

A VIEW OF MASONIC SACRED GEOMETRY

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Presented August 22, 2004
Los Altos Lodge No. 712, CA

Revised in 2007 to correct a few typos after being
Published in the SRICF Annual Review
Ad Lucem 2007, pages 53-74
Published by the High Council

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1. Introduction

Masonry is concerned with the internal development of individuals through the use of geometry and the tools of geometry and stone building. Sacred geometry is the study of a particular class of geometry, that being of certain constants of Nature, that are seen in many locations on the Earth, on other planets, and indeed throughout the Universe. The GAOTU has a plan, and Earth is part of that plan, and we see the structure of Sacred Geometry in many places on our Earth.

I have always felt that the symbols of Masonry, such as the square and the compass, were derived from one geometrical form. That is to say that the original square and compass, and other Masonic symbols, each have their original one TRUE SHAPE, and that other constructions are just other representations of those particular shapes.

This paper describes my discovery of these True Masonic Symbols, using only Sacred Geometry, and using only the Golden Ratio as the building block for these geometrical constructions. [1,2]

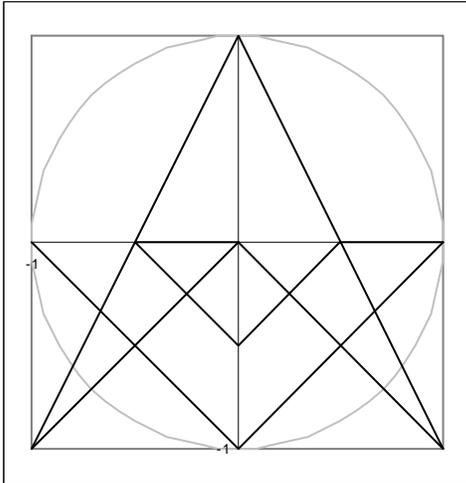
By using only the Golden Ratio, a compass, and a straight edge (and not a ruler), the following Masonic Craft Lodge Symbols are derived in this paper: The Square and Compass corresponding to each of the separate Three Masonic Degrees, The All-Seeing Eye, and the Letter G. In addition, by an extension of these geometries, the following symbols of York Rite Masonry are also derived: The Royal Arch, The Keystone, The True (Past Master's) Square and Compass, and the Cross of the Knights Templar.

The Square becomes the support for the EA and the Compass becomes the superstructure for the future building of the Masonic Edifice of the EA.

The EA also learns that he must circumscribe his desires and keep his passions within bounds, and when he is ready, he may proceed to accept More Light. This ability to be ready includes having the willingness to learn, the ability to learn, and the willingness to be open and receptive to new teachings. This is a major step for some people.

3. Fellowcraft

The Fellowcraft Mason (FC) learns that Masonry is a progressive science, and is taught by degrees only. He learns that he will now receive only a portion of the Masonic Knowledge that is available to the members of his Lodge. He is told about climbing the winding staircase of 3, 5, and 7 steps to reach the Middle Chamber, and about the importance of geometry. From his experiences in the Second Degree, the FC may later imagine the Square and Compass of the Second Degree as being represented as:



In this paper, all symbols will be constructed by crossing circles and lines, and it will left to the reader to “color in” the appropriate two-dimensional Masonic shapes of interest.

4. Master

The Master Mason (MM) receives all of the knowledge available to him from his Lodge of Master Masons. He is now taught “the secrets” of a Master Mason. Only Master Masons are allowed to travel, and to utilize their knowledge in other lands and countries. Surely this same knowledge was not given to EA or FC Masons. This additional knowledge most probably included the use of what is now known as “Sacred Geometry”.

Sacred Geometry includes using the physical properties of the Universe, or The Laws of the GAOTU. There are many such physical constants in 2D geometry, including: “e” [e], “phi” [ϕ], and “pi” [π]. In this paper, we shall only consider the universal constant “phi” [ϕ].

The number phi [ϕ] is called “the Divine Proportion”, “the Golden Section” and “the Golden Ratio” and is defined as:

$$\phi - 1 = 1 / \phi$$

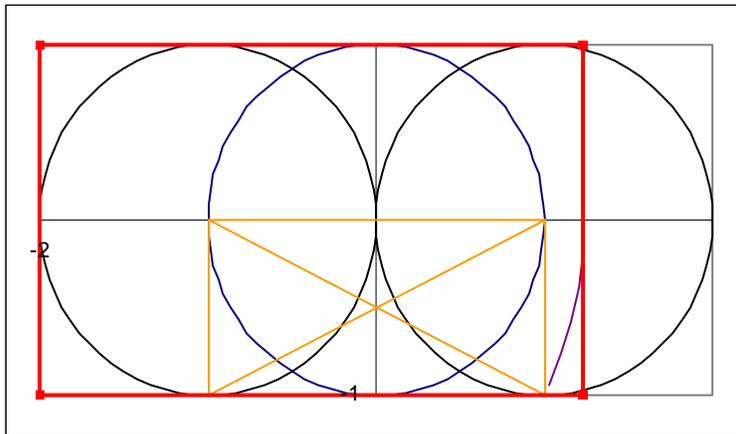
from which

$$\phi = [1 + \text{sqrt}(5)] / 2 = 1.618034\dots$$

where “sqrt” shall mean “the square root of” (as in Microsoft Excel cell formulas).

