IEREK PRESS Academic Research Community
http://www.press.ierek.com
ARChive Scientific Research
ISSN (Print: 2537-0154, online: 2537-0162)
Proceedings of the Academic Research Community on Social and Behavioral Sciences

Research Paper
Received: 9 December 2025, Accepted: 8 July 2026, Published online: 31 July 2026
DOI: 10.21625/archive-sr.v10i2.1262

Giza Pyramid: The Complete Oneness Sacred Edifice

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Abstract

Accumulating building information of the pyramid shape as a tomb mostly took all of the third and fourth dynasties' time in Egypt. The tomb, as a mastaba, symbolized the oneness of the people's sacred belief in the beginning of time. When the mastaba was vertically multiplied into six to give shape in height by the time of Djoser, they were covered by a non-successful casing by Sneferu's time. That casing was abandoned, and the multiple mastabas were visually clear by the same time; here the oneness was betrayed, which pushed Sneferu to try for a new, complete tomb/pyramid. For the second time, it was not a successful try, so he built a third pyramid, which was the "Red Pyramid". Constructionally, it was sound, but architecturally and proportionally, it was not successful.

By the time of "Khufu", thanks to the architect "Hemiunu," he managed to select a complex of structural systems to hold together for the purpose of having a complete edifice symbolizing the sacred oneness. The combination of four structural systems was: 1- two cross-diagonal walls, 2- seven stepped cores filling the four gaps within the diagonal walls, where both systems were rotated by six degrees clockwise. 3- one pyramid that forms a coat, following the four geographic directions, enclosed both the rotated cross walls and the stepped core; 4- the last cover was the casing dress over the previous one.

Courses were different in height all over the pyramid. They mostly served the stability of constructing the two main chambers that acquired the names of King's and Queen's; consequently, the core steps followed that formation. Stone arrangement in each course of the 210 existing courses – plus the missing ones- followed two orientations, one in the core and the other in the coat and the dress. Under seismic blows, forces of each orientation contradicted the other, resulting in an almost zero effect and causing the edifice's stability. The final edifice shape expressed the whole idea of the complete, stable, balanced, aesthetically sound, and impressive oneness. That was the Great Pyramid of Giza.

Keywords

Symbolism; Mortuary deity; Eternal life; Ontological significance; Pyramid's design; Structural stability

1. Introduction

The architecture of the pyramids in Ancient Egypt originated as a free-standing *mastaba*, an early tomb structure situated in an open landscape and imbued with sacred significance. Over millennia, this architectural form evolved into the iconic pyramid shape exemplified by the Giza pyramid. Architecture often functions as a tangible expression of metaphysical and cosmological principles. This paper, therefore, investigates the symbolic dimensions embedded in the pyramid's design, seeking to uncover the ancient beliefs that influenced the construction of these magnificent structures, which remain enduring symbols of Egypt's rich cultural heritage.

Central to this inquiry is the influential role of Ptah, a major Memphite deity associated with craftsmanship and creation. As a patron of craftsmen, particularly sculptors and stone tomb builders, and the preeminent deity of Memphis from the First Dynasty onward, Ptah's cult expanded throughout Egypt in tandem with Memphis' growing political significance. Specifically, we will examine how Ptah's theological attributes, often summarized in the Memphite triad of Life, Power, and Stability, may have symbolically manifested in both Old Kingdom Egyptian architecture and pyramid design and construction.

1.1. Background and context: Symbolism

The architectural development of the pyramid-shaped royal tomb took place primarily across the Third and Fourth Dynasties of Egypt. The earliest monumental tomb, the mastaba, a rectangular, flat-topped structure, stood as a significant architectural innovation, symbolizing the unified cosmological beliefs of the people at the dawn of

Egyptian civilization. Symbolism permeated every aspect of ancient Egyptian life, fundamentally shaping its writing system, monumental architecture, sculpture, rituals, and philosophical thought. In hieroglyphic writing, concepts were represented by symbolic drawings. For instance, the action of walking was depicted by two stylized legs Λ with feet directed forward. Similarly, a house was depicted as an open square, while a city was symbolized by a circle divided into four quadrants. The sun god Ra was denoted by a simple disc, and water by a horizontal zigzag line. On temple walls, the sky goddess was portrayed as a woman arched over the earth, supported by her hands and feet. A month was indicated by three vertical strokes enclosed within a horizontal cartouche, signifying the thirty days of the lunar cycle.

Just as symbols and hieroglyphs conveyed complex ideas through visual forms, the notion of 'oneness' in this research refers to the collective assets unified within a single belief system. In ancient Egyptian culture, deities not only represented cosmic and natural forces but were also closely tied to kingship, craftsmanship, and other social institutions, functioning as archetypes that legitimized and embodied human roles within society (Assmann, 2001; Hornung, 1996; Kaelin, 2016). Multiple deities, known as Netjeru, were venerated across diverse aspects of life, including Ra, Hotep, Amon, Aten, Sokar, Osiris, Thoth, and Maat. Among them, Ptah (**Figure 1**) was arguably one of the most influential figures within this complex pantheon. He attracted particular reverence for his creative and constructive powers that embodied qualities deeply embedded in the Egyptian collective psyche. Ptah's significance was especially pronounced among craftsmen and tomb builders who regarded him as the divine patron of their skills and labor.

