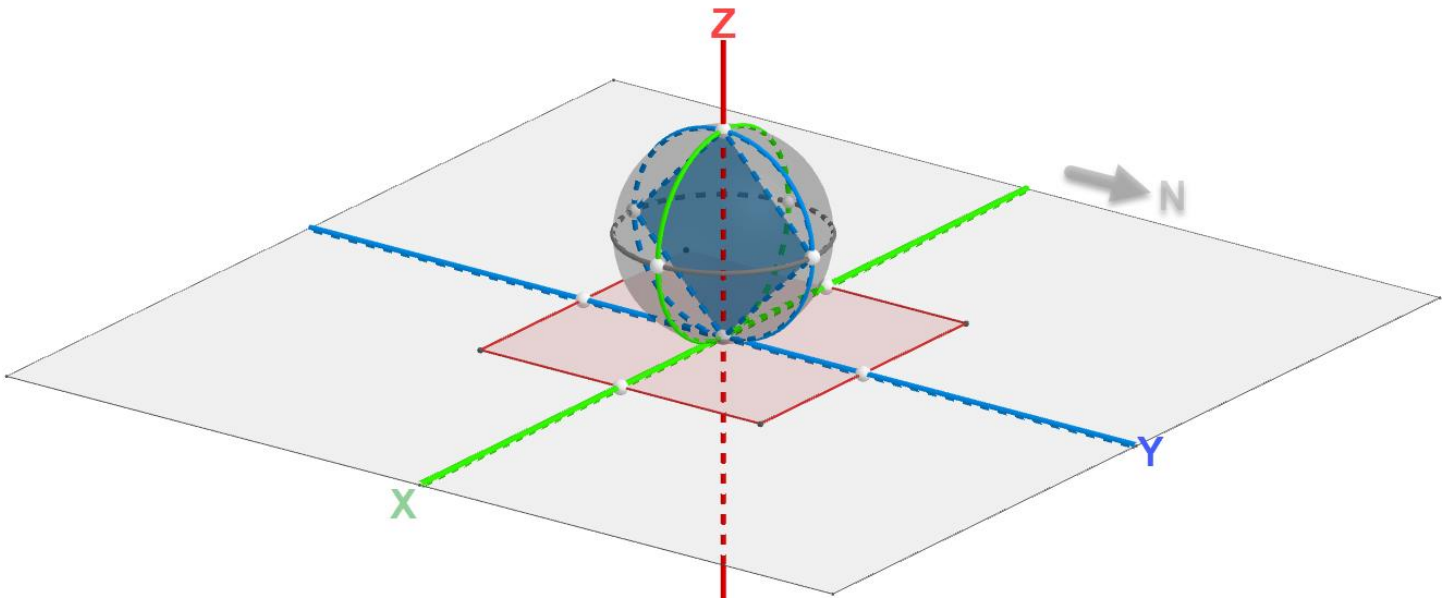


The Cosmology of the Great Pyramid

Part 2: Exterior and Interior Design

Carl Balowski | October, 2024

Abstract

This study is the second part of a three-part series exploring the geometric relationships that underpin ancient structures. Part 1 focused on geometric approximations in ancient Egypt, while Part 3 will tie these findings together by exploring the solstitial and metrological correlations between the Great Pyramid and Stonehenge via Heliopolis.

In this part, the study delves into the geometric relationship between the interior and exterior design of the Great Pyramid, with an emphasis on the placement of the King's Chamber and coffer within the broader architectural framework. Utilizing Petrie's precise survey measurements, the research investigates how the pyramid's structure aligns along three primary axes—the X-axis (east/west), Y-axis (north/south), and Z-axis (vertical)—which form the foundation of its geometric integrity. The study reveals that the pyramid's interior, particularly the King's Chamber, adheres to the same geometric principles that shape its exterior. The deliberate offset of the chamber in relation to these axes, especially its NW corner, reflects key mathematical relationships such as the silver ratio and √2, creating a seamless harmony between the pyramid's internal configuration and its monumental exterior form.

A central focus of this part is the elevation of the King's Chamber floor at 42.946 meters, which divides the pyramid's height according to the silver ratio and √2 proportions. This calculated design aligns the chamber with broader geometric principles governing the pyramid's height, base, and axes. The NW corner of the King's Chamber forms a 16 x 5 1/11 Royal Cubits pi rectangle with the pyramid's axes, underscoring the intentional inclusion of pi and √2 within its design. This discovery highlights that the Great Pyramid's layout is not only symbolic but deeply rooted in precise mathematical principles, reflecting both the silver ratio and pi.

The study concludes by examining the placement of Khufu's coffer in relation to the King's Chamber, suggesting that Khufu's mouth, placed at the south side of the coffer, holds symbolic and geometric significance. The positioning of Khufu's mouth, dividing the space within the chamber according to the silver ratio, mirrors the external design of the pyramid, where the height and base reflect the pi ratio and the circle-square relationship. This interconnectedness between the interior and exterior demonstrates that the pyramid's design was meant to symbolically align Khufu's journey in the afterlife with the geometric order of the cosmos. Additionally, it highlights the conceptual framework of the square-circle relationship that the ancient builders likely employed for both the architecture and the metaphysical meaning behind it.

The Interconnected Geometric Unity of the Pyramid's Exterior and Interior

Focusing solely on the pyramid's exterior without considering the interior layout overlooks the essential interconnectedness of the design. Therefore, in this study, I will explore how these geometric relationships shape both the exterior design of the pyramid and the placement of the King's Chamber and coffer. The Great Pyramid is structured around three primary axes: the X-axis (east/west), the Y-axis (north/south), and the Z-axis (vertical), which form the foundation of its precise geometric design and architectural integrity (Figure 1). The pyramid's square footprint ensures identical dimensions along the X and Y axes, making the east/west and north/south views symmetrical. However, this symmetry does not capture the full complexity of the pyramid's design, as the relationship between the interior and exterior reveals a deeper geometric unity.

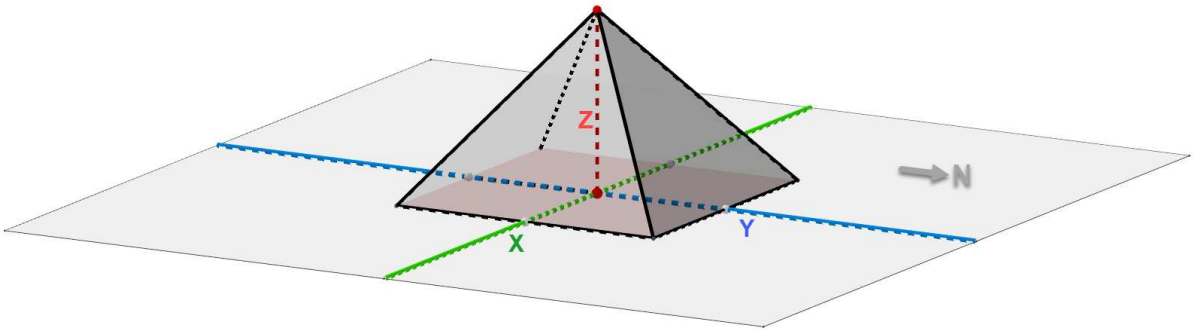


Figure 1

The placement of the King's Chamber and the coffer within the pyramid adheres to the same geometric principles that govern its exterior. Although the chamber's off-axis positioning (Figure 2) and the coffer's off-centered placement have long puzzled researchers, appearing to contradict the pyramid's outer symmetry, these choices reflect a deeper architectural logic. As we will see, the proportional positioning of the chamber and coffer in respect to the axes, bases and apex corresponds to the approximations of π and √2, as articulated through the silver ratio rectangle within the circle's quadrant. This primitive geometric principle, which defines the relationship between the circle and square, is expressed in both the pyramid's external form and its internal configuration.

