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SHAMANISM AND SYMMETRY

My interests as a medical anthropologist have bridged conventional allopathic/ scientific medicine and CAM (complementary & alternative medicine) in Siberia, Mongolia, Southeast Asia and northern North America. I have also looked at how mainstream western medicine and the healing traditions of Indigenous Peoples may be integrated for enhanced health and health promotion in both cultures. While most theorists and practitioners emphasize the differences, or at least view these as opposite ends of a continuum, shamanism reveals underlying principles that may be universal to all cultures and to all disciplines. My search for the equivalence in the social sciences, humanities and arts of the search in the sciences for a "theory of everything" led me from the sacred geometry[1] I encountered in shamanism to the pivotal concept in mathematics of symmetry.

In this paper, then, I review key approaches in the scientific and anthropological literature to the study of western and traditional healing modalities, the sacred and the secular, and science and art. Do explanations have to be either materialist or metaphysical, natural or cultural? Or can we identify more essential principles or concepts that underlie such relationships? Sciences such as new physics and mathematics have identified symmetry as a pivotal concept. Mario Livio, an astronomer with a degree in theoretical astrophysics whose work is cited throughout this paper, explains the symmetry and order of both the natural and human-made worlds. I apply his analysis to cultural praxis, particularly shamanism, to suggest that symmetry is also 'the essence' of the paradigms and archetypes that are the language of culture.

In The Art Instinct (our natural tendency to create and appreciate art), author Dutton views art as a genetic characteristic that conveys an adaptive advantage – a product of evolution in the strictly biological sense. Reviewer Martin Kemp (emeritus professor of the history of art at the University of Oxford) points out that we are only at the beginning of a programme to understand "how image-making capacity, including art in Dutton's sense, serves a range of functions, including pleasure in the aesthetic sense, and how these relate to those intellectual, intuitive, inventive, imaginative and mimetic capacities that we have indeed evolved." (Kemp 2009:45).

Mircea Eliade, whose work I will compare to this essentially materialist view of "art", refers to how all 'primitive' societies possess a consistent body of mythical traditions, a 'conception of the world' that novices (Eliade is describing initiations) acquire as sacred teachings:

> *For what he learns concerning the world and human life does not constitute knowledge in the modern sense of the term, objective and compartmentalized information, subject to indefinite correction and addition. The world is the work of Supernatural Beings – a divine work and hence sacred in its very structure* (Eliade 1958: x).

In such societies, art is another representation of the sacred. Eliade acknowledges "countless innovations" accepted by primitive societies, "But, in

[1] Sacred geometry refers to the study of archetypal patterns of which the material world is composed, and that are considered to be core patterns of creation.

contrast to modern society, primitive societies have accepted all innovations as so many 'revelations,' hence as having superhuman origin" (Eliade 1958:xi). Further, Eliade goes on to say,

> "*nothing better expresses the idea of creation, of making, building, constructing, than the cosmogony. The cosmogonic myth serves as the paradigm, the exemplary model, for every kind of making. Nothing better ensures the success of any creation (a village, a house, a child) than the fact of copying it after the greatest of all creations, the cosmogony" (Eliade 1958: xii).*

Can these contrasting views on science and art be reconciled or even considered via a common discourse? Kemp points out that, "At present, though, we are not even within touching distance of a 'biology of art.' Artists and scientists still have to define mutually relevant problems in aesthetics, the history of the arts, biology and the brain sciences." (Kemp 2009: 44). And while science continues to search for a 'theory of everything', it remains contentious as to whether such a theory (if it exists), would have applications in the everyday world.

This paper, then, considers whether there are common paradigms underlying sciences such as physics and mathematics, psychology, the social sciences, aesthetics and the arts. It also considers the sacred/secular and the culture/nature dichotomies (articulated above in Kemp as instinct versus culture; and materialist versus metaphysical) in terms of mutually relevant problems, areas where there is already overlap, and also opportunities for collaboration. There may be essential, archetypal relationships in all 'art' forms, regardless of the cultural context; science, particularly the language of mathematics, can provide a map for interpreting and understanding them. Shamanism is implicitly interdisciplinary, offering a field of study that may be found to articulate and perhaps embody aspects of all of these disciplines or at least inform the discussion of common paradigms. EMDR[2], energy psychology[3], and EFT[4], all relatively new therapies, recognize a similar elemental structure.