Figure 1. Ptah as the local deity of Memphis. Usually represented in mummy form, Ptah holds the ankh, was-scepter, and Djed pillar, symbolizing life, power, and stability.
Source. Wikipedia.

Ptah's notable attributes include:

- Originating as the local deity of Memphis from the First Dynasty onward, with the city's political prominence facilitating the spread of his cult throughout Egypt.
- Serving as the divine patron of craftsmen, particularly sculptors and builders of stone tombs.
- Forming part of the Memphite Triad of deities, together with Sekhmet and Nefertum.
- Commonly depicted in mummy form, wearing a skullcap and false beard, and holding the combined symbols of life (*ankh*), power (*was*), and stability (*Djed*).

As a mortuary deity, Ptah was frequently merged with Soker and Osiris to form the composite god Ptah-Soker-Osiris. Renowned for his powers, Ptah likely played a crucial role in guiding the craftsmanship involved in building the pyramids, resulting in the perfection we observe today. An examination of Ptah's divine attributes highlights several central aspects: eternal life, generative vitality, and the sustaining force of existence itself.

2. Life

2.1. Eternal Life

The concept of eternal life may have been embodied in the pyramids through their enduring presence over time and their perceived connection to the celestial realm and the kingdom of the gods. A popular expression from previous millennia suggests that the pyramids would last as long as the Earth itself, a testament to their remarkable durability. This notion is reinforced by the fact that the pyramids have withstood the test of time, showing minimal signs of deterioration.

The pyramids' correspondence with the sky (Allen, 2007; Bauval & Gilbert, 2001) is evident in their geometric alignment with prominent stars, including Sirius, Betelgeuse, Capella, and Al Nitaq (Figure 2). This alignment mirrors the geometric relationships between the sacred city of Iunu and the pyramids of Saqqara, Meidum, Giza, and Djedefre. The ancient Egyptians held a profound belief that the earthly realm was a reflection of the celestial kingdom (Assmann, 2012; Redford, 2002), a notion deeply ingrained in their collective consciousness.

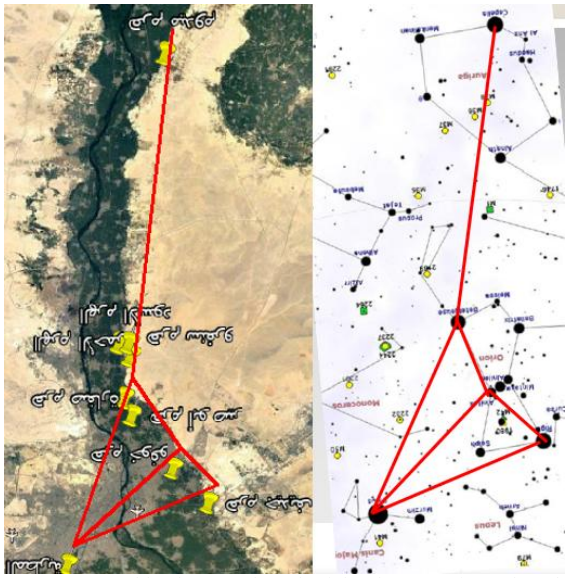

Figure 2. Reflection of the sky plan on Egypt's sacred landscape. The celestial order was mirrored on the land through the placement of sacred sites.

Furthermore, the pyramids' freestanding presence within the vast Sahara Desert echoes the panoramic view of the starry night sky, where numerous bright stars appear as isolated, majestic entities. This architectural design may have been inspired by the Egyptians' conviction that upon death, each king would continue his life on a designated star. The position of this star in the celestial realm would determine the site of the king's pyramid, as seen in the cases of Djoser, Sneferu, Khufu, Djedefre, Khafre, Menkaure, and others.

2.2. Plan of the sky

The sky has long been regarded as a vast and intricately patterned expanse, marked by a whitish band whose contours evoke the flowing curves of the cyma recta and cyma reversa (**Figure 3**). Most visible stars appear within this luminous band, while others are dispersed in carefully distinguished constellations. The brightest among them captured the attention of ancient sages, who associated particular stars with specific sacred sites and royal figures.