The properties of ϕ are well documented [1,2], and several researchers have shown that the most pleasing rectangular shape to the human eye is “The Golden Rectangle”, composed of a base-to-height ratio of ϕ -to-1. The fact that ϕ has been used in many buildings, churches, and paintings because of its pleasing property to the human mind is undisputed. The explanation of this has to do with the theory of resonance in physics, and is related to the use of the “major-6th” in music (a ratio of 1 to 8/5, or 1.6). [1, p. 55]

The exact geometrical construction of the Golden Rectangle is shown below:



A circle of a unit (1) radius is drawn, followed by two others, all with their centers on a straight line separated by that radius. The diagonal lines cross a rectangle of size 1 by 2, and thus have length of $\text{sqrt}(5)$. Placing a compass at the left circle’s center, and drawing an arc upward creates the width of the Golden Rectangle, $1 + \text{sqrt}(5)$, as the height of that rectangle is 2. Thus, the Golden Rectangle has the base-to-height ratio of ϕ .

It is left to the reader to show that if a Golden Rectangle has a square removed from either end, then the resulting figure is also a smaller Golden Rectangle, reduced in size by the factor ϕ . This idea given rise to drawings in several books of swirling golden rectangles and so-called ‘golden spirals’, which are made up of successive smaller golden rectangles or one-quarter circular arcs each of a constant radius. Be careful – even some of these books are wrong! [1, p. 101] A True Golden Spiral, will continually and gradually increase in size, growing by the amount ϕ in the radial direction for each revolution. The equation for that spiral would look like, in polar coordinates:

I have not yet examined the various Masonic Symbols contained with the Scottish Rite Masonic Bodies. I do assume that they will all be able to be derived in geometric form, just as those for the York Rite – as shown below.

Also, the Scottish Rite Symbols are said to have been all designed by Albert Pike, when he rewrote and formulated all of the Scottish Rite Degrees now used within the US. The various symbols of the York Rite Bodies, however, can be traced back to Scotland and the UK, and therefore may be much “older and wiser” than those of the Scottish Rite.

6. York Rite

I have learned that the Three Degrees of Masonry in the US today do not correspond to the Traditional Three Degrees of Masonry as they were taught in the UK or Europe about 300 years ago. The Master Mason’s Degree in the US today is not the same as the Master Mason’s Degree there - the difference being that the Master Mason’s Degree in the UK was conferred only on those who had been Master’s of their Lodge, and was therefore a “Past Master’s Degree” as conferred there. The content of this latter degree has been preserved in the US in the York Rite within the Royal Arch Degree.

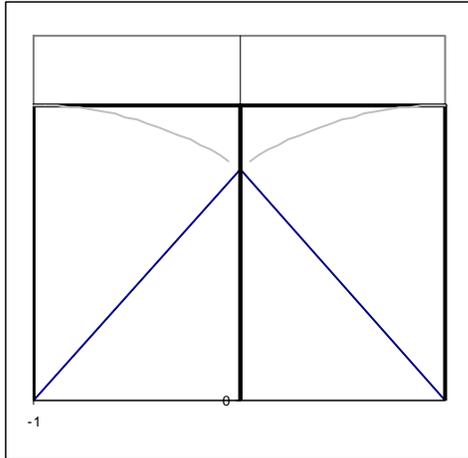
The question that then arises is: What is this “Royal Arch”, and where is it defined using Sacred Geometry?

I believe that the answer lies in Egypt – within the design of the Great Pyramid of Egypt!

This one pyramid was placed there “as a marker” for all mankind, and is described in history as being of a particular and specific 4-sided shape: that “the area of each of its faces is the square of its height.”

A little math will show, assuming the pyramid’s base is defined as two, that the area of each face must be ϕ , and that the height must then be $\sqrt{\phi}$, the square root of ϕ .

The side view of that pyramid will then show two right triangles of base 1, height $\sqrt{\phi}$, and hypotenuse ϕ . What is that geometrical figure?



That is exactly what one would get when putting two Golden Rectangles on end next to each other, and collapsing their longer sides to a central point, the apex of this pyramid, as shown above. Thus, this particular “Pyramid” shape encodes the Golden Rectangle geometry – exactly!

Also, the Great Pyramid was said to have: a “perimeter that was the same as a circle using the height of the pyramid as its radius”. [2] Thus:

$$8 = 2 \pi \sqrt{\phi} \quad (\text{as it is written})$$

from which we can show that ϕ is almost the same as

$$\phi \text{ (approx.)} = 16 / \pi^2$$

to an accuracy of 0.19% !!! Wow!

