The recognition of spirituality between architecture and the sky. The case of megalithic astronomical heritage

*João Duarte Estevão Ramos**

Abstract: The duality of architecture, between its material and spiritual dimensions, reveals the symbolic nature of this human activity, which is capable of conveying messages about our condition as beings under the sky and on Earth, and about our understanding of the world. Since the dawn of our species, the contemplation of the sky has reflected a search for a spiritual connection with the cosmos. As such, this essay explores the spiritual dimension in architecture through megalithic astronomical heritage, highlighting how these structures reflect a sense of spirituality resulting from the relationship between architecture and the observation of the celestial vault, the Sun, and the Moon. In this sense, through the methodology presented, we seek to enlighten the reader on how megalithic monuments reflect spiritual and cosmological conceptions, providing a deeper understanding of the interaction between human beings, architecture, and their worldview.

Keywords: Architecture; astronomical heritage; spirituality; sky; megalith monuments

* joao.duarte.ramos@campus.ul.pt.

1. Introduction

The duality of architecture is clearly observable through the link between its material and spiritual realms, revealing its symbolic nature, which goes beyond its utilitarian function through its ability to convey meaningful messages and emotions regarding the very condition of the human being as a creature situated under the sky and on Earth.

A sense of spirituality in architecture implies the search for harmonization with an invisible order that is distinct from the physical realm of our existence in the world, leading human beings to a deeper and more comprehensive understanding of their lives and their environment. In this sense, it's not surprising that throughout history the search for a human connection with a sense of spirituality has often been expressed through the simple observation and contemplation of the sky. Since ancient times, the connection between humans and the sky has been fundamental to both the physical and spiritual aspects of our lives. The simple act of looking up at the sky not only helps human beings find their way around the land, but also gives rise to spiritual beliefs and rituals linked to architecture.

This essay seeks to explore the spiritual dimension that exists between architecture and the sky through megalithic astronomical heritage[1]. These ancient structures demonstrate humanity's desire to understand its presence and position in the vast and unknown Universe. The deliberate layout and positioning of these monuments in relation to the phenomena of the celestial vault imply a strong link between their architecture, the observation of the sky and the spiritual beliefs of primitive humans. Thus, we seek to understand how megalithic astronomical heritage can convey a sense of spirituality to human beings themselves, since we believe that these monuments fulfil a spiritual function that is essential to human understanding of the Universe – because the relationship between architecture and spirituality involves not only the search for and the delimitation of shelter, but also the desire to connect with the Sacred, with the divine and with the very enigmas of the cosmos.

[1] - It should be noted that this essay only deals with megalithic monuments, but that these are not the only historical examples of architecture through which human beings have sought to establish a spiritual connection with heaven. In fact, megalithic monuments are just one of the typologies covered in the author's PhD thesis, which encompasses five distinct groups in its entirety: 1. the megalithic monuments; 2. the pre-classical temples and necropolises of Egypt; 3. the architectures of classical Greek and Roman antiquity; 4. the other ancient and/or so-called «archaic» cultures of astronomy (native peoples and tribes of America, the Middle East and India); and 5. the basilicas, cathedrals and churches with meridians.

To achieve this goal, the methodology employed in this essay is based on a multidisciplinary approach that uses methods such as theoretical analysis, literature review and the interpretation of historical evidence related to the megalithic astronomical heritage.

2. Spirituality and the duality of art and architecture

But what do we mean by the duality of architecture? In fact, we are referring to a concept intrinsic to its practice and discipline, which goes back to the very beginning of its history. This duality refers to the fundamental correlation between spirit and matter in the creation of the architectural experience, the constant connection between the concrete and the subjective, the abstract and the tangible; this being a central issue in the theory and practice of architecture and one that is deeply rooted in philosophy, aesthetics, and human culture itself.

Actually, architecture, like all art, thrives on this dichotomy. As objects of human creation, works of art belong to the physical and material dimension of our reality. However, their main function is to be appreciated as an aesthetic object, because, as Harries states, the work of art is always equal to the sum of the thing itself and its aesthetic component – work of Art = thing [object] (material) + aesthetic component (spiritual) –; and in the case of architectural works, they are the result of the sum of the functional shelter and its aesthetic complement – «work of architecture = building + aesthetic component»[2]. As such, according to the author, we assume that a work of art, be it a painting, sculpture or other artistic expression, always understands its conception as producing two essential elements that are subtly related to each other: the object itself and its aesthetic component. The object refers to the physical and material dimension of the work, the concrete device that we can observe and touch. On the other hand, the aesthetic component is seen as the spiritual, subjective, and creative dimension of the work, which involves the artistic expression and the artist's intention. In architecture, the work presents itself as a balanced union between its practical functionality and its aesthetic expression. In other words, a work of architecture is not just a utilitarian object, but a pure manifestation or expression that seeks to harmonise the practical and functional needs of a building with its aesthetic elements, which convey a message and provoke an emotional response in the subject.

2 - K. Harries, *Transcending Aesthetics*, in J. Bermudez (ed.), *Transcending Architecture Contemporary Views On Sacred Space*, Catholic University of America Press, Washington, D.C. 2015, p. 214.

