



# laetus in praesens

Alternative view of segmented documents via Kairos

11 September 2017 | Draft

## Cognitive Implications in 3D of Triadic Symbols Valued in 2D

### Representations of the triskelion in virtual reality and implications for quantum consciousness

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#### Introduction

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The argument here has been further developed separately (*Psychosocial Learnings from the Spiral Form of Hurricanes: implications of the triple helix and the 3-fold triskelion as "cognitive cyclones"?* 2017), to which the following is therefore an introduction.

## Introduction

A number of traditional symbols considered fundamental in various cultures have typically been rendered in two dimensions. They are to be found in architecture, flags, and a variety of insignia, and are much valued in terms of their significance. They can be understood as providing a collective cognitive focus, a source of inspiration, and may well be a catalyst for meditation. The question here is the further significance to which they may give rise when rendered in three dimensions rather than two. Exploration of the possibility is enabled by development in computer software, especially in anticipation of the widespread deployment of virtual reality devices.

The example explored here is the **triskelion** (triskele) or triple spiral, notably when based on interlocking **Archimedean spirals**. The symbol, also known as the "**spiral of life**", appears in many early cultures dating back to the Neolithic period, most notably that of the famed megalithic tomb of **Newgrange** in Ireland, built around 3200 BC. It has been the focus of many interpretations, perhaps most usefully that of **Glenys Livingstone** (*Celebrating the Triple Spiral: a PaGaian Cosmology*, *PaGaian Cosmology*, 2007). Traditional Asian versions of the triskelion include the Japanese **Mitsudomoe**, the Tibetan Buddhist **Gankyil**, and the Korean **Sam Taegeuk** (*Triple Tomoe and Related Threefold Symbols*, *Pennine Tai Chi*). Variants appear in church architecture and jewelry.

As a logo, modern usage includes that of **Trisquel** (officially Trisquel GNU/Linux), a **Linux distribution**, derived from another computer operating system, **Ubuntu**. It is the logo of **Mankind 2000**. As with the swastika, the triskelion may well be used by white supremacist groups, especially in countries where the swastika is banned. The triskelion form is specifically associated with the protein **clathrin** which performs critical roles in shaping rounded vesicles in the cytoplasm for intracellular trafficking. As names, both "triskelion" and "triskele" are associated with commercial products and services (if not trademarked).

Such a symbol is of particular interest given the cognitive importance attached to a number of triadic patterns. These include the **semiotic triangle of meaning** of **Charles Ogden**, the triangulated Oedipus complex of **Jacques Lacan**, the **phenomenological epoché** of **Francisco Varela**, and the **Christian Trinity**. Of particular interest is the triadic form of the logo of the **Roerich Pact**, namely the inter-American *Treaty on the Protection of Artistic and Scientific Institutions and Historic Monuments* (1935). This provides legal recognition that the defense of cultural objects is more important than the use or destruction of that culture for military purposes, and that the protection of culture always has precedence over any military necessity.

Especially appropriate to the argument here is that the 3-fold set of **Borromean rings** has been rendered in 3D and adopted as the **logo of the International Mathematical Union** in 2006. The set of rings is a famous topological link of three components. The rings have the surprising property that if any one component is removed, the other two can fall apart (while all three together remain linked). This so-called **Brunnian property** has led the rings to be used over many centuries in many cultures as a symbol of interconnectedness, or of strength in unity. It has been used in a medieval depiction of the Christian Trinity, for example.

Composed as it is of three interweaving Archimedean spirals, the triskelion could well be described as a triple helix. Although it is not used as the logo of the [Triple Helix Association](#), it is appropriate to note the pattern of international conferences of that body since 1996. These seek to promote all aspects of the interaction between academy-industry-government in fostering research, innovation, economic competitiveness and growth.

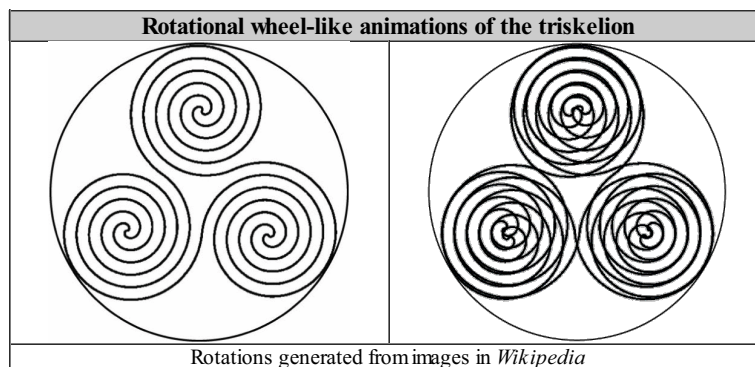
The question is whether and how richer insight might be enabled by rendering two-dimensional patterns of significance into 3D, notably through recognition of the dynamics associated with any such topological transformation. To the extent that a two-dimensional pattern may be cognitively embodied in some way as a focus of identity, the "extrusion" of the pattern to engender a form in 3D is particularly intriguing. There is then the implication that the 2D pattern is an especially restricted projection of a richer and deeper sense of identity -- a limitation inappropriate to the times, and perhaps dangerously so.

There is the possibility that forms of connectivity that prove difficult in 2D, if not impossible, may be rendered comprehensible by renderings in 3D. This could be relevant to eliciting imaginative new thinking -- transcending the many binary framings by which intractable conflicts are currently sustained. What subtler insights can such 3D renderings "carry", engender and distinguish -- notably as a means of counteracting tendencies to their dysfunctional conflation in practice?

The transformation of perspective from 2D to 3D can itself help to frame consideration of the individual and collective implications of "quantum reality". Their credibility has been remarkably argued by [Alexander Wendt](#) (*Quantum Mind and Social Science: unifying physical and social ontology*, 2015). The possibility is all the more relevant because that argument is made from the perspective of one of the most prominent scholars of international relations with a special focus on international security. He notably calls into question the conventional understanding of the division of the global system into "states", suggesting the need for a quantum model of human identity

## Eliciting significance from symbol dynamics in 2D and 3D

The point of departure for this exploration has been consideration of rotational dynamics of the triskelion, illustrated below, as previously presented with respect to reframing "wheels of governance" (*Central pattern generators and higher order values?* 2017).



The argument has been variously developed with respect to other symbols considered to be of fundamental significance in some way:

- [enneagram](#): This was explored in terms of the recognition by [Stafford Beer](#), with respect to management cybernetics, of the embedding of the (seemingly 2D) enneagram within the 3D icosahedron, which he describes as emerging from collaboration with [Joseph Truss](#) -- in a chapter on *The Dynamics of Icosahedral Space (Beyond Dispute*, 1994, pp. 196-209), as discussed separately (*Imagining the nature of cognitive "flight" in terms of the enneagram*, 2014)
- [lauburu](#): Various animations have been produced as separately indicated (*24-fold Pattern Implied by Dynamics of the Lauburu in 3D*, 2016). The relevance of the lauburu was noted with respect to experimental animation of the Smith Chart in *Modulating cognitive transformations: electrical metaphors and semiconductor* (2012) and *Wave-language potentially implied in encodings elaborated by cultures* (2013). These animations related to further commentary (*Improvisation in Multivocal Poetic Discourse: Basque lauburu and bertsolaritza as catalysts of global significance*, 2016)
- [swastika](#): Animations of the counter-rotation of the two forms of the swastika were presented with that of the triskelion (*Central pattern generators and higher order values?* 2017), noting the cognitive significance of the implied dynamic (*Swastika as Dynamic Pattern Underlying Psychosocial Power Processes: implicate order of Knight's move game-playing sustaining creativity, exploitation and impunity*, 2012). The dynamics can be discussed in relation to that of other patterns (*Cross, swastika variants and lauburu*, 2008) as a feature of the *Sustainability through Magically Dancing Patterns* (2008)
- [Star of David](#): The relation of this symbol to the 3D form of the Merkabah is separately described (*Framing Global Transformation through the Polyhedral Merkabah: neglected implicit cognitive cycles in viable complex systems*, 2017). This notably explored the 2D *Star of David as reinforcing dangerous cognitive reductionism* and the *Richer pattern of significance through complexification of the Star of David*. The animations of mappings onto the Star of David was also presented. Of particular interest at this time is the symbolic reconciliation with the 5-fold Islamic Star (*Middle East Peace Potential through Dynamics in Spherical Geometry: engendering connectivity from incommensurable 5-fold and 6-fold conceptual frameworks*, 2012).
- [pentagram](#): A key contribution to understanding of navigation around the globe -- between 2D and 3D perspectives -- has been the

mathematical formulation [Napier's rules for right spherical triangles](#). These were associated with a simple 5-fold structure later termed the *Pentagramma Mirificum*. Arguably such thinking has implications for psycho-social understandings of globality, as previously argued (*Global Psychosocial Implication in the Pentagramma Mirificum: clues from spherical geometry to "getting around" and circumnavigating imaginatively*, 2015). There is then a strong case for exploring how the geometry of "stars" may frame thinking in some poorly recognized way -- potentially to be informed by neglected insights concerning the mathematics of globality. There is a curious parallel with respect to health and healing between the pentagonal *Wu Xing* pattern, as a fundamental Chinese concept, and the Pythagorean symbol of the *Hygiea* (*Beyond dispute in 5-dimensional space: Pentagramma Mirificum?* 2015). That there is a degree of sensitivity to such pentagonal symbols is evident from the concern which can be aroused in the media by their inversion and association with questionable rituals.

