Rachel Fletcher

SIX + ONE

In Hebrew, Christian and Islamic revelation, the world is created in six days of physical activity, followed by a single day of stillness and rest. Geometry provides a fitting metaphor, for the radii of six equal circles mark out the circumference of an identical circle placed in the center

I "Six days of creation" and other metaphors

- With a compass, draw a circle.
- Next, place the compass point at the top of the circle and draw a second circle of equal radius, such that the center of the second circle lies on the circumference of the first.
- Draw a third circle of equal radius from the point where the first two circles intersect, on the right.
- Continuing to work in a clockwise direction, draw a fourth circle of equal radius from the point where the third circle intersects the original circle.
- Continuing to work in a clockwise direction, draw a fifth, sixth, and seventh circle of equal radius, in similar fashion (Fig.1).

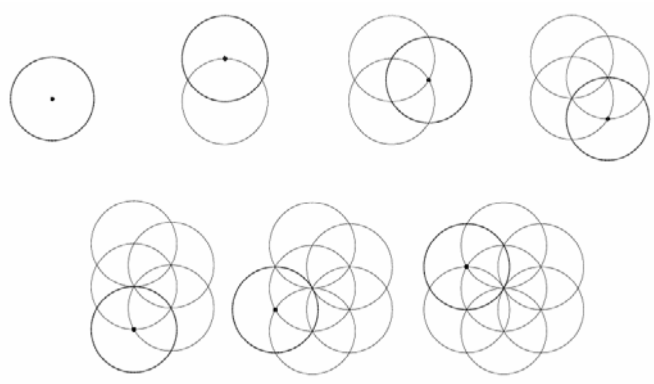

Fig.1

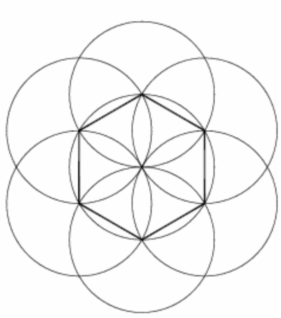

Fig. 2

Six equal circles surround an identical circle in the center. Their radii correspond to the six edges of a hexagon that is inscribed within the center circle (Fig. 2). "Hexagon" is from the Greek *hexagônos* (from *hex* "six" + *gônia* "angle," which is related to *gonu* "knee") [Harper 2001, Liddell 1940, Simpson 1989].

Patterns of "6 + 1" circles may symbolize the genesis of the created world and its temporal and spatial aspects. In this context, the six circles, which orbit the circumference of the original circle, represent six active days of physical creation. The original circle, whose circumference revolves around a fixed unmoving center, represents the infusion of creation with spirit, on the Sabbath day of stillness and rest.

"Six + 1" circles may represent the axes or directions by which we orient to the created world. Zenith and Nadir lie on the world's primary axis. The axes of North-South and East-West locate the cardinal points on the earth's horizon (Fig. 3).

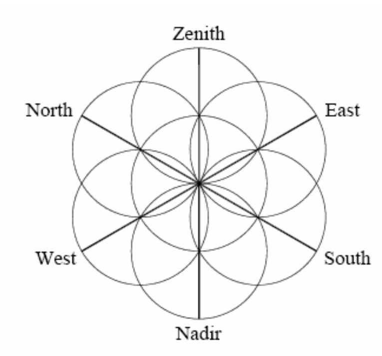

Fig. 3

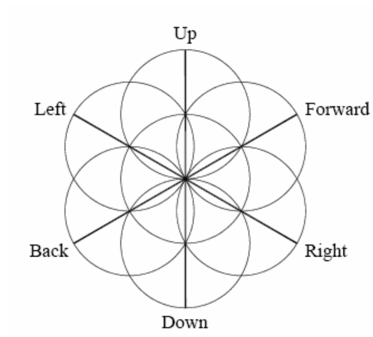

Fig. 4

In similar fashion, our physical bodies relate inherently to the world in a six-fold way. We stand, fixing our spine to the heavens, and experience "up" and "down." Opening our arms, we indicate "right" and "left." Stepping into the world of action, we move "forward" and "backward." A seventh place of stillness resides within, at the center or the heart (Fig. 4).

Let us imagine the sphere of the earth expanded to the celestial sphere and the earth's equator projected to the celestial equator. The plane of the ecliptic is the imaginary circle on the celestial sphere, which locates the apparent yearly path of the sun with respect to the twelve constellations in the Zodiac. The ecliptic is tilted 23.5 degrees relative to the celestial equator.[1]

On the longest day of the year in the northern hemisphere, the sun appears at the point on the ecliptic that is furthest above the celestial equator, intersecting the Tropic of Cancer at the moment of the summer solstice—the first day of summer (June 21). On the shortest day of the year, the sun appears at the point on the ecliptic that is furthest below the celestial equator, intersecting the Tropic of Capricorn at the moment of the winter solstice—the first day of winter (December 21 or 22). The ecliptic crosses the celestial equator at two points called the vernal and autumnal equinoxes. The sun appears at the equinoxes on the days of nearly equal day and night—the first day of spring (March 20 or 21) and the first of autumn (September 22 or 23). In the southern hemisphere, these positions are reversed. [Carpenter 1999, Nave 2001] (Fig. 5[2]).

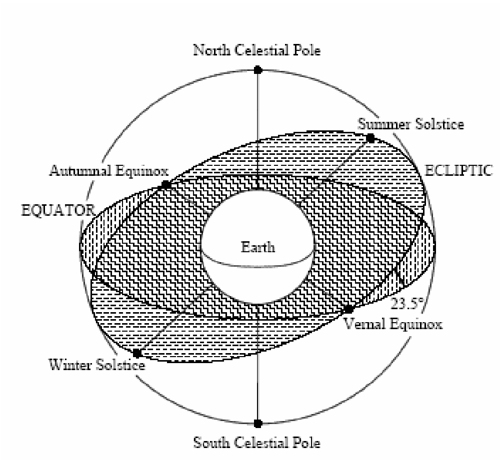

Fig. 5

Definitions :

The celestial equator is the plane in the celestial sphere that is perpendicular to the axis of the earth. Day and night are of equal length when the sun is in the equator. "Celestial" is from the Latin *caelestis* (from *caelum* "heaven" or "sky"). "Equator" is from the late Latin phrase *circulus aequator diei et noctis* (from *aequare* "to make equal"), which means "the equalizing circle of day and night" [Simpson 1989, Soanes 2003].