As Botton states, architecture always fulfils a dual function, as it not only serves the practical and material purposes of our reality, but also acts as a means of communication[3]. It is precisely through the very expression of architecture, its form, scale, composition of materials and layout, that buildings seem to *express themselves* and can *occasionally give us the impression that they are speaking to us about meaningful and moving things*[4]. This remarkable capacity of architecture leads us to look at architecture not just as a physical, material and utilitarian element, but as a vehicle for the symbolic expression of the human spirit; as a full form of individual, cultural and historical communication, which has the potential to impact our experience and interpretation of the world around us.

However, it will now be important to define what we mean by spirituality in order to understand how this concept is interpreted in the specific field of architectural practice and discipline. In this sense, according to Pérez-Gomez, we can see how spirituality is related to the "air", with the term *spiritus* – from the Latin term for breath, blow, breeze, air, spirit or soul, also related to the Greek term *pneuma* (πνεῦμα) – evoking an invisible dimension, personified by the breath of life or by the human breathing, which is always present in our daily experience[5]. Therefore, spirituality is not presented as something mystical, secret or obscure, but rather as something that encompasses the very availabilities and vulnerabilities that are part of human perception in a more mundane sense. Thus, a sense of spirituality refers to the awareness of the invisible dimension that permeates our existence in the world. It reflects an experience of awareness of elements that often go unnoticed, leading our Being to recognise them as having a profound and transcendent dimension. Therefore, the notion of spirituality presents itself as something more comprehensive within the reach of the individual and the community, as a state of deep relationship between the subject and their world, regardless of their religious beliefs or practices.

The aim of spirituality is to elevate the experience of the human condition to a state of inclusive wholeness through which we seek to achieve a holistic understanding of our place in the world, our subordination to our own inner Being and the experience of contact with the Sacred and the transcendent[6]. In turn, according to Tacey, spirituality presents itself as a constant search for a «sensitive, contem-

---

[3] - Cf. A. de Botton, *A Arquitectura da Felicidade*, Dom Quixote, Alfragide 2009, p. 86.

[4] - *Ibidem*.

[5] - Cf. A. Perez-Gomez, *Foreword,* in *Architecture, Culture, And Spirituality*, Routledge, London 2016, p. XVII.

[6] - Cf. T. Barrie – J. Bermudez – P. Tabb, *Introduction* to *Architecture, Culture, And Spirituality*, Routledge, London 2016, p. 5.

plative and transformative relationship with the Sacred»[7]. In addition, spirituality is understood as a reflection on the nature of our reality and as a journey of personal and inner transformation, where the search for the Sacred triggers a process of spiritual growth and development. It's not just a search for transcendent experiences, but also a path to self-knowledge and inner evolution.

3. Astronomy and the sky

For primitive human beings, the sky stood out as a singular element above their heads, constantly providing them with an orientation and perspective on the world. Today, however, in our urban culture, it is only in occasional situations, when we move away from the city and retreat to more remote and distant places that we rediscover the splendour of the firmament; we heal our «amnesia» and remember, if only for a few moments, «the power, mystery and beauty that have always been part of our interaction with the sky, and we're happy about it»[8]. It's about satisfying a need to understand our humanity and the phenomena of the world – as beings placed between the Earth and the sky –, anything else could do this job, but the sky, insofar as it repeats itself cyclically without any interference from our fellow human beings, does it in an exceptional way – one might even say «magical» –, even today[9].

> First, just by looking at the sky – by taking in its sweep, its majesty, and its mystery – we marveled, and wonder and awe we experienced made us feel a connection with the cosmos. We liked that feeling. We required it. It gave us an inkling of who we were, from where we came, and where we were going. Second, by watching the sky, keeping careful track of its rhythms and patterns, we understood relationships, scientifically and poetically. That understanding helped us feel at home in the universe. We still can't do without it.[10]

In this sense, let's realise that the relationship between human beings and the sky was established in the early days of our species through astronomy, one of humanity's oldest scientific disciplines and founded precisely on human spiritual, religious, and mythological practices. Astronomy is characterised as the scientific

---

7 - D. Tacey, *The Spirituality Revolution: The Emergence of Contemporary Spirituality*, Routledge, East Sussex 2004, p. 11.

8 - E. Krupp, *Beyond the Blue Horizon: Myths and Legends of the Sun, Moon, Stars, and Planets*, Oxford University Press, Oxford 1992, pp. 6-7.

9 - Id., *No Rasto De... As Antigas Astronomias*, Publicações Europa-América, Mem Martins 1984, p. 18.

10 - Id., *Beyond the Blue Horizon*, cit., p. 2.

study of celestial bodies and the phenomena of the sky, standing out as a science of enormous importance throughout human history since it was presented as an essential tool for human beings to mark the passage of time, define their image of the cosmos and position their existence within the Universe according to Dolan[11]. For primitive and ancient humans, the cycles of the celestial vault were presented as tools to orientate their existence in space and time, and as such, astronomy took on much more than the role of "pure" science. This discipline also adopted a fundamental Sacred component in the cosmologies, myths, and rituals of community life, and the first examples of architecture linked to the phenomena of celestial bodies were intended to establish a spiritual correlation between humans, the gods, the sky, and the Earth.