Symmetry and Science

"Mathematics has been the language of science for thousands of years, and it is remarkable successful" (Rees[5] 2009:37). Einstein, for one, saw the world essentially as a geometrical structure (Rees 2009:38). Other theorists, particularly in the field of consciousness studies, link up mathematics and geometry with culture in a metasystem within which diverse disciplines, including the data of parapsychology, may be integrated. Arthur M. Young's *Geometry of Meaning*, for example, is a search for the unity of myth, mathematics and morphology. It points towards the unification of symbolic meaning with mathematical manipulation, providing a comprehensive metaphor with which to describe processes of consciousness. Such a metasystem links humankind,

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[2] Eye Movement Desensitization and Reprocessing is a therapeutic intervention that uses rapid left-right eye movements to deal with trauma.

[3] As developed by Donna Eden

[4] Emotional Freedom Technique developed by Gary Craig

[5] Martin Rees is professor of cosmology and astrophysics at the University of Cambridge. His work is about the relationship between mathematics and science. My application of his and the 'scientific' work of others' to shamanism or 'culture' is on my own initiative and is speculative.

the individual, and the universe.[6] Leonardo da Vinci's understanding of geometry and art revealed certain 'roots' such as the golden section and the Fibonacci series – basic and universal languages that are found in every human culture and, of course, in Nature (see Lundy 1998).

What synergistic concept might draw from or inform such a broad, interdisciplinary and intercultural discussion? Johnson, describing the Jungian concept of 'self', writes that, the awakening of the symmetrical unity of the self is the great goal of our psychological evolution:

> *The* self *is the sum of all the divergent forces, energies, and qualities that live within you and make you who you are - a unique individual. The self is the balanced, harmonious, symmetrical unity at the very center of one's being, which each of us senses within"* (1983:18-19).

In a broader sense, symmetry has become a pivotal concept "in our ideas about the cosmos around us and in the fundamental theories attempting to explain it" (Livio 2005:2) and is a crucial aesthetic element. There is even a preference for symmetry in animal mate selection. Symmetric pattern also provokes intense emotional response.

In shamanism, I have found that symmetry is a (and perhaps the) key explanatory and modeling concept for seemingly diverse phenomena - shamanic ritual, the shaman's toolkit, songs and chants, the shamanistic relationship to the spirit world, layout of homes in indigenous communities, et cetera, if we consider their underlying structure and their substance. Below, I give illustrations of symmetry from my research in central Asia, Southeast Asia, the Canadian Arctic, and the Tibetan Bön tradition. But first a synopsis of symmetry from the scientific perspective.

The word "symmetry" comes from the Greek *sym* and *metria* meaning "the same measure" and originally had to do with proportion and its ensuing beauty. In the 18th century, it was introduced to mean, in the mathematical sense, "immunity to a possible change." "Group theory", a concept introduced by Évariste Galois (1811-1832), "is recognized today as the 'official' language of all symmetries" and thus of all disciplines (Livio 2005: ix), as well as "the mathematical language that describes the essence of symmetries and explores their properties" (ibid 2).

Livio goes on to describe the role of symmetry:

> *With every step toward the revolutions of relativity and quantum mechanics, the role of symmetry in the laws of nature has become increasingly appreciated. Physicists are no longer content with finding explanations for individual phenomena. Rather, they are now convinced more than ever that nature has an underlying design in which symmetry is the key ingredient... symmetry is one of the most important tools in deciphering nature's design* (Livio 2005: 43-45).

Livio points out how it "sits right at the intersection of science, art, and perceptual psychology. Symmetry represents the stubborn cores of forms, laws, and mathematical objects that remain unchanged under transformations" (ibid: 45). He then identifies these invariant cores in seemingly different disciplines from the financial world to abstract art. In the language of the social sciences, psychology and shamanism, these invariant cores are surely prototypes, paradigms, and archetypes.

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[6] From Jeffrey Mishlove: *The Roots of Consciousness*. New York: Marlowe and Company, 1993: 82-86.

Related to Eliade's conception of the cosmogony as paradigm is Carl Jung's interpretation of archetype. While the archetypal concept is associated with Carl Jung, it had been around for much longer, going back at least as far as the ancient philosophical texts of Plato and other. In Platonic terms, it refers to the unseen and fundamental or essential ideas from which objects and images manifest in the material world. Jung likewise viewed archetypes as archaic and primordial: "eternal ideas are primordial images stored up (in a supracelestial place) as eternal, transcendent forms" (Jung 1969:33). Thus an archetype is the fundamental and original principle of form and order out of which the psyche and also, for the purposes of this paper, culture emerge[7]. Jung, further, considered the archetype to have a numinous or spiritual character[8].

