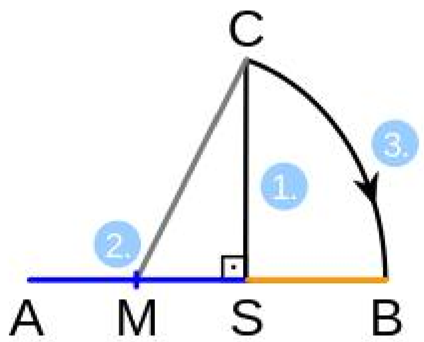
49 The Great Pyramid and Senet Board

Many have written about the role of the Golden Proportion in the Great Pyramid and the surrounding site at Giza. Robert Temple, for example, has written several books in which he discusses what he calls the "golden angle" that constantly occurs in the Pyramid and its environs.

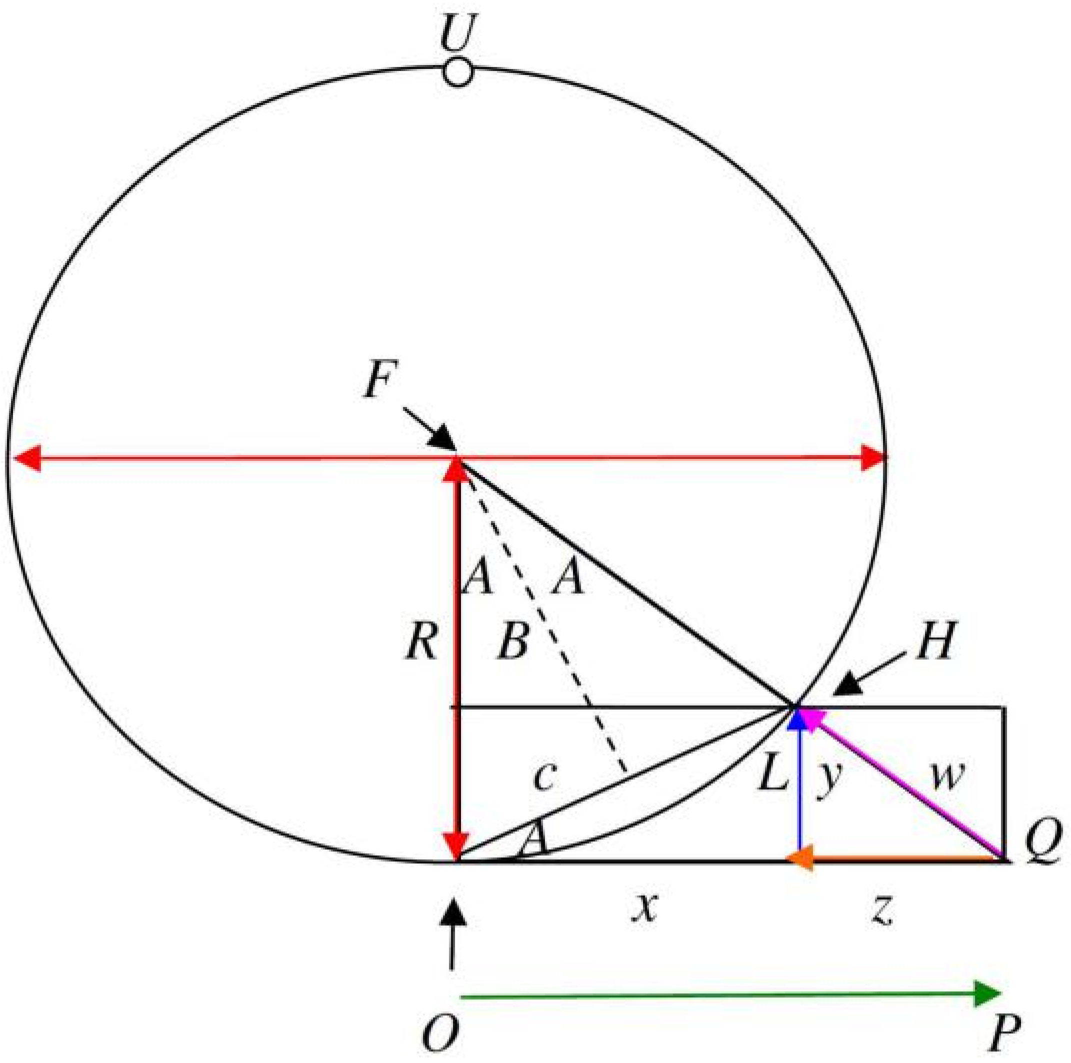
His "golden angle" is derived in the following simple manner.