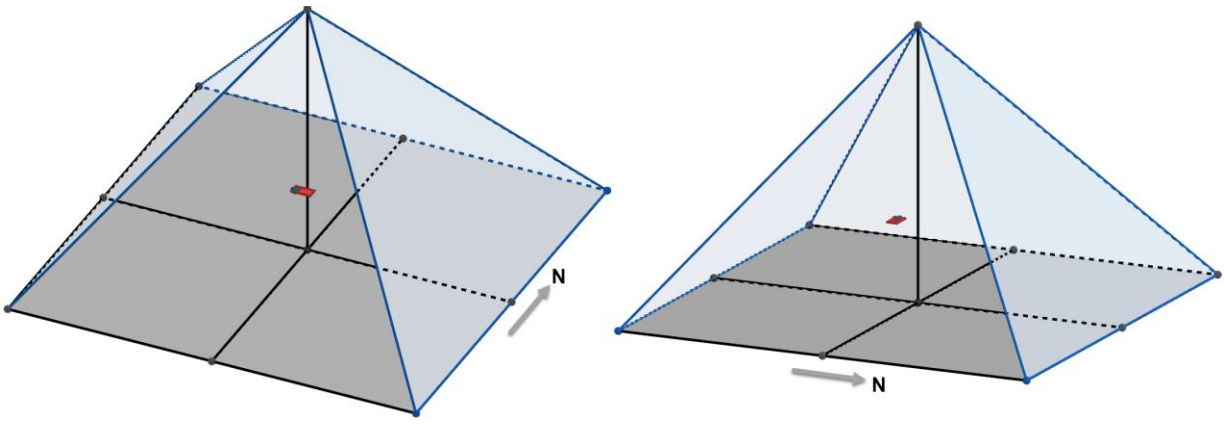


Figure 2

Circle-Square Relationship and the Silver Ratio

Figure 3 illustrates the most basic example of the circle-square relationship, where a square's area is doubled by arcing its diagonal.

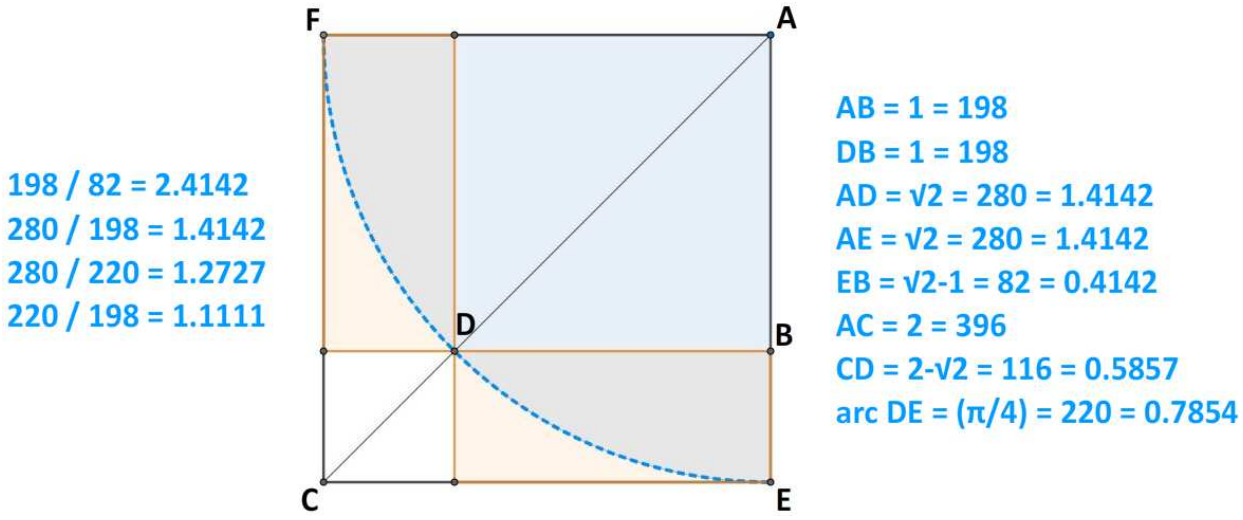


Figure 3

In Part One of this study, we explored how this principle works through fractional approximations. To recap: the blue square has a side AB equal to 1, and its diagonal AD is √2. When this diagonal forms an arc, representing one-quarter of a full circle, it leads to the creation of a larger square with sides AE and AF, both equal to AD (or √2). This larger square now has its own diagonal AC, equal to 2, which is segmented into the Silver Ratio at point D. By simple geometry, the area of this larger square is twice that of the original blue square. Thus, the larger square's area is $(\sqrt{2})^2 = 2$, while the original blue square's area is 1, meaning that two of the smaller blue squares together equal the area of the larger square (Figure 4).

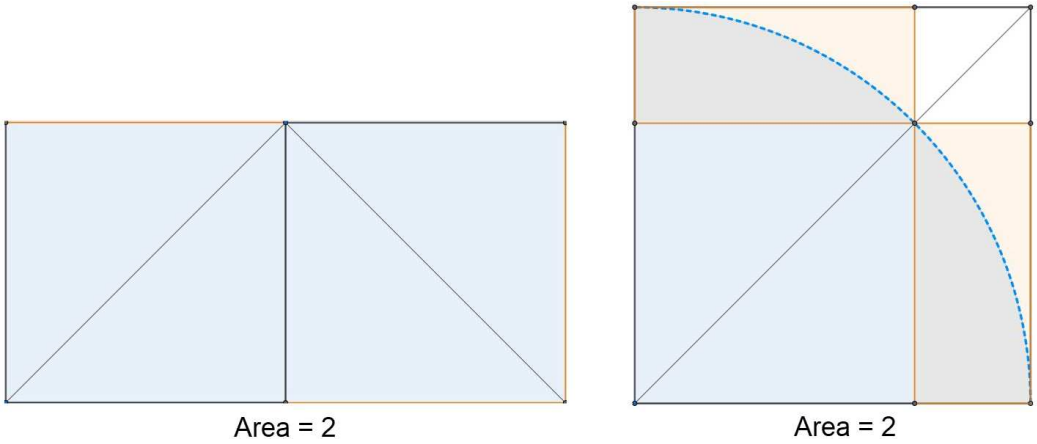


Figure 4

Application of the Silver Ratio to Sacred Architecture

The fundamental doubling of the square is achieved by arcing its diagonal, essentially "circling the square." While the arc initiates this transformation, a closer look reveals that the true mathematical mediation between the smaller and larger square is governed by the silver ratio. This ratio segments both the side AE and diagonal AC of the larger square at key points B and D in Figure 3. The result is the creation of eight silver ratio rectangles, through which the arc gracefully moves around the 4 quadrants of the circle, much like the diagonals traversing an octagon, as shown in Figure 5. This divides the circle into eight 45° sectors, reminiscent of the Great Pyramid's precise 45° alignment with Heliopolis, as discussed in my previous studies and to be further elaborated upon later.