Symmetry and Symmetries

Livio suggests that we can identify the quantity of different types of symmetry (e.g. "there exist only 230 different types of spatial symmetry groups (just as there are only 7 different symmetry groups of linear strip patterns)" (2005:246). Here, I detail some symmetries I have identified in shamanism.

In many dictionary definitions, symmetry is taken to mean the familiar bilateral symmetry (also called mirror-reflection symmetry), that is up/down, front/back, characteristic of the human body, animals and many artifacts. These Siberian 'male' and 'female' standing stones, for example, represent the gender relationship as bilaterally symmetrical and as the portal between the spirit world and this world (**Illustration).**

Plants and some animals such as jellyfish, on the other hand, possess symmetry similar to that of a cone; that is, producing symmetrical mirror reflections through their central, vertical axis. In shamanism, 4 is a sacred number (although it may represent different phenomena in different cultural contexts), and it is an example of bilateral symmetry. (**Illustration).** In Himalayan shamanism, for example, "it symbolizes the spatial coordinate cross of the four directions of the heavens" (Müller-Ebeling 2002: vii).

Mathematics has identified many more types of symmetry such as rotation, reflection, translation and glide reflection, as well as other transformations not geometrical in nature such as permutations.

Rotational symmetry is characteristic of snowflakes – they can be rotated by certain angles around an axis perpendicular to their plane (passing through center) and they remain the same (Livio 2005:10). While snowflakes have 6-fold rotational symmetry, starfish have 5-fold. Many flowers (for example, the English daisy, chrysanthemum) possess an approximate rotational symmetry in that they look just about the same when rotated by any angle – this symmetry contributes to their universal aesthetic appeal (Livio 2005: 2005 10). An example of rotational symmetry is the flower designs of Hilltribe costumes from Southeast Asia (**Illustration)**.

The circle is one of the simplest rotationally symmetric figures:

> "*If you rotate it around its center through, say, 37 degrees, it remains unchanged. In fact you can rotate it through any angle around a*

[7] Jung (cited in M. Stein: *Jung's Map of the Soul: An introduction*. Chicago: Open Court Publishing Company 1998:127) confirmed that "Archetypes are not derived from culture; rather cultural forms are derived from archetypes."

[8] And thus (referring back to Dutton whose work on art as instinct introduced this paper) an archetype in this view is not an "instinct" which is related to patterns of behaviour and physiological drives.

perpendicular axis through its center and you will not notice any difference. The circle therefore has an infinite number of rotational symmetries. These are not the only symmetries the circle possesses. Reflections in all the axes that cut along a diameter (figure 8b) also leave the circle unchanged." (Livio 2005:14).

In shamanism, the circle is a very common design element. On the deerstones of Central Asia, it has been interpreted as an earring or the sun[9] (**Illustration**). As a drum, it is said to represent the world or cosmos. About Himalayan shamanism, "The bands and the ties, which are wound around the wrist eight times, are also supposed to protect the people from evil influences with a 'magical circle'" (Müller-Ebeling 2002:52). Amongst the Hilltribes of Southeast Asia, a red string is put on children's wrists to protect them from bad spirits. Amongst the Tsataan reindeer-herders, the spirit reindeer is marked by a red string encircling its neck which also conveys protection to the herd and the herders.

Livio points out that the same system "can, therefore, have multiple symmetries, or be symmetric under a variety of symmetry transformations" (2005:15) as with the sphere or the equilateral triangle. Extending this idea to culture, a 'symbol' may have many interpretations or many derivatives (since the circle is both elemental and ubiquitous in the natural world).

Sphere: About the sphere as a symmetrical form, Livio writes, "Rotating a perfect sphere about its center, using an axis running in any direction, leaves it looking precisely the same" (Livio 2005:14). The sun or moon, when represented in 2-dimensional form as on a deerstone, becomes flattened into a circle (**Illustration**).

Equilateral triangle: "There are six symmetry transformations – three rotations and three reflections – associated with the equilateral triangle" (Livio 2005: 15). These forms, or derivatives of them, are often represented or interpreted as mountains, as in this Hilltribe pattern from northern Thailand (**Illustration**).

Symmetry of repeating patterns: "One of the most familiar of all symmetric patterns is that of a repeating, recurring motif. From friezes...to carpets and even birdsong, the symmetry of repeating patterns has always produced a very comforting familiarity and a reassuring effect" (Livio 2005:15; **Illustration** from Livio figure 3 on page 3).