The ecliptic is the plane in the celestial sphere that represents the apparent yearly orbit of the sun. "Ecliptic" comes via the Latin from the Greek *ekleiptikos* (from *ekleipô* "to leave out, omit, pass over"), which means "caused by an eclipse." It is so named because both the sun and moon must appear in the plane of the ecliptic to produce solar and lunar eclipses [Liddell 1940, Simpson 1989, Soanes 2003].

The **Tropic of Cancer** is a circle parallel to the celestial equator that intersects the ecliptic at its northernmost point. The **Tropic of Capricorn** is a comparable circle that intersects the ecliptic at its southernmost point.

When viewed qualitatively, the number "six" conveys information about the created world. "Cosmos," the Pythagorean name for the universe, is from the Greek *kosmos*, which means "order" [Liddell 1940, Simpson 1989]. Gematria, a system related to Greek, Hebrew and other ancient languages, identifies hidden meanings within words by assigning numerical values to individual letters of the alphabet.[3] The numerical values for the individual letters in the Greek ΚΟΣΜΟΣ (*kosmos)* are 20 (Κ) + 70 (Ο) + 200 (Σ) + 40 (Μ) + 70 (Ο) + 200 (Σ). These add to 600 and distill to 6 [Bond 1977, 6, 85].

John Michell observes that ancient astronomers, by adopting the mile as the standard unit of measure for cosmic cycles and distances, conveyed the fundamental measures of our solar system in terms of the number 6. The diameter of the sun is 864,000 miles, or (6^3 x 4000). The diameter of the moon is 2,160 miles, or (6^3 x 10). The mean diameter of the earth is 7920 miles, or (6^2 x 220). The mean distance from the earth to the moon is 237,600 miles or (6^3 x 1100). The mean distance from the earth to the sun is 93,312,000 miles or (6^6 x 2000) [Michell 1988, 104-105].

II Application: snowflakes

No two snowflakes are alike, yet they follow similar patterns of six-fold symmetry (Fig. 6[4]).

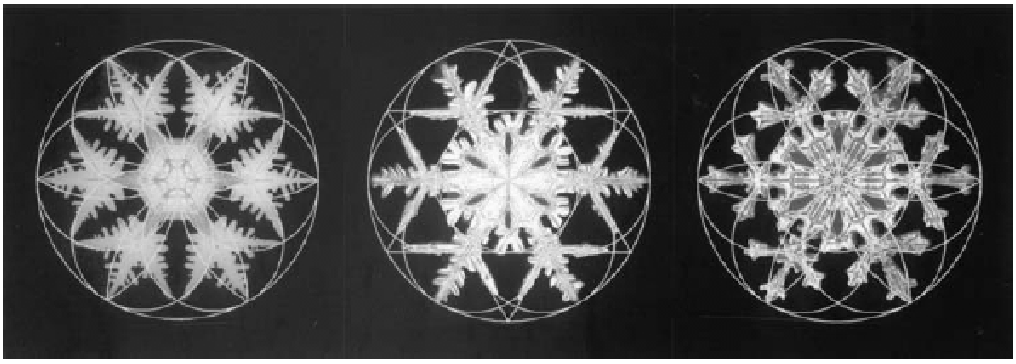

Fig. 6

III The Star of David

Patterns of "6 + 1" circles may generate elementary geometric forms.

- Repeat Figure 1, as shown.

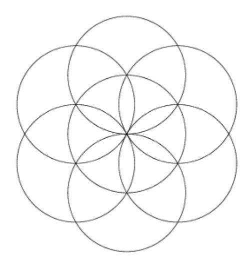

Fig. 1

- Locate points A, B, C, D, E, and F, where the centers of the six outer circles intersect the circumference of the circle in the center.
- Connect points A, C and E.

The result is an upward pointing "earth-based" equilateral triangle.

- Connect points F, B and D.

The result is a downward pointing "heaven-based" equilateral triangle.

Together, the two intersecting triangles form a hexagram, commonly recognized as the Judaic Star of David, or *Magen David* (Fig. 7).

In the last two centuries, the six-pointed *Magen David*, which means "Shield of David," has become the universally recognized symbol of Judaism and the Jewish people. It is said to represent the hexagram-shaped shield or emblem carried by David during his defeat of the giant Goliath. For many cultures, it may symbolize the unification of opposing forces, as when the downward pointing triangle portrays the descent of spirit into matter, and the upward pointing triangle expresses the aspiration of the manifest to reach the divine.

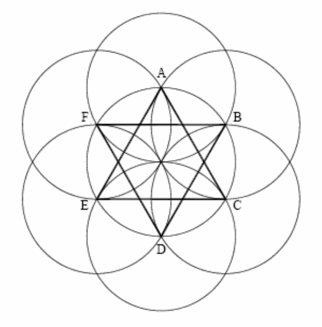

Fig. 7

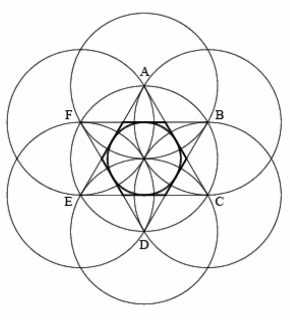

Fig. 8

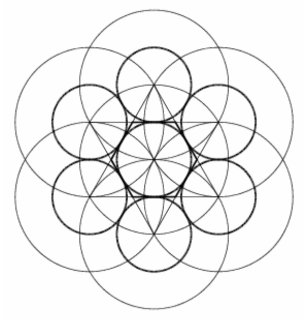

Fig. 9

Definitions:

The **equilateral triangle** is a closed plane figure of three equal sides and three 60° angles. The Latin for "triangle" is *triangulum*, from *triangulus* (tri-, from *tres* "three" + *angulus* "angle" or "corner"), which means "three-cornered" [Lewis, 1879, Simpson 1989].