Astronomy can certainly be interpreted as a science, but it also represents a human form of spiritual quest that allows for the representation (and it will always be, as the history of astronomy attests), contemplation and exploration of the Universe and people's relationship with it. Thus, the process of acquiring scientific knowledge – the need to search, the sense of questioning and the desire for enlightenment – can manifest itself as a form of transcendence capable of transporting human consciousness to something greater than itself, and in documented cases, since time immemorial and to this day, as a form of quest that sometimes reaches the expanded dimension of a spiritual character, as something capable of providing a sense of connection with the divine and with the mysteries of the Universe.

4. The cycles of the Sun.

In this sense, let's realise that the rhythm of human life in the world accompanies the rhythm of culture itself and, in turn, that the rhythm of culture is constantly intertwined with the seasonal cycle and the cycle of the sky - and when we talk about the cycle of the sky we are immediately transported to the movements of the Sun in the celestial vault.

As we all know, the Sun (our star) constantly reveals its daily movement, *it rises approximately in the east and sets in the west, like all celestial objects*[12]. The sky above us is generally interpreted as a dome extending in all directions from the horizon, and this representation is useful for illustrating astronomical phenomena and the trajectory of celestial objects as they travel across the sky. The moment when the Sun passes precisely over the meridian line, reaching its maximum angle

11 - Cf. M. Dolan, *Decoding Astronomy in Art and Architecture*, Springer, Cham 2021, p. 5.

12 - Cf. E. Krupp, *No Rasto De... As Antigas Astronomias*, cit., p.18.

in relation to this reference point, is recognised as the local apparent "midday", which is relatively close to the midday indicated by our clocks[13]. This particular time of day indicates that the Sun has moved from the horizon line and reached its maximum elevation in the sky above the observer, before starting to move down towards the horizon again. This is one of the two most "simple" and comprehensible cycles of the celestial vault and a unit of time that we take for granted, the diurnal movement of the Sun that defines the 24 hours of our daily lives and demarcates its "rebirth" each morning and its "death" each evening.

However, there is a second apparent movement of the Sun that gives us a second unit of time. It stands to reason that just as the Sun moves in an "arc" over our heads every day, this same "arc" varies throughout the year, because *the annual solar movement defines the year, just as the diurnal movement defines the day*[14]. For an observer located on the Earth's plane, the Sun's trajectory changes position in the celestial vault due to the inclination of the Earth's axis of rotation in relation to the celestial equator (23.5º), which is called the "obliquity of the ecliptic"[15]. If we take the northern hemisphere as a reference point – and the same happens in the southern hemisphere, only the other way round – as the Earth orbits the Sun we can see that its daily position in the sky changes slowly throughout the year. As the summer solstice (the day with the most hours of sunlight in the year) approaches, the Sun moves further and further north, forming higher arcs in the sky, which tells us that the Earth's axis of rotation, on the northern hemisphere side, is aligned towards the Sun[16]. After the summer solstice, we observe daily that the Sun moves progressively southwards, forming lower arcs in the sky as the winter solstice approaches (the day with the fewest hours of sunlight in the year), which indicates that the Earth's axis of rotation, now on the southern hemisphere side, is aligned towards the Sun[17]. This is the second cycle of the celestial vault that is clear to any observer positioned on the surface of the Earth's plane, the 365 days of the Earth's translation around the Sun, the 12 months of the year, and this same cycle is re-

13 - Cf. *Ivi*, p. 19.

14 - Cf. *Ivi*, p. 22.

15 - The plane of the Earth's orbit around the Sun, or the projection of the Sun's apparent trajectory onto the celestial vault observed from the Earth, is called the "ecliptic". This plane of the ecliptic is not perpendicular to the equator but has a rounded inclination of 23.5º (the exact value of this inclination is 23.26º) which is called "obliquity", and it is precisely because of this factor that the Earth has its seasons. Cf. J. Belmonte, *Appendix* to *As Leis do Céu: Astronomia e Civilizações Antigas*, Mareantes Editores, Seville 2003, pp. 259-271.

16 - Cf. P. Alvim, *Recintos Megalíticos Do Ocidente Do Alentejo Central: Arquitectura e Paisagem Na Transição Mesolítico-Neolítico*, Universidade de Évora, Évora 2009, p. 49.

17 - Cf. *Ibidem*.

sponsible for the seasonal changes of the Earth itself, the four seasons (summer, autumn, winter, and spring). It is at the height of this cycle that the summer and winter solstices occur, taking place on 21 June and 21 December respectively, marking the moments when the Sun reaches its most extreme positions in relation to the equator. The equinoxes, the first days of spring and autumn, fall in the middle of the interval between the solstices, occurring on 21 March and 21 September, and mark the moments when the Sun reaches its medium position in relation to the equator.

Nevertheless, although history shows us that many monuments sought to harmonise and connect with the cycles of the Sun, let's bear in mind that unlike their alignment with the solstices, which are clearly marked by very apparent indications of the Sun in the celestial vault, their alignment with the equinoxes cannot be carried out using such a simple and direct observation methodology[18] – a fact that is reinforced if we take into account that the Sun is not the only celestial body that provides us with a spatial and temporal orientation, but also a calendar reference. So it's important to realise that unlike the alignment of certain monuments with the sunrise or sunset on the summer and winter solstices, their alignment for the equinoxes proves to be substantially more complex to execute by simply observing the appearance of the Sun on the horizon line[19]. This is hardly surprising, as there is another celestial object whose observation from Earth's plane gives us another way of measuring and calculating time on Earth: the Moon.