- **torus / helix:** Although 3D forms in their own right, whether as individual symbols, or combined in relation to a spiral form, these can be explored as potentially of relevance to the form of a **mandala** in 3D, given its particular cognitive significance (*Visualization in 3D of Dynamics of Toroidal Helical Coils: in quest of optimum designs for a Concordian Mandala*, 2016; *Enabling Wisdom Dynamically within Intertwined Tori: requisite resonance in global knowledge architecture*, 2012)
- **Mandelbrot set as visually rendered:** As with the set of Borromean rings, although not widely recognized, 2D representations of the Mandelbrot set are considered by mathematicians as offering especially valuable insight into the fractal organization of complexity. Various renderings in 3D also exist. The possible psycho-social significance can be explored (*Psycho-social Significance of the Mandelbrot Set: a sustainable boundary between chaos and order*, 2005; *Understanding the Monster through the Mandelbrot set -- Moonshine connectivity?* 2007).

The possibly of unexplored implications of the use of such symbols at the present time is evident in the case of **The Pentagon**, or the logo of NATO. These therefore lend themselves to exploration of how they might be understood through forms of higher dimensionality (*Envisaging NATO Otherwise -- in 3D and 4D? Potentially hidden faces of global strategy highlighted through polyhedra*, 2017). Whereas mapping, most notably of the globe, focuses on projection from 3D to 2D, the latter addresses the seemingly unexplored challenge of inferring a 3D form from one in 2D (*Explanation as interplay of projection and "conjection"?* and *Surrogates of "conjection" as an unrecognized cognitive process?*).

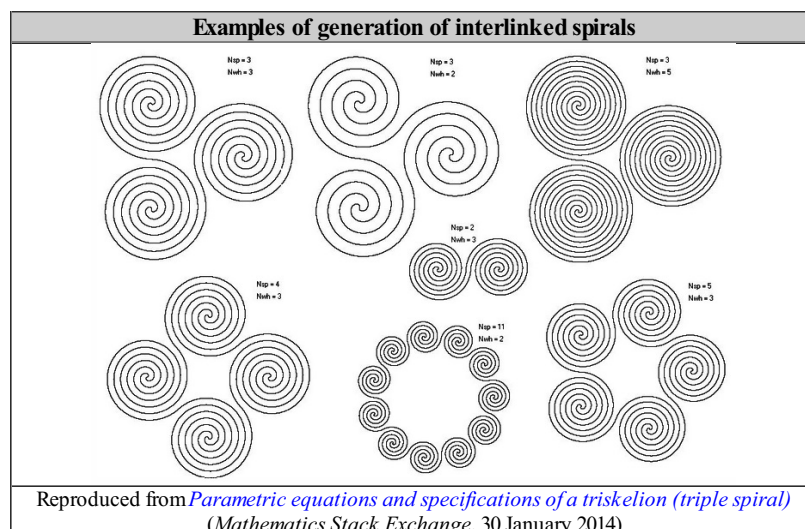
There is particular value in exploring triadic symbols such as the triskelion -- beyond that noted above -- namely the manner in which it is implied by the relation between the three primary **Abrahamic religions**. Necessarily a matter of great controversy, it is their conflictual relations which are so characteristic of current global dynamics, as may be variously discussed (*Root Irresponsibility for Major World Problems: the unexamined role of Abrahamic faiths in sustaining unrestrained population growth*, 2007; *Systemic Reliance of World Religions on Human Sacrifice: covert use of fatal conflict to ensure vital resource management*, 2014).

Curiously, beyond the motivation of any of the Abrahamic religions (despite efforts at interfaith dialogue), the triadic nature of their relationship goes systematically unexplored, as can be otherwise reframed (*Triangulation of Incommensurable Concepts for Global Configuration*, 2011). There is seemingly no symbol of that relationship as a whole, irrespective of the existence of distinctive geometric symbols for each of them.

Another approach to the challenge of these divisive times is through identifying a pattern through which a variety of such conventional symbols might be interrelated (*Dynamic Exploration of Value Configurations: interrelating traditional cultural symbols through animation*, 2008; video).

## Adapting 2D images to 3D: transformations of cognitive significance

There are of course numerous images of the symbols of interest. With the focus of this exercise on the triskelion, a preliminary challenge was the location of a precision rendering in 2D. The form is of mathematical interest, given the challenge of generating a triple spiral (*Parametric equations and specifications of a triskelion (triple spiral)*, *Mathematics Stack Exchange*, 30 January 2014). This extends to the generation of "quadskelions" and "polyskelions", namely chains of interlinked spirals as reproduced below from that exchange.



The triskelion can, as a consequence, be rendered as a line drawing using [scalable vector graphics](#) (SVG). This suggests that a preferable approach might have been to endeavour to use the original parametric functions. The point of departure was however to use a 2D SVG image in *Wikipedia*. Unfortunately, as indicated by various queries on the web, such "SVG images" are not as readily manipulable as might be assumed by the definition of SVG. Prior to processing them, Adobe Illustrator asks for them first to be "validated", for example.

This conversion issue can be bypassed by making an image of the SVG image using a screenshot facility -- saved to PNG in this case and then viewed in Adobe where the line pattern can be processed by the trace function into a path. The result can then be saved in an SVG form, readily read by other software.

The challenge is then how to transform the path from a simple line, however curved, into a 3D object -- a curving tube in this case. The SVG format provides explicit path indications with coordinates, but these are not immediately convertible into a 3D object, although the logical relationship is evident. The goal in this exercise was to be able to process and manipulate such an object in [X3D Edit](#) -- a freely available application for creating and rendering 3D objects. Specifically the path (appropriately transformed) was recognized as potentially constituting the spine of an extrusion of a complex circular tube -- a process characteristic of editing in 3D ([About using extrusion as 3D symbology](#), [ArcMap](#)).

The conversion between the SVG format of the path and that compatible with X3D Edit was achieved with the kind intervention of Sergey Bederov of [Cortona3D](#) (a rendering package for [VRML](#), the predecessor of the [X3D](#) format). Details are indicated in the following insert.

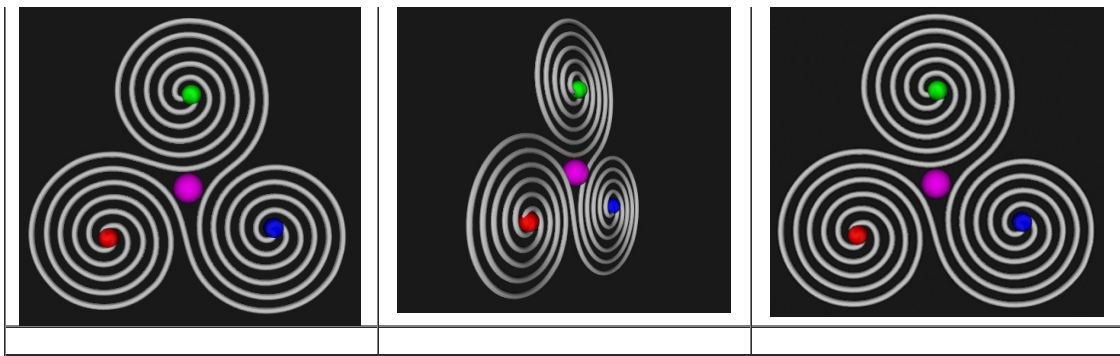
<b>Technical details in conversion of triskelion SVG to X3D</b>
<ul style="list-style-type: none"> <li>• Open the SVG file in a text editor (eg Notepad++). The description of the SVG attribute can be found in the <a href="#">SVG specification</a>:. The attribute contains one command "M" (move with two absolute coordinates), many commands "c" (cubic Bezier curve with six relative coordinates) and one command "C" (cubic Bezier curve with six absolute coordinates). The coordinates are separated by commas; a comma before a negative number is omitted because "-" is already an unambiguous separator.</li> <li>• Cut and paste the text of the "d" attribute into a separate file. Select all and shift to the left using Shift+Tab. Using find-replace (case insensitive, with regular expressions), replace "c" to "\r\n", this separates each Bezier curve to a separate line. Replace "\r\n\r\n" to "\r\n", this removes empty lines. Replace "," to "\t". Replace "-" to "\t-". Select all and Shift+Tab to the left.</li> <li>• Delete the first "M". Select all and copy-paste to Excel.</li> <li>• This gives:             <ul style="list-style-type: none"> <li>◦ the first row with a 2D vector indicating the starting point of the curve, which becomes the first "base point".</li> <li>◦ 67 rows with three 2D vectors. Each vector defines a Bezier control point relative to the current "base point". The third vector becomes the new "base point". So each Bezier curve is connected to the previous one, and is defined by four control points. The last row with three 2D vectors.</li> <li>◦ Each vector defines a Bezier control point in absolute coordinates (remember it was "C" instead of "c"). So it's another Bezier curve with four control points.</li> </ul> </li> <li>• The control points themselves are not enough to build a legible triskelion, so they must be interpolated into actual Bezier curves. Each Bezier curve was therefore divided into 20 steps. The formulae can be found <a href="#">here</a></li> <li>• The intermediate points were calculated using a spreadsheet (eg Excel), creating two columns with 1361 values each. These two columns can be copy-pasted into an X3D file, for use in an Extrusion -- either as a spine or as a crossSection. A third column (all zeros) can be added, if the points are to be used as a spine</li> <li>• Extrusion possibilities initially developed:             <ul style="list-style-type: none"> <li>◦ Tubular: In this case the points are used as the spine. The crossSection of this Extrusion is a small circle (octagon for example), and provides the first X3D rendering. A thin cylindrical tube is routed along the triskelion path.</li> <li>◦ Linear: In this case the points are used as the crossSection. The spine of this Extrusion is a simple line segment with two vertices.                 <ul style="list-style-type: none"> <li>▪ this has two large 1360-gonal faces which are badly rendered in a 3D viewer (eg H3DViewer), so it can be converted to an IndexedFaceSet to provide a second X3D rendering. The cross-section is highly non-convex, and the H3DViewer (for example) does not support such cross-sections even with convex=false". Using solid=false", at least some of the intended shape is visible in H3DViewer.</li> <li>▪ using an Extrusion Editor module (eg in VmlPad) can convert Extrusions to IFS. The resulting IndexedFaceSet also contains the same 1360-gonal faces.</li> <li>▪ using another application, all faces can be automatically triangulated. The Coordinate and coordIndex data can then be pasted into a third X3D rendering</li> </ul> </li> </ul> </li> </ul>