First draw a straight line segment AS. Then erect a perpendicular to AS at SC with AS = SC. Next bisect line AS at point M. Thus MS is 1/2 the length of CS. If you extend AS out beyond S and draw an arc using M as your center and MC as the radius (length $\sqrt{5}$ relative to MS), it will intersect the extended AS at point B, which will set up the golden ratio SB : AS = AS : AB. The upright right triangle MSC forms an acute angle at C which is what Temple calls the "golden angle". It is 26.56505 degrees. (26° 33' 54"). This is the angle used for the sloped passageways inside the Pyramid. It is also used in many places on the Giza plateau as discussed in detail by Temple. (Turn the diagram 90 degrees to the right to see the slope of MC with the "golden angle".)

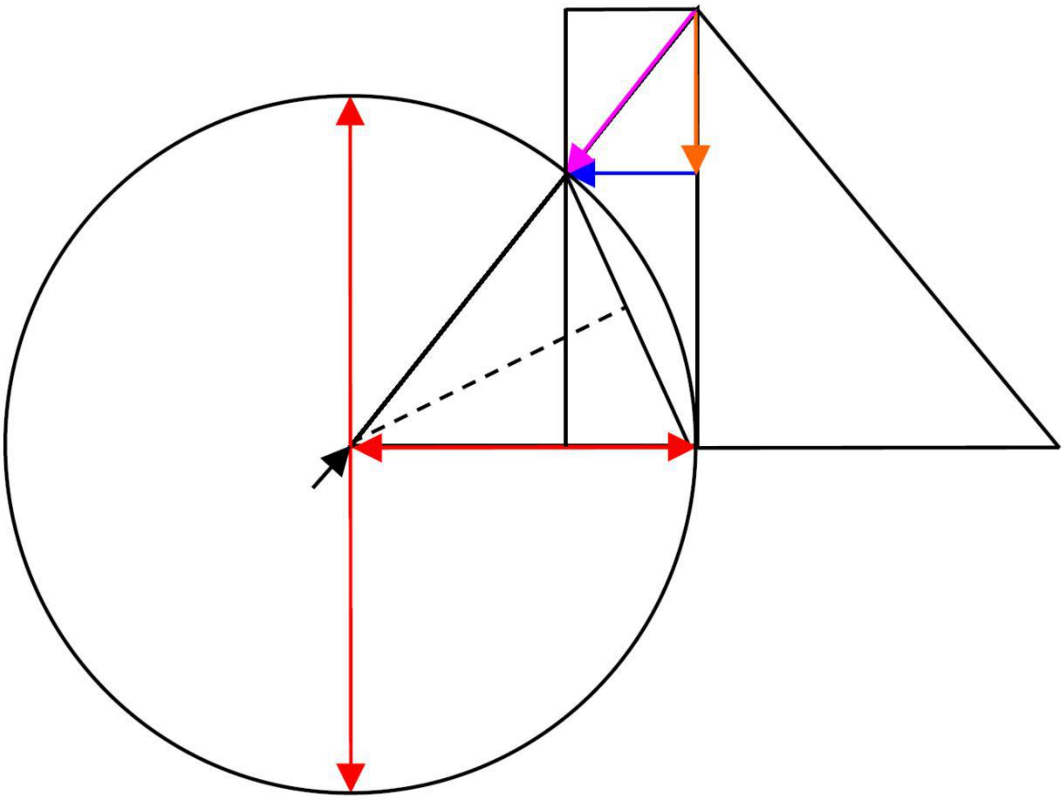
In the previous article we discussed how the Egyptians used pendulum plumb bobs in various ways. I became interested in finding the least amount of push that would give the greatest rise to a pendulum. It is clear that an initial push is almost horizontal. However, as the pendulum swings upward the gravitational downward tendency slows the pendulum and may eventually stop its rise. A push that moves the pendulum no more than 15 degrees stays within a simple formula. But, when it goes beyond 15 degrees it requires calculus. I was looking for the "sweet spot" that would give the most rise for the least push.

After some calculations I came up with a surprising conclusion.



