp.232–33.
[113] Vance, 'Description of an Ancient Temple near Crendi, Malta', pp. 233–34.
[114] Themistocles Zammit, *The Neolithic Temples of Hal-Tarxien—Malta: A Short Description of the Monuments with Plan and Illustrations*, 3rd ed. (Valletta: Empire Press, 1929), p. 13.
[115] Luigi M. Ugolini, *Malta:Origini Della Civilta Mediterranea* (Malta: La Libreria dello Stato, 1934), p. 128.
[116] Ugolini, *Malta*, p. 138.
[117] Gerald J. Formosa, *The Megalithic Monuments of Malta* (Vancouver, Canada: Skorba, 1975), pp. 17–21.
[118] George Agius and Frank Ventura, *Investigation into the Possible Astronomical Alignments of the Copper Age Temples in Malta* (Malta: University Press, 1980).

from Ggantija South, with 125.5° to Mnajdra East with 204°, giving a measure of 78.8° of arc.[119]

In 1990 Paul Micallef published a booklet concluding with clear indications that the Mnajdra South Temple is the only solar temple in the Maltese islands.[120] Richard England suggests that the temple builders' interest in cyclic time through sunrise and sunset not only provided a seasonal timing pattern or marker system to orient the layout and position of the temple structures, but also represented celestial archetypes, providing the bridge between mundane time and cosmic time.[121] England further states 'the group ritual force which generated the building forms of Hagar Qim, Mnajdra, and other such sites was born from the belief and conviction that the universe does not function in isolated patterns, but as a whole totally related to the essence of the *cosmos* itself'.[122]

6. Discussion

Aside from the engaging questions of how and why the Neolithic seafarers arrived at an Islandscape, an even more intriguing point of discussion is how they, in the first instance, discovered remote and out-of-sight Islandscapes, such as Pantelleria and Lampedusa. These two islands have the lowest T/D ratio of any Mediterranean island seen from the north—from which direction all archaeological evidence maintains they have been colonised. Their discovery can be compared to finding a needle in a haystack, to use a popular expression.

The scarce research and literature done on sea crossings from Sicily to Malta may give some valuable indications; however, as far as I am aware, little or no research has ever been done regarding Pantelleria and Lampedusa. This might be due to the immense lack of obtainable archaeological, ethno-, and anthropological evidence on the question at hand. The hypothetical criteria prevails too strongly or, to say it pertinently, we have no idea whatsoever! Hopefully, the future will provide us some more indications!

Regarding the hypothetical issues of Lampedusa and Pantelleria, they may have been discovered by pure chance as seafarers lost their way

[119] Giorgia Fodera Serio et al., 'The Orientations of the Temples of Malta', *Journal for the History of Astronomy* 23 (1992): pp. 116–17.
[120] Paul I. Micallef, *Mnajdra Prehistoric Temple: A Calendar in Stone* (Malta: Union Print, 1990), p. 41.
[121] Richard England, 'A Space-Time Generalogy', in *Malta before History*, ed. Daniel Cilia (Malta: Miranda Publishers, 2004), p. 412.
[122] Formosa, *Megalithic*, p. 12.

travelling around the central Mediterranean basin, or on their way to/from Europe and Africa. Even so, it is quite impressive that prehistoric peoples placed it on a cognitive map and travelled back to it a second time.

The Neolithic people's possible navigational skill sets have been previously described. In addition, could prehistoric societies have had a cognitive perception of natural elements that moderns lack? Could they challenge and understand basic forces of nature, elements of places in which modern human beings' mental sophistication and Cartesian worldview would not survive? Have we, as a race, lost the ability and capability to attune to and live with the natural forces of the world? Is this a plausible explanation for how prehistoric and aboriginal societies explored worlds that most modern human beings would not even dare to consider, nor even survive under the same conditions? Obviously, there is no straight answer to these questions. The same goes for why and how humans crossed the Mediterranean Sea more than 10,000–12,000 years ago.

As a star moves with an apparent speed from east to west at about 10° an hour as seen from earth, it is plausible that sea-navigating star-gazers developed considerable observational knowledge of the rising and setting of stars and star groups over the night sky for certain periods of the year, especially during the major sailing seasons. By following the movements of the sun over a certain period of time, one will notice two periods in a calendar year where days and nights are equally long and the sun rises and sets on exactly the same point; in modern terms these are the spring and autumn equinoxes. These are times of the year when, by using the most basic sundial there is—a *gnomon* or a vertical stick—one can establish the four Cardinal directions: east, west, south and north. This and the stars were used to navigate in the African desert by the nomadic cattle herders at Nabta Playa (6100–5500 BCE).[123] Is it plausible that seafarers of that era may have used similar tools for finding their way on the open sea?