5. The cycles of the Moon

In this regard, if the Sun is the "king" of the day, we assume that the Moon is the "queen" of the night, and these two celestial bodies are responsible for the alignment of countless monuments from prehistory and antiquity, and for a set of "polarised forces" that characterise some of the most characteristic dualities of the worldviews and histories of ancient peoples throughout space and time – day and night, male and female, light and darkness, good and evil, life and death, etc. –; because a lot of ancient knowledge about the cosmic order and the passage of time depended on understanding the lunar cycle and its relationship with the events of nature. And despite the superiority we sometimes attribute to the Sun itself, according to Krupp, the Moon is a fundamental element in timekeeping due to its *rapid and obvious changes*, and is still very relevant today, serving the Is-

18 - Cf. C. Silva, *Neolithic Cosmology: The Equinox and the Spring Full Moon*, in «Journal of Cosmology», 9, 2010.

19 - Cf. P. Alvim, *Recintos Megalíticos Do Ocidente Do Alentejo Central*, cit., pp. 50-51.

lamic calendar and determining the strict calculation of the Christian Easter, to name but two of the religions in the Book[20].

The lunar year is made up of approximately 354 days, a value that can be obtained by observing the Moon's synodic period[21] (or lunation), which consists of 29 days, 12 hours, 44 minutes, and 2.8 seconds. This lunar year cycle is 11 days shorter than the 365-day solar year, which naturally means that, after a few years, the moons and seasons become out of sync, since the seasons follow the Sun and not the Moon, so this difference is counted as a whole month after two and a half years[22]. Regarding its cycle, the Moon, like the Sun, rises in the east on the horizon and moves westwards with each daily rotation of the Earth. But because the Moon moves around the Earth, it has a unique cycle that differs from the solar cycle. As Belmonte states, the movement of the Moon around the Earth is substantially more "capricious" since this natural satellite orbits *in a plane that is neither the equator nor the ecliptic*, but an inclined plane (5º in relation to the ecliptic), which makes its movements in the celestial hemisphere more complex and difficult to predict compared to the cycles of the Sun[23]. In addition, the Moon's orbit changes over a period of about 18.6 years due to the «precession of the lunar nodes»[24],which characterises the rotation of the Moon's orbit about itself[25]. As a result of this factor, the Moon, unlike the Sun, has not two, but four *lunar standstills* in this 18.6-year cycle, the *major lunastices*, with a declination of ± 28.5º (23.5º + 5º), and the *minor lunastices*, with a declination of ± 18.5º (23.5º - 5º), in both cases to the north and to the south[26].

Thus, the progression of the Moon's four phases – one of its most fascinating, if not "magical" features – is revealed to be the result of a series of changes in the Moon's appearance in the sky, resulting from the way the Moon, Earth and Sun are positioned in relation to each other as the Moon makes its orbit around the Earth. Starting with the "new moon", this is the phase in which the illuminated face of the Moon is turned to the opposite side of the Earth, making it invisible to the ob-

20 - Cf. E. Krupp, *No Rasto De... As Antigas Astronomias*, cit., p. 33.

21 - The word "synodic", from the Greek word *sunodikós* (συνοδικός) and the Latin *synodicus* refers to the conjunction of two or more celestial bodies and is also used to describe the time that passes between two consecutive full moons, which is called a "synodic" month.

22 - Cf. J. Cashford, *The Moon Myth and Image*, Octopus Publishing Group, London 2003, p. 51.

23 - J. Belmonte, *Appendix* to *As Leis do Céu,* cit., p. 262.

24 - A lunar node is one of the Moon's two orbital nodes, i.e. two imaginary points in the sky that mark the meeting between the Moon's orbit and the ecliptic. It is precisely because of this factor that the Moon has four lunations, which occur in a nodal cycle of 18.6 years. (Cf. *Ivi*, pp. 259-271).

25 - Cf. P. Alvim, *Recintos Megalíticos Do Ocidente Do Alentejo Central*, cit., p. 49.

26 - Cf. J. Belmonte, *Appendix* to *As Leis do Céu*, cit., pp. 262-263.

server for around two days[27]. After this phase of the Moon, the illuminated area becomes more and more visible as the Moon advances in its orbit, giving the sensation that its brightness is progressively increasing. Next, we have the "first quarter", also known as the "crescent", when half of the Moon is visible: a 90º angle is formed between the Moon, the Earth, and the Sun[28]. During this phase, the Moon is to the east of the Sun and for this reason its illuminated part has a westward convexity. After the "first quarter" is the "full moon", which occurs when the Moon is in opposition to the Sun, 180° apart, with its face towards the Earth fully illuminated by sunlight[29]. Following the "full moon", the second half of the lunar cycle begins, which follows a symmetrical pattern to the previous one, only in reverse, with the "third quarter" following the "full moon". The "third quarter" occurs after the "full moon", when half of the Moon is visible and a 90º angle is formed between the Moon, the Earth and the Sun, but now on the opposite side, since in this case the Moon is to the west of the Sun and its illuminated portion has its convexity directed eastwards – an illuminated portion that gradually diminishes until the return of the "new moon"[30].