Hexagram, the regular figure of six lines that is formed by the intersection of two equilateral triangles, is from the Greek *hex,* which means "six," and *grammê*, which means "stroke or line of a pen" [Liddell 1940, Simpson 1989].

- Locate the inner hexagon that results when the two equilateral triangles (ACE and FBD) intersect.
- Inscribe a circle within the hexagon (Fig. 8).
- Draw six additional circles of equal radius at the apexes of the two equilateral triangles (points A, B, C, D, E and F).

Six equal circles surround an identical circle in the center (Fig. 9).

IV The circle and the hexagon

Circles and spheres enclose more area or volume, relative to their surface measures, than any other two- or three-dimensional forms. Hence, spherical forms are often adopted as a means of defense, as when animals seeking protection roll up into compact balls.

In this way, individual circles or spheres economize area or volume. But collections of circles and spheres do not organize efficiently, since their clusters result in pockets of empty space. However, if a cluster expands with pressure applied equally throughout, the "points" of contact between adjacent circles become "lines" of contact between adjacent hexagons, filling in empty space. As a grouping, tessellated or close-packed hexagons arrange more efficiently than clusters of circles. One example is the beehive, where spherical cells of larvae form tessellations of hexagons as the cells expand, when viewed in section (Fig. 10).

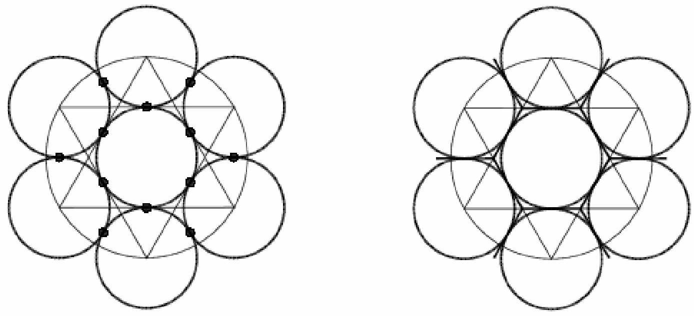

Fig. 10

Circles and hexagons may be used interchangeably as symbols of the heavens, the cosmos, cosmic dimensions, and perfectly ordered forms.

Definition:
"**Tesselated**" is from the Latin *tessera*, which means "a square piece of wood or stone" and is possibly from the Greek *tessares* or *tetra*, which mean "four," [Liddell 1940, Simpson 1989]. Shapes such as squares or hexagons, when tiled or juxtaposed on a plane surface, are tessellated.

- Repeat Figure 1, as shown.

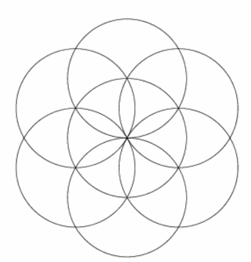

Fig. 1

- Locate points A, B, C, D, E, and F, where the centers of the six outer circles intersect the circumference of the circle in the center. Connect points A, C and E, then points F, B and D.

The two triangles that result (ACE and FBD) form a hexagram (Fig. 11).

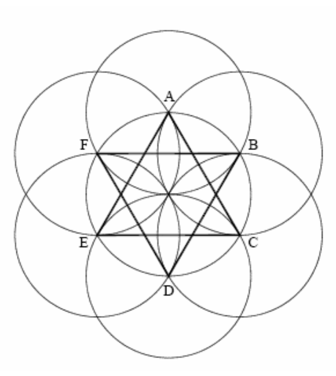

Fig. 11

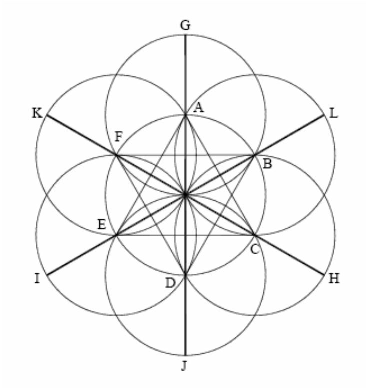

Fig. 12

- Draw the vertical diameter AD through the center circle.
- Extend the line AD in both directions to the outer limits of the construction (points G and J).
- Draw the diameter BE through the center circle.
- Extend the line BE in both directions to the outer limits of the construction (points L and I).
- Draw the diameter CF through the center circle.
- Extend the line CF in both directions to the outer limits of the construction (points H and K) (Fig. 12).

Definition:
The **diameter** of a circle is the straight line that passes through the center and intersects two opposing points on the circumference. "Diameter" is from the Greek *diametros* (from *dia* "through, across" + *metron* "measure") [Liddell 1940, Simpson 1989].

- Locate points M, N, O, P, Q and R, where the outer circles intersect beyond the circle in the center.
- Connect points R, M, N, O, P and Q.

The result is a regular hexagon (RMNOPQ).

- Draw the three axes MP, NQ and OR.
- Draw the equilateral triangle GHI.
- Draw the equilateral triangle KLJ (Fig. 13).
- Within each of the seven circles, locate two intersecting equilateral triangles in the shape of a hexagram.
- Locate the hexagon within each hexagram.
- Draw the line segments for seven tessellated hexagons (Fig. 14).