There are also more accurate definitions that relate ϕ and π , such as: [2, p. 194]

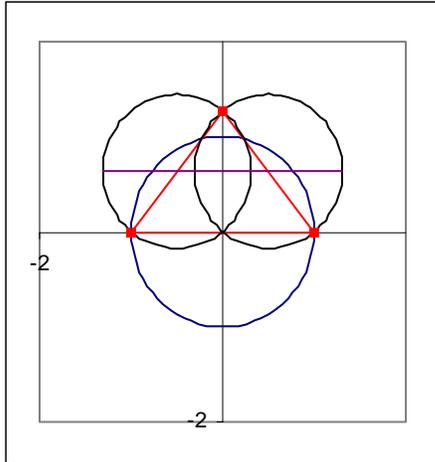
$$\phi \text{ (approx.)} = \sqrt{5 \pi / 6}$$

to an accuracy of 0.00077%. Triple-oh-seven - Wow!

7. Royal Arch

I believe that the Pyramid figure above represents the Masonic Royal Arch: two right triangles of sides $1:\phi:\sqrt{\phi}$ side-by-side. From this, all other York Rite Masonic Symbols can be easily derived.

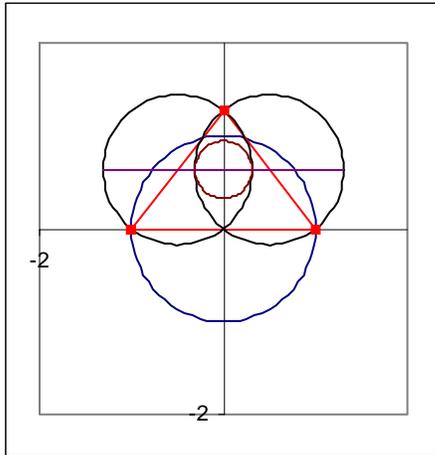
Beginning with the figure above, we can draw a circle of radius one from the center of the base, bisect both hypotenuses of the triangles, draw circles of radius $\phi/2$ around each hypotenuse, draw the diameter connecting those new circles, and obtain:



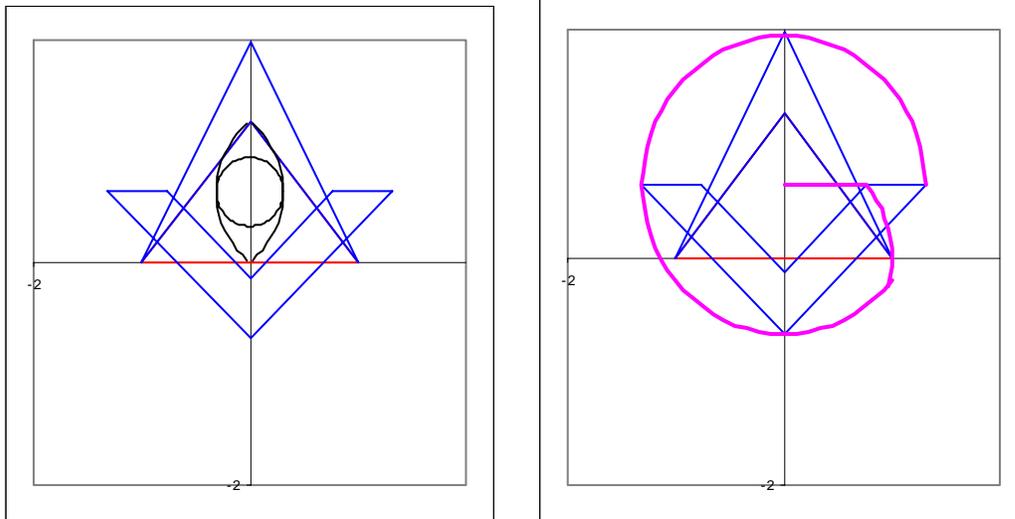
where the square points identify the points of the above sacred Pyramid.

At this point we must note that the horizontal line bisecting the sides of the Pyramid also crosses the height of the Pyramid at exactly half-way between the base and the apex.

It can then be shown that these two new circles of radius $\phi/2$ overlap by an amount $1/\phi$, and that a new circle can be drawn with that diameter. The center of this circle is exactly half-way up the height of the Pyramid.



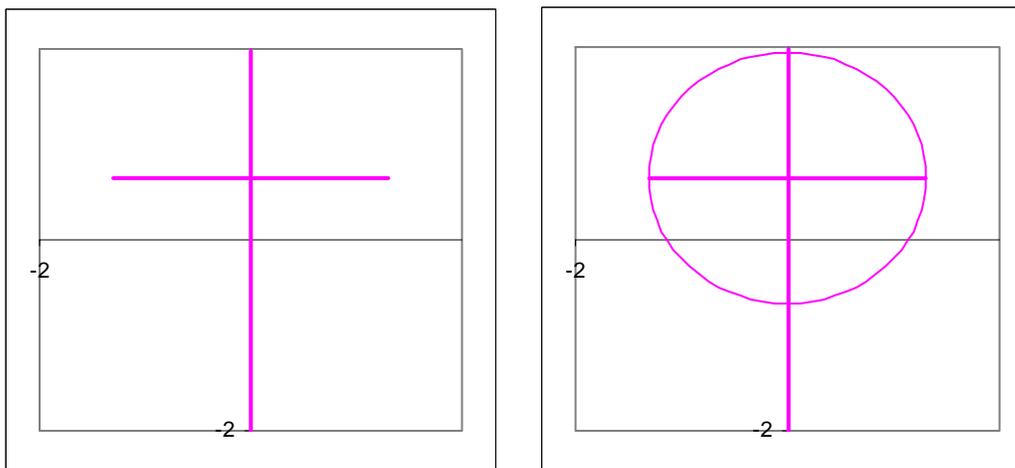
A larger circle can now be drawn from this center whose radius is $\phi - 1/(2\phi)$, so that it encompasses the two inner circles:



These, then, could be the True Symbols of Masonry for a Royal Arch Mason, or equivalently, for a Past Master Mason in the UK or Europe.