6. Architectural astronomical heritage

As such, for primitive humans, the sky was used as an instrument of orientation, because before the existence of modern forms of navigation and timekeeping, societies were dependent on the rhythms and cycles of celestial bodies, making the myth and symbolism of the sky and its phenomena an essential strategy for passing on their knowledge throughout the generations[31]. In this context, the solar and lunar cycles were responsible for the way in which human beings interacted with the world, having a notable importance for their subsistence, since these cycles are of enormous importance for agriculture, while at the same time determining cultural, spiritual, and religious behaviours, such as the marking of dates or days of celebrations and festivals at astronomically significant times. According to Krupp, to ancient peoples, it must have seemed that astronomical indicators were both the cause and the symbol of the world's great forces[32]. So, it's not surprising that since the founding of the first civilisational settlements, humankind has set-

27 - Cf. E. Krupp, *No Rasto De... As Antigas Astronomias*, cit., p. 34.
28 - Cf. *Ibidem*.
29 - Cf. *Ibidem*.
30 - Cf. E. Krupp, *No Rasto De... As Antigas Astronomias*, cit., pp. 34-35.
31 - Cf. M. Dolan, *Decoding Astronomy in Art and Architecture*, cit., p. 5.
32 - Cf. E. Krupp, *No Rasto De... As Antigas Astronomias*, cit., p. 23.

tled in places suitable for observing and contemplating the sky itself, a factor that has led them to build large permanent public monuments in these same places in an attempt to establish a tangible connection with the celestial vault.

These monuments are now known as astronomical heritage and are defined as «the material evidence relating to astronomy and to social uses and representations of astronomy»; and these vestiges can assume various natures such as: I) tangible objects, monuments, places and landscapes with a connection to celestial bodies; II) movable objects, such as instruments and archives; III) intangible knowledge, such as primitive knowledge related to astronomy; and IV) natural environments that promote human interest in the phenomena of the celestial vault[33].

In turn, architectural astronomical heritage can be interpreted as the set of architectures with a clear connection to the sky and celestial bodies, as places with a tangible connection to the sky and the Earth, to space and time, with their orientation, composition, form and architectural expression clearly dependent on certain phenomena of the celestial vault, such as the movement of the Sun and Moon, the solstices and equinoxes, sidereal movements and markings, stellar references, asterisms, etc. In addition, the architectural astronomical heritage encompasses a range of typologies that are transversally marked by greater or lesser aesthetic affirmation – in the sense of «aesthesia», *aestesis* (αἴσθησις) – which is precisely what is consistent with an existential and questioning projection of the Universe in its expansive nature – and which would be said to contain a spiritual dimension from its beginnings until its gradual "scientification", starting in particular with the Enlightenment in the case of Europe and the westernization it brought about.

It is in this context that we can identify megalithic monuments as an integral typology of architectural astronomical heritage. Megalithic monuments[34] constitute a heritage of inestimable and universal value, being composed of diverse structures that can be found in different parts of the world[35]. These structures, erected thousands of years ago – from the Neolithic period to the Bronze Age and even beyond – are in some cases, more frequent than is often assumed, one of the oldest forms of human affirmation over the territory and of architecture: are a tes-

33 - Cf. M. Cotte – C. Ruggles, *Introduction* to Id. (eds), *Heritage Sites of Astronomy and Archeoastronomy in the Context of the UNESCO World Heritage Convention: A Thematic Study*, 2 voll, vol. I, International Council on Monuments and Sites – International Astronomical Union, Paris 2010, p. 2.

34 - The word "megalithic" – from the Greek word *megalíthos* (μεγαλίθος), "large stone" (*megas* = large + *lithos* = stone) – is used to describe stone block structures characterized by the organization of menhirs or groups of stones into dolmens or more complex enclosures, such as stone circles, tombs, and temples.

35 - Cf. M. Dolan, *Decoding Astronomy in Art and Architecture*, cit., pp. 34-35.

timony to the skill and technical and cultural knowledge of primitive societies. However, the main function of megalithic monuments remains somewhat intriguing to this day and has been the subject of countless studies and speculations, without ruling out the funerary/commemorative function, which is well known in certain monumental types. According to Pedro Alvim (1970-2015), in the awakening of archaeology, especially in the British Isles, the assumption that megalithic monuments were places of worship for the Sun, the Moon or celestial bodies, as calendar instruments for measuring and marking time or as symbolic representations of the planetary system, lacks scientific consent, and therefore there is no clear knowledge about the "real" functionality of these monuments[36]. However, there is now a consensus that these structures exclusively or cumulatively fulfilled two specific functions: a funerary function, and a ritual, sacral or spiritual function[37]. And in fact, what has been established is that these monuments served as places of worship for human rituals and practices.