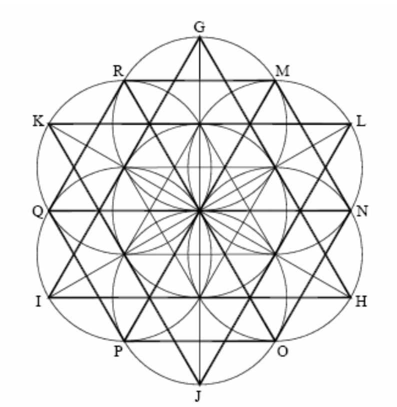

Fig. 13

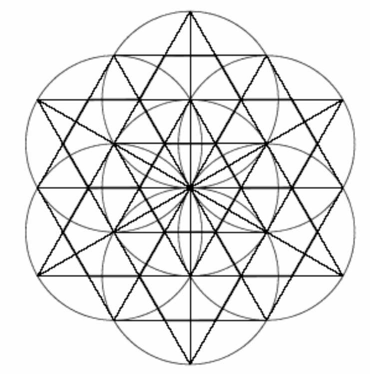

Fig. 14

V The triangle and the ratio 1 : √3

- Repeat Figure 1, as shown.

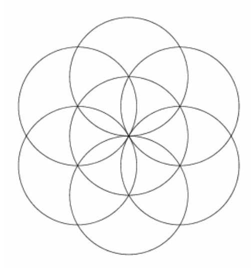

Fig. 1

- Draw the vertical diameter AB through the center circle.
- Extend the line AB in both directions to the outer limits of the construction (points C and D).
- Draw the diameter EF through the center circle.
- Extend the line EF in both directions to the outer limits of the construction (points G and H).
- Draw the diameter IJ through the center circle.
- Extend the line IJ in both directions to the outer limits of the construction (points K and L) (Fig. 15).
- Connect points C, K and H.

The result is an equilateral triangle.

If the half side (KB) of the equilateral triangle (CKH) is 1, the altitude (BC) equals √3 or 1.7320508… . (Fig. 16).

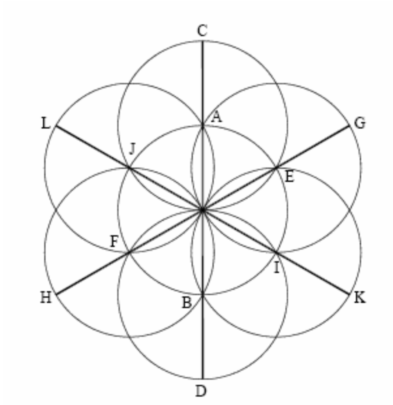

Fig. 15

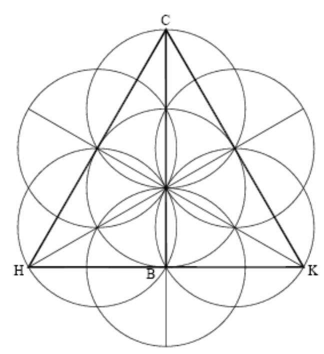

Fig. 16.
KB:BC :: 1: √3

The half-side and altitude of any equilateral triangle are in the ratio 1 : √3.

We will revisit the equilateral triangle and its inherent proportions further on.

VI The square and the ratio 1 : √2

- Repeat Figure 1, as shown.

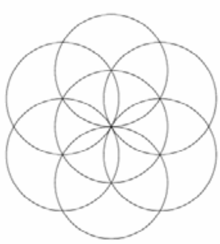

Fig. 1

- Draw the vertical diameter AB through the center circle.
- Extend the line AB in both directions to the outer limits of the construction (points C and D).
- Draw a circle on the line CD. (Place the compass point at O. Draw a circle of radius OC.)
- Locate points E and F, as shown.
- Draw the line EF through the center circle.
- Extend the line EF in both directions to the circumference of the large circle (points G and H).

Lines CD and GH locate the vertical and horizontal diameters of the large circle (Fig. 17).

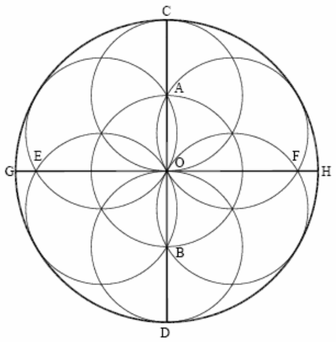

Fig. 17

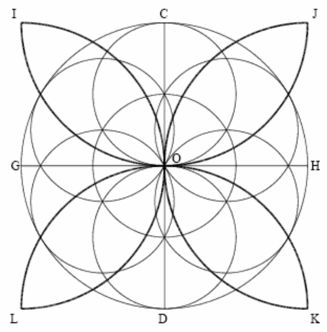

Fig. 18

Definitions:
"**Vertical**" is adapted from the Late Latin *verticalis* (from *vertex* "summit," "highest point" and "crown of the head"), which means "overhead." In geometry, the **vertex** is the point where two or more lines or edges connect, such as in angles, polygons or polyhedra. [Harper 2001, Simpson 1989].

"**Horizontal**" which meant originally "relating to or near the horizon," is from the Greek *horizôn*, which means "separating circle" or "bounding circle" [Harper 2001, Simpson 1989].

- Locate point C at the top of the vertical diameter CD.
- Place the compass point at C. Draw a half circle of radius CO through the center of the circle (point O), as shown.
- Locate point D at the bottom of the vertical diameter CD.
- Place the compass point at D. Draw a half circle of radius DO through the center of the circle (point O), as shown.
- Locate point G at the left end of the horizontal diameter GH.
- Place the compass point at G.
- Draw a half circle of radius GO through the center of the circle (point O), as shown.
- Locate point H at the right end of the horizontal diameter GH.
- Place the compass point at H. Draw a half circle of radius HO through the center of the circle (point O), as shown.

The four half circles are of equal radius and intersect at points I, J, K and L (Fig. 18).

- Connect points I, J, K and L.

The result is a square.

- Draw the diagonal JL through the square IJKL.

If the side (IJ) of the square is 1, the diagonal (JL) equals $\sqrt{2}$, or 1.4142135.... (Fig. 19).