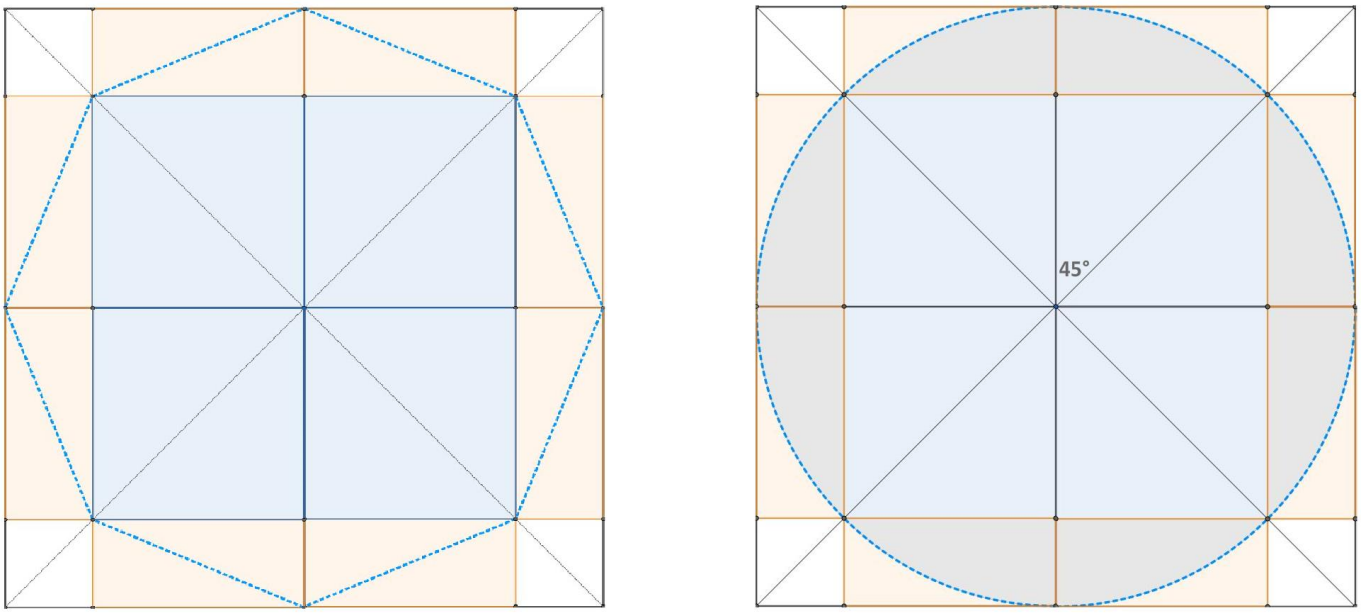


Figure 5

It becomes evident that the fundamental doubling (or halving) in the circle-square relationship is driven by the arc's segmentation of the 45° diagonal according to the silver ratio. In this way, any discovered architectural or metrological application of the silver ratio and the arc traversing these sectors might act as a shorthand for a deeper understanding of the geometric principles underlying the circle-square relationship—and, by extension, the broader cosmic order. This is especially relevant at sites like Giza and Stonehenge, where, as I will demonstrate in Part Three, their architectural design and latitudinal positions were chosen to align with the Winter Solstice sun and Heliopolis on the 'circular' horizon, in accordance with the square like silver ratio.

As seen in Figure 3, the square with side AE is equivalent to 280 Royal Cubits. If we assume that AE represents the height of the Great Pyramid along the Z-axis, then the arc DE, measuring 220 Royal Cubits, perfectly matches the half-base of the pyramid along the X and Y axes. Additionally, AB and BE, measuring 198 and 82 Royal Cubits respectively, precisely define the height of the King's Chamber floor beneath the apex and above the ground, segmenting the pyramid's height according to the silver ratio, just as shown in our figure.

Correlation Between the Pyramid's Faces and the Silver Ratio Circle

If we conceptually observe the Great Pyramid from each of its four faces, we see identical views, with each face showing the same height of 280 Royal Cubits, segmented by the King's Chamber floor in accordance with the silver ratio.[1] Each face also includes two half-bases, each measuring 220 Royal Cubits. When these views are compared to the four quadrants of the silver ratio circle, an impressive correlation becomes apparent. Each directional view of the pyramid, with its segmented height and two half-bases, aligns perfectly with the quadrants of the silver ratio circle, differing only in angular measure (Figure 6). Pairing the pyramid's faces in this way also reveals the relationship between the pyramid's height and base, which forms a precise pi rectangle for each pair, or 4 divided by 14/11 (Figure 7).

It becomes evident that the designers of the Great Pyramid, by segmenting its height according to the silver ratio and equating the pyramid's perimeter to the circumference of the silver ratio circle, intentionally used the geometric form of a square circumscribed by a circle as their template. This design accentuates both the silver ratio and pi. Furthermore, it is not difficult to envision this two-dimensional square-circle template as a three-dimensional volume, taking the form of the 'octant sphere'—a sphere circumscribing an octahedron (Figure XXXX). This combination of geometric forms underscores the intentional and sophisticated design principles embedded in the pyramid's architecture.

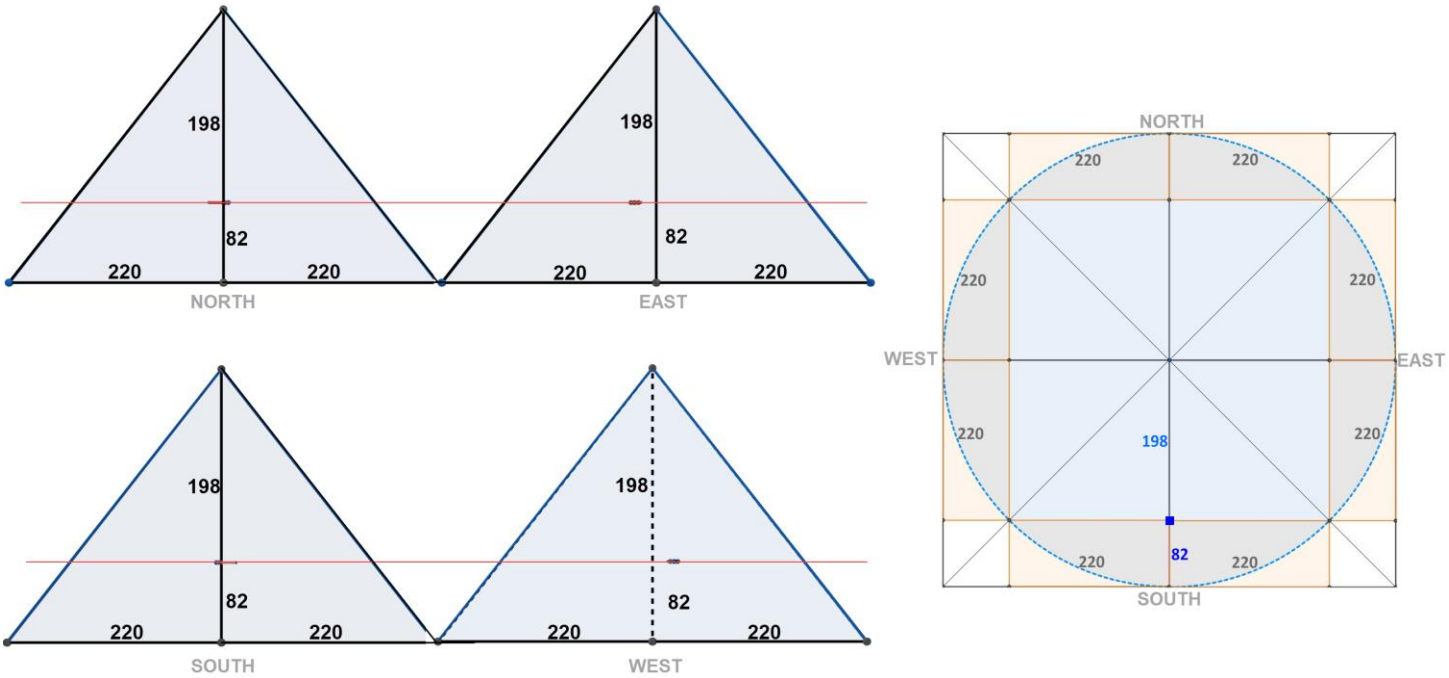


Figure 6

[1] As will be shown from Petrie's survey, the King's Chamber is offset 8.377 meters south of the X axis and 2.665 meters west of the Y axis, making the horizontal view of each face unique. However, the Z axis elevation does not change with observers' direction. The keen reader will have already noticed in this footnote, that the offset of the King's Chamber between the X and Y axes precisely approximates pi.