> Settlers also began creating megalithic structures of stone and wood for living quarters, burials, and ceremonial or religious purposes. Many if not most of the earliest surviving monuments intended for ritual or spiritual usage had correlations with the heavens. Astronomy was practiced not for amassing scientific knowledge but rather as a vital part of community rituals.[38]

7. Spirituality in megalithic astronomical heritage

How can megalithic astronomical heritage convey a sense of spirituality to human beings? To answer this question, let's start by noting that many of the megalithic monuments were used as mass graves, with the stones often stacked in such a way as to create burial chambers in which the bodies of the deceased were laid to rest along with offerings and funerary goods, and it is therefore accepted that these practices reflected beliefs about the afterlife and the essentially ritual role of death in prehistoric societies. In addition, in these specific places, prehistoric communities gathered to worship deities or to perform ceremonies directly related to significant astronomical events, such as the solstices and equinoxes. In fact, the very alignments and orientations of these monuments *constitute one of the most enigmatic typologies within the megalithic phenomenon*[39].

---

36 - Cf. P. Alvim, *Recintos Megalíticos Do Ocidente Do Alentejo Central*, cit., p. 15.

37 - Cf. P. Pereira, *Arte Portuguesa: História Essencial*, Temas e Debates, Lisbon 2014, p. 30.

38 - M. Dolan, *Decoding Astronomy in Art and Architecture*, cit., p. 34.

39 - Cf. P. Pereira, *Lugares Mágicos de Portugal*, 8 voll., vol. I: *Paisagens Arcaicas*, Temas e Debates, Lisboa 2009, p. 64.

According to Pereira, based on existing studies, (Alvim; Belmonte; Bradley; Calado; Gonçalves; Hoskins; Krupp; Ruggles et. al.), the orientation of numerous megalithic funerary monuments with a corridor to the east points to a clear *importance of solar veneration* in relation to the ancestral cult of the Sun, which has a deep connection with the idea of the *rebirth of the dead*, who, after being placed in the ground under a *uterine symbolic-religious* element or device, would be reborn each morning with the rising of the Sun and the victory of light over darkness (the coming of the light and life of the day after the death and darkness of the night) [40]. This suggests that there is a deep connection between these structures and the contemplation of the sky as a joint veneration of the Universe, Humanity and their ancestors within the three planes of existence – the sky, the Earth and the underworld. Thus, the alignment of these architectures with the Sun, the Moon and other phenomena of the celestial vault are often associated with elementary or developed forms of empirical astronomy, which could have its own connection with the Sacred stories and mythologies of primitive peoples, with the cycles of nature, life and death and, in turn, with the gods and our fellow human beings; a connection which provides an essential information on the location, orientation, "centering" and identification of these monuments, while at the same time giving them an "exceptional character" that allows humans to contact the divine[41].

> The alignment could be a monumental core that is central to a territory or region. It could thus be a place of assembly that contributes to the homogeneity and unity of a human group that recognizes it as a place to perform rituals (worship/honor of stele-menhirs, ancestor cult, deposition of offerings, place of exchange with communities outside the tribe).[42]

In fact, according to Ruggles, most of the monuments incorporated alignments determined by the rising and setting of the Sun at the summer solstice, the winter solstice and the equinoxes. However, these prehistoric monuments are obviously not «"observatories"»[43]. As the author exemplifies, funerary tombs (which clearly reveal their basic and primary function) even if they were oriented by certain phenomena of the celestial bodies, were not observatories in a formal sense – if we understand that they were built primarily to facilitate astronomical observation – but they do have a clear connection with the sky, which is encapsulated in the

40 - Cf. Id., *Arte Portuguesa*, cit., p. 34.

41 - Cf. Id., *Lugares Mágicos de Portugal*, 8 voll., vol. II: *Arquitecturas Sagradas,* Temas e Debates, Lisboa 2009, p. 14.

42 - Id., *Lugares Mágicos de Portugal*, vol. I: *Paisagens Arcaicas*, cit., p. 67. (T.d.A.).

43 - C. Ruggles, *Later Prehistoric Europe*, in *Heritage Sites of Astronomy and Archeoastronomy in the Context of the UNESCO World Heritage Convention*, cit., p. 28.

monument. In this sense, it's important to understand that the astronomical alignments of megalithic monuments clearly have a cosmological, spiritual, calendrical– as they mark the passage of time and the seasonal cycles of the Earth itself –, ritual and symbolic character based on the behavior of the groups, peoples and communities that built these monumental structures. If we look at the case of Newgrange, it is clear that it is not an observatory «in any sense of the word», because within its limited capacities at the time «people did not go to the lengths of building such a huge and impressive monument just so that someone could sit inside in the dark, among the bones of the dead, waiting to find out if the shortest day of the year had arrived»[44]. What is clear is that the astronomical alignment of Newgrange expresses and communicates to us that in the consciousness of a community more than five thousand years old there was a clear, profound and highly important connection, on the one hand, between the Sun and the seasonal cycles, and on the other, between the Sun and the passage of time, providing us with vital information for understanding the way in which primitive prehistoric peoples understood and inhabited the cosmos[45].

> The architecture of public monuments, great and small, can give the archaeologist important clues about the worldviews of those who built them. One reason is that their designs may reflect the perceived cosmos, revealing associations that existed in the minds of the builders, just as the solar alignment at the passage tomb of Newgrange in Ireland reveals a perceived connection between the Sun and the ancestors.[46]

Megalithic monuments helped to reinforce the order of things in the world, leaving an indelible mark on the landscape, which inevitably influenced the worldviews of future communities[47]. In this way, the architectural features of megalithic monuments can provide us today with significant knowledge about the symbolic and cosmological importance that a civilization attributed to the natural and built elements that made up its world and the terrestrial and celestial landscape itself. The creation and planning of megalithic monuments often encapsulated a more general – one might even say holistic – vision of the space that defined the ancient world, which was inevitably shaped both by the Earth's topography and geography but also by a sense of spirituality – one could even speak of a spirituality of the

---

44 - Cf. *Ivi*, p. 34.