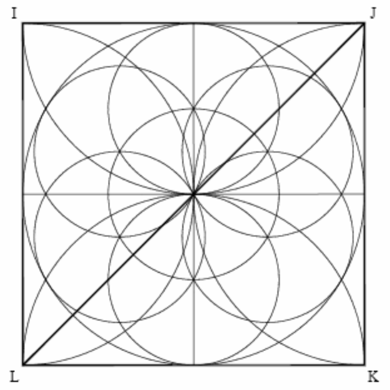

Fig. 19.
IJ:JL :: 1: √2

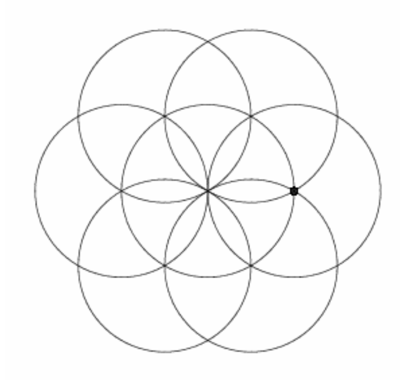

Fig. 20

The side and diagonal of any square are in the ratio l : √2.

We will revisit the square and its inherent proportions in a future column.

VII The pentagon and the ratio 1 : ϕ

- With a compass, draw a circle.
- Place the compass point at the right end of the circle and draw a second circle of equal radius, such that the center of the second circle lies on the circumference of the first.
- Draw a third circle of equal radius from the point where the first two circles intersect, below.
- Continuing to work in a clockwise direction, draw a fourth, fifth, sixth and seventh circle of equal radius, in similar fashion (Fig 20).
- Draw the horizontal diameter AB through the center circle.
- Extend the line AB in both directions to the outer limits of the construction (points C and D).
- Draw a circle on the line CD. (Place the compass point at O. Draw a circle of radius OC.)
- Locate points E and F, as shown.
- Draw the line EF through the center circle.
- Extend the line EF in both directions to the circumference of the large circle (points G and H).

Lines GH and CD locate the vertical and horizontal diameters of the large circle (Fig. 21).

- Erase four of the seven smaller circles, as shown (Fig. 22).

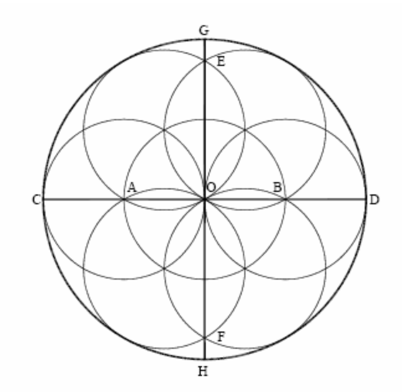

Fig. 21

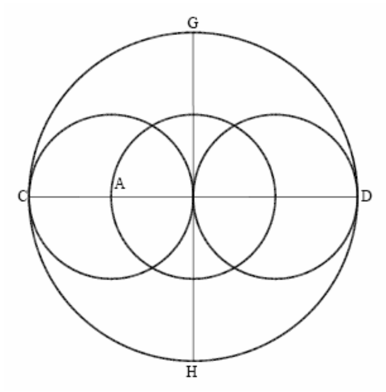

Fig. 22

- Draw a line from point H to point A. Extend the line HA to the circumference of the left circle (point I).
- Place the compass point at H. Draw an arc of radius HI, which intersects the extension of the horizontal diameter (CD) at points K and L.
- Draw a line from point G to point A. Extend the line GA to the circumference of the left circle (point J).
- Place the compass point at G. Draw an arc of radius GJ, which intersects the extension of the horizontal diameter (CD) at points K and L (Fig. 23).
- Locate the point where the line segment HA intersects the small left circle (point M).
- Place the compass point at H. Draw an arc of radius HM that intersects the large circle at points N and P.
- Locate points Q and R where the arc on radius HI intersects the large circle (Fig. 24).

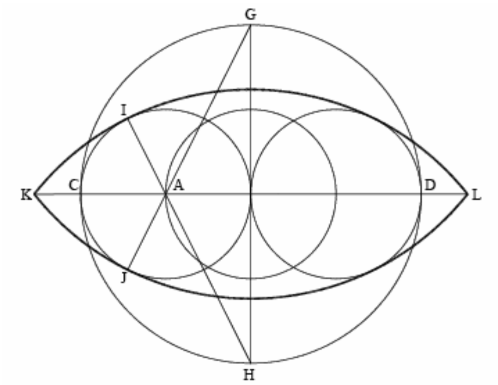

Fig. 23

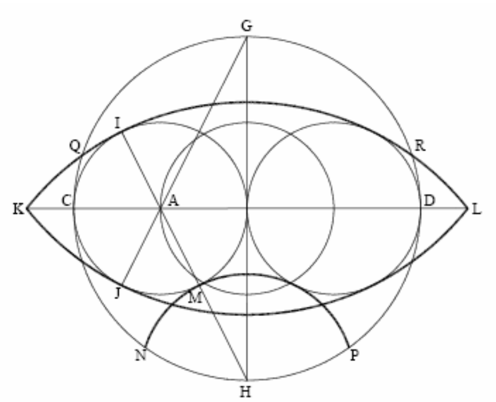

Fig. 24

- Connect the five points G, R, P, N and Q.

The result is a regular pentagon.

- Draw the diagonals GP and GN.

If the side (NP) of the pentagon is 1, the diagonal (PG) equals phi ($\phi = \sqrt{5}/2 + 1/2$ or 1.618034...).

The ratio 1 : ϕ is known as the Golden Section, or the "extreme and mean" ratio (Fig. 25[5]).