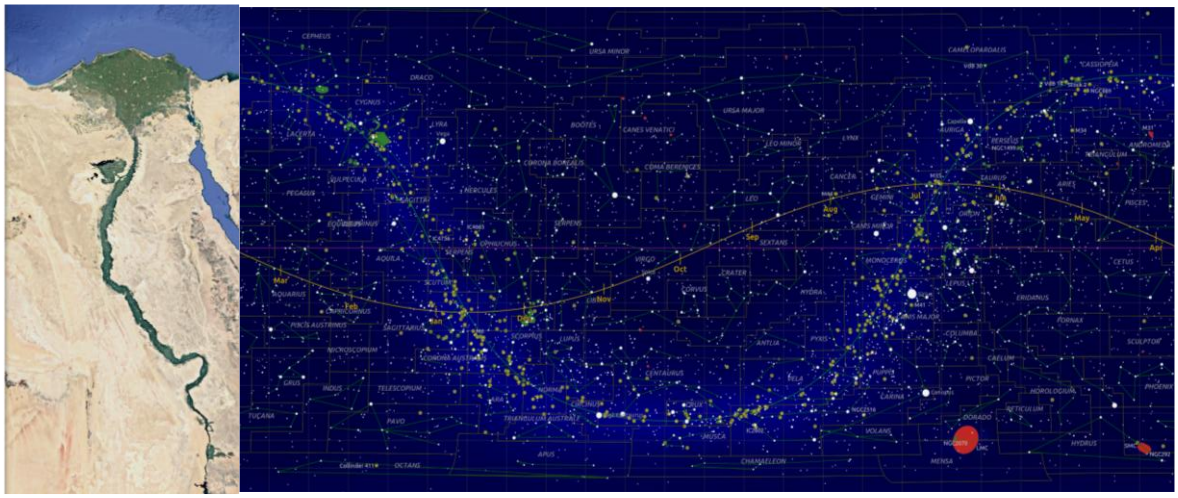

Figure 3. The Nile valley having the main cities as Iunu and Meidum within the desert area, reflects the presence of the Milky Way, with the bright stars Sirius and Capella within the sky.

The ancient Egyptians envisioned the whitish band stretching across the blue expanse of the sky as a celestial counterpart to the great Nile River on earth, while the 'red' terrestrial background was viewed as a metaphorical canvas. This conception reflected their broader cosmological imagination, in which the heavens were understood as a mirrored reflection of Egypt itself, with the divine realm above corresponding to the sacred landscape of Egypt.

2.3. Golden ratio (φ):1.618

Polished version with accurate source and supporting evidence:

The golden ratio ($\varphi \approx 1.618$) has long been associated with ideals of harmony, balance, and perfection in art and architecture (Meebed et al., 2024). In the context of the Egyptian pyramids, scholars have argued that their proportions may have symbolized a connection between earthly structures and the divine or celestial realm, reflecting the Egyptians' broader cosmological worldview. While the degree of intentionality remains debated, measurements of the Great Pyramid of Khufu suggest that the ratio of its base to its height approximates φ, leading some researchers to interpret this as evidence of a deliberate application of the golden ratio in monumental design (Markowsky, 1992).

Across cultures, the golden ratio has been regarded as a timeless principle of aesthetic appeal reflected in architecture, sculpture, and design as a means of conveying perfection and divine proportion. The incorporation of the golden ratio in the pyramid's design may have reinforced the symbolic alignment of sacred structures with cosmic order, underscoring the Egyptians' belief in the mirroring of heaven and earth.

Within this framework, the use of such a proportion is thought to:

- Mirror celestial harmony and serve as an architectural analogue to the balance and order believed to govern the cosmos.
- Symbolize divine proportion as a potential metaphor for equilibrium within the divine realm.
- Bridge earthly and celestial spheres. By embedding this ratio in monumental architecture, the builders may have sought to establish a symbolic connection between the terrestrial and the celestial, reinforcing the pyramid's role as a locus of unity.

The divine significance of the golden ratio in ancient Egyptian culture is a fascinating topic, and exploring its implications can provide valuable insights into their architectural and philosophical beliefs.

3. Power

3.1. Authority

Flanagan's (1975, 2017) concept of pyramid power was first popularized through claims of its psychological impact on both individual perception and collective experience, where the pyramid form was said to command respect, evoke

acceptance, and exemplify mastery in design and execution. The pyramid's grandeur and perfect arrangement of massive stone blocks, precisely aligned with the cardinal directions, conveyed a sense of authority and warrant for action. The surrounding wall, designed with precision and sacredness (**Figure 4**), further reinforced this notion. The pyramid's sheer scale and construction justified the controller's power, making it clear who was in charge.