45 - *Ibidem*.

46 - Id., *Ancient Astronomy: An Encyclopedia of Cosmologies and Myth*, ABC-Clio, Santa Barbara 2005, p. 271

47 - Cf. *Ibidem*.

Earth – which was expressed spatially through the mythologies, rituals and cults of the civilizations of early humans[48].

In fact, after this clarification, it will be possible to identify countless millenary structures that fulfilled their primary function – funerary, spiritual or cultural – and that exercised, in parallel with it, a tangible connection with the sky – ranging from the megaliths of the British Isles with cases such as Newgrange, Stonehenge and Avebury, to Portuguese megaliths itself, with examples such as the *Stone Circles of Xerez*, *Portela de Mogos*, *Vale Maria do Meio* and the well known *Almendres* being some of the most notable cases of this primordial and ancestral connection. These remarkable megalithic monuments stand out as significant places of spirituality, ritual, worship and sharing delimited by spatial alignments referring to the territory, sacred geography, and celestial bodies, inevitably fulfilling a spiritual or religious function underlying the very spirit of the Earth and of stargazing. According to Pereira, we can understand how the constructive act of megalithic monuments clearly assumes an «exceptional character», and that the constant use of specific typologies over millennia is certainly not due to *the isolation of populations or technological limitations*, but rather to the spiritual power of their *magical-religious determinants*[49]. *This is because the sky reveals itself in its entirety as infinite and transcendent – as a representation of the ganz andere* by excellence –[50]; or as Eliade states, simply observing and contemplating the celestial vault triggers (would trigger, we add), in itself, a spiritual experience[51]. In this sense, according to the author, we see how the celestial vault, physically unreachable to human beings, reveals itself as the domain of transcendent reality and "supreme truth", acquiring the status of the dwelling place of the gods and the final destination of our fellow human beings, where it is believed that the spirits of the deceased will find their resting place. Therefore, the tangible connection to the celestial vault and the ascent towards the sky, materialized metaphorically through the megalithic monuments, acquires a spiritual connotation since these architectures allowed – and we can affirm that they still allow – human beings to symbolically

48 - Cf. R. Bradley, *The Significance of Monuments: On the Shaping of Human Experience in Neolithic and Bronze Age Europe*, Routledge, London 1998, p. 108.

49 - Cf. P. Pereira, *Lugares Mágicos de Portugal*, vol. I: *Paisagens Arcaicas*, cit., p. 59.

50 - According to Rudolf Otto, the *ganz andere*, or «the totally Other», is a quality of the Sacred that is completely different from everyday reality, something that transcends human experience and that describes the experience of the *numinous* – from the Latin *numen*, divine, divine presence or will. Cf. R. Otto, *The Idea of the Holy: An Inquiry into the Non-Rational Factor in the Idea of the Divine and Its Relation to the Rational*, Oxford University Press, Oxford 1924, pp. 5-7.

51 - Cf. M. Eliade, *O Sagrado e o Profano: A Essência Das Religiões*, Livros do Brasil, Lisbon 1983, p.128.

transcend their own mortal condition over the world and participate, to a certain extent, in the divine realm. Indeed, through the architecture of megalithic monuments, human beings acquire the ability to create places that can be considered as crossing points between worlds – between the sky, the Earth, and the underworld, between the domain of mortals and the realm of divinities – acquiring significant spiritual and cultural importance for the peoples who built them. In short, these *places illuminate the landscape or territory itself, giving it a dimension that it did not have before or that was not so easily assimilated*[52].

8. Final considerations

Following these reflections, we can see how the spiritual experience of megalithic astronomical heritage arises from the need to create exceptional places capable of exerting a tangible link between the sky and the Earth, space and time; standing out as places of existential support that are experienced as possessing an ordering of the world, of the cosmos, of nature, of the human condition itself, and of the phenomena of the human spirit, inevitably transposing their meaning into the forms of their architecture – an interpretation that was gradually forgotten throughout the contemporary age and which deserves due attention from the history and criticism of architecture today. However, the link between architecture, astronomy and the Sacred is profound and of great importance in the history of humanity, with the aim of creating a meaningful experience of contact with the transcendent, the divine and the mysteries of the Universe. If architecture, and particularly the spiritual experience of architecture, presents itself as a form of language inevitably capable of expressing meaningful, immersive, and symbolic environments, megalithic monuments may well be seen as places of profound connection between the past, the present and the future; this experience being a reflection and testimony of the lasting importance of the image of the sky and the cosmos in human cultures.