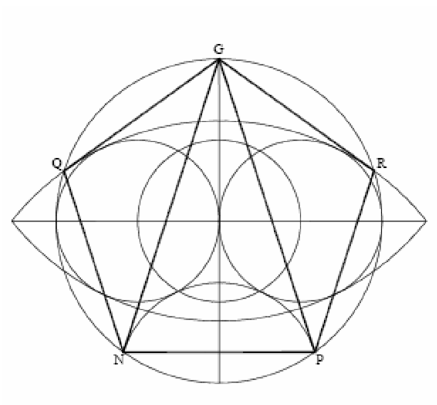

Fig. 25.
NP:PG :: 1: ϕ

The Greek for "pentagon" is *pentagônon* (from *penta-* "five" + *gônia* "angle") [Liddell 1940, Simpson 1989].

The side and diagonal of any regular pentagon are in the ratio 1 : ϕ. We will revisit the pentagon and its inherent proportions in a future column.

VIII The l : √3 rectangle revisited

In Geometer's Angle 12 [Fletcher 2004], we explored the dynamic symmetry of the l : $\sqrt{3}$ rectangle. Here, we revisit its properties in a new context.

- Repeat Figure 1, as shown.

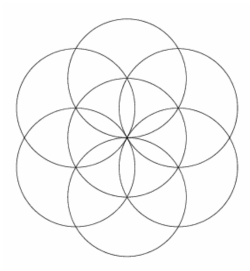

Fig. 1

- Locate points A, B, C and D, as shown.
- Connect points A, B, C and D.

The result is a rectangle (ABCD) with short and long sides in the ratio 1 : √3.

AB : BC :: 1: √3 .

- Draw the diagonals AC and BD.

The two diagonals intersect at an apex shared by two equilateral triangles within the rectangle (Fig. 26).

- Locate points E and F, as shown.
- Draw a line EF.
- Locate points G and H, as shown.
- Draw a line GH.

The rectangles EABF, GEFH and DGHC that result are each in the ratio 1/√3 : 1 or l : √3.

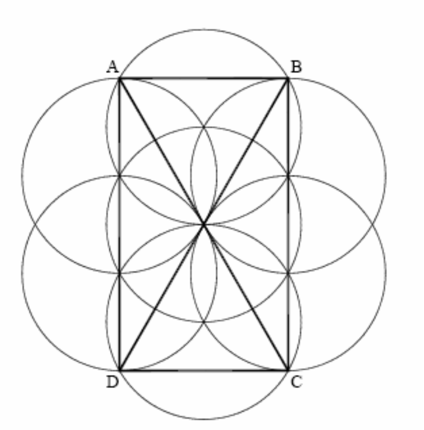

Fig. 26

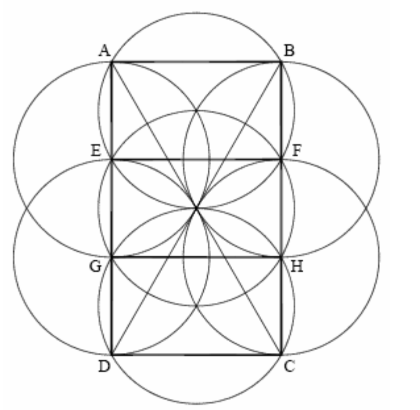

Fig. 27.
EA:AB :: AB:BC
1/√3 : 1 :: 1: √3

The major l : √3 rectangle ABCD divides into three reciprocals that are proportionally smaller in the ratio l : √3 (Fig. 27).[6]

- Locate point I where the diagonal AC intersects line EF.
- Locate point J where the diagonal BD intersects line EF.
- From point I, draw a line that is perpendicular to line EF and intersects line AB at point K.
- From Point J, draw a line that is perpendicular to line EF and intersects line AB at point L.

The rectangles IEAK, JIKL and FJLB that result are each in the ratio 1/3 : 1/√3 or l : √3.

The major l : √3 (or 1/√3 : 1) rectangle EABF divides into three reciprocals that are proportionally smaller in the ratio l : √3 (Fig. 28).

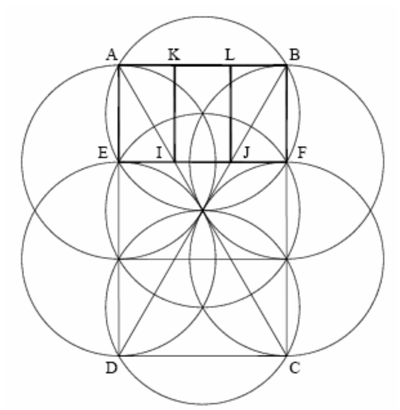

Fig. 28.
IE:EA :: EA:AB :: AB:BC
1/3 : 1/√3 :: 1/√3 : 1 :: 1: √3

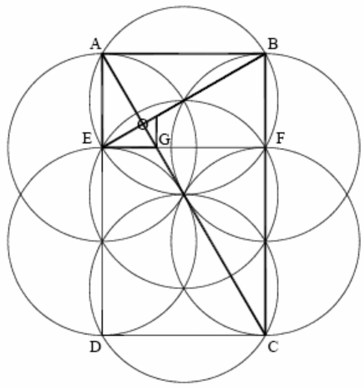

Fig. 29.
OG: OE :: OE: OA :: OA : OB :: OB : OC
1: √3 :: √3: 3 :: 3: 3√3 :: 3√3: 9

- Draw the diagonal AC of the rectangle ABCD.
- Draw the diagonal BE of the reciprocal EABF.

BE: AC :: 1: √3.

The diagonals AC and BE intersect at 90° at point O (Fig. 29).

- Extend the diagonal BE through point E, to point J, as shown.
- Locate point K at the center of the center circle.
- Draw the line JK.
- From point J, draw a line perpendicular to line JK that intersects the extension of line BA at point L.
- From point B, draw a line perpendicular to line LB that intersects the extension of line JK at point M.

The result is a rectangle (JLBM) with short and long sides in the ratio 1: √3.

JL : LB :: 1: √3

- From point A, draw a line perpendicular to line LB that intersects line JM at point N.
- From point K, draw a line perpendicular to line JM that intersects line LB at point P.