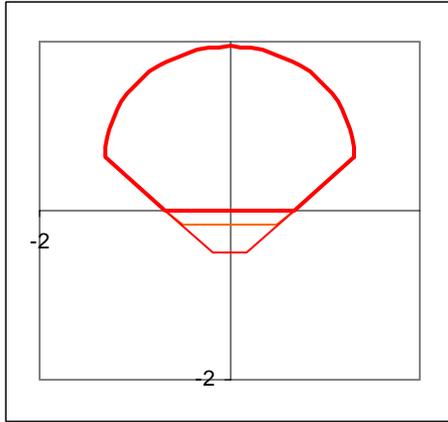
Also specifically encoded are the Christian Cross and the Celtic Cross of St. Patrick.

We should recall that St. Patrick was able to convert the “pagans” in Ireland over to Christianity only by incorporating the “Sun” Deity into the Christian Cross - as a circle. The resulting Celtic Cross is still used today in Ireland. We see that this circle is the one of radius $\phi^2/2$ and is centered in the “Eye” of the Pyramid. Obviously, it represents the Sun God Horus.



Continuing our Masonic Symbols quest, a new problem now arises: Where is the Royal Arch Keystone? It is not apparent in any of the above diagrams.

We can find the approximate keystone shapes shown below; however, they do not look like the keystones used in the Royal Arch Degree:



This seeming impasse is resolved by remembering that “Masonry is taught by degrees only”, and that there is probably More Light to be found later within the Royal Arch Degree.

Before continuing, however, let us review what we have constructed so far:

We started with a unit circle, and created three overlapping circles (3 steps). We then drew a line down, made a hypotenuse of $\sqrt{5}$, extended it to the horizontal, and added a vertical and horizontal side to make a Golden Rectangle (5 steps). We then started with two such Golden Rectangles, collapsed them to a single triangle, bisected one hypotenuse, and drew two hypotenuse circles, the central circle, the base circle, and the outer circle (7 steps) – and we arrived looking at the center – into the center or Middle Chamber of the Pyramid (Temple). This sounds familiar...!

As an aside, I must say that the construction of the Great Pyramid of Giza had and has nothing whatsoever to do with “King Solomon” or “Israel”. Creative book writers may have blended many past events into a single story, to try to entertain and confuse us – and we are not so deceived. In actual fact, the Koran says that civilization started around 2,000 BC – and therefore, for the disciples of Islam, nothing in history can be older than that. So, any official that works for the government of Egypt must believe in the Koran (politically at least), and thus the Great Pyramid of Giza must therefore have been built around 2,000 BC, by Khufu, as the now-well-known faked markings are apparent in the upper chambers above the so-called “King’s Chamber”. For those of us not restrained by the limitations of the man-made Koran, the Great Pyramid has been shown to have been built much, much earlier – according to detailed archeological and astronomical studies and calculations - probably around 10,500 BC. [3,4]

We have continually expanded – raising our Masonic Edifice. Let us continue to do so.

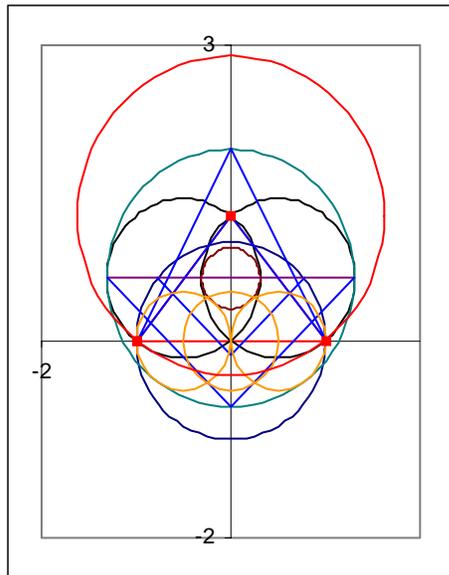
In searching for Even More Light, I tried many paths. What I finally realized is that in our work so far, we have built our Masonic Edifice using only the sacred number phi [ϕ]. Perhaps, then, we should continue to do so.

Looking at the square and compass above, the length of the inner lower edge of the compass is ϕ , while the outer edge length is the hypotenuse on the triangle whose other two sides are 1 and $[1 + \phi + \sqrt{\phi}]/2$. This is a triangle with sides of 1, 1.9440, and 2.1870. This hypotenuse length seemed to be a very complicated expression to work with, until I noticed that $\sqrt{2} \phi$ is 2.2882, almost the same length (to 5%). My logic is that, if a Golden Rectangle $[1:\phi]$ was collapsed to get the Royal Arch Pyramid, perhaps the next construction should involve a simple multiple of ϕ , such as $\sqrt{2} \phi$.