In other words, throughout history, the phenomena of the celestial vault have been crucial to human beings, serving not only as physical and temporal guides, but also as carriers of spiritual and symbolic meaning. In turn, we reiterate that the link between the spiritual experience of architecture and astronomy can be observed from the most remote antiquity in cultures and traditions around the world, and for many societies, manifested in various forms and physical, material and/or sometimes associated with immaterial dimensions, such as the alignment of megalithic monuments with astronomical events, assuming an essential importance

52 - Cf. P. Pereira, *Lugares Mágicos de Portugal*, 8 voll., vol. II: *Arquitecturas Sagradas,* cit., p.11

for their life, for their subsistence and for the formulation of their cosmologies. In fact, since ancient times, observing the sky has been used as a means of worship, meditation, inspiration, contemplation, and veneration – and even as an anthropological position associated with the exercise of power. Contemplating the sky and its phenomena can induce in human perception a sense of humility and reverence, which allows human beings to exercise a spiritual connection with the divine, with the unknown and with something greater than ourselves.

So, let us understand that megalithic monuments can be interpreted as places of tangible manifestation of the connection between the sky and the Earth, between science and spirituality, and between the human being and the divine, providing us with an understanding of human existence and its search for meaning in this world. Ultimately, whether megalithic monuments can (or cannot) be considered as objects capable of conveying a sense of spirituality through their architecture depends on beliefs and personal and cultural perspectives, but it is this interrogation, the admitted possibility of the existence of the questioning, reflective, mysterious, sublime and ontological dimension of these monuments that leads us to believe that they present themselves as "portals" between the physical and the spiritual, and as a lasting reflection of the human being's fascination with the sky.

9. Acknowledgements

This essay had the support of *CIAUD, Research Centre for Architecture, Urbanism and Design, Lisbon School of Architecture, Universidade de Lisboa.* The author would like to acknowledge Professor Jorge Nunes and Professor Paulo Pereira for their support.

Bibliography:

Alvim, P. *Recintos Megalíticos Do Ocidente Do Alentejo Central: Arquitectura e Paisagem Na Transição Mesolítico-Neolítico*, Universidade de Évora, Évora 2009;

Barrie, T. – Bermudez, J. – Tabb P., *Introduction* to Id. (eds.), *Architecture, Culture, And Spirituality*, Routledge, London 2016, pp. 1-11;

Belmonte, J., *As Leis Do Céu: Astronomia e Civilizações Antigas*, Mareantes Editora, Lisboa 2003;

Botton, A., *A Arquitectura Da Felicidade*, Dom Quixote, Alfragide 2009;

Bradley, R., *The Significance of Monuments: On the Shaping of Human Experience in Neolithic and Bronze Age Europe*, Routledge, London 1998;

Cashford, J., *The Moon Myth and Image*, Octopus Publishing Group, London 2003;

Cotte, M. – Ruggles, C., *Introduction* to Id. (eds), *Heritage Sites of Astronomy and Archeoastronomy in the Context of the UNESCO World Heritage Convention: A Thematic Study*, 2 voll, vol. I, International Council on Monuments and Sites – International Astronomical Union, Paris 2010, pp. 1-12;

Dolan, M., *Decoding Astronomy in Art and Architecture*, Springer, Cham 2021;

Eliade, M., *O Sagrado e o Profano: A Essência Das Religiões*, Livros do Brasil, Lisboa 1983;

Harries, K., *Transcending Aesthetics*, in J. Bermudez (ed.), *Transcending Architecture Contemporary Views On Sacred Space*, Catholic University of America Press, Washington, D.C. 2015, pp. 208-222;

Krupp, E., *No Rasto De... As Antigas Astronomias*, Publicações Europa-América, Mem Martins 1984;

Krupp, E. *Beyond the Blue Horizon: Myths and Legends of the Sun, Moon, Stars, and Planets*, Oxford University Press, Oxford 1992;

Otto, R. *The Idea of the Holy: An Inquiry into the Non-Rational Factor in the Idea of the Divine and Its Relation to the Rational*, Oxford University Press, Oxford 1924;

Pereira, P., *Lugares Mágicos de Portugal*, 8 voll., vol. I: *Paisagens Arcaicas*, Temas e Debates, Lisbon 2009;

Pereira, P., *Lugares Mágicos de Portugal*, 8 voll., vol. II: *Paisagens Arcaicas*, Temas e Debates, Lisbon 2009;

Pereira, P., *Arte Portuguesa: História Essencial*, Temas e Debates, Lisbon 2014;

Perez-Gomez, A., *Foreword*, in Barrie, T. – Bermudez, J. – Tabb P. (eds.), *Architecture, Culture, And Spirituality*, Routledge, London 2016, pp. XVII–XIX;

Ruggles, C., *Ancient Astronomy: An Encyclopedia of Cosmologies and Myth*, ABC-Clio, Santa Barbara 2005;

Ruggles, C., *Later Prehistoric Europe*, in Cotte, M. – Ruggles, C. (eds.), *Heritage Sites of Astronomy and Archeoastronomy in the Context of the UNESCO World Heritage Convention: A Thematic Study*, 2 voll., vol. I, International Council on Monuments and Sites – International Astronomical Union, Paris 2010, pp. 28-35;

Tacey, D. *The Spirituality Revolution: The Emergence of Contemporary Spirituality*. Routledge, East Sussex 2004.

Sitography:

Silva, C., *Neolithic Cosmology: The Equinox and the Spring Full Moon*. in «Journal of Cosmology» 9, 2010, pp. 2207-2216. https://thejournalofcosmology.com/Ancient Astronomy113.html.