The rectangles NJLA, KNAP and MKPB that result are each in the ratio 1/√3 : 1 or l : √3.

The major l : √3 rectangle JLBM divides into three reciprocals that are proportionally smaller in the ratio l : √3 (Fig. 30).

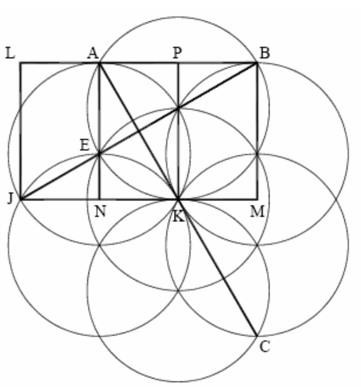

Fig. 30.
NJ:JL :: JL:LB
1/√3 : 1 :: 1: √3.

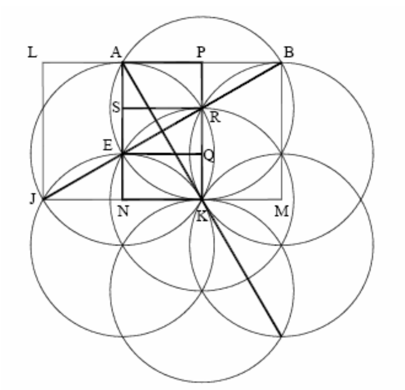

Fig. 31.
SA:AP :: AP:PK
1/3 : 1/√3 :: 1/√3 :1

From point E, draw a line that is perpendicular to line AN and intersects line PK at point Q.

- Locate point R, where the diagonal BJ intersects line PK.
- From point R, draw a line that is perpendicular to line PK and intersects line AN at point S.

The rectangles SAPR, ESRQ and NEQK that result are each in the ratio 1/3 : 1/√3 or l : √3. The major l : √3 rectangle APKN divides into three reciprocals that are proportionally smaller in the ratio l : √3 (Fig. 31).

- Repeat the process continually, as shown, utilizing the diagonals AC and BJ.

At each successive level, a major l : √3 rectangle divides into three reciprocals that are proportionally smaller in the ratio l : √3 (Fig. 32).

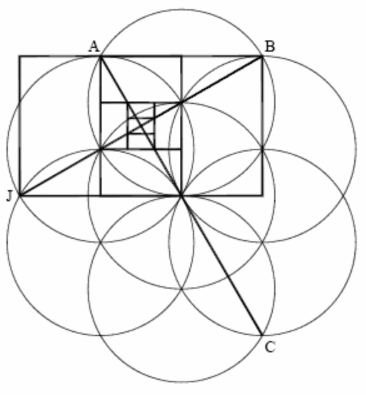

Fig. 32

Point K locates the midpoint of the diagonal AC.

- Place the compass point at K. Draw a semi-circle of radius KA, through point B.

- Locate point B on the perimeter of the semi-circle.
- From point B draw lines to points A and C.

By the Theorum of Thales, triangle ABC is a right triangle.

- From point B on the semi-circle, locate the line BO, which is perpendicular to line AC.

Triangles BOA, COB and CBA are similar.

Line OB is the mean proportional or geometric mean of lines OA and OC (Fig. 33) [See Fletcher 2004].

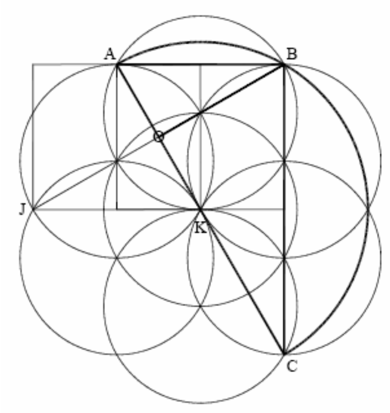

Fig. 33
OA : OB :: OB : OC
1 : √3 :: √3 : 3

IX The 1 : √3 spiral revisited

- Repeat Figure 1, as shown.

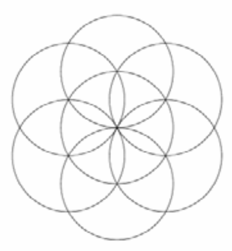

Fig. 1

- Locate points A, B, C, D, E and F, where the outer circles intersect beyond the circle in the center.
- Connect points A, B, D and E.

The result is a rectangle (ABDE) with short and long sides in the ratio 1: √3.

- Connect points B, C, E and F.

The result is a rectangle (BCEF) with short and long sides in the ratio 1: √3.

- Connect points C, D, F and A.

The result is a rectangle (CDFA) with short and long sides in the ratio 1: √3.

- Locate the equilateral triangle AGL (Fig. 34).

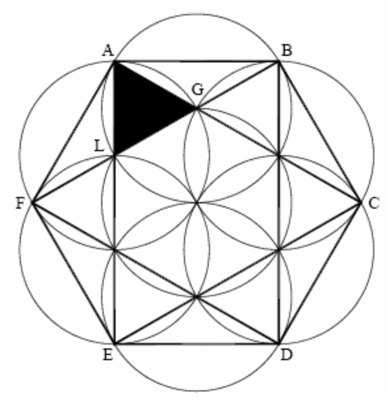

Fig. 34.
AB : BD :: 1: √3

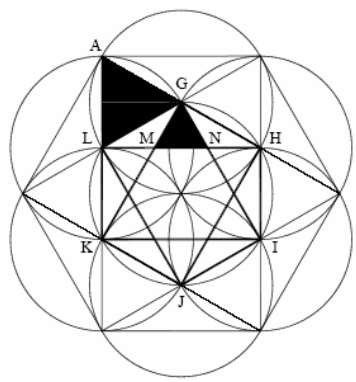

Fig. 35.
GH : HJ :: 1/√3 : 1
AG : GN :: 1/√3 : 1/3

- Locate points G, H, I, J, K and L, where the centers of the outer circles intersect the circumference of the circle in the center.
- Connect points G, H, J and K.