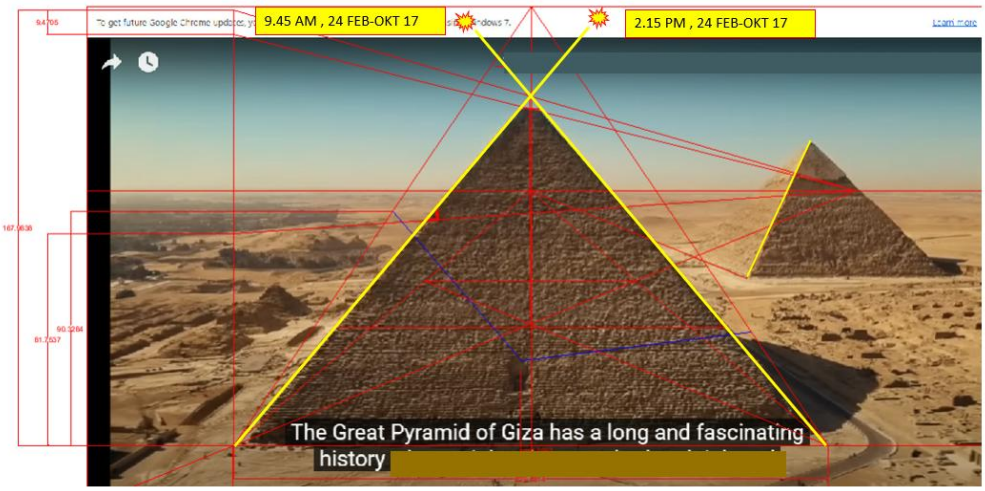

Figure 4. Geometric proportions of the Great Pyramid. The square base measured 230 m per side with a height of 147 m. The slanting façade measured 185.9 m in height, forming a golden ratio with half the base dimension. The pyramid contained 210 courses in eight layers. Northern diagonals connecting the base corners to the apex aligned with sunrays at 9:45 a.m. and 2:16 p.m. on February 24 and October 17 each year.

3.2. Dominion

The pyramid's symbolic preeminence was further expressed through its monumental form, which was perceived as a point rising toward the sky and understood to ensure the pharaoh's safe passage to the afterlife (Encyclopaedia Britannica, n.d.). As a symbol of Ptah's sacred belief, power was palpable in the pyramid's massive dimensions, such as the 230-meter base length, 146-meter height, and 210 courses of stone. The pyramid's monumental presence has endured for millennia, continuing to inspire awe in all who encounter it. Constructed from an estimated 2.5 million blocks with a combined weight of roughly 6.5 million tons, its sheer scale further reinforced its symbolic power and enduring authority.

3.3. Divine Power

The pyramid's geometric perfection and architectural mastery naturally evoke a sense of divinity (Encyclopaedia Britannica, n.d.). Its four corners were conceived as cosmic supports, akin to spectral pillars upholding the sky. Earlier notions of the divine and eternal life, the celestial order, and the harmony of the golden ratio converge in the pyramid's design, reinforcing its sacred significance. In both grandeur and precision, the structure embodies the divine power that the ancient Egyptians believed was inherent in their monumental creations.

4. Stability

4.1. Bilateral Forces

The pyramid's stability was enhanced by a sophisticated mathematical design that minimized lateral forces generated by seismic activity. A central core block was constructed with horizontal courses rotated approximately six degrees, while the outer casing was precisely aligned with the four cardinal directions (Fernandez & Farell, 2006; Nell & Ruggles, 2014). This design hypothetically allowed horizontal forces within the core to be equalized with opposing forces in the containing cover, thereby reducing structural damage.

The visible top course of the pyramid still showcases this design (**Figure 5**), and further investigation revealed that this design principle was applied throughout the pyramid's structure. This innovative approach demonstrates the advanced understanding of engineering and mathematics possessed by the ancient Egyptians.

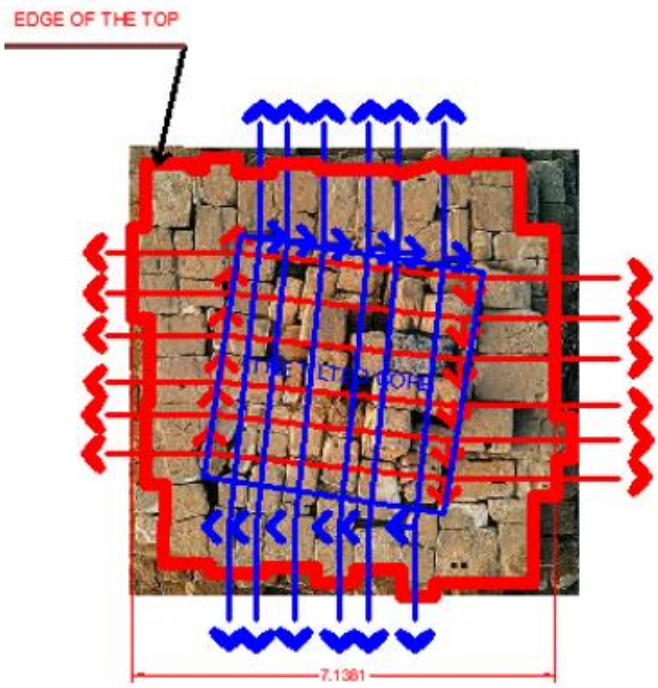

Figure 5. Seismic forces acting on the rotated core and coat. These interactions produced "bilateral forces" that contributed to the pyramid's stability.