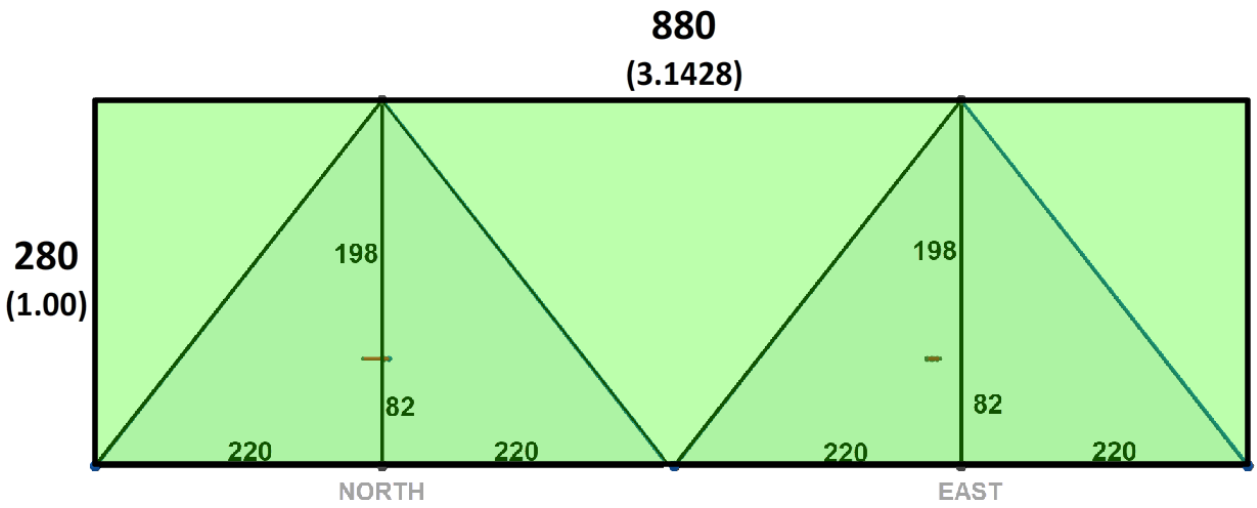


Figure 7

The Octant Sphere and Celestial Geometry

An octant sphere is essentially the three-dimensional equivalent of a square circumscribed by a circle, where three great circles encircle the three "squares" formed by an octahedron, each aligned with the X, Y, and Z axes (Figure 8). This transformation takes the familiar two-dimensional circle-square relationship into a spatial volume, dividing the sphere into eight equal sections. The three great circles—the equator (or horizon), the north-south meridian, and the east-west meridian—intersect at six key points on the sphere's surface, marking the cardinal directions: north, south, east, west, zenith, and nadir.

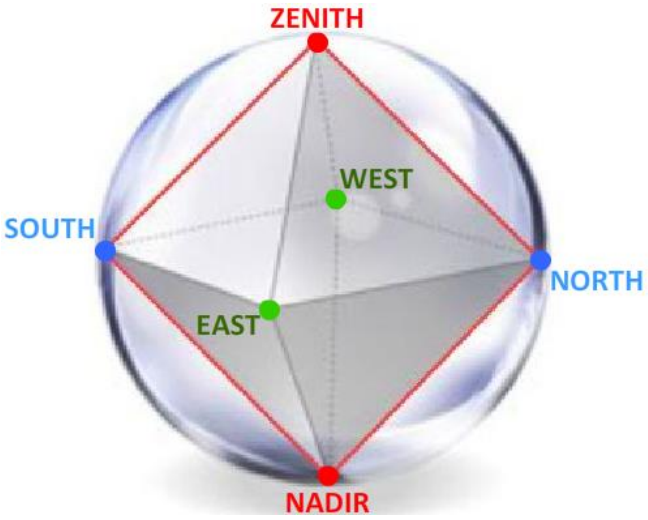


Figure 8

Dividing the celestial sphere this way is a natural method for humans to orient themselves, whether navigating by the stars or using geographic reference points. From the center of the sphere, facing north, the horizon separates above from below, while the north-south meridian, aligned with the North Star, divides east from west. The east-west meridian, tied to the equinoxes, further defines these cardinal directions and completes the framework by dividing

north from south. This inherent system of bearings is applicable at any latitude on Earth. These three great circles of the octahedron intersect at six cardinal points that form the fundamental spatial directions. Dividing the sphere into eight symmetrical sections, or octants, referenced to True North, reflects both contemporary and ancient human practices of navigation, astronomy, and metrology. Four octants lie in the northern hemisphere between the equator and zenith, while the other four occupy the southern hemisphere between the equator and nadir. Constructing such an octant sphere with precision, however, requires accurate alignment of the great circles at the cardinal points, which can be virtually impossible without a geometric framework.

Constructing an Octant Sphere Using an Octahedron

Euclid's Elements, specifically Proposition 13:14, demonstrates how to construct an octant sphere by first building an octahedron. The octahedron, with its six vertices corresponding to the cardinal points, serves as an intuitive and logical geometric framework, allowing the great circles to align perfectly with the sphere's divisions. The three squares of the octahedron, each lying in a different plane according to the X, Y, and Z axes, help to guide the placement of the great circles (Figure 9). Each of the octahedron's 12 edges (4 edges per square) trace the paths of the great circles, simplifying the process of dividing the sphere into eight equal sections, and each diagonal of each of the three squares (red, green and blue) define the X, Y and Z axes respectively, and thus the diameter, of the sphere. This Euclidean approach reveals the square's (√2) symbiotic role with the circle (pi) in making the octant sphere become a reality.

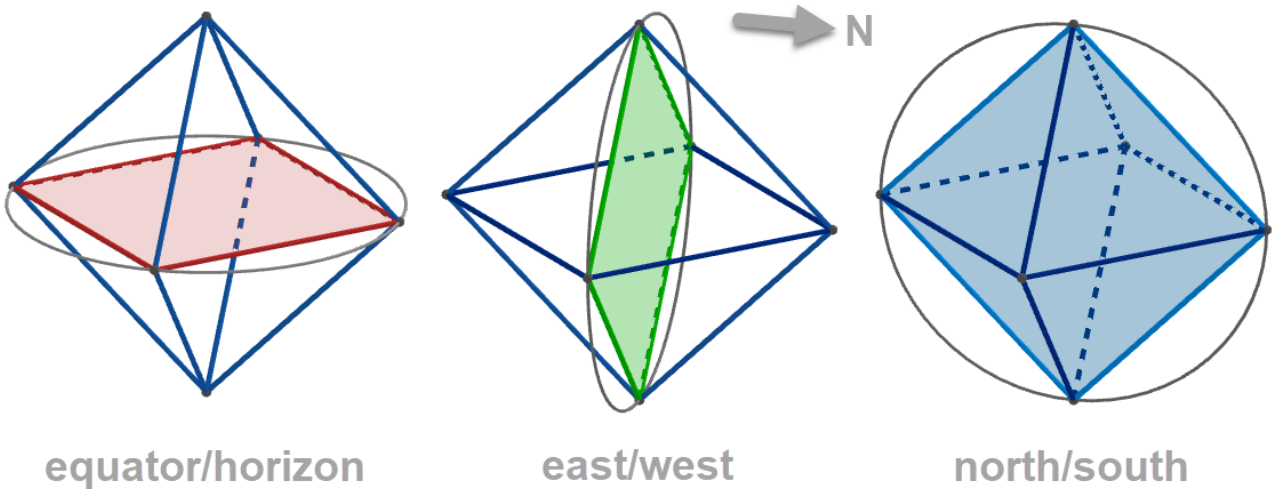


Figure 9

Mapping the Octant Sphere to the Great Pyramid

Imagine we are the designers of the Great Pyramid. Visualize an octant sphere modeled after the silver ratio circle, with a diameter of 280 Royal Cubits, and an inscribed octahedron with sides measuring 198 Royal Cubits. If we place the nadir of this octant sphere at the geometric centroid of the pyramid's planned site—this centroid being directly opposite the pyramid's apex, serving as a theoretical 'nadir'—and then roll the sphere 90° in each of the four cardinal directions, the vertices of the inscribed octahedron would make contact with the ground at precisely 220 Royal Cubits from the

centroid. This movement traces out a perfect square on the ground, which exactly matches the square base of the Great Pyramid (Figure 10).