The result is a rectangle (GHJK) with short and long sides in the ratio 1/√3 : 1 or l : √3.

- Connect points H, I, K and L.

The result is a rectangle (HIKL) with short and long sides in the ratio 1/√3 : 1 or l : √3.

- Connect points I, J, L and G.

The result is a rectangle (IJLG) with short and long sides in the ratio 1/√3 : 1 or l : √3.

- Locate the equilateral triangle GNM (Fig. 35).
- Locate points M, N, O, P, Q and R, as shown.
- Connect points M, N, P and Q.

The result is a rectangle (MNPQ) with short and long sides in the ratio 1/3 : 1/√3 or l : √3.

- Connect points N, O, Q and R.

The result is a rectangle (NOQR) with short and long sides in the ratio 1/3 : 1/√3 or l : √3.

- Connect points O, P, R and M.

The result is a rectangle (OPRM) with short and long sides in the ratio 1/3 : 1/√3 or l : √3.

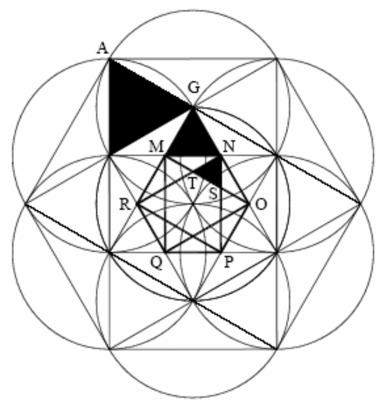

Fig. 36.
MN : NP :: 1/3 : 1/√3
AG : GN :: GN : NS
1/√3 : 1/3 :: 1/3 : 1/(3√3)

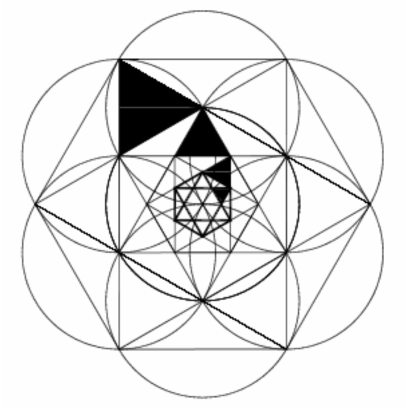

Fig. 37

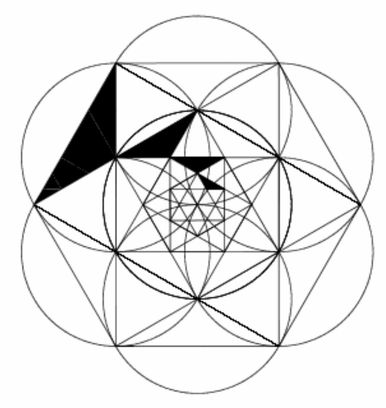

Fig. 38

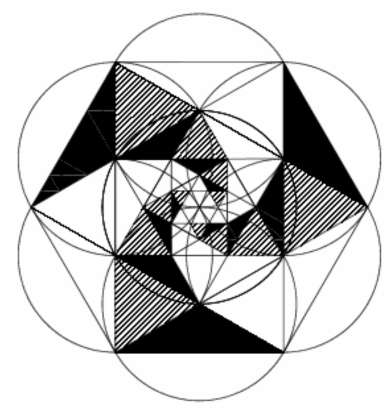

Fig. 39

- Locate the equilateral triangle NST (Fig. 36).
- Repeat the process, as shown.
- Locate a 1 : √3 spiral comprised of four equilateral triangles (Fig. 37).
- Locate a 1 : √3 spiral comprised of four isosceles triangles (Fig. 38).
- Locate three 1 : √3 spirals, as shown (Fig. 39).

Definitions:

"**Equilateral**" is an adaptation of the late Latin *æquilateralis* (from *aequi-* "equal" + *latus* "side"). Geometric figures having all sides or faces equal are equilateral [Simpson 1989].

The Greek for "**isosceles**" is isoskelês (from *isos* "equal to" + *skelos* "leg"), which means "with equal legs." Triangles having two sides of equal length are **isosceles** [Liddell 1940, Simpson 1989].

Notes

1. This is because the earth's axis of rotation is not perpendicular, but tilted by 23.5° with respect to the plane of its orbit around the sun.
2. Diagram adapted from [Nave 2001].
3. "Gematria" is a medieval cabbalistic term adopted from the Greek *geômetria*, "geometry" [Liddell 1940, Simpson 1989].
4. Image: The Wilson A. Bentley (1865-1931) collection of photomicrographs of snow crystals (negatives 3879, 2001, and 3307). Reproduced by permission, the Buffalo Museum of Science. Geometric overlays by Rachel Fletcher.
5. Construction adapted from Lawlor 1982, 74-75.
6. The reciprocal of a major rectangle is a figure similar in shape, but smaller in size, such that the short side of the major rectangle equals the long side of the reciprocal. The diagonal of the reciprocal and the diagonal of the major rectangle intersect at right angles [Hambidge 1967, 30, 131]; see [Fletcher 2004].

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About the geometer

Rachel Fletcher is a theatre designer and geometer living in Massachusetts, with degrees from Hofstra University, SUNY Albany and Humboldt State University. She is the creator/curator of two museum exhibits on geometry, "Infinite Measure" and "Design By Nature". She is the co-curator of the exhibit "Harmony by Design: The Golden Mean" and author of its exhibition catalog. In conjunction with these exhibits, which have traveled to Chicago, Washington, and New York, she teaches geometry and proportion to design practitioners. She is an adjunct professor at the New York School of Interior Design. Her essays have appeared in numerous books and journals, including "Design Spirit", "Parabola", and "The Power of Place". She is the founding director of Housatonic River Walk in Great Barrington, Massachusetts, and is currently directing the creation of an African American Heritage Trail in the Upper Housatonic Valley of Connecticut and Massachusetts.