Whilst such technicalities may seem irrelevant to the argument here (and trivial to those with skills in this arena), there is a case for recognizing that they constitute useful metaphors of the obstacles to a shift in understanding required to transform a 2D form into one which can be insightfully explored in 3D -- and especially within a virtual reality context. This argument is developed below with respect to the implications for quantum consciousness.

## Forms of the triskelion in 3D of potential significance

**Rotation of basic form:** A point of departure is to present the 3D triskelion as it is normally perceived in 2D, as shown (left image below). The three-dimensional nature of the form is evident through its rotation (central image). In a virtual reality context, movement of the spheres may be enabled along the pathway constituted by the form (as indicated subsequently).

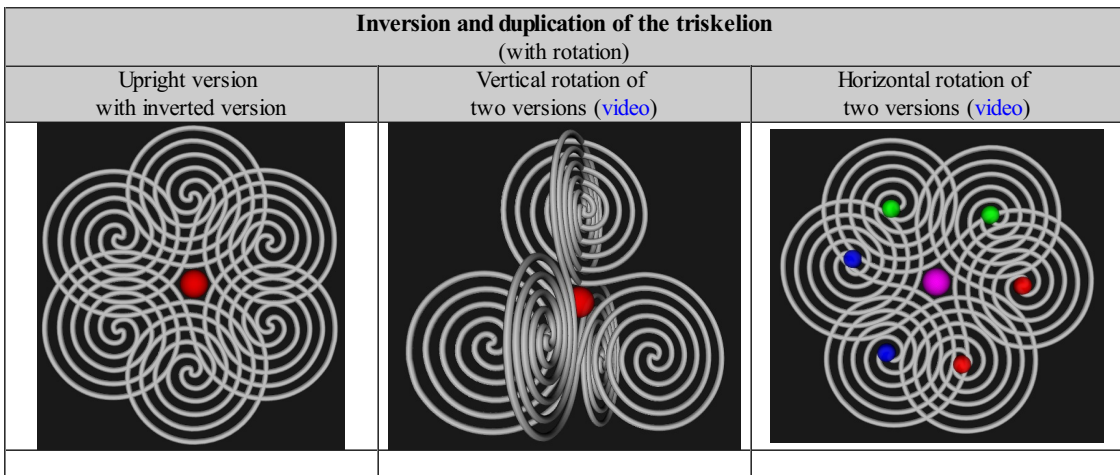
<b>Screen shots of 3D triskelion as normally viewed in 2D</b> (variously associating coloured spheres with focal points; and rotation on vertical axis)		
Stationary view	Rotation of form (slow)	Rotation of form (fast)



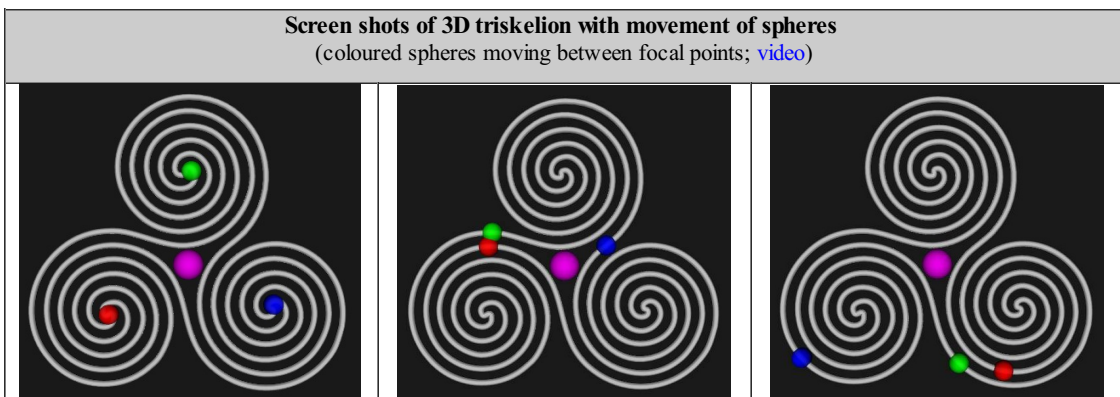
Although such presentations are but a small step beyond what can be achieved in 2D, it is appropriate to note the flexibility inherent in the 3D variant. The X3D (or VRML) formats basic to the images and animations can be readily modified with a text editor. Thus the cross-section of the tubular path can be increased or decreased, as with the presence or absence of the added spheres. Similarly the rate of rotation of the form, or any movement of the added spheres (shown below), can be increased or decreased.

With respect to any new level of significance, the addition of the spheres to the presentations can be explored in the light of the challenging dichotomy between the "red pill" and "blue pill" metaphor highlighted by the popular movie *The Matrix* (1999), as separately discussed (*Psychosocial Transformation by "Pill Pushing"? Model-making, strategic advocacy and the myth of the "red pill"*, 2017). The latter notably includes a discussion of *Values and principles as pills?* and *Visualization in 3D of a trinity of connotations as a cognitive pill*. In the absence of any symbolization of the relationship between the mutually hostile Abrahamic religions, the pattern provides an interesting basis for discussion -- especially with the role of any third in relation to the whole, which has proven so problematic to imagine.

**Inversion and duplication:** Much controversy is typically associated with the inversion of triadic forms, namely the problematic significance of having the upper circle pointing downwards. This was previously addressed in the rotation and counter-rotation of the triskelion (as mentioned above).



**Movement of spheres along triskelion pathway:** The coloured spheres can be readily moved along the spiral pathways, as shown below. It is notable that the form of the pathway does not result in the spheres colliding. The relative speed of movement of the spheres can be modified, as well as their relative sizes; made smaller, they could move "within" the tubular pathway. Both could be varied along the pathway, perhaps to the point of rendering a sphere invisibly small in portions of the pathway.



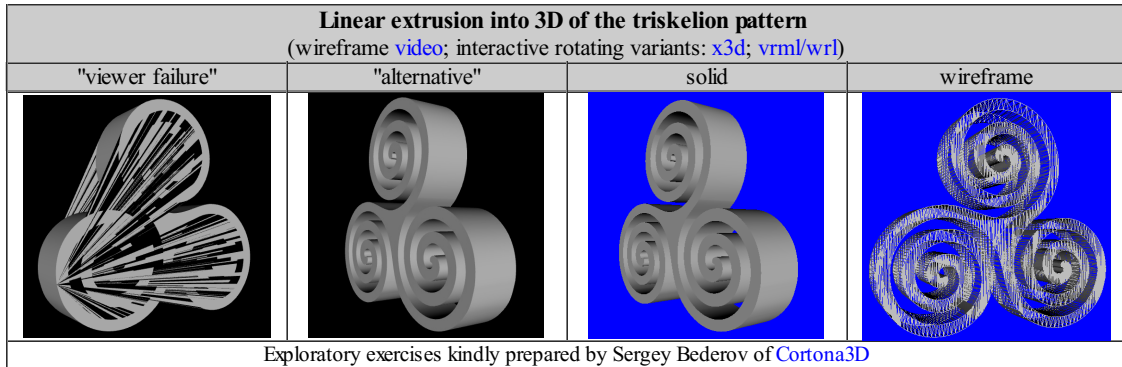
These images are potentially useful as a means of holding contrasting views of a triadic pattern, notably that on the left. This could involve rotation around a horizontal axis indicating the emergence of an inverted form, and "reabsorption" of one contrasting form. The rotation of perspectives which are potentially orthogonal to one another is indicated with respect to the vertical axis by the central and

right-hand images (and as animated). Again it can be stressed that the relative rate of rotations of the two forms can be readily modified.

**Triple rotation around binary axes:** Namely 3-fold over rotation around axes through centers (forthcoming)

**Non-tubular solid:** In quest of a "solid" form of the triskelion, one approach is to use the 2D pattern in a simple linear extrusion between two points. The result is problematic, as indicated by the image on the left below, about which Sergey Bederov remarks that the cross-section is highly non-convex, and such cross-sections may not be readily supported by some viewers (even with convex="false") -- as is the case with H3DViewer. Using one option (solid="false") he was able to render visible at least some of the intended shape. All VRML viewers display non-convex polygons correctly and some X3D viewers may do so without such obvious deficiencies.