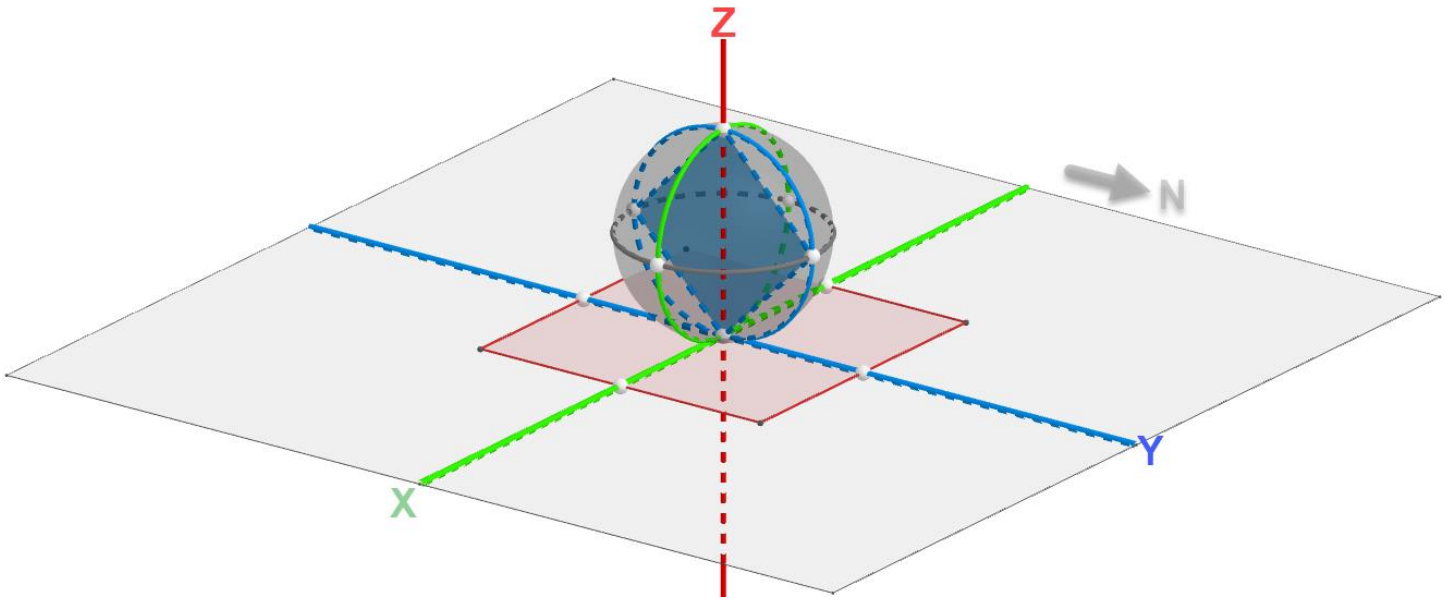


Figure 10

In simpler terms, the octahedron's square, with sides of 198 Royal Cubits and a diagonal of 280 Royal Cubits, can be mapped onto the ground through the rolling of the sphere's quadrant, perfectly replicating the pyramid's footprint. Once the square of the octahedron is established on the ground, the four corners of the square can be connected to the zenith (the apex of the sphere) to produce the exact height and slope angles of the Great Pyramid.

After this, the side of the octahedron connected to the zenith can be arched through the diagonal (or diameter) of the sphere, segmenting the height of the pyramid according to the silver ratio. This precise segmentation creates a link between the octahedron, the silver ratio, the circle, and the exterior of the pyramid, directly connecting it to the interior design, particularly in defining the elevation of the King's Chamber floor. Ultimately, this geometric harmony between the exterior and interior of the Great Pyramid reflects the underlying axioms that seem to govern not only the pyramid's architecture but, to the ancients, also the geometry that shapes the universe itself.

Geometric Principles in the Great Pyramid's Design

The Great Pyramid's precise orientation toward True North and its design reflecting this circle-square relationship is a strong indication that such geometric principles were central to its construction. The pyramid's alignment and its incorporation of the silver ratio and geometric relationships, like the octant sphere, suggest that this theory of design, rooted in basic geometry, is not only possible but highly probable. For ancient builders, encoding these cosmic principles into sacred architecture would have reflected their deep understanding of celestial order, making the pyramid a monumental representation of the geometrical axiom which governs the creator's consciousness.

The Silver Ratio and Stonehenge Connection

This theory concerning basic geometrical governance is further supported and motivated by the discovery, as demonstrated in my initial Stonehenge Giza Connection study, that the precise latitudinal distance between Stonehenge and the Equator compared to the distance between Stonehenge and Giza is also in exact silver ratio proportion (Figure 11). In that study it is also shown that the Station Stone rectangle at Stonehenge is a silver ratio rectangle whose perimeter precisely matches the base length of the Great Pyramid at 440 Royal Cubits, and its diagonal points directly toward Heliopolis, further signifying the import of the silver ratio to these ancient megalithic builders. Therefore, we should now turn our attention to the placement of the King's Chamber and the coffer within the overall design plan to see if it too corelates with the silver ratio circle as shown earlier.

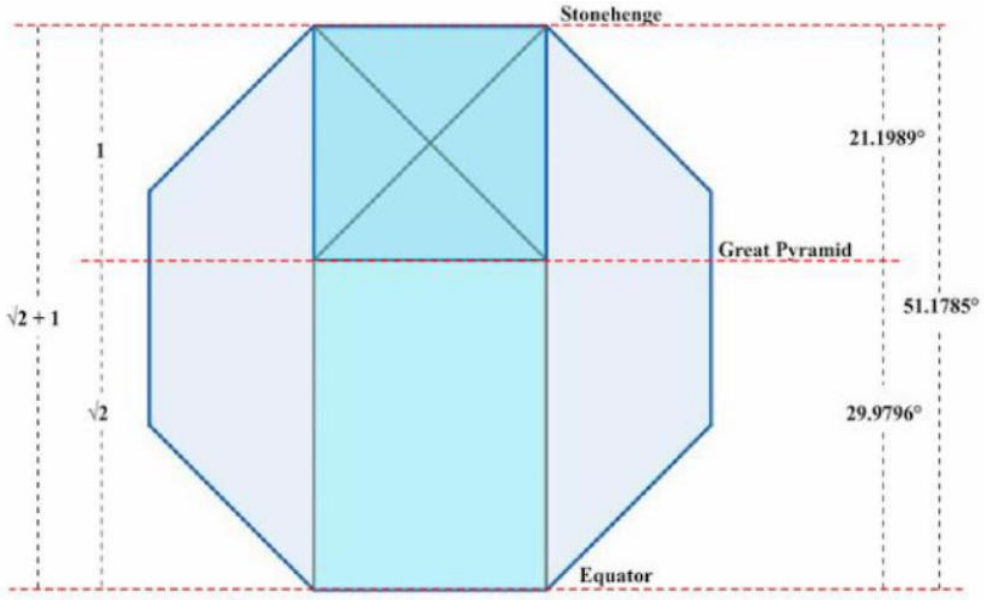


Figure 11

The Opening of the Mouth Ceremony

To approach this diligently, we must first ask a fundamental question: what was the likely purpose of the King's Chamber and the coffer? By answering this, we can likely gain deeper insight into their specific placement and design within the pyramid. This inquiry leads us to explore the Opening of the Mouth ceremony, an ancient ritual crucial to understanding the chamber's function.