Building on this observation, the rotated core design seems to have been systematically employed across successive layers, thereby enhancing both stability and structural integrity. Such an architectural strategy would have facilitated a more uniform distribution of seismic forces, mitigated stress concentrations, and reduced the likelihood of structural damage or collapse.

That stability concept was profoundly and more scientifically studied (Darwish, 2017) and concluded: "This force distribution suggests that the north-south orientation carried more structural stress, potentially inducing a clockwise rotational twist within the pyramid's mass" (**Figure 6**).

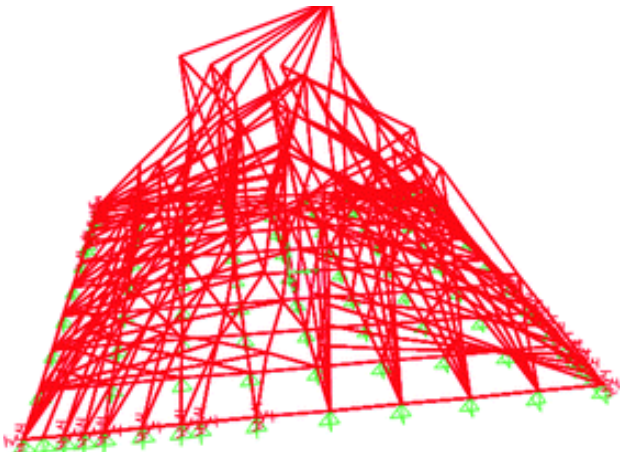

Figure 6. The seismic forces that affected the pyramid were kept within, according to its inner design, as shown in a graph. Source. Darwish (2017)

One primary factor influencing the structural dynamics of the Great Pyramid is seismic activity. When seismic waves impact the pyramid, they strike at its center of gravity, which is situated at approximately one-quarter of the pyramid's total height (about 137 meters above the base) (Lehner, 1997; Stadelmann, 1997). This resulted in a spherical dispersion of seismic energy, which may have caused localized shifts in the stonework, pushing peripheral blocks outward and eventually leading to the loss of the outer casing stones.

Potential findings from such an analysis may include:

- Consistency in core design. The rotated core configuration appears to have been applied systematically across the pyramid's layers, demonstrating a sophisticated understanding of structural engineering principles.
- Precision in construction. Evidence may point to highly accurate construction techniques, such as precise alignment of blocks and careful placement of stones, which contributed to the pyramid's stability.
- Advances in the use of materials. The ancient Egyptians may have employed advanced approaches to materials selection, such as choosing specific types of stone or mortar, to enhance the monument's durability and resistance to environmental stressors.

Taken together, these findings underscore the ingenuity and technical expertise of the ancient Egyptians in designing and constructing monumental architecture such as the pyramids.

4.2. The rotated stepped core

To confirm the rotated stepped-core design described by Romer (2007), the researcher examined the pyramid's internal passages, including the Ascending Passage, the Grand Gallery, and the King's Chamber. Using a simple compass, the researcher measured the orientation of the eastern surfaces of these elements (**Figure 7a**). The results supported the rotated-core hypothesis (**Figure 7b**), yielding deviations of approximately 5°, 5°, and 4° for the Ascending Passage, Grand Gallery, and King's Chamber, respectively.