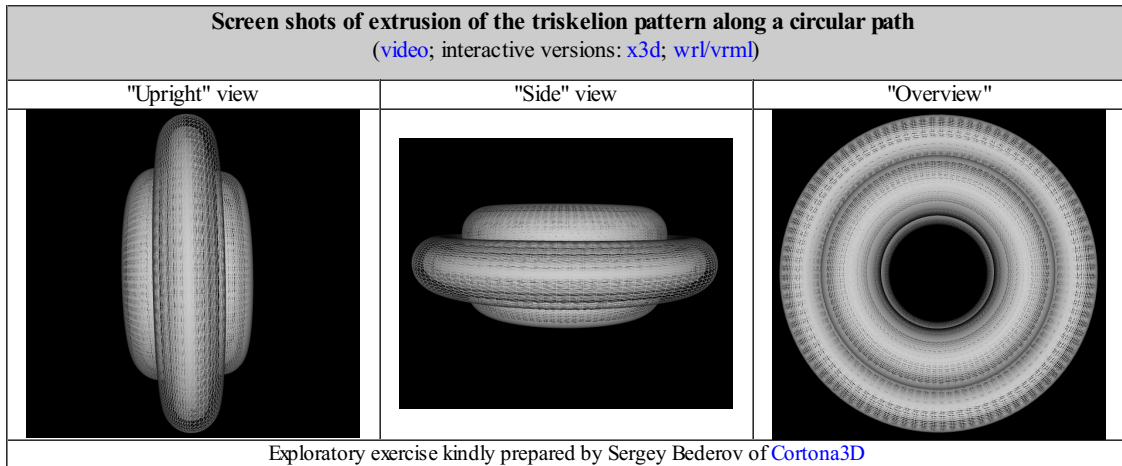
Following further manipulation, as an alternative (to enable rendering with H3DViewer), Bederov made use of the IndexedFaceSet option, with all faces explicitly triangulated to enable use of that viewer (as in the alternative image on the left). The deficiencies of any viewer suggest consideration of the possible cognitive deficiencies in the "view" of any higher order form, notably as potentially associated with any particular cognitive model. The recourse to triangulation merits consideration of its more general implications, especially in relation to any trinity (*Triangulation of Incommensurable Concepts for Global Configuration*, 2011; *Holiness framed by a triangulated configuration of holes*, 2014).



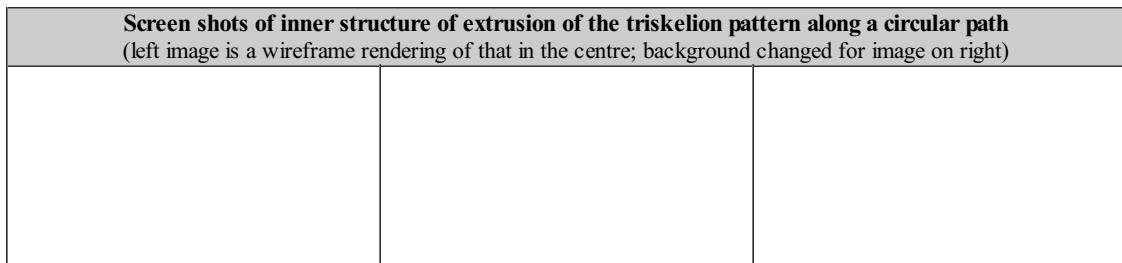
3D-printable variants are variously marketed, notably in the form of a pendant (*Triple Spiral - Triskele - Sacred Geometry - Celtic; Triple Spiral*)

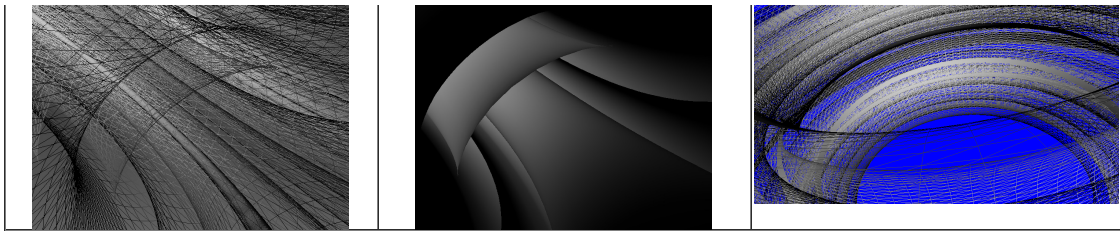
**Triangular extrusion of the triskelion pattern:** (in preparation)

**Circular extrusion of the triskelion pattern:** A linear extrusion usefully raises the question as to the greater integrity implied by an extrusion along a circular spine, if that is possible. Of particular relevance is then the diameter of the circle, with one such exercise (giving of toroidal form) variously presented below. A smaller diameter would necessarily increase the degree of closure. Without using the wireframe rendering no hint of the spiralling inner structure would be possible in the views shown, however that inner structure can be explored using 3D viewers. It should be emphasized that the triskelion is the cross-section of the toroidal tube depicted below -- understood as extruded from the triskelion, or as a rotation of it around the centre of the torus.



Some impression of navigation within the 3D form above in virtual reality can be obtained from the following screen shots obtained using the VRML variant, using the viewer Cortona3D. Presumably the views could be enhanced for greater clarity with other techniques.





As rendered in the images above, the circularly extruded 3D triskelion invites reflection in terms of the following:

- Although not visible in the absence of 3D viewer capacity, the spiral coilings around the toroidal form (but contained within it) are consistent with the earlier explorations noted above (*Visualization in 3D of Dynamics of Toroidal Helical Coils: in quest of optimum designs for a Concordian Mandala*, 2016; *Concordian Mandala as a Symbolic Nexus*, 2016).
- The spiral form is reminiscent of the [marine nautilus](#) valued as emblematic of desirable forms of growth and development. It is notably used both as a symbol of educational development and of strategic appropriateness ([New Zealand Curriculum Nautilus](#), [Nautilus Institute for Security and Sustainable Development](#)). The question is how to benefit from this dynamic, as discussed separately (*Enabling Governance through the Dynamics of Nature: exemplified by cognitive implication of vortices and helicoidal flow*, 2010).
- The form of the triskelion is also somewhat reminiscent of that of standard renderings of the fractal Mandelbrot set, whose psycho-social implications can be explored (*Sustainability through the Dynamics of Strategic Dilemmas -- in the light of the coherence and visual form of the Mandelbrot set*, 2005; *Psycho-social Significance of the Mandelbrot Set: a sustainable boundary between chaos and order*, 2005). It is therefore appropriate to note explorations of 3D renderings of the set, known by the term [Mandelbulb](#).

As noted above, the triskelion is composed of three interweaving Archimedean spirals, and is of the same class as the [hyperbolic spiral](#) and [Fermat's spiral](#). All static spirals appearing in nature are however [logarithmic spirals](#), not Archimedean, although many dynamic spirals (such as the [Parker spiral](#) of the [solar wind](#), or the pattern made by a [Catherine's wheel](#)) are Archimedean. Such distinctions suggest reflection on contrasting modes of psycho-social development, as can be variously considered (*From global to helicoidal -- from pi to phi?*, 2010; *"Seeing" as implied by the Fibonacci spiral*, 2011; *Spiralling around "nothingness" and "pointlessness": the implication of phi*, 2012).

As might be expected, being of interest to mathematicians, there are various accessible examples of [Archimedean spirals, extruded to 3D](#), presented dynamically and interactively.

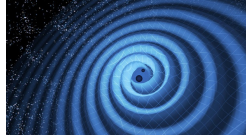

**From "biskelions" to triskelions?** The collection of images of polyskelions (presented above), includes what might be termed a "biskelion" or a "diskelion" -- namely two interweaving Archimedean spirals (image on left below). More correctly these are [Fermat spirals](#), namely a type of Archimedean spiral. This may be compared with a variety of mathematically [distinct spirals](#), including: an [Euler spiral](#) (spiro, clothoid or Cornu spiral) and a spiral tiling (as presented in the *MathWorld* entry on [tiling](#), from the cover illustration of Branko Grünbaum and G. C. Shephard, *Tilings and Patterns*, 1987). It can also be compared with the classic symbol of Taoism (image on right).

Comparable two-fold symbolic indications of challenging attraction of dyadic thinking?			
"Biskelion"	Euler spiral / Clothoid	Spiral tiling	Tao symbol

This raises the question of the comparability of these patterns, if only in a cognitive sense (beyond fascination with a single spiral) -- and of how this may extend to the triskelion with further implications for comprehension. They suggest various exercises relating the [Fibonacci spiral](#), the Clothoid and the Tao symbol (*Designing Global Self-governance for the Future: patterns of dynamic integration of the netherworld*, 2010; *Tao of Engagement -- Weaponised Interactions and Beyond: Fibonacci's magic carpet of games to be played for sustainable global governance*, 2010).

Of current relevance are the various announcements of the detection of gravitational waves associated with interacting black holes, notably by the [CALTECH Laser Interferometer Graviational-Wave Observatory \(LIGO\)](#), as discussed by Graham Templeton (*What are gravitational waves, and where does physics go from here now that we've found them?* *Extremetech*, 12 February 2016), Whether presented as photos, simulation screen shots, or imagined artwork, the dynamics bear a surprising resemblance to the twin spiral biselion discussed above.