The key was in discovering that, if the Masonic Edifice from Blue Lodge to York Rite required the use of ϕ , then perhaps the more advanced York Rite Degrees also were based somehow upon ϕ . But how? Then I thought: To receive Light, must receive it from its Source. That means it must be radiated from its Source. Where would that be? How about from the apex of the Pyramid! Using a circle with radius ϕ at the top of the Pyramid, enclosing the Pyramid proved to be the next logical step (see next page).

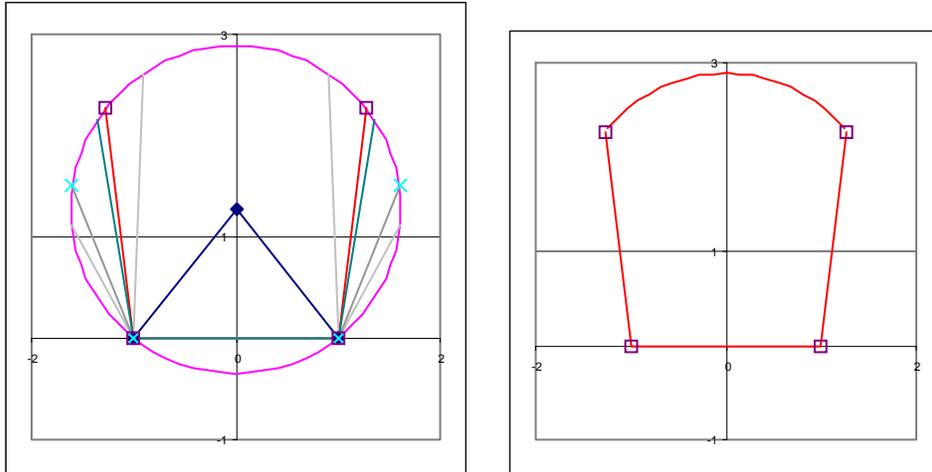
It then appeared that a Royal Arch Keystone could be found using the base of the Pyramid, and the arms of the compass – when the arms were swung outward from the top of the compass to this new circle. The bottom compass arms, however, appear to be too short. While the top arm of the compass appeared to look about right, its length is a very complex expression - and the GAOTU loves simplicity. The solution was in finding a replacement for this length that was almost the same value, and was geometrically constructed from ϕ . I believe the proper length should be $\sqrt{2} \phi$.

Adding this new circle with radius ϕ at the top (Source) of the Pyramid results in:



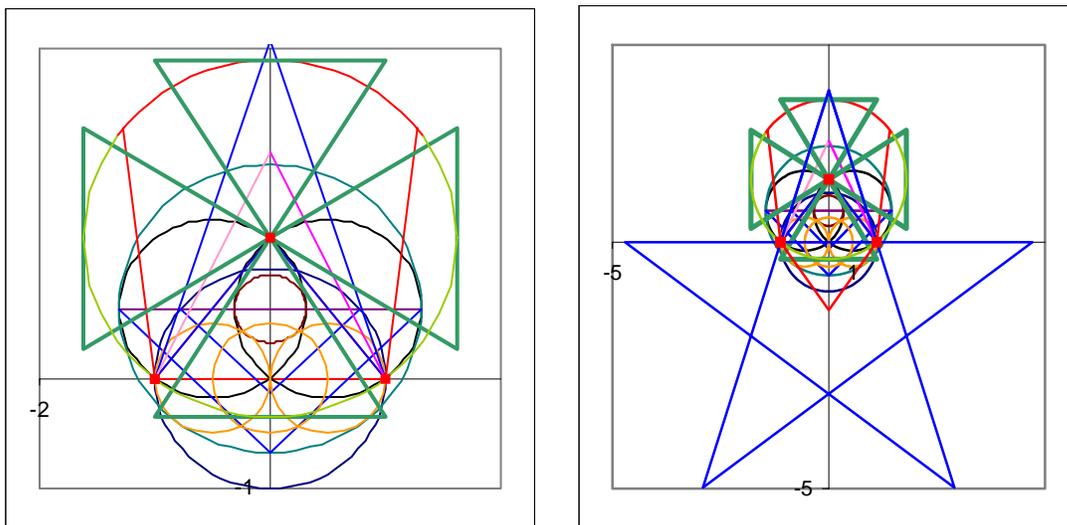
A comparison of using five different arm line lengths for the Keystone was then made, as seen below. This shows the arm lengths of $\sqrt{\phi}$, ϕ , 2.1879, $\sqrt{2} \phi$, and 2ϕ , as these lines are swung out from the base of the Pyramid to intersect the ϕ radius circle. A good

representation of the Royal Arch Keystone is only seen when we use the line length of either 2.1879 or $\sqrt{2} \phi$. For these reasons, and other reasons that will become apparent later, I will use for these arm lengths the simple line length of $\sqrt{2} \phi$, as marked with the squares on the circle. The Royal Arch Keystone is thus readily seen.