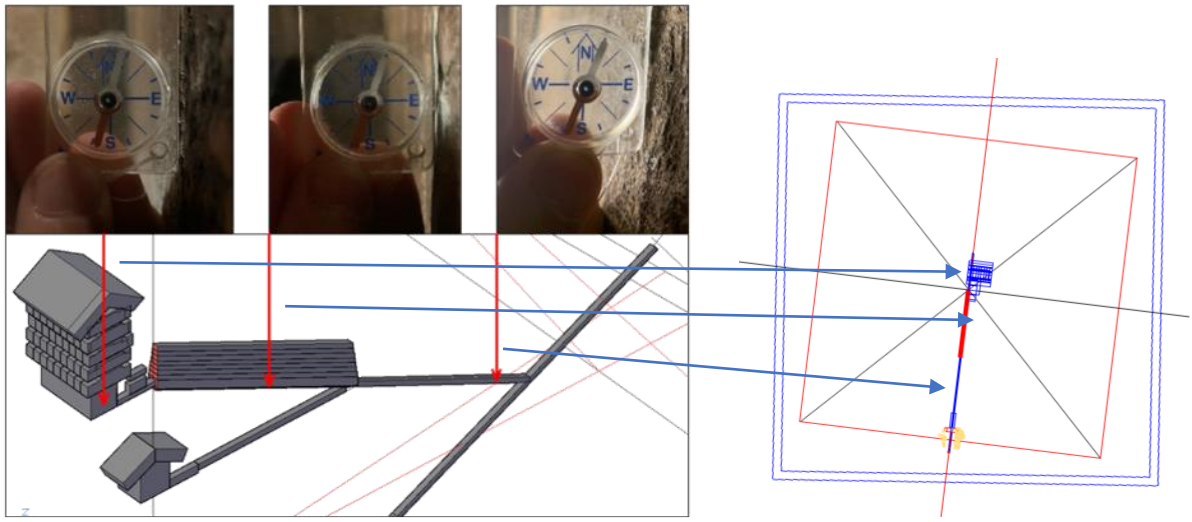

Figure 7. (a) Rotated internal spaces of the pyramid. The King's Chamber, Grand Gallery, and Ascending Passage were rotated off north by approximately 4°, 5°, and 5°, respectively. (b) Overlay of pyramid outlines. The external pyramid outline (blue) is shown in relation to the rotated stepped pyramid (red) and its internal spaces.

4.3. Multiple mastabas

The stepped core design, previously observed in the Meidum Pyramid, was also evident in the Giza Pyramid. Key observations in **Figure 8a** included:

- Step one coincided with the floor level of the Queen's Chamber and the newly discovered passage behind the main entrance.
- Step two aligned with the floor of the King's Chamber.
- The first four relieving roofs over the King's Chamber were situated within step four, while
- the end gable roof was embedded in step five.
- The first and last courses of each step were typically thicker than the others (**Figure 8b**).

The pyramid's stability was ensured through two innovative design elements:

1. The rotated core, utilizing the mechanical system of bilateral directions for laying stones.
2. The varying heights of steps, accommodating designed galleries, chambers, and the internal spiral ramp.

These design features demonstrate the highest level of proficiency in ancient Egyptian architecture.

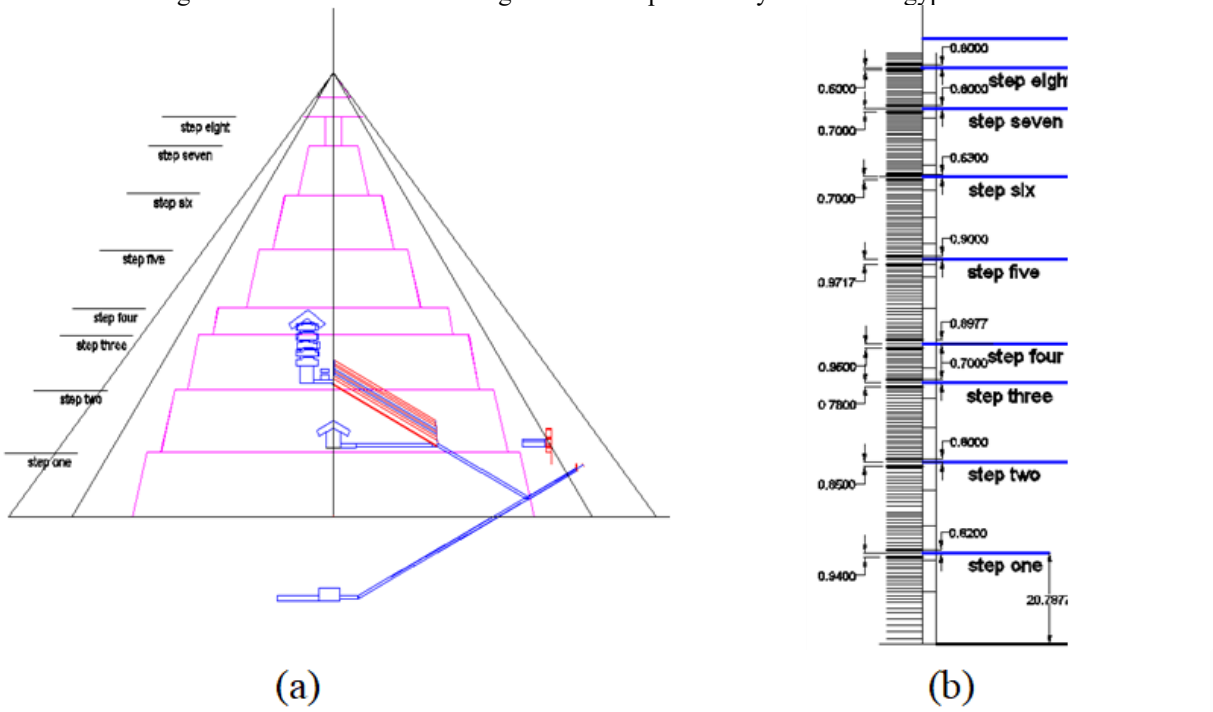

Figure 8. (a)Step heights in relation to internal chambers. Step heights were determined to align with the floor levels of the Queen's Chamber, the main entrance, the King's Chamber, and the highest relieving void with its gabled roof. (b)Variation in course thickness. The thickness of the first and last courses of each step determined its overall height.