The Opening of the Mouth ceremony was a deeply significant interment ritual in ancient Egyptian tradition, intended to restore the senses of the deceased, allowing them to eat, drink, breathe, and speak in the afterlife. Central to this ceremony was the importance of the mouth in Egyptian cosmology and rites, as it was believed to be the gateway through which the soul could communicate, receive sustenance, and perform vital rituals in the afterlife. Originating in the Old Kingdom, this sacred practice was initially reserved for royalty and the elite, reflecting its crucial role in ensuring the deceased's continued existence and influence in the spiritual realm.

The ceremony symbolized the rebirth of the dead, echoing the resurrection of Osiris, the god of the underworld, who was restored to life after being slain and dismembered by Set. Just as Osiris's mouth was opened to allow him to speak the words of power and assume his divine role, the Opening of the Mouth ceremony was performed to empower the deceased, especially the Pharaoh, to participate in the afterlife and uphold the cosmic order. This act was not merely a funerary rite but a profound spiritual transformation, where the deceased was endowed with the ability to speak and invoke the necessary spells to navigate the afterlife and commune with the gods.

The ritual drew a poignant parallel to the 'opening of the mouth' of a newborn, when a mother or midwife clears the child's mouth to initiate life. The priest wielding the adze in this ceremony symbolized this nurturing gesture, the adze representing the 'arm' of the mother, symbolically opening the mouth of the deceased to 'birth' them into the afterlife. Eberhard Otto, in recognizing this connection, translated "dwn'," one of the Egyptian terms for the adze, as 'extended arm,' underscoring the role of this tool in the ceremony as a symbol of both nourishment and rebirth.

The ceremony involved a series of complex rites performed by priests, who used special tools like the adze to symbolically open the mouth, eyes, ears, and nose of the mummy or statue, reactivating the deceased's physical faculties. These acts were accompanied by offerings, incantations, and symbolic gestures, each designed to reinvigorate the senses and ensure the deceased's ability to eat, speak, and breathe in the afterlife. This activation of the senses was crucial, as the ability to speak was believed to grant the deceased the power to invoke protective spells, receive offerings, and maintain their vital essence in the spiritual realm.

The Opening of the Mouth ceremony reflects the Egyptians' deep understanding of the mouth's pivotal role in their cosmology, where speech was not just communication but the means by which reality was created and sustained. By enabling the deceased to speak and perform sacred rites, the ceremony affirmed their rebirth and ensured their participation in the eternal cycle of life, death, and regeneration. This ritual was essential to preserving the divine order and cosmic balance, securing eternal life for the pharaohs and the nobility, and reaffirming their role in maintaining harmony throughout the universe.

The Pyramid as a Vessel for Khufu's Ka

Given the profound significance of the Opening of the Mouth ceremony, it is likely that the most sacred focus of the Great Pyramid was not confined to the King's Chamber or even the position of Khufu's coffer. Instead, the entire design—both exterior and interior—was sacred, with the ultimate goal of pinpointing the exact X, Y, and Z location of Khufu's head, specifically his mouth, within the pyramid. In this sense, the pyramid itself served as a type of "body" for Khufu's Ka, with its precise geometry and alignment acting as a vessel for his spirit and the King's chamber acting as the body's mouth. Much like the Ka statue in ancient rituals, this location was key to ensuring Khufu's eternal life. The sacredness of the pyramid's design, including its exterior, reflects its dual role as both a physical monument and a spiritual body, carefully constructed to guide Khufu's Ka through the afterlife. The off centered placement of both the

King's chamber and Khufu's mouth relative to the pyramid's spine (the Z axis), and elevation above the ground, relative to the pyramid's base and Benben like pyramidion, could hold special significance, potentially linked to the ceremony's goal of reanimating the pharaoh's senses for his journey into the afterlife.

'Misalignment' of the Coffer and Symbolic Placement of Khufu's Mouth

Thanks to Petrie's meticulous survey of the Great Pyramid, the King's Chamber, and the coffer, we can reasonably hypothesize the position of Khufu's head (and thus mouth) in relation to this crucial axis, exploring whether it aligns with the pyramid's overall design, even though the actual location of his head is no longer known.

The nearly 3-ton rectangular granite coffer in the King's Chamber remains intact but is slightly misaligned, tilted by about 2.5° relative to the surrounding walls. This minor misalignment likely occurred not because explorers tried to 'relocate' the coffer as sometimes speculated, but rather because they tilted it in an attempt to look underneath, possibly searching for a hidden opening in the floor. This tilting caused a small shift, moving the south end of the coffer eastward or the north end westward by just 4 centimeters, resulting in its current 2.5-degree skew. Although Khufu's body is no longer in the coffer and the exact position of his head remains hypothetical, this minor adjustment would not significantly impact our conjecture regarding the precise location of his head and mouth. Consequently, the ceremonial positioning of the pharaoh's mouth in the King's Chamber, relative to the pyramid's spine—and its symbolic alignment with the apex, base, and the sacred geometry of the pyramid—can still be reasonably reconstructed.

Petrie's Measurements: A Reliable Foundation

The precise measurements of the interior and exterior of the Great Pyramid recorded by Sir William Flinders Petrie in his 1883 work, 'The Pyramids and Temples of Gizeh', are essential for studying the Great Pyramid and the King's Chamber. Petrie's meticulous and unbiased approach provides a reliable foundation, offering a factual basis that contrasts with modern interpretations often rooted in fanciful speculation or incomplete data. His documentation dispels myths and inaccuracies, allowing for an accurate assessment of the pyramid's design, proportions, and symbolic significance.

In this study, I have carefully selected exact measurements from within the ranges reported by Petrie, converting his original data, recorded in tenths of inches, into meters for greater precision and alignment with modern standards. Notably, these detailed measurements—particularly those concerning Khufu's coffer—are missing from the 1990 revised edition by Zahi Hawass. Therefore, this research relies exclusively on Petrie's original work, preserving critical data that is absent from later revisions. All conversions of these measurements into Royal Cubits, as used in the construction of the Great Pyramid, are based on the Royal Cubit being equivalent to 20.614 inches +/- 0.002 inches, or 0.5236 meters, as demonstrated in Glen Dash's modern survey of the pyramid's base and corroborated by Petrie's mean measure of the King's Chamber (page 27). This method, detailed in my earlier study, 'The Meter and the Royal Cubit in Ancient Egypt', ensures that our analysis is grounded in precise and consistent units of measurement, reflecting the ancient builders' original intent.

King's Chamber and Coffer Placement: Alignment with the Silver Ratio and pi

According to Petrie (page 85), the floor of the King's Chamber lies between 1690.80 and 1694.30 inches above the pavement, or 42.946 to 43.035 meters, with a margin of error of +/- 0.6 inches. For this study, I have used the lower end of this range, 1690.80 inches, which equals 42.946 meters or 82.019 Royal Cubits, calculated using 0.523606 x 82.019 (Figure 12). This positions the floor of the King's Chamber in a Silver Ratio division of the Great Pyramid's total height, resulting in a 280 : 198 : 82 ratio, or 3.414 : 2.414 : 1, as shown in the above silver ratio circle and demonstrating a construction accuracy of 99.99%, or within 5 millimeters.