When I rotated the diagram I had made and the numbers I found, I discovered that the angle matched that of the Great Pyramid and the vectors generated the shape of the Senet Board. In other words, the angle at Q on the drawing with the vector triangle *wyz* is about 25.915°, which is half of 51.83° (or **51° 49' 48")**. The Great Pyramid angle at the apex is estimated to be **51° 50' 40"** (the apex is missing). The ratio of the Push linear distance (*OP*) to the Lift of the bob (*L*) turns out to be 3.33, which is 10/3, which gives the ratio of length to width of the Senet Board.

That was a shock to say the least, and it may be of interest for architects to check my math, although I doubt they want to build another Great Pyramid to see what happens, but they could build a precise model.

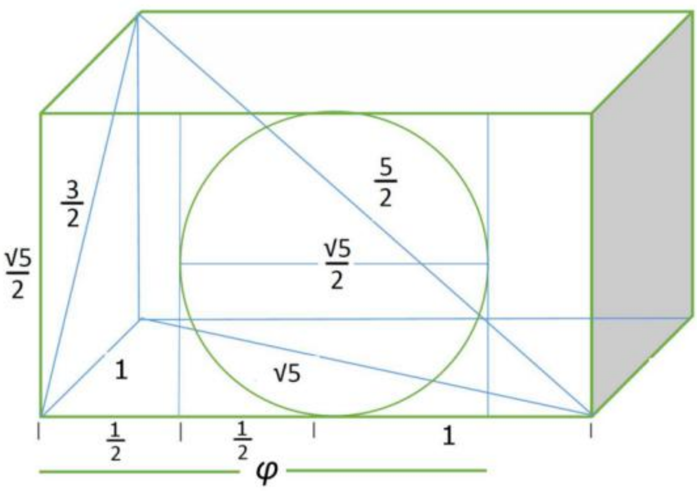


Above Diagram Rotated and Extrapolated to show
Great Pyramid Outline.

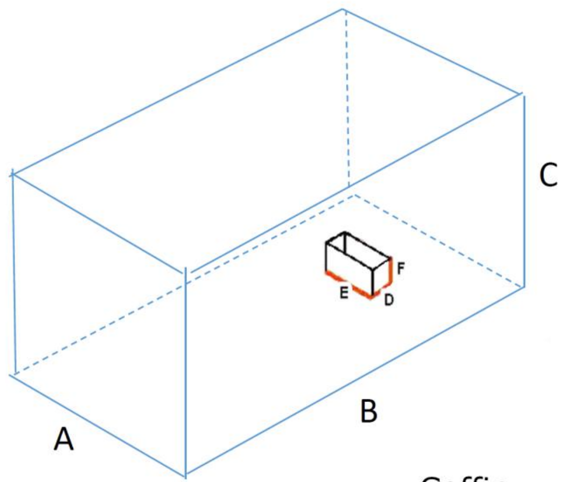
What does this mean? It seems that the design of the Great Pyramid arrived at the most efficient angle for relieving stress from the great weight of the stones.

We will now turn our attention to the so-called King's Chamber inside the Great Pyramid and its dimensions.

The King's Chamber



You can see from the dimensions that the chamber contains the golden ratio *φ.* The length is twice the width, so the diagonal is √5, and that gives us a golden right triangle and the acute angle is the same as Temple's "golden angle".