8. Knights Templar

I have always been intrigued by the insignia of the Knights Templar: the unique four sided Maltese Cross. It has always been apparent to me that this must be related to the Great Pyramid in Egypt. The proof came one day as I noticed that this four-sided cross can be constructed from four Golden Rectangles – as one might now expect. If each triangle in that cross is defined to have a height of ϕ and a base of 2, then not only would that cross fit exactly into the figure above, it would also be an exact 2D representation of the Great Pyramid in Egypt, as each triangle would be exactly the same shape in proportion as each face on the Pyramid! Inserting this Sacred Geometry Templar Cross into our complete Masonic construction results in:



where I have also included the right triangle of sides $\sqrt{2} \phi$ above the center of the Pyramid, and have also added the new tallest right triangle whose sides are 2ϕ .

In this figure ALL of the Masonic Sacred Geometry Symbols are presented!

The new tallest triangle has sides 2ϕ and a base of 2. This geometry is the exact top portion of a regular pentagram or five-pointed star. I include this here, as most of the Square and Compass jewels that I viewed in the displays at the Grand Lodge of Scotland included an exact pentagram star exactly nested inside of the compass. Thus, this triangle could be used as the upper edge of the Compass to enclose the entire Masonic Symbol in a regular pentagram five-pointed star.

Since this Templar Cross is based upon exact ϕ geometry, the reader can see that if this cross is cut out and the edges are placed together using tape, then one would get an exact 3D geometrical model of the Great Pyramid of Egypt!

9. Sacred Geometry and Ancient Egypt

The real significance of the science of ancient Egypt to Masonry may be found in this quote [2, p.261]: “Tons Burnes, who dedicated his “The Secrets of Ancient Geometry” [10] to the Fraternity of Freemasons, shows that the Great Pyramid, like most of the great temples of antiquity, was designed on the basis of an advanced but hermetic geometry known only to initiates, only fragments of which percolated to the classic and Alexandrine Greeks. According to Burnes, the secret of this ancient geometry was so well guarded that the whole of it was not revealed until the publication of his book in 1969.” And that: “Brunes found that the circle was indeed considered sacred by the Egyptians, as were the square and the cross and the triangle, all of which are intimately incorporated into the Great Pyramid with its square base and triangular faces designed to represent the “sacred” circle.”

One mystery of the Great Pyramid is that of its casing stones, and what cause them to be so hard, so impervious to weather and damage, and so reflective. One answer appears where Kinnaman writes that “there is one specific Talc deposit in the world, which when subjected to 2,000 degrees F. will turn perfectly white.” He also later states: “This product is impervious to weather, heat, and electricity.” - and - “What the Egyptians seem to have done is that they knew all this chemistry, and they faced the casing stones with this synthetic product. I suggest that this is the solution of the mystery of the casing stones of the Great Pyramid.” [11, p. 59] Clearly this was and still is a very special Pyramid.

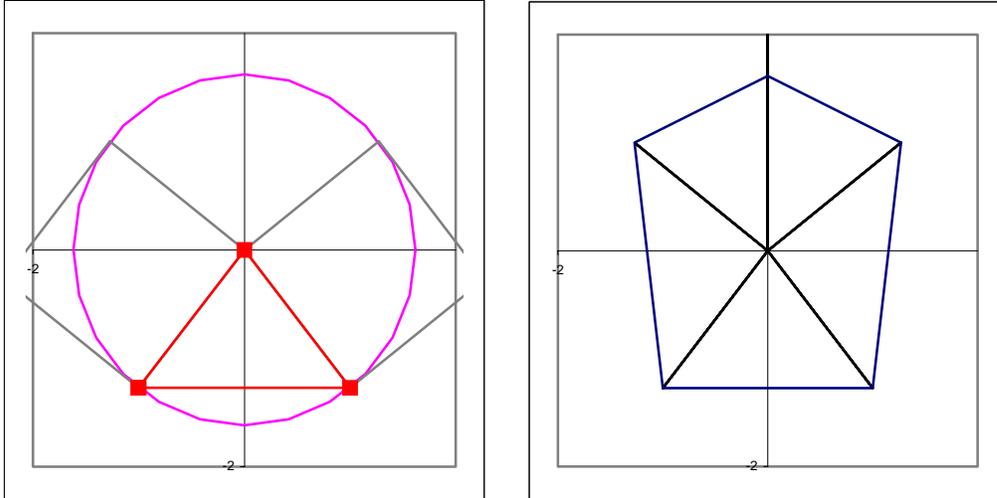
I would be remiss if I did not mention the experiments that have been performed over the years with pyramids of this special and particular shape. “Pyramid Power” was a big fad in the 1960s, and several books have been written about the uses of that Pyramid since then. [12,13,14] Studies have shown that strange energy and magnetic fields can be created within such pyramids, even with using only the edges without the faces, when the sides of the Pyramid are aligned to magnetic North at that physical location. Also,

energetic and healing energies are said to emanate from the apex of such Pyramids, for various uses, like under your bed. In addition, decay processes are slowed within such Pyramids, and formal patents have been issued for such Pyramid-shaped containers to store milk, and to keep razor blades sharp, for long periods of time. Perhaps our science today is just beginning to understand the usefulness of this particularly shaped object. To my knowledge, only Dan Davidson has actually documented scientific experiments in such “shape physics” experiments, including additional experiments which he conducted inside the Great Pyramid and inside of the “King’s Chamber”. [14]