When it comes to prehistoric Maltese cosmology there are many indications that the Neolithic temple builders seem to have applied a certain intentionality in the topology of their sacred temple sites which represented a multi-level cosmology with land, sea, and skyscapes.[124] There are several indications that Neolithic Maltese communities had, and

[123] J. McKim Malville et al., 'Astronomy of Nabta Playa', in *African Cultural Astronomy—Current Archaeoastronomy and Etnoastronomy Research in Africa*, ed. J. Holbrook (Springer, 2008).
[124] Grima, 'Landscape', pp. 246–52.

possibly were inspired by, a cosmic awareness related to the movements of celestial bodies, stars, and star groups, especially the Pleiades with its heliacal rising due east during the Spring.[125] The Pleiades have been universally recognized as having been used by various ancient cultures the world over to mark the passage of time and the seasons of the year.[126]

Based on this theory, it can be argued that taking only land- and seascapes into consideration to represent the totality of Maltese prehistoric cosmology reduces cosmology to a two-dimensional representation of its totality; to say it more directly, to talk about Maltese cosmology without some relation to skyscape causes the term *cosmology* to lose significance as a totality of a belief or universal system, cognitive or spiritual.

Based on the research by Ventura et al. which found, in 1981, an apparent man-made posthole which aligned the Mnajdra South Temple to the winter solstitial sunrise, I took a photo from Mnajdra showing that the sunrise on the winter solstice clearly covers the three cosmological elements—land, sea, and skyscapes—arguably the three main components of an islander's cosmology (Figs. 3 and 4).

Elsewhere I have addressed the hypothesis of astronomical intentionality behind temple constructions and, in particular, the Mnajdra Temple, and concluded: 'The prehistoric temple builders' astronomical purposes or intentionality cannot be verified as there is no written documentation to support such an assumption. Therefore, all evidence is circumstantial, but should not be dismissed merely because it is difficult to quantify'.[127] However, based on research by Ventura et al., Vassallo and others as previously mentioned, there are both quantified and qualified indices that the temples have an orientation and alignments to celestial bodies based on their architecture, constructional layout and location. Further, in my own research on the Mnajdra Temple, only in the South Temple, I found no less than twelve potential alignments towards the rising sun at the Equinoxes and the Solstices.[128] A common and valid argument related to alignments and orientation is: 'it is not difficult to find one if one looks for it'. At Mnajdra, nevertheless, I argue that there are consistent

[125] Frank Ventura et al., 'Possible Tally Stones at Mnajdra, Malta', *JHA* 24 (1993).
[126] Anthony Aveni, *People and the Sky: Our Ancestors and the Cosmos* (London: Thames & Hudson, 2008), p. 10; D. R. Dicks, *Early Greek Astronomy to Aristotle* (Ithaca, NY: Cornell University Press, 1970), p. 10.
[127] Lomsdalen, 'Intentionality', Ch. 7. Conclusion.
[128] Lomsdalen, *Sky and Purpose in Prehistoric Malta*.

astronomical alignments towards the rising of the sun at specific times of a solar year, throughout its millennia-spanning construction period.[129]