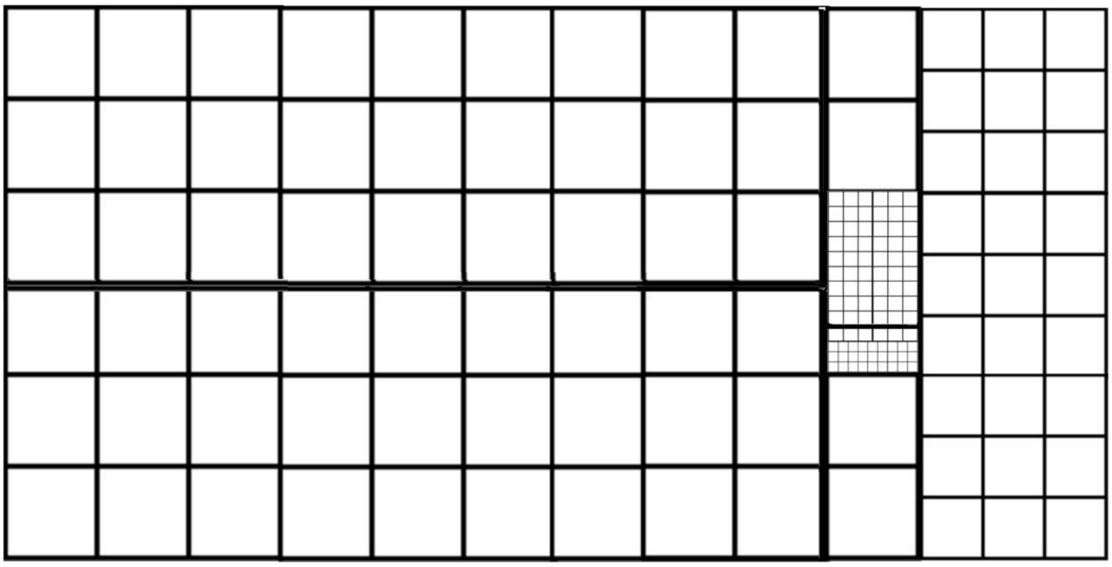


Chamber			Coffin	
A = 206.065 P"	W		D = 38.693 P"	W
B = 412.132 P"	L		E = 89.805 P"	L
C = 230.388 P"	H		F = 41.2132 P"	H

The coffin in the chamber is very odd. Its dimensions are not in the same ratio as the chamber, but the ratio of the sum of the chamber dimensions to the sum of the coffin dimensions is 5/1.

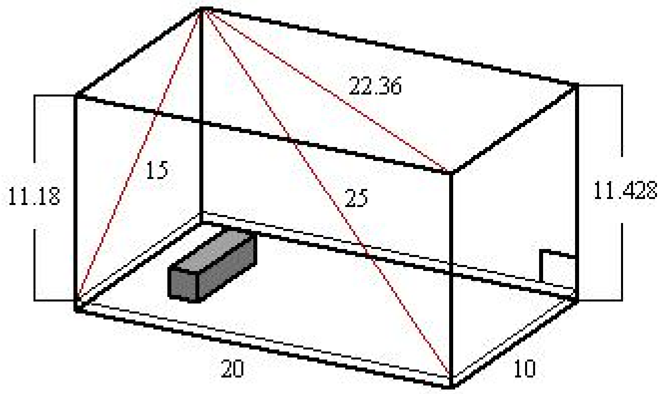
Now we turn to the floor of the chamber. Its length is twice its width, and the width divides into 6 equal squares, so we can place two large Senet Boards side by side down the length of the chamber with two large squares left over at the end. These two large squares can be divided into 3 equal segments that form three rows of smaller squares, each 9 squares in length. In the two middle squares of the tenth row of 6 large squares we can place the coffin. The coffin repeats the pattern for the whole chamber floor, but at a smaller scale.

The geometry of the chamber floor is built around a study of the geometry of the Senet Board. I had no idea the Senet Board was so deeply encoded into the architecture of the Great Pyramid, but the close connection of its geometry with that of the Golden Ratio is a telltale sign of the links.



It also informs us that the Ennead (group of 9) substructure of the Senet Oracle Board is extremely important for understanding how Universal Cosmic Numbers of Thoth's stone box relate to this huge stone box of Osiris within a gigantic monument to Isis.

The above drawing I made is not quite accurate in one detail. The dimensions of the coffin are not in the exact same ratio as the dimensions of the chamber, so it does not fit exactly into 2 floor squares in the 12x6 scheme. (Take a calculator and study the measurements given on the previous page.) The coffin is narrower, longer, and less high than it would be if it were exactly the same shape as the Chamber. However the 3 dimensions of the coffin summed together are almost exactly 1/5 of the Chamber dimensions summed together. I have made an idealized coffin that exactly fills two floor squares in the 6x12 space. That way we can fit exactly 30 coffins into the 6x10 portion of the floor space of the Chamber. The "Ennead" space at the end is made of 27 smaller squares. This allows us to fit 13 even smaller copies of the Chamber floor space into 26 of the 27 smaller squares. The 27th square can be split down the middle into 2 even smaller copies of the Chamber floor. The whole Chamber can then be completely tiled with smaller copies of itself; 30 larger ones, 13 smaller ones, and 2 even smaller ones. Each copy consists of 2 full Senet Boards plus an Ennead. Each of these smaller copies of the floor can be tiled with the same pattern of even smaller copies of the floor. Thus the King's Chamber is really a fractal Senet Board design. Each parallel pair of Senet Boards consists of 2 Enneads plus 3 smaller copies of the Chamber floor, or we could say 30 of the smaller copies of the Chamber floor. I do not know why the ancient Egyptians made the dimensions of the coffin 1/5th of the Chamber dimensions, but not in the exact same ratio. Maybe it was just as a kind of joke to jar the almost perfect fractal pattern a bit. The Egyptians seldom made errors by mistake.