From an elementary mathematical and physics point-of-view, this Sacred Geometry shape of the Great Pyramid is related to resonance. “Resonance” is when waves of vibration or energy act in such a way as to build each other up, and not diminish each other. This is seen most commonly when tuning a certain frequency in a radio or TV, when one signal is pulled out of all of the signals being transmitted throughout the airwaves. As resonance is not wanted by musicians or concert performers, there is not a lot of information on this effect in the musical or scientific literature. The invention of the laser is an application of resonance, as the light must bounce perfectly between the mirrors on the ends of the crystal creating the light, so the spacing must be near-perfect! This should remind us of the almost perfectly flat and parallel walls at Luxor in Egypt, and at other ancient Egyptian sites, and even within the Great Pyramid itself. Who really knows what happens when a resonant tone, of say 51.0 Hertz [14, p. 135], is propagated within the Grand Gallery of the Great Pyramid, and all of those huge and heavy granite blocks, embedded with large amounts of quartz crystals, being to oscillate in resonance with that tone. This is akin to your phonograph needle making EM waves that are transmitted to your stereo system. What could such much more profound EM waves do to your consciousness, mind, body, or spirit – inside of the Great Pyramid? I believe that the ancient secrets of Masonry point us to discover these ancient and forgotten Truths!

Perhaps applications of Sacred Geometry could also advance our current understanding of science, and improve the condition of life in our world! Resonance is constructive vibration. “Sympathetic Vibration” is when other objects vibrate at certain frequencies when in a resonating environment. There are several devices that have been built using the science of sympathetic vibration, that defy even the laws of physics as we know them today! [15] These devices, attributed to John Worrell Keely, are being documented and further researched by various organizations. Perhaps it is the Master Masons and the York Rite Masons of today who are to carry science and technology forward to re-discover the usefulness of these ancient and forgotten, if not overtly suppressed and concealed, secrets. [16,17]

The concepts discussed in the last section can also be extended into the construction of a five-sided Pyramid. Beginning with the $1 : \phi : \sqrt{\phi}$ Pyramid and the circle of radius ϕ at its apex, we can construct an interesting five-sided figure as follows:



The squares of side ϕ on the sides of the Pyramid are used to show the construction of the arm length $\sqrt{2} \phi$. A little math will show that the sides of this figure on the right, from the bottom center to the apex are: 1, $\sqrt{2} \phi$, and $\sqrt{2}$. It is also interesting to note that the upper two points are located at (x,y) coordinates $(\pm \sqrt{\phi}, 1)$, so that a line drawn between them bisects the upper y radius line into a Golden Ratio. Wow! The simplicity of this figure is another reason for using the arm length of $\sqrt{2} \phi$ in the Royal Arch Keystone discussed earlier.

Since the height of the Pyramid is $\sqrt{\phi}$, we can obtain a 5-sided 3D representation of the Great Pyramid by erecting a 5-sided tent on the above right figure, whose height is 1. I expect that this 3D five-sided Pyramid will be seen elsewhere in Egypt, and beyond.

The secrets of the Great Pyramid are indeed vast, and who is to say that we have now uncovered all of those secrets, or even discovered all of the interior chambers within the Pyramid? Remember that today's only access into the Grand Gallery and the "King's Chamber" is through the so-called "ascending passage", which is blocked by several very large granite stone blocks. Clearly, if these chambers are to be visited, there are other as yet unknown ways to get there. Many researchers are hoping to unravel these secrets and apply them to our civilization today, by asking whomever will respond, to assist them. [5]

I believe that there is a definite link between the construction of the Great Pyramid, the symbols of Masonry, and the teachings that are available for mankind. Perhaps it is up to the Masons of today to research these areas, obtain the information, and teach their Masonic Brethren, to advance mankind's knowledge, and the application of that knowledge to make this a better world in which to live.

In closing, I include a portion of text that furthers demonstrates the mystery and greatness of this Pyramid: "With the Pyramid, the ancient Egyptians had not only squared the circle but effectively cubed the sphere." [2, with full text in the Appendix]

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Appendix

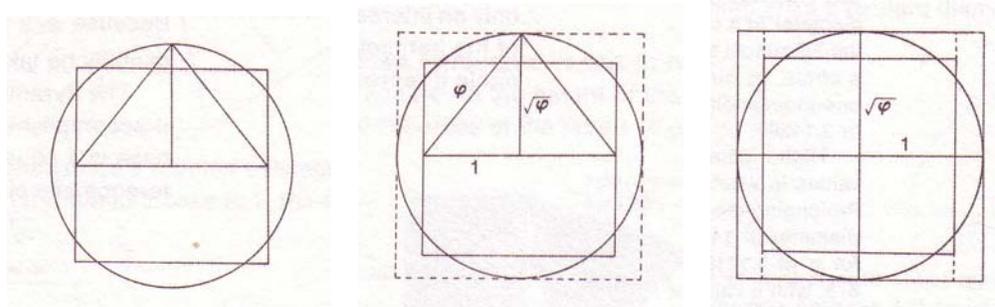
This information is taken from pages 197 to 200 in Peter Tompkins book "Secrets of the Great Pyramid". [2] This should be of great interest to all Master Masons:

"Although the squaring of a circle is an insoluble problem if you use the irrational number of pi, it is nevertheless practically resolvable as a function of the Golden Number phi. Because $\pi/2 = 2/\sqrt{\phi}$ - to within a thousandth part, pi can usefully be taken as $4/\sqrt{\phi}$.