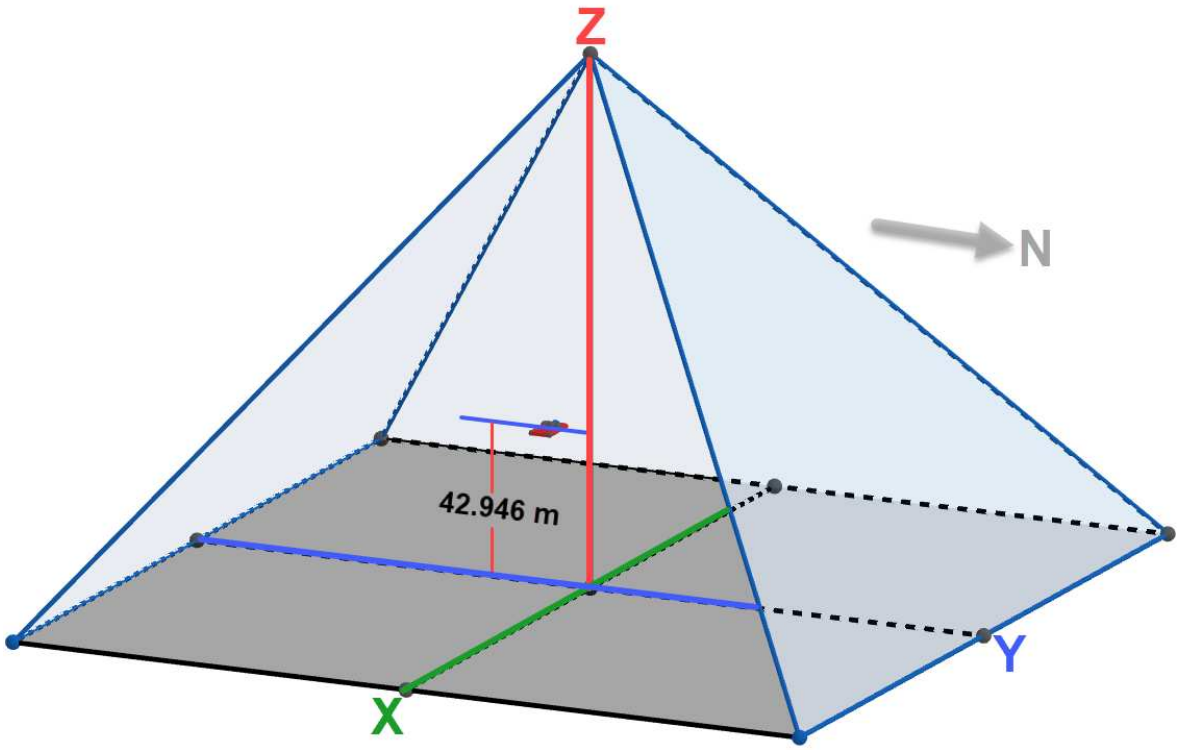


Figure 12

On page 82, Petrie records the dimensions of the King's Chamber, with the east/west walls ranging from 205.97 to 206.43 inches and the north/south walls from 411.88 to 412.78 inches. For this study, I settled on measurements of 206.14 inches (5.2360 meters) for the east/west walls and 412.28 inches (10.4721 meters) for the north/south walls, corresponding precisely to 10 and 20 Royal Cubits, respectively. Petrie (page 85) also notes that the north wall of the King's Chamber is 329.80 to 331.40 inches (330.6 +/- 0.8 inches) south of the pyramid's X-axis. I chose 329.83 inches (8.3777 meters), which equates to exactly 16 Royal Cubits.

Additionally, Petrie states that the west wall of the King's Chamber is between 104.70 and 110.70 inches (107.7 +/- 3.0 inches) west of the pyramid's Y-axis. For this study, I used a value of 104.94 inches (2.6656 meters), equivalent to 5 1/11 Royal Cubits. For Khufu's coffer, Petrie (page 86) gives the exterior dimensions as 89.62 inches in length and 38.50

inches in width. I adopted these exact figures, converting them to 2.276 meters and 0.9779 meters, respectively. The interior length, according to Petrie, is 78.06 inches, which I have used as 1.982 meters in this study.

Petrie also details (page 85) the positions of Khufu's coffer within the chamber: the northeast and northwest base corners are 48.35 and 50.06 inches from the north wall. I selected a midpoint of 49.76 inches (1.242 meters) for this study. The northwest and southwest corners are 53.32 and 56.54 inches from the west wall, for which I used 54.96 inches (1.3960 meters). Lastly, Petrie notes that the south corners of the coffer are between 67.62 and 68.60 inches from the south wall, and I have applied a measurement of 67.625 inches (1.7177 meters).

Therefore by using measurements all within range of Petrie's supplied data we will see that the designers of the Great Pyramid intentionally positioned the King's Chamber to seamlessly integrate its vertical and lateral dimensions into a cohesive geometric design. As we have seen, the floor of the chamber was elevated 82 Royal Cubits above the ground pavement and 192 Royal Cubits below the apex, creating a precise segmentation of the pyramid's height according to the Silver Ratio circle which we examined earlier in this study. Therefore, it should come as no surprise to us to find proportions within the King's chamber that coincide with the exterior design of the pyramid, specifically the silver ratio and pi as it relates to not only the positioning of the Kings chamber, but also the head of Khufu within the coffer, highlighting the significance of the opening of the mouth ceremony.

Geometrical Precision of the King's Chamber and the Pyramid's Z-Axis

From this point onward, we will discuss the dimensions and orientation of the King's Chamber and its coffer in meters, converted from Petrie's original measurements in inches, as outlined above and now shown in a topological plan view (Figure 13).

The Z-axis represents the vertical spine, or height, of the pyramid, with the top called the apex (zenith) and the bottom referred to as the centroid (nadir). The distance from the centroid to the apex measures 146.609 meters. While the King's Chamber does not intersect the Z-axis, it is positioned exactly 8.377 meters, or 16 Royal Cubits, south of it and the X-axis. However, if the King's Chamber were to intersect the Z-axis (let's call this point Q), its floor would do so at precisely 42.946 meters above the centroid. This would segment the Z-axis into two parts: 42.946 meters from the centroid to the floor and 103.663 meters from the floor to the apex.

This division results in a remarkably accurate approximation of both √2 and the silver ratio. Specifically, 146.609 / 103.663 = 1.4142 (√2) and 103.663 / 42.946 = 2.4138 (silver ratio), achieving accuracies of 99.999% and 99.984%, respectively. This leads to an intriguing question: if the designers of the pyramid elevated the floor of the King's Chamber relative to the apex in accordance with √2, as the data strongly suggests, why did they offset the north wall of the chamber by exactly 16 Royal Cubits (8.377 meters) south of the X and Z axes?