Spiral dance of black holes	Colliding black holes	Black hole merger

		
Source: <a href="#">LIGO/T Caltech. Pyle</a> ; also <a href="#">video</a> of artist's animation showing merger of two black holes and gravitational waves rippling outward during the event (another <a href="#">video</a> ).	Detail of image of <a href="#">Gravitational wave detection showing shape of ripples from black hole collision</a> ( <i>The Guardian</i> , 27 September 2017) Source: <a href="#">alamy_JHP71R.jpg</a>	<a href="#">Black hole merger and space-time reverberations visualized</a> . (T. Dietrich, Max Planck Institute for Gravitational Physics / R. Haas, NCSA, 27 September 2017); and <a href="#">video</a>

Especially intriguing is both the reversal of direction of the spirals and the manner in which the centres of the spirals may be linked through another dimension (as cognitive "wormholes"), potentially to be recognized only intuitively, as in the case of the triskelion. More intriguing is the cosmic significance of the 2-spiral process and the possible cognitive functionality of a 3-spiral process -- understood as the classic [three-body problem](#) of concern to physics and to quantum mechanics, and celebrated in popular science fiction by [r Liu Cixin](#) (*The Three-Body Problem*, 2008).

## Quantum consciousness implications of fundamental symbol patterns

**Cognitive embodiment of patterns:** The technicalities and possibilities of new forms of representation merit consideration in the light of arguments from the perspective of cognitive psychology of [George Lakoff](#) and [Rafael Nunez](#) (*Where Mathematics Comes From: how the embodied mind brings mathematics into being*, 2000) further to an earlier study (George Lakoff and [Mark Johnson](#), *Philosophy in the Flesh: the embodied mind and its challenge to Western thought*, 1999).

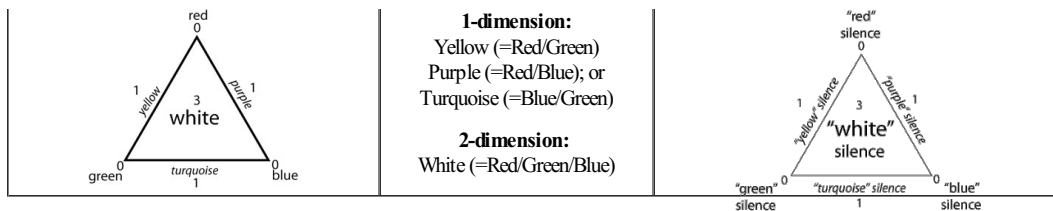
As suggested above, to the extent that a 2D symbolic pattern may be cognitively embodied as a focus of identity, any "extrusion" of that pattern to engender a form in 3D merits particular attention as a contrast to "projection" (from 3D to 2D). The transformational dynamics of such extrusion suggest that identity may be more richly associated with that dynamic rather than with a visibly static pattern in which any dynamic is only implied (if not ignored).

**Constrained comprehension of the three-fold:** Much has been made of the conflictual dynamics of binary relationships and the strategic difficulties of dilemmas. To the extent that it is claimed that the dynamics of the three-fold are comprehended, it can also be claimed that such "comprehension" is constrained in ways which render it inapplicable in practice -- where it could be said to be most needed. Examples are provided by:

- Three-fold patterns of divinity: Seemingly, whatever the religion, any fundamental trinity is claimed to be comprehended by the priesthoods as explicated definitively in learned texts. Ultimately the relationship is typically held to be a "mystery" beyond ordinary comprehension, as with the [Christian Trinity](#). However any such acknowledgement of subtlety has seemingly not informed the challenges of those religions in engaging with others.
- Abrahamic religions: There is clearly little comprehension of the relationship between the three primary [Abrahamic religions](#) which is of relevance to reframing fruitfully the conflicts they reinforce and in which they have engaged over centuries. These are clearly fundamental to global dynamics at this time. Islam considers any trinitarian relationship to be blasphemous. The monotheism of Judaism excludes the possibility of any trinity.
- Eternal triangle: On a personal level, experience of the "[eternal triangle](#)", which is such a challenge to the binary ideal of family life, remains beyond fruitful comprehension by those involved and affected. It is typically a source of great existential suffering and tragedy.
- Analytical methods offer explanatory capacity which has proven to be of limited value in reframing conflictual relationships in practice. These include:
  - [Dialectical method](#): Recognized in terms of "[thesis, antithesis, synthesis](#)" as originated by [Georg Hegel](#), this ideal has proven to be of limited relevance to psycho-social domains in which "synthesis" is desperately required in practice.
  - [Semiotic triangle of meaning](#) of [Charles Ogden](#),
  - [Oedipus complex](#) as articulated in the triangulation of [Jacques Lacan](#),
  - [Phenomenological epoché](#) of [Francisco Varela](#)

The challenge of elusive triadic comprehension can of course be depicted in that of [Borromean rings](#) with their [Brunnian property](#), as noted above, but with limited relevance to the psycho-social domain -- despite its occasional use in depicting the Trinity. The nature of the challenge can be rendered more explicit through a triangular pattern basic to the mathematical argument of [q-analysis](#), as developed by [Ron Atkin](#) (*Multidimensional Man; can man live in 3-dimensional space?*, 1981). As separately summarized ([Comprehension: Social organization determined by incommunicability of insights](#)), Atkin illustrates the challenge of comprehension in relation to experience "within" the geometry of a triangle -- especially with regard to the perspective necessary to comprehend the geometry of the triangle as a whole -- namely the trinity.

Vision-Light variant	Codification of relative orders	Sound-Silence variant
	<b>0-dimension:</b> Red, Green or Blue	



**Triadic thinking?** Various approaches to triadic thinking are cited (notably clustered as *Triadic Thinking* by Academia.edu):

- Paris Arnopoulos: *Triple Helix and Triadic Codex: braiding nature, culture and nurture* (Paper for Third Triple Helix International Conference, 2000)
- Norman D. Cook:
  - *Harmony, Perspective and Triadic Cognition* (Cambridge University Press, 2012).
  - *Triadic Insights in Astronomy, Art and Music* (2010)
- Anna Burhouse; *Now We are Two, Going on Three: triadic thinking and its link with development in the context of young child observations* (*International Journal of Infant Observation and Its Applications*, 4, 2001, 2).
- *What is Triadic Thinking?* as articulated by John G. Bennet (*The Triad*, 1956)
- Martin Brown: *The Triadic Trap*. (18 May 2014) as author of *Civilizing the Economy: a new economics of provision* (University of San Francisco, 2010)
- Sigmund Ongstad: *Bakhtin's Triadic Epistemology and Ideologies of Dialogism (Bakhtinian Perspectives on Language and Culture*, 2004, pp 65-88)
- Michael Giesecke: *Triadic Thinking and Post-Typographic Epistemology* (In: Torsten Meyer, et al: *Education Within a New Medium. Knowledge Formation and Digital Infrastructure*, 2008, pp. 290-297).
- Giuseppe Naimo: *Consciousness: a triadic process* (Murdoch University, 2002)

There is extensive interest in the dynamics of the "triple bond" in molecular chemistry. That understanding has also been used to frame aesthetic forms (Joseph G. Price (Ed.), *The Triple Bond: plays, mainly Shakespearean in performance*, Pennsylvania State University Press, 1975; Wouter Davidts, *Triple Bound: Essays on Art, Architecture and the Museum*, Valiz/Antennae, 2017).

**Triple helix:** As noted above, given the manner in which it is constituted by three interweaving Archimedean spirals, the triskelion could well be understood as a form of triple helix -- as projected into 2D. **Double helix DNA** 3D structures are the primary form among all life forms on this planet; **triple helix DNA** has been reported occasionally and for transient periods -- and is explored as a molecular structure. The geometry of the triple helix -- as a symbol -- is now closely associated with the triple helix approach.

**Use of the intermolecular triple helix as an intersectoral symbol**

As described by the Triple Helix Research Group of Stanford University, the Triple Helix thesis is that the potential for innovation and economic development in a knowledge society lies in a more prominent role for the university and in the hybridisation of elements from university, industry and government to generate new institutional and social formats for the production, transfer and application of knowledge. (*The Triple Helix Concept*; publications).

It is in this sense that the triadic thinking underlying the activities promoted by the [Triple Helix Association](#) merit particular attention, as instigated by Henry Etzkowitz (*Triple Helix: a new model of innovation*, 2005). This is suggested by a selection of its [international conference](#) themes and papers since 1996:

- [Addressing ecosystem challenges in an era of crises](#) (Heidelberg, 2016)
- [Academic-Industry-Government Triple Helix model for fast-developing countries](#) (Beijing, 2015)
- [Triple Helix as nucleus of innovation and economic growth](#) (Tomsk, 2014)
- [Triple Helix in a context of global change: continuing, mutating or unravelling?](#) (London, 2013)
- [Emerging Triple Helix models for developing countries: from conceptualization to implementation](#) (Bandung, 2012)
- [Triple Helix in the development of cities of knowledge, expanding communities and connecting regions](#) (Madrid, 2010)
- [Role of Triple Helix in the global agenda of innovation, competitiveness and sustainability](#) (Glasgow, 2009)

As an institutional member, the [World Association of Triple Helix and Future Strategy Studies](#) (WATEF) is a scholarly association that promotes evidence-based methodologies to analyse complex social interactions to understand social and technological change.

Despite the manner in which a form of triadic thinking is clearly emphasized, it would seem to be the case that there is little emphasis on the cognitive dimension in contrast with that on the implementation of forms of collaboration engendering innovation. The degree of reification implied by the triple helix model contrasts with the fundamental challenge suggested by the DNA-related metaphor. This is implied to a far greater degree by the triskelion as a symbol and the paradoxical cognitive dynamics with which it has been associated over millennia. However the possibility of projecting it into 3D -- as a form of triple helix -- indeed merits further consideration.