4.4. Logic of construction

During the reign of Khufu, the architect Hemiunu masterfully integrated four distinct structural systems into a single, unified monument that embodied the principle of sacred unity. These systems in **Figure 9** included:

- Two cross-diagonal walls
- Seven stepped cores, filling the spaces within the diagonal walls and rotated approximately 6° clockwise
- A pyramid coat, aligned with the four cardinal directions and enclosing both the rotated cross-walls and the stepped core
- An outer casing, covering and completing the previous layers

The courses varied in height to support the stability of the King’s Chamber and Queen’s Chamber, and the stepped core was constructed in accordance with this arrangement. The stone arrangement in each of the 210 extant courses (together with the missing ones) followed two distinct orientations: one within the core and another in the coat and outer casing. This dual orientation minimized the impact of seismic forces, thereby enhancing the overall stability of the monument. The Great Pyramid of Giza's final shape embodied the principles of completeness, stability, balance, and aesthetic appeal, creating an impressive symbol of oneness.

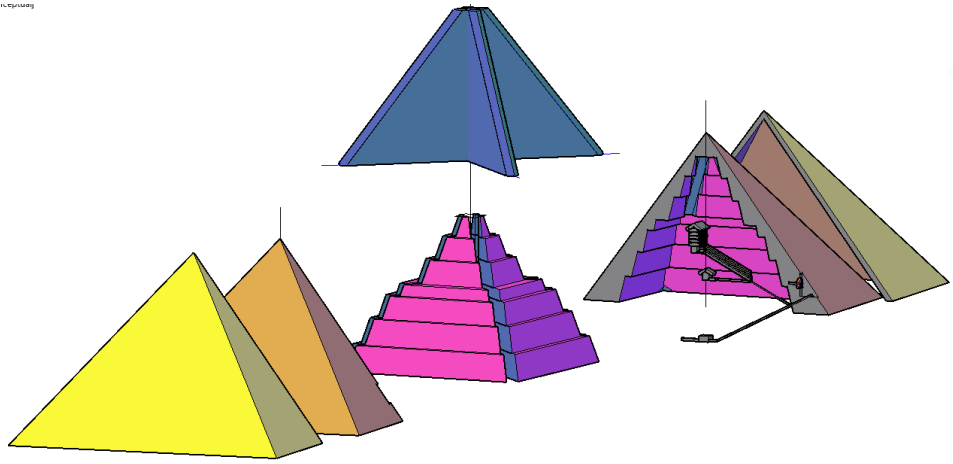

Figure 9. Structural section of the rotated core. The core was composed of seven steps, each with a central block and surrounding slanted layers or mastabas.

5. Conclusion

Since the pyramid cannot be regarded merely as an enormous building, the enduring question has always been: What is its meaning? What does it symbolize? Why does it rise so prominently in the open landscape? This complexity confronts researchers anew each time the inquiry begins. Research in the field was usually either scientifically quantitative or, environmentally, qualitatively worked out.

For this work, its essence is mostly environmentally qualitative, hypothetical effort, with a few quantitative measurements where it could have been permissible.