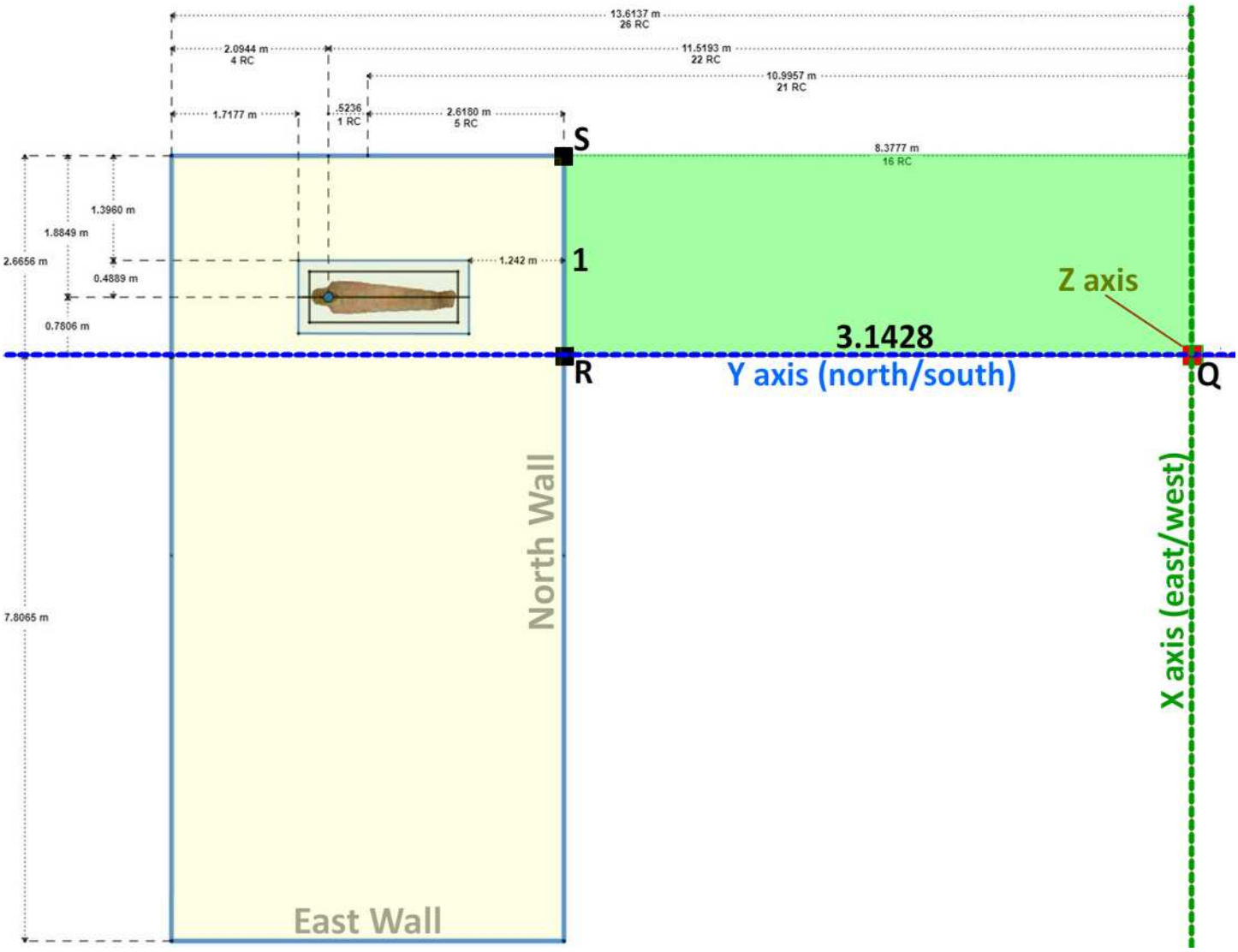


Figure 13

Mathematical Alignment of the Coffer and Khufu's Symbolic Positioning

To explore this question, and knowing the precise position of the north wall of the chamber relative to the X and Z axes, we must determine the location of the NW corner (point S) of the King's Chamber. This corner, being the closest to point Q (the intersection of the X, Y, and Z axes), is most likely the foundation point for the chamber's construction. Petrie's measurements give us the relative distances of both the west and north walls from their respective axes, allowing us to confidently place the NW corner of the chamber at 8.377 meters south of the X-axis and 2.6656 meters west of the Y-axis, designated as point S. Remarkably, this creates a 16 x 5 1/11 pi rectangle (in green) between the NW corner of the chamber (point S) and point Q, serving as the chamber's mathematical portal via the √2 (198 Royal Cubits) to the pyramid's apex.

This discovery is amazing, as it reveals that these measurements not only align with Royal Cubits but also form a perfect pi rectangle, consistent with earlier observations from the pyramid's side views. This strongly indicates that the builders intentionally positioned the NW cornerstone of the King's Chamber to emphasize the relationship between pi and √2 within the pyramid's overall design. Given the care taken to incorporate the silver ratio's square-circle relationship into the exterior and the chamber, it raises the question: would the builders even dare to neglect similar geometric precision in the placement of Khufu's coffer?

According to Petrie's survey, the coffer, like the King's Chamber itself, is offset from the center of the surrounding structure. The exterior dimensions of the coffer measure 2.276 meters in length and 0.977 meters in width, while the interior measures 1.977 meters by 0.677 meters. The long axis of the coffer, oriented north-south, is centered 1.8049 meters from the west wall of the chamber, and the short axis is 2.380 meters south of the north wall. Now, if we imagine placing a fully embalmed and outfitted Khufu inside the coffer, with his head on the south side, he would be facing True North and the Imperishable Stars upon rising. In this position, his mouth would be 2.094 meters from the south wall of the chamber and centered on the coffer's long axis, 1.8049 meters from the west wall, and 0.7806 meters from the X-axis. His mouth would also be positioned exactly 1 Royal Cubit south of the center of the King's Chamber and 22 Royal Cubits south of the pyramid's X-axis, making it exactly 198 Royal Cubits from the southern base of the pyramid—just like the floor of the King's Chamber is 198 Royal Cubits below the apex.

In essence, the positioning of Khufu's mouth within the chamber mirrors the pyramid's external design. Just as the floor of the King's Chamber precisely divides the pyramid's height (Y-axis) according to the silver ratio, the placement of Khufu's mouth divides the space between the Y-axis and the west wall along the east-west axis, following the same geometric principle. The east-west measures, 2.6656 / 1.8849 = 1.4142, and 1.8849 / 0.7806 = 1.4146, approximate √2. This interior alignment reflects the pyramid's exterior ratios, where the proportion of 2.6656 / 2.0944 = 1.2727 reflects the design according to the silver ratio circle. Khufu's mouth thus occupies the √2 point in the topological plan of the King's Chamber, just as the King's Chamber segments the Z-axis of the pyramid's exterior in the north-south view. This positioning suggests a profound symbolism: Khufu's mouth is the mouth of the pyramid and it was at his command that the pyramid came into existence.

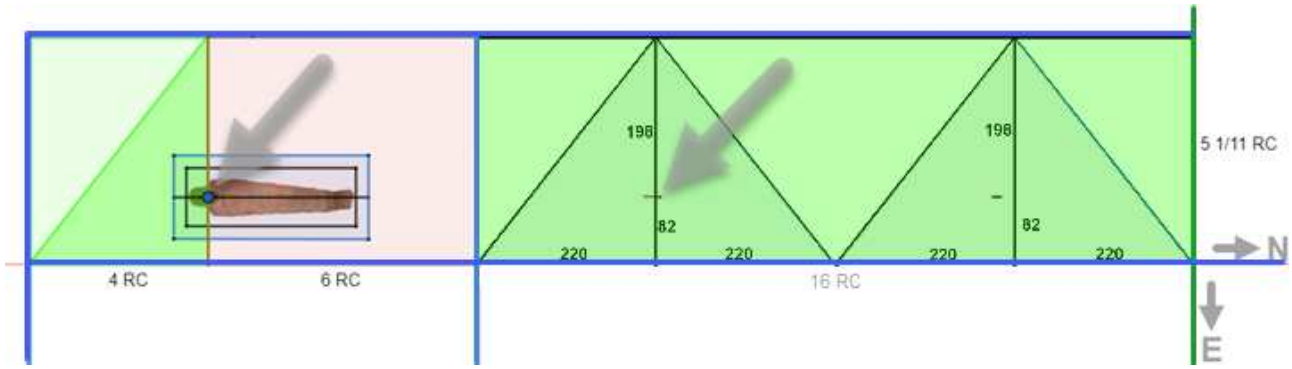


Figure 14