**Patterns as "cognitive aeriels"?** From the perspective of this argument, a fundamental question is why a range of simple patterns have proven historically to be such cognitively powerful triggers -- as "powerful symbols". Why have so many cultures engaged with triadic symbols in particular over such a long period -- with the triskelion dating back to Neolithic times?

Given a degree of recognition of the function of [aerial arrays](#), and the importance of their appropriate configuration, it could be suggested that such triadic patterns serve as a means of orienting awareness to greater subtlety. Do such patterns offer a means of "capturing" and recognizing "cognitive waves" otherwise only susceptible to intuitive recognition -- much as is appreciated in some Native American



cultures in the form and function of so-called [dream catchers](#). Might the triskelion be fruitfully understood in the light of a [tripole antenna](#)?

With respect to indication of 3D spirals, of interest is the depiction of the radiation pattern of an Archimedean spiral antenna (Isa Kocakarın and Korkut Yegin, (*Glass Superstrate Nanoantennas for Infrared Energy Harvesting Applications*, *International Journal of Antennas and Propagation*, 2013). Curiously the term "[cognitive antenna](#)" is used with respect to "[cognitive radio](#)" to describe the sequential switching of elements of an "[intelligent antenna](#)" array based on spectrum sensing.

**Intuitive recognition of quark structure and dynamics?** Given the very fundamental nature of a [quark](#) as an imagined ordering of matter, it could be inferred that humans have some degree of intuitive understanding of the pattern by which they are constituted. The quark is a feature of the [Standard Model of Elementary Particles](#).

In the language of particle physicists and quantum mechanics, a [proton](#) is composed of two [up quarks](#), one [down quark](#), and the [gluons](#) that mediate the forces "binding" them together. The [color assignment](#) of individual quarks is arbitrary, but all three colors must be present. It is this triadic pattern which can be understood as indicative of triadic relationships in general, and especially those imagined with respect to the psycho-social system.

The image on the left is indicative of the complexity of that triadic structure as described by *Wikipedia*. That on the right is suggestive of the manner in which the triadic pattern functions as an "aerial" embedded in electromagnetic waves -- with the triskelion then suggestive of an orderly combination of both insights.

Imagined depictions of quarks	
Quark structure	Absolute Quark-Gluon Plasma model
	
By <a href="#">Arpad Horvath</a> (Own work, <a href="#">CC BY-SA 2.5</a> , <a href="#">Link</a> ) Reproduced from <i>Wikipedia</i>	By <a href="#">Tepparat Songkraw</a> (screen shot of <a href="#">video</a> variously depicting models by <a href="#">www.absolutebase.com</a> )

A triadic pattern is a feature of discussion of quantum reality as indicated by the following:

- Ralph G. Beil: *A Triadic Theory of Elementary Particle Interactions and Quantum Computation* (2007)
- Ralph G. Beil and Kenneth L. Ketner: *A Triadic Theory of Elementary Particle Interactions and Quantum Computation* (Institute for Studies in Pragmaticism, 2006)
- A. Mikhailova and B. Pavlov: *Resonance Triadic Quantum Switch* (2001)
- Hidezumi Terazawa: *'Trinity' relations of hadrons, quarks, and subquarks* (*IAEA/INIS*, February 1996)

For example, the last discusses the mathematical design of a realistic three-position quantum switch controlled by the classical electric field in the form of a circular quantum well -- a unit disc on a plane -- with four straight channels attached to it. This device implements a triple splitting of an input waveguide. Such thinking is vital to current development of [quantum computing](#) with its transcendence of the constraints of conventional binary computation, notably the use of a [qutrit](#) as a unit of [quantum information](#) that exists as a superposition of three orthogonal quantum states.

Can the three points of focus of any triadic pattern -- like the triskelion -- be fruitfully understood otherwise as "mutually orthogonal"?

**From the triad to patterns of higher order?** The human brain is necessarily constrained in imagining such patterns of order and communicating them credibly (*Comprehension of Numbers Challenging Global Civilization*, 2014; *Engaging with Insight of a Higher Order: reconciling complexity and simplicity through memorable metaphor*, 2014).

The quarks of three distinctive "colours" are embedded within the 4x4 matrix of the standard model of particle physics. Given the extent to which recognition of such patterning is partially governed by human cognitive capacity, rather than restricting the focus to the Standard Model of Elementary Particles, a case can be made for the more general relevance of its subtly complex insights (*Beyond the Standard Model of Universal Awareness*, 2010; *Epistemological Panic in the face of Nonduality*, 2010).

Examples of a delightful future possibility of this kind are evident in speculations such as the following:

- Roy Crase: *Handywork of the Trinity: the structure, forces, and meaning of reality* (iUniverse, 2002)
- Ernest L. Simmons:
  - *Quantum perichoresis: quantum field theory and the Trinity* (*Theology and Science*, 4, 2006, 2)
  - *The Entangled Trinity: quantum physics and the Trinity* (Fortress Press, 2014)
- Michael Allwein: *Quarks and the Holy Trinity!* (*Sermons at St. James Gettysburg*, 31 May 2015)
- *Dante's Heavenly Vision and the Physics of the Proton* (*On-Screen Scientist*)

Aspects of the argument have been developed through the conflation of alternative fundamental mappings (*Metaphorical Insights from the Patterns of Academic Disciplines: learning from the Standard Model of Physics?* 2012). Potentially of particular relevance is the challenge of more significant mapping of the goals collectively framed by the international community (*Mapping 8 Millennium*

*Development Goals onto the 3x3x3 surfaces of Rubik's Cube*, 2017) and extending the argument to a 4x4x4 matrix of the subsequent Sustainable Development Goals (*Interplay of Sustainable Development Goals through Rubik Cube Variations: engaging otherwise with what people find meaningful*, 2017)

## On being "walking wave functions" in terms of quantum consciousness?

As noted above, the possible implications may be taken further in the light of the challenges to conventional understandings of identity emerging from considerations of quantum reality as articulated by Alexander Wendt (*Quantum Mind and Social Science: unifying physical and social ontology*, 2015; [video](#); [interview](#)). He argues that quantum consciousness theory is speculative, but compared to the alternative its simplicity is hard to beat (p. 292). He concludes with a bold claim: "whatever their current force as explanatory virtues, the coherence, breadth, and simplicity of the quantum hypothesis make it *too elegant not to be true*". (p. 293).

As one of the currently most eminent of scholars in international relations theory and its implications for security, he argues provocatively that conventional understanding of the existence of nation states is questionable, notably from the hypothetical perspective of extraterrestrials::

In contrast, social structures are mind-dependent, and so no as yet un-invented technology will enable ETs to see them. Indeed, even if ETs could scan our brains they would not see them, since social structures are not "in" our brains either, but in our minds. This is not to say that, through careful study of our behavior and perhaps extrapolation from their own experience, ETs could not infer the presence of states. But that would mean coming to see them as we do, by learning to read our minds. Short of that, the ETs would have to report back home that while Earth was teeming with life, perhaps even intelligent life, nowhere were there any states. (pp. 24-25)

Curiously the challenging nature of "existence" is even more strikingly made with respect to the "[international community](#)" to which so many appeals are made and which is considered a key to global governance (*International Community as God or Sorcerer's Apprentice? Strategic chaos in the absence of an interlocking temporal pattern of longer-term cyclic processes*, 2015).

**Quantum consciousness:** Fortunately or unfortunately, speculation with regard to "[quantum consciousness](#)" has become fashionable in many domains -- seemingly to little effect with respect to understanding of global crises. Wendt offers a quantum model of man in sections on [quantum cognition](#) and rational choice, agency and quantum will, and non-local experience in time. The points made are remarkably argued.

Of relevance to the discussion above with respect to "extrusion" of 3D forms from a 2D pattern is how a pattern fundamental to the sense of human identity might be understood otherwise. A triadic pattern such as the triskelion could be recognized as a 2D template or "cut out" -- consonant in the case of the Christian trinity with "the image of God", however it may function as a "cognitive aerial" (as argued above).

As with the nation state, to what extent does individual human identity exist over time as "extruded" through that pattern? How does it exist in 3D -- or as a form of higher dimensionality -- other than as creatively imagined, perhaps mistakenly? The question relates to Buddhist insights into the "[emptiness of form](#)".