The above drawing from http://home.hiwaay.net/~jalison/gpkc.html shows the King's Chamber in cubits as measured by Petrie. The length is 20, the width is 10, and the height is 11.18 from the floor blocks to the ceiling. The diagonal of the end wall is 15 and the diagonal from the other end of the length to the other end of the end wall diagonal is 25. This forms a nice 15x20x25 = 3x4x5 right triangle. The diagonal of the floor (or ceiling) is 22.36, which is the square root of 500, or 10x√5. If we use these cubit measurements for the floor with its width of 10 and length of 20, then we can lay out 6 Senet Boards along the floor, each with 3x10 cubit dimensions. At the end, beyond the coffin, we have a 2x10 cubit rectangle made of two more rows of cubit squares. This can be divided into 5 pairs of cubit squares, each of which is a 1:10 scaled down version of the Chamber floor forming a 1x2 cubit rectangle. Each such rectangle then contains 6 small Senet Boards plus 2 extra rows that are 1/10th the size of the 2x10 cubit rectangle (.2x1 cubit). We can repeat this process with 5 further scaled down versions of the whole floor, and so on indefinitely. Again we have a very neat fractal Senet Board layout for the King's Chamber.

Each time we downscale the "Chamber floor" model dimensions become an order of magnitude smaller (1/10th the size of the previous model). If we start with a model floor made of 1-meter squares, 34 such scaled down iterations brings us to the Planck scale.

49 Study Questions

* Use a pencil, straightedge, and compass to construct a "golden angle" such as seen at the beginning of this article.

* Find several examples of this golden angle in the Great Pyramid and in various parts of the Giza plateau. Robert Temple discusses this angle at length in his books that deal with the Giza plateau.

* Read and study the section on pendulums in my free ebook download, **The Cosmic Game**, pp. 60-73. This includes a discussion by Miles Mathis about ways the ancient Egyptians may have been able to do calculus based on simple tables of numerical relationships rather than a complicated theory of limits. See how the efficient use of forces leads to the angle of the Great Pyramid and how the ratio of the Senet Board is also built into this.

* Study the ratios in the dimensions of the King's Chamber until you understand how the golden ratio is built into it as well as the "golden angle".

* Study how the floor of the King's Chamber is a mosaic of Senet Boards and Enneads, which are also calendars and expressions of Thoth's numbers of the Cosmos.

* Construct a King's Chamber floor mosaic on the model suggested by the drawing made by Petrie. Draw a rectangle that is composed of two large squares. You can use a meter as your unit for a square's side. Then you have a 1x2 meter rectangle. Divide the rectangle into a grid in which each smaller square is 1 decimeter (10 centimeters) on a side . The grid contains 200 such squares. Mark off 6 Senet Boards each being 10 decimeters (1 meter) long and 3 decimeters wide like columns along the rectangle. The boards are arranged in parallel so that they cover 18 squares of length, leaving two decimeter columns at the end where the coffin would be. Divide the two columns into ten 10x20 decimeter rectangles. Each of these ten smaller rectangles is a scaled-down version of the 1x2 meter large rectangle. We can divide the whole board into 100 such 10x20 decimeter rectangles. The area of our King's Chamber floor has shrunk by two orders of magnitude. However, the width each of the larger Senet Boards is 3 decimeters (30

centimeters). The small diagonal on each Board is then 31.62 cm (or 3.162×10^{-1} m). The width of each smaller Senet Board is 3 cm, so the diagonal is 3.162 cm, or (3.162×10^{-2} m, or one order of magnitude smaller). After 33 more such shrinkages, we get to the Planck scale. The diagonal is then $3 \times 1.054 \times 10^{-35}$ m, which is getting into the range of the Planck length (approx. 1.6×10^{-35} m). The Planck length is the distance light travels in 1 unit of Planck time ($5.39116(13) \times 10^{-44}$ s). This is the level of what physicist John Wheeler called “quantum foam”, a realm where anything is possible, since even the laws of nature no longer hold at that level. What if we place the two columns that “shrink” the floor layout into the zone where the great stone sarcophagus lies, and we get into the sarcophagus and practice the Ocean Awareness Meditation? (See article # 52.) Will we gain enhanced access to the quantum foam at the basis of the universe?