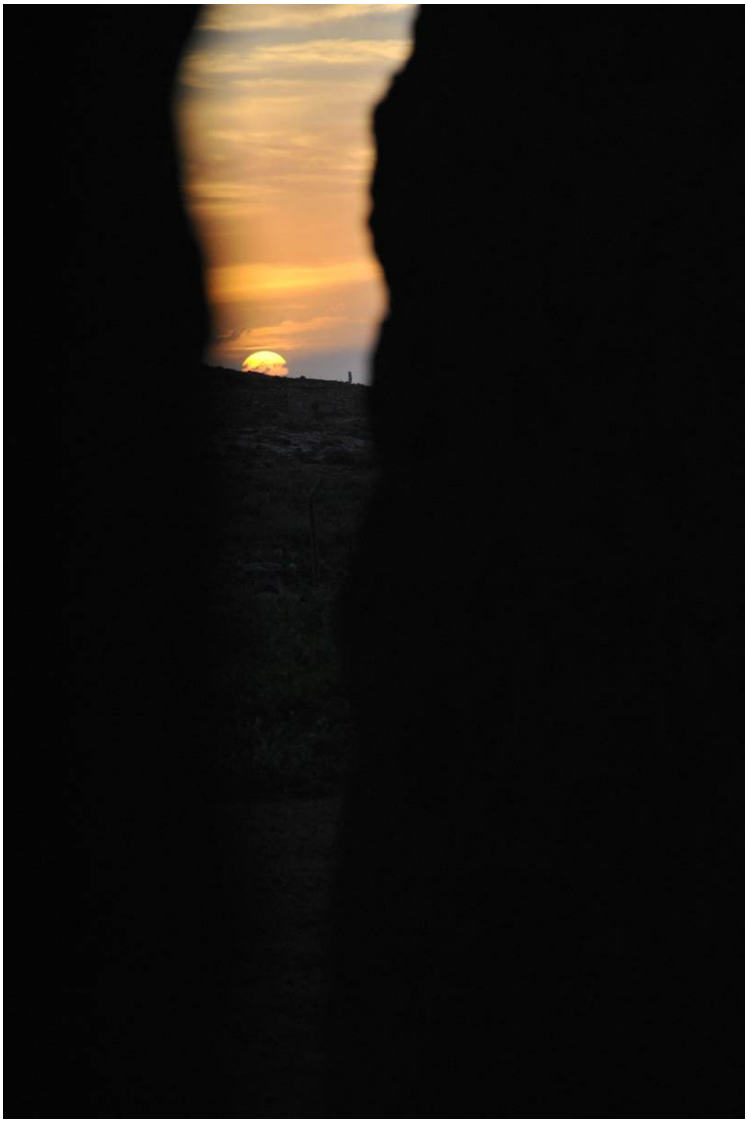

Fig. 3. Above the winter solstice sunrise over the posthole seen from inside Mnajdra South Temple. Photo, T. Lomsdalen.

[129] Lomsdalen, *Sky and Purpose in Prehistoric Malta*.