Wendt argues that that:

The idea that people are just very complicated machines has a long pedigree, and became dominant in cognitive science and beyond with the advent of the computational theory of mind in the mid-twentieth century. In this picture we are walking computers, constantly crunching data from the environment to realize pre-programmed objectives. (p. 153)

He imagines a contrasting perspective, variously stressing that humans are effectively **walking wave functions**:

In this book I explore the possibility that this foundational assumption of social science is a mistake, by re-reading social science "through the quantum". More specifically, I argue that human beings and therefore social life exhibit quantum coherence -- in effect, that we are walking wave functions. (p. 16)

Wendt develops this argument from various perspectives in response to existing schools of thought:

Quantum consciousness theory suggests that human beings are literally walking wave functions. Most quantum decision theorists would not go that far, and indeed -- perhaps wary of controversy -- they generally barely mention quantum consciousness, and then only to emphasize that they are making no claims about what is going on deep inside the brain (much less about consciousness), but are only interested in behavior. (p. 164)

With respect to how humans exist over time, beyond any patterned slice in the moment, Wendt argues:

If we are walking wave functions, then even though our experiences at each moment are actualities, at the quantum level of the unconscious, "there are many histories that are there as potentialities". (p. 211)

The study by Wendt provides a valuable summary of the views of a variety of schools of thought, suggesting that:

While there are a priori reasons to doubt it, there is growing experimental evidence that human behavior in fact follows quantum principles. If that evidence continues to mount, it would confirm a key prediction of quantum consciousness theory, according to which our subjectivity is a macroscopic quantum mechanical phenomenon -- that we are walking wave functions. That would constitute a basis for solving the mind-body problem, and in so doing unifying physical and social ontology within a naturalistic, though no longer materialist, worldview. (p. 292)

Wendt concludes:

In arguing that human beings really are walking wave functions, therefore, my goal has been only to try to foresee what such a confrontation might look like. (p. 290)

You might not share my aesthetic sense and thus be reluctant to believe we really are walking wave functions. That's of course fine. But by arguing it could be true I hope I have given you reason to suspend your belief that we really are just classical machines, and thus to suspend your disbelief in quantum consciousness long enough to try assuming it in your work. If you do, perhaps you will find your own home in the universe too. (p. 302)

## Paradoxes of communicating fundamental insight through metaphor

**Metaphor:** In making the case above for being "walking wave functions" in the light of quantum consciousness, Alexander Wendt explicitly indicates his understanding of its reality:

I intend the argument not as an analogy or metaphor, but as a realist claim about what people really are. Scholars have long pointed to a number of strong analogies between human and quantum processes: between free will and wave function collapse, the holism of meaning and non-locality, observer effects in psychological experiments and quantum measurement, and even double-entry accounting and quantum information. These and other analogies are sufficiently suggestive that one might apply quantum thinking to social life simply on that basis. While one could read this book entirely in that way, as an interesting analogy, my personal belief is that human beings really are quantum systems. (p. 16)

Given the manner in which he explicitly and fruitfully questions the existence of nation states, and proposes a new understanding of human identity, it is appropriate to ask what degree of "existence" should be attributed to the quantum model he articulates. Paradoxically, for example, one reality of that articulation is that it exists as intellectual property -- in this case copyrighted by the author rather than by the publisher (as is so often the case).

Although Wendt has no need to address this particular paradox or the question of the existence of those who engender and appreciate models -- notably physicists -- he calls into question the reality of analogies and metaphors, whilst asserting his personal belief in his own perspective. To what extent can a physicist be understood to exist in the light of a quantum perspective? Provocatively it might be suggested that Wendt is as much as "writing wave function" as a walking one -- with the obligation of quantum physicists to recognize that they are "experimental wave functions".

Relevant to that question is the role of analogy and metaphor as explored by [Douglas Hofstadter](#) and [Emmanuel Sander](#) (*Surfaces and Essences: analogy as the fuel and fire of thinking*, 2013), as a further development of Hofstadter's earlier work (*Fluid Concepts and Creative Analogies: computer models of the fundamental mechanisms of thought*, 1995) and an extension of his seminal work on music and self-reference (*Gödel, Escher, Bach: an Eternal Golden Braid*, 1979). The importance of metaphor is specifically highlighted with respect to the creativity of Albert Einstein.

Whilst such creative thinking is much to be appreciated, in historical terms any such model may only herald a potential [paradigm shift](#) of great significance -- but one which history will recognize as susceptible to replacement by even more radical insights. There is a sense in which such models are temporary surrogates for intuited insights embodied in symbolic forms such as the triskelion, whose significance is somehow sustained over millennia in contrast to those of any model.

**Sustainability:** In contrast to the enduring use of such **centro-symmetric symbols**, it is intriguing to note global efforts to frame sustainability through a simple **asystemic checklist** of [Sustainable Development Goals](#). These can however be experimentally reordered as a 4x4 **matrix** of goals, evoking the integrity associated with so-called magic squares (*Refining the Value of Sustainable Development Goals: in quest of the systemic coherence of global attractors*, 2017; *Interplay of Sustainable Development Goals through Rubik Cube Variations: engaging otherwise with what people find meaningful*, 2017).

Use of a 4x4 matrix for sustainability, whether magical or not, bears a curious resemblance to the many representations of the Standard Model of Elementary Particles as basically a 4x4 matrix. It is therefore appropriate to note the exercise by [Thomas DeMichele](#) to reconfigure that pattern of quantum entities into centro-symmetric form, specifically for the benefit of "non-experts" (*The Standard Model (of Particle Physics) Explained, Fact/Myth*, 3 March 2016). Insights into ordering fundamental particles have however been explored through use of the [Freudenthal magic square](#) (M. S. El Naschie, *Freudenthal magic square and its dimensional implication for ... 137 and high energy physics, Chaos, Solitons and Fractals*, 36, 2008, 3, pp. 546-549). Such preoccupations are clearly far from the checklists through which efforts to order and communicate global strategy are made -- presumably because these are held to be inherently more readily comprehensible.

**Self-reference and self-reflection?** Observation plays a critical role in quantum phenomena. The quantum perspective endeavours to address the problematic implications of wave function collapse as a consequence of "observation" during the process of measurement. As noted by Wendt:

In most interpretations of quantum theory particles cannot be said to exist prior to measurement, and in preparing quantum systems for observation an entanglement is created with the observer that affects what is eventually seen. That does not mean that the observer literally creates reality, but it does mean that she participates in what is actually observed, and as such observation cannot even in principle approximate the classical ideal of [subject-object] separation (p. 36)

It would however appear that, as observers, physicists are inherently averse to exploring the implications of any form of "self-reference" in the quest for a Theory of Everything. This contrasts with concerns articulated from a cybernetic perspective in considering means of control of complex systems, and potentially those of significance to global governance (Maurice Yolles, *Knowledge Cybernetics: a new metaphor for social collectives*, *Journal of Organisational Transformation and Social Change*, 3, 2006, 1). From that perspective, feedback processes of first, second, third and possibly higher order are envisaged, engaging any observer to an ever higher degree, as discussed with respect to *Cybernetics of cybernetics: complex adaptive systems?* (*Consciously Self-reflexive Global Initiatives*, 2007).

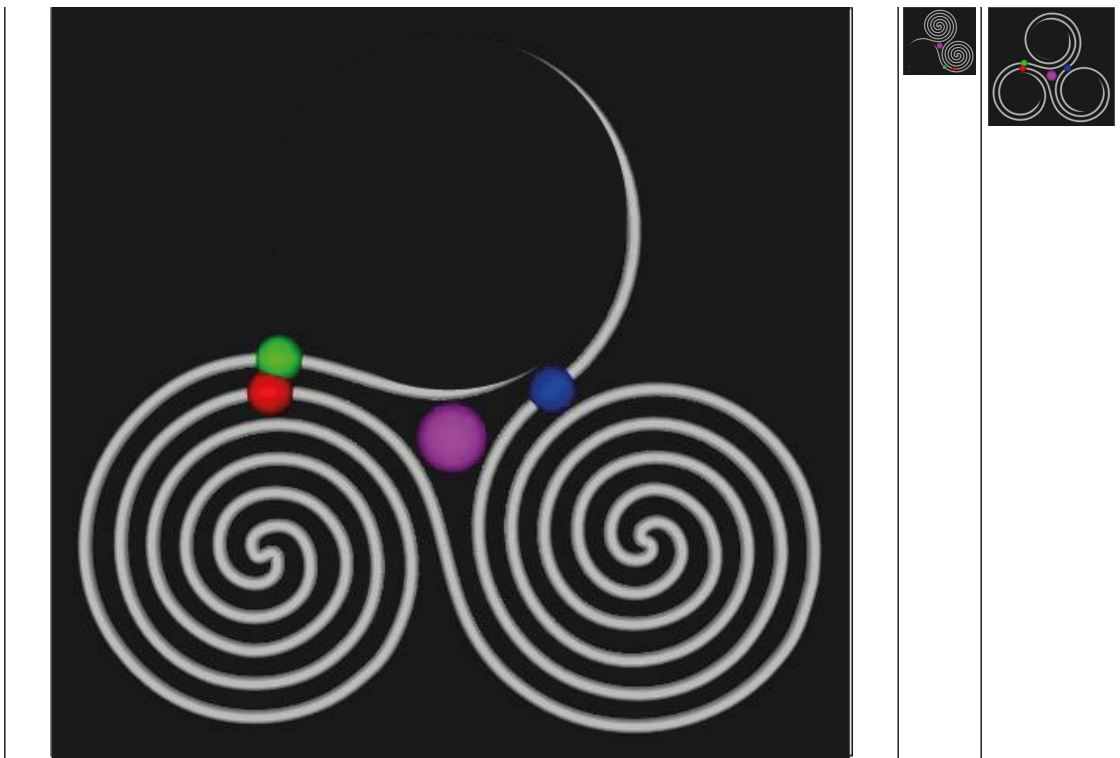
Such ever more intimate engagement is clearly a feature valued in the implications of fundamental symbols and the meditative reflection they evoke, and for which they are a focus. Whilst such higher order reflection may be implicit in some symbols, the structure of the triskelion potentially offers an indication of such nested levels through its three-fold form -- appropriately labyrinthine, given the challenge to comprehension. It is even tempting to recognize that the number of spiralling circles is of a similar order to the number of degrees of self-reference which can be variously envisaged. The three-colour requirement for a quark then suggests the need for the complementary "cognitive labyrinths" as distinguished by the three colours used in some of the images above.