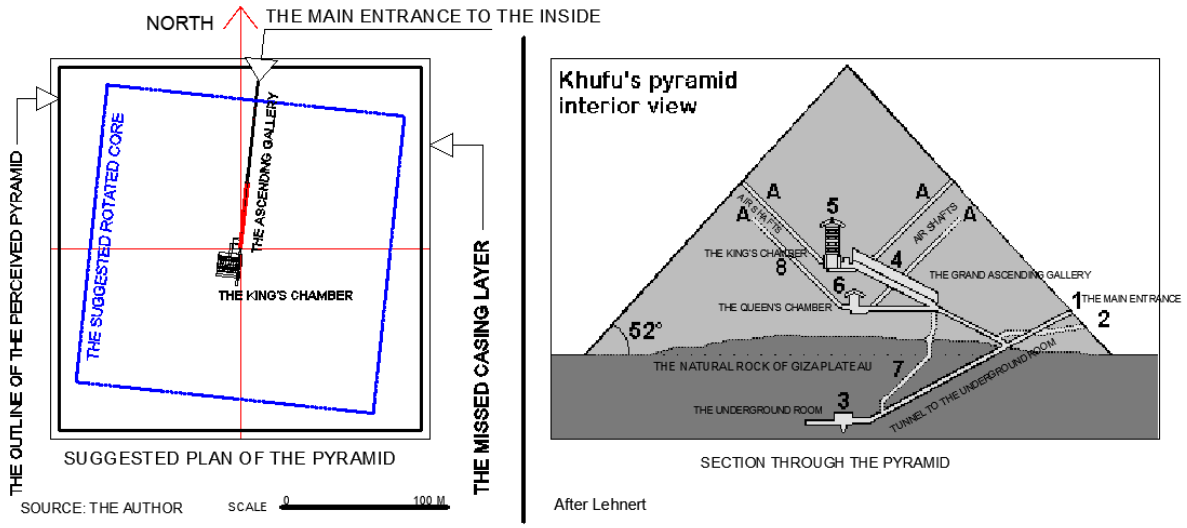

Figure 10. Hypothetical Plan and Section of Giza Pyramid

In seeking the meaning behind such a world-monumental physical edifice (**Figure 10**), one must turn to the profound beliefs of the ancient Egyptians besides its clear scientific facts. Their worldview was shaped by the wisdom of Thoth, yet the divine force embodied in the pyramid could not be attributed to Re alone. Rather, it was Ptah, the creator god of Memphis, who assisted Re, molded and fashioned all living beings, and presided as the master craftsman since the dawn of civilization. Ptah was revered as the patron of builders, the divine architect who inspired the construction of sacred mastaba-stations for kings on their journey to the heavens. He was believed to hold three essential powers: Life, Power, and Stability. These qualities, in turn, became the defining characteristics symbolized by the pyramid itself.

1. **Life:** Eternal life, celestial orientation, and the divinity of proportion embodied in the golden ratio were the compelling symbolic expressions immediately conveyed by the pyramid's form.

2. **Power:** Authority, dominion, and divine power constituted a triadic expression, made manifest through the monument's massive, oversized scale, which dominated the open landscape with an almost unimaginable presence.
3. **Stability:** Stability and resilience of the structure demanded architectural innovation, compelling the architect to devise a system capable of binding millions of stone blocks into a single enduring structure, resistant to all known natural forces of the Earth. This hypothetical system was composed of three interlocking elements: the rotated stepped core, the crossed diagonal walls, and the enclosing coat over which was laid the smooth white casing that gave the pyramid its radiant, finished surface.

That was the awe-inspiring Great Pyramid of Giza that has endured for millennia, standing as one of the world's most impressive monuments.

Acknowledgements

The abstract of this paper was presented at the Conservation of Architectural Heritage (CAH) Conference, which was held on the 08th-11th of October 2025.

Funding

This research did not receive any specific grant from funding agencies in the public,

commercial, or not-for-profit sector/ individuals

Ethics Approval

Not applicable.

Conflict of interest

The author(s) declare(s) that there is no competing interest.

References

Allen, J. P. (2007). The ancient Egyptian pyramid texts. Society of Biblical Literature.

Assmann, J. (2001). The search for God in ancient Egypt (D. Lorton, Trans.). Cornell University Press.

Assmann, J. (2012). Egyptian solar religion in the New Kingdom: Re, Amun and the crisis of polytheism. Routledge.

Bauval, R., & Gilbert, A. (2001). The Orion mystery: unlocking the secrets of the pyramids. Random House.

Darwish, M. (2017). Variation of the structural dynamic characteristics of the Great Pyramid with the limestone properties. In H. Rodrigues, A. Elnashai, & G. M. Calvi (Eds.), Facing the challenges in structural engineering (pp. 1–11). Springer International Publishing. https://doi.org/10.1007/978-3-319-61914-9_1

Encyclopaedia Britannica. (n.d.). What do the pyramids of Giza represent? In Encyclopaedia Britannica. Retrieved October 28, 2025, from https://www.britannica.com/question/What-do-the-pyramids-of-Giza-represent

Fernandez, J. M., & Farell, B. (2006). A reversed structure-from-motion effect for simultaneously viewed stereo-surfaces. Vision Research, 46(8-9), 1230–1241.

Flanagan, P. (1975). Pyramid power. De Vorss & Co.

Flanagan, P. (2017). Pyramid power II: The scientific evidence. CreateSpace Independent Publishing Platform.

Hornung, E. (1996). Conceptions of God in ancient Egypt: The one and the many (J. Baines, Trans.). Cornell University Press. (Original work published 1971).

Kaelin, O. (2016). Gods in ancient Egypt. Oxford Research Encyclopedia of Religion. https://doi.org/10.1093/acrefore/9780199340378.013.244

Lehner, M. (1997). The complete pyramids: Solving the ancient mysteries. Thames & Hudson.

Markowsky, G. (1992). Misconceptions about the golden ratio. The College Mathematics Journal, 23(1), 2–19. https://doi.org/10.2307/2686193

Meebed, Y. A., Fathi Al-Muslimi, G. M., Fawaila, L. A., & Khaled Ali, D. M. (2024). Analytical study of the golden ratio in the architecture of the pyramids of Giza. Journal of Arts & Applied Sciences (JAAS), 11(2), 303–315.

Nell, E., & Ruggles, C. (2014). The orientations of the Giza pyramids and associated structures. Journal for the History of Astronomy, 45(3), 304–360.

Redford, D. B. (2002). The ancient gods speak: A guide to Egyptian religion. Oxford University Press.

Romer, J. (2007). The great pyramid: Ancient Egypt revisited. Cambridge University Press.

Stadelmann, R. (1997). Die ägyptischen Pyramiden: Vom Ziegelbau zum Weltwunder [The Egyptian pyramids: From brick building to wonder of the world] (3rd ed.). Verlag Philipp von Zabern.