The [Great] Pyramid is so designed that for all practical purposes it accomplishes the squaring of the circle. The Pyramid's base is a square whose perimeter is equal to the circumference of a circle whose radius is the Pyramid's height.

Superimpose the square on the circle and you get not only an interesting but an extremely useful diagram consisting of the perimeter of the Pyramid and the circumference of the circle it represents.

Three more lines will provide the mathematically correct cross section of the Pyramid of Cheops.

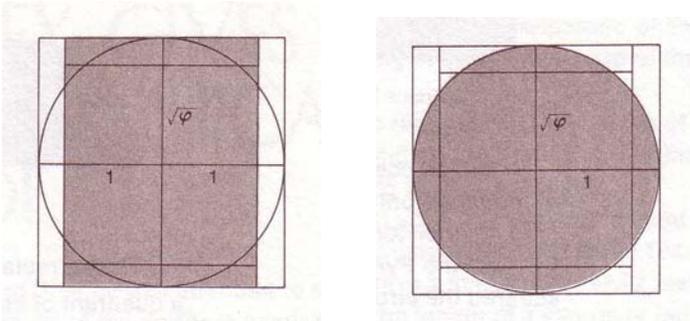


By simply enclosing the diagram in another square, and inserting the phi relationship as it exists in the Pyramid, a key is obtained for readily translating spherical surfaces into flat ones of equal area.

To obtain a rectangle equal in area to the basic circle, two sides of the smaller square need merely be prolonged till they touch the sides of the larger square.

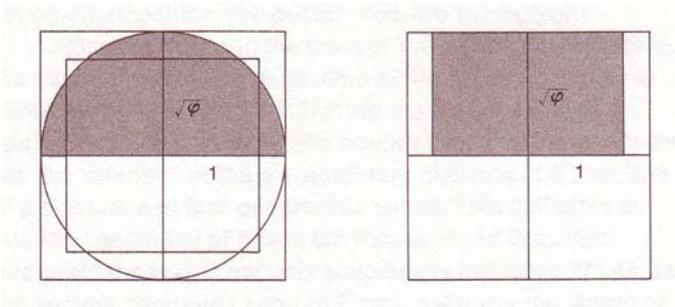
The area of the rectangle is its length times its width, or $2\sqrt{\phi} \times 2$, which is $4\sqrt{\phi}$.

The area of the circle is πr^2 , or $\pi\phi$ in this case, the radius being $\sqrt{\phi}$. But since $\pi = 4/\sqrt{\phi}$, the area is also $4\sqrt{\phi}$ the same as the rectangle.

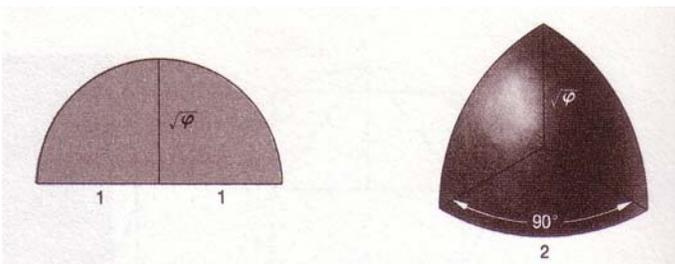


Thanks to the Pyramid's structure it is thus possible, with virtually no mathematics, to draw a rectangle (from the base of the Pyramid and twice its height) which will be equal in area to a circle on its height. This leads directly to being able to draw a rectangle or triangle equal to a spherical quadrant, resolving the main problem of the map maker with the same simplicity.

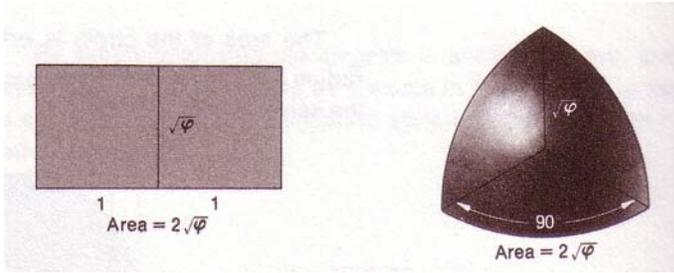
As the whole circle equals the whole rectangle, half the circle is equal to half the rectangle.



But half a flat circle is also mathematically rigorously equal in area to the spherical surface of a quadrant of 90 degrees.



Thus a rectangle of height $\sqrt{\phi}$ and a base of 2 is equal to a quadrant of height $\sqrt{\phi}$ and an arc of 2.



It is thus possible to translate a spherical quadrant of 90 degrees of longitude onto a flat Mercator surface of equal area or onto an undistorted triangle of exactly half that area.

With the Pyramid, the ancient Egyptians had not only squared the circle but effectively cubed the sphere.” [2, pp. 197,200]