**Dysfunctional avoidance of paradox:** Issues of self-reference lend themselves to exploration in terms of the challenge of self-signification as argued from a phenomenological perspective by Steven M. Rosen (*How Can We Signify Being? Semiotics and Self-signification*, *Cosmos and History: the journal of natural and social philosophy*, 10, 2014, 2). He sees this objective as having been tacitly subverted by the semiotic structure of conventional phenomenological writing. In summary:

First it is demonstrated that the three components of the sign -- sign-vehicle, object, and interpretant (C. S. Peirce) -- bear an external relationship to each other when treated conventionally. This is linked to the abstractness of alphabetic language, which objectifies nature and splits subject and object. It is the subject-object divide that phenomenology must surmount if it is to signify Being. To this end, we go beyond alphabetic convention and explore the use of iconic signs. Following the lead of Merleau-Ponty, the iconic expression of Being is seen as entailing paradox, and we are directed to the fields of visual geometry and topology, where we work with three paradoxical figures: the Necker cube, Moebius strip, and Klein bottle. While the Necker cube and Moebius prove to have their limitations in fully signifying Being, the Klein bottle, possessing an added dimension (made palpable via a stereogram), can embody Being more intimately, provided that it is approached in a radically non-classical way.

**Occlusion of portions of the triskelion:** Whether in 2D or 3D, the triskelion images offer the possibility of indicating different "pathologies" of the sustainability represented by the pattern as a whole. With respect to requisite self-reflexivity, the manner and degree of occlusion are then indicative of reduced cognitive functionality. Examples of this approach are presented below.

Cognitive constraints on self-reflexivity? Use of triskelion spirals as indications of pathologies of sustainability		



**Being a waveform?** If indeed it is possible to imagine oneself as a "walking wave function", as so extensively argued by Wendt, there is a case for exploring how this might be *experienced* in contrast to how he so usefully *describes* it -- especially given the limitations of description within that understanding.

Any 2D pattern serving as a template for identity in the moment could then also be explored in the light of understanding of a so-called "standing wave", rather than as a "walking wave". Both frames are consistent with the development by [Francisco Varela](#) of the Buddhist understanding of "laying down a path in walking" (*Laying Down a Path in Walking: essays on enactive cognition*, 1997).

Such a perspective acquires greater credibility with respect to personal identity, specifically in relation to aging and the continuing renewal of biological tissue. Identity is then a matter of convention to a much higher degree than one would prefer to think -- notably reinforced by legal definitions, as with the existence of Wendt's model as intellectual property. In such a context, even in the case of DNA, it remains a matter of debate as to what carries and holds the pattern of any sense of existence in a continuing manner.

Related insights are explored in the following:

- [Being Neither a-Waving Nor a-Parting: cognitive implications of wave-particle duality in the light of science and spirituality](#) (2013)
- [Being a Waveform of Potential as an Experiential Choice: emergent dynamic qualities of identity and integrity](#) (2013)
- [Encountering Otherness as a Waveform: in the light of a wave theory of being](#) (2013)

Especially intriguing are the implications for comprehension, with the possibility of the emergence of *homo undulans* in evolution beyond *homo sapiens* ([Emergence of Homo undulans -- through a "grokking" dynamic?](#), 2013; [Clues to Comprehension through Wave Language](#), 2013). *Homo undulans* features as the penultimate chapter of the very detailed study by Daniel Dervin (*Creativity and Culture: a psychoanalytic study of the creative process in the arts, sciences, and culture*, 1990).

Of relevance to global crisis, of further interest is how turbulence can be imaginatively embodied, as separately argued ([Quantum Wampum Essential to Navigating Ragnarok: thrival in crisis through embodying turbulent flow](#), 2014). In that sense, the triskelion merits exploration as a form of "wampum", echoing the significance associated with widespread use of circlets of beads ([Designing Cultural Rosaries and Meaning Malas to Sustain Associations within the Pattern that Connects](#), 2000).

At the time of writing, various references are made to the probability of **societal collapse**, most recently highlighted from a NATO perspective ([Nato chief: world is at its most dangerous point in a generation](#), *The Guardian*, 8 September 2017). Such a probability has been framed otherwise by [Jared Diamond](#) ([Collapse: How Societies Choose to Fail or Succeed](#), 2005). Of relevance is then how collapse might be more creatively understood, given the insights offered by [wave function collapse](#) ([Metaphors To Die By Correspondences between a collapsing civilization, culture or group, and a dying person](#), 2013).

Thanks are due to [Cadell Last](#) for enabling the concluding sections,  
but for which he should not be held responsible

## References

H. Atmanspacher. Quantum Approaches to Consciousness: critical survey. *Stanford University Encyclopedia of Philosophy*, 2006 [[text](#)]

Ron Atkin. *Multidimensional Man; can man live in 3-dimensional space?* Penguin, 1981

- Ralph G. Beil. *A Triadic Theory of Elementary Particle Interactions and Quantum Computation*. Press of Arisbe Associates, 2007
- Ralph G. Beil and Kenneth L. Ketner. *A Triadic Theory of Elementary Particle Interactions and Quantum Computation*. Institute for Studies in Pragmatism, 2006. 49 pp. [[review](#)]
- David M. Boje and Tonya L. Henderson. *Being Quantum: ontological storytelling in the Age of Antenarrative*. Cambridge Scholars Publishing, 2014
- Ernst Cassirer. *Philosophy of Symbolic Forms*. Yale University Press, 1923-1929 [[summary](#)]
- J. C. Cooper. Triquetra/Triskele/Fylfot. In: *An Illustrated Encyclopaedia of Traditional Symbols*. Thames and Hudson, 1987
- Jared Diamond. *Collapse: How Societies Choose to Fail or Succeed*. Viking Press, 2005 [[summary](#)]
- Daniel Dervin. *Creativity and Culture: a psychoanalytic study of the creative process in the arts, sciences, and culture*. Fairleigh Dickinson Univ Press, 1990
- Henry Etzkowitz. *Triple Helix: a new model of innovation*, SNS Press, 2005 (in Swedish)
- Eva Rydberg Fåhraeus. *A Triple Helix of Learning Processes: how to cultivate learning, communication and collaboration among distance-education learners*. Stockholm University, 2003 [[text](#)]
- Nick Herbert. *Quantum Reality: beyond the new physics*. Anchor Books/Doubleday, 1985
- Douglas Hofstadter:
- Gödel, Escher, Bach: an Eternal Golden Braid: a metaphorical fugue on minds and machines in the spirit of Lewis Carroll. Basic Books, 1979 [[summary](#)]
  - Fluid Concepts and Creative Analogies. Harvester Wheatsheaf, 1995
  - I Am a Strange Loop, 2007 [[summary](#)]
- Douglas Hofstadter and Emmanuel Sander:
- Surfaces and Essences: analogy as the fuel and fire of thinking. Basic Books, 2013
  - L'Analogie. Coeur de la pensée. Editions Odile Jacob, 2013
- George Lakoff and Mark Johnson:
- Philosophy in the Flesh: the embodied mind and its challenge to Western thought. Basic Books, 1999
  - Metaphors We Live By. University of Chicago Press, 1980.
- George Lakoff and Rafael E. Nunez. *Where Mathematics Comes From: how the embodied mind brings mathematics into being*. Basic Books, 2000
- Patrick Lewtas. What It Is Like to Be a Quark. *Journal of Consciousness Studies*, 20, 2013, pp. 9-10, 39-64.
- Glenys Livingstone. Celebrating the Triple Spiral: a PaGaian cosmology. *PaGaian Cosmology*, 2007 [[text](#)]
- A. Mikhailova and B. Pavlov. Resonance Triadic Quantum Switch. 2001 [[text](#)]
- Giuseppe Naimo. *Consciousness: a triadic process*. Murdoch University, 2002 [[abstract](#)]
- Paavo Pyllkkänen. Can quantum analogies help us to understand the process of thought? *Mind and Matter*, 12, 1, pp. 61-91 [[text](#)]
- Steven M. Rosen. How Can We Signify Being? Semiotics and Self-signification. *Cosmos and History: the journal of natural and social philosophy*, 10, 2014, 2 [[text](#)]
- Victor Stenger. The Myth of Quantum Consciousness. *The Humanist*, 53, 1992, 3, pp. 13-15 [[text](#)]
- Radek Trnka and Radmila Lorencova. *Quantum Anthropology: man, cultures, and groups in a quantum perspective*. Charles University Karolinum Press, 2006
- Francisco Varela:
- Laying Down a Path in Walking: essays on enactive cognition. Zone Books/MIT Press, 1997
  - Laying Down a Path in Walking: a biologist's look at a new biology. *Cybernetic*, 2, 1987, pp. 6-15. [[text](#)]
- Alexander Wendt:
- Quantum Mind and Social Science: unifying physical and social ontology. Cambridge, 2015
  - Flatland: Quantum Mind and the International Hologram. In: Mathias Albert, et al. (Eds), *New Systems Theories of World Politics*, Palgrave Macmillan, 2010
  - Social Theory of International Politics. Cambridge, 1999
- Stephen Wolinsky. *Quantum Consciousness: guide to experiencing quantum psychology*. Bramble Book, 1993
- Danah Zohar and Ian Marshall. *The Quantum Society*. Morrow, 1995

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