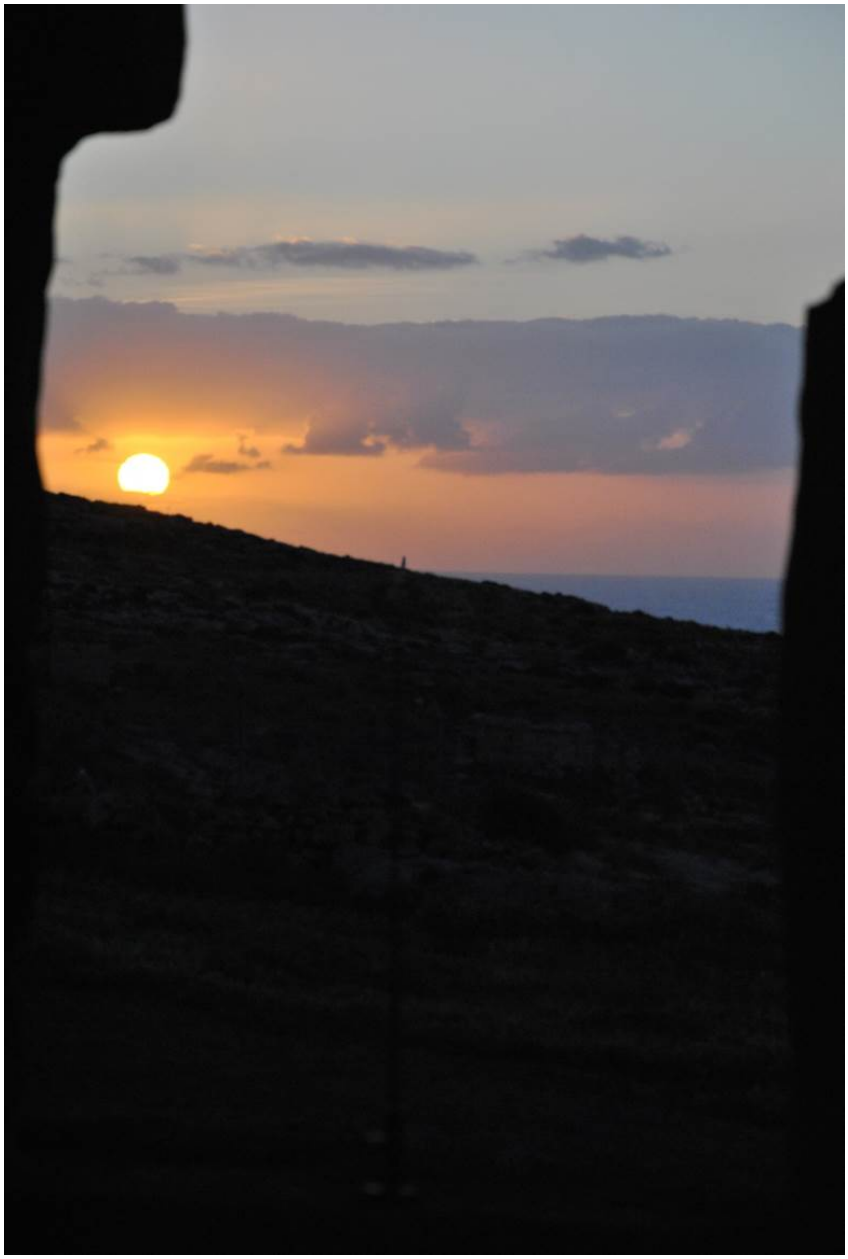

Fig. 4. The same winter solstice sunrise [as Fig. 3] seen from inside the Mnajdra Meddle Temple. Photo, T. Lomsdalen.

To include the temple alignments into a cosmological context of the Archipelago's Neolithic population poses and obvious challenge. As Grima has argued earlier, the temples are constructed with demarcated areas of land and sea representations as a part of a cosmological connotation. Malone clearly states they are temples and Stoddart argues they were used for religious rituals with the presence of a priest inside and the rising sun behind the shoulders of the congregation standing outside the temple. Based on physical layout, archaeological artefacts, astronomical observations, circumstantial evidences and various scholarly arguments, the question if the temples were an emic contribution to their builders cosmology, seems to prevail. Whether a temple cosmology was a common religion for the whole Archipelago, is an open question. However, with an estimation of about forty prehistoric temples spread throughout Malta and Gozo, it cannot be disregarded that cosmology may have been an integrated part of the population's belief system and a ritual temple practice.

7. Conclusion

Regarding the objective of this paper to examine if, and to what extent, land, sea and sky were integrated elements of a Maltese prehistoric cultural cosmology, a wide range of relevant scholarly research material and perspectives has been investigated. As outlined, three main areas were taken into consideration to reach a conclusion. Firstly, as Malta is an island and there are many questions regarding how and why this Islandscape was colonised, the wider perspective of early sea travel throughout the Mediterranean basin was discussed; discovery, colonization and seafaring to and from Malta should be seen in context of the seas around the archipelago. According to material retrieved, the first Mediterranean Islandscape discoveries, visits, and colonisations occurred around 5000 to 6000 years prior to Maltese colonisation. This implies that Mediterranean prehistoric cultures and societies already possessed considerable knowledge and ability of seafaring, long before Maltese settlement. The question of why Malta was colonised at all leaves many more open questions, as the barren Maltese Islandscape seems to have provided few natural resources needed for an increased quality of life for the first settlers.

However, with regard to the Maltese Temple Period's cosmology in context of land, sea and skyscapes, the picture looks quite different. Malone et al. are probably very close to the truth by stating 'Malta

provides one of the best documented cases of prehistoric ritual'.[130] The Maltese Temple Period elaborated a wide range of figurative art, decoration, iconography and both human and animal representation, together with sacred architecture concerned about both life and death, suggesting a spiritually and cognitively rich worldview, representative of a multi-dimensional cosmology. The temple builders' apparent awareness of celestial bodies' movements and their observations of astronomical phenomena seem to be implemented, represented, and symbolized both ichnographically and in the physical architecture of their temples and ritual structures, manifesting elements of water, earth, heaven, life and death. This may imply an extended understanding of a spiritual, holistic universe, subject to land, sea and skyscape: probably, the three most important elements in an islander's cosmology. Nevertheless, further research must be conducted in order to draw definite conclusions on the subject at hand.

[130] Caroline Malone *et al.,* 'Introduction. Cult in Context', in *Cult in Context: Reconsidering Ritual in Archaeology*, ed. David A. Barrowclough and Caroline Malone (Oxford: Oxbow Books, 2007), p. 3.