The symmetry transformation in this case is called *translation*, meaning a displacement or shift by a certain distance along a certain line. The pattern is called symmetric if it can be displaced in various directions without looking any different. In other words, regular designs in which the same theme repeats itself at fixed intervals possess translational symmetry. Ornaments that are symmetric under translation can be traced all the way back to 17,000 BC (the Paleolithic era). A mammoth-ivory bracelet found in the Ukraine, for example, is marked with a repeating zigzag pattern. Other translation-symmetric designs are found in a variety of art forms e.g. the patterns of M.C. Escher and William Morris. In Nature, translation-symmetric creatures such as the centipedes have identical body segments which may repeat as many as 170 times (Livio 2005:16). The ascending deer on the Central Asian deerstones is an example of this type of symmetry (**Illustration)**.

Symmetry in music:

[9] William Fitzhugh, Smithsonian, pers. comm. 2007 and 2006.

In response to his own question about, "whether symmetry with respect to translation, and indeed reflection and rotation too, is limited to the visual arts, or may be exhibited by other artistic forms, such as pieces of music", Livio gives several examples in western music, pointing out that symmetry defined as other than purely geometric and referring to the sounds rather than to the layout of the written musical score, confirms translation-symmetric music:

> *"As Russian crystal physicist G.V. Wulff wrote in 1908: 'The spirit of music is rhythm. It consists of the regular, periodic repetition of parts of the musical composition... the regular repetition of identical parts in the whole constitutes the essence of symmetry... Even more generally, compositions are often based on a fundamental motif introduced at the beginning and then undergoing various metamorphoses" (Livio 2005:18).*

About Mozart's compositions, "British musicologist and composer Donald Tovey identified their 'beautiful and symmetrical proportions' as one of the key reasons for their popularity." (Livio 2005:19). Isn't it interesting that Mozart was called a shaman by his contemporaries (Flaherty 1992)?

A shaman's song from northern Canada illustrates Wulff's periodic repetition and fundamental motif that is metamorphosized. In a previous paper (Walker 2003), I analyzed the song and movement that accompanied it in terms of their 'balancing' properties; there are several examples of symmetry in the quote from the circle to the left-right swaying. Diamond Jenness is writing of an early experience with shamanic incantations amongst the Copper Eskimos:

"*From generation to generation, from* inyuit sivulingni, *'Men of the first times,' as the natives say, various incantations,* akeutit, *have been handed down to appease or drive away the malignant spirits. The incantation is usually sung by all the people, with one of their shamans standing in the centre of the ring; and as they sing their bodies sway from side to side, though their feet remain stationary. At the conclusion of the refrain the shaman invokes his familiars, and with their aid produces the desired result. Children are generally excluded from these performances. Many of the incantations are very old and have lost whatever meaning they had originally; but this does not lessen their potency. I heard one sung during a snow-storm in the late summer of 1915. Tusayok and Kesullik had no tent, so they improvised a rude shelter by stretching some skins between two crags; but since in spite of this they were very cold and uncomfortable, Tusayok chanted an incantation and repeated it over and over again for about an hour. There were only about half a dozen words in it, and each taken by itself was intelligible enough, but no one had any clear idea of what the whole song meant. Tusayok thought, however, that the mere singing of this incantation, even though he was not himself a shaman, might have the effect of driving away the evil shades or spirits who were causing the storm and produce fine weather again. Literally translated the song ran: -*

I come again, I, again.
I come again, I, again. Do you not know?
*I come again, I, again.**
*(*Footnote: A spirit is supposed to be speaking all through.)*
(Jenness 1923:187).

The *amar huur* (in Mongolian) or jew's harp is commonly used throughout Central Asia and Southeast Asia. It requires a regular breathing pattern (breathing is itself symmetrical); my initial analysis suggests a symmetrical structure to the music made with it by a musician or a shaman. I also suggest that the healing properties of the music derive from Wulff's criteria above. Here, the shaman Haltsan[10], describes the healing properties of the *amar huur*:

> *The shaman Haltsan told Oyumaa he was out of consciousness for a whole week – running around naked with no idea what he was doing. A cook took him to see a psychologist which didn't help. Haltsan said when he played his jew's harp, he was able to get his consciousness back.*
>
> (Walker Field Notes, Mongolia 2007).

That is, he became whole again in the sense of Johnson's symmetrical unity described above.

Glide-reflection symmetry is described by Livio as combination of translation and reflection symmetry (**Illustration** after Livio figure 14, page 21):

> *"Translation and reflection can be combined into one symmetry operation known as glide reflection. The footprints generated by an alternating left-right-left-right walk exhibit glide-reflection symmetry (figure 14). The operation consists simply of a translation (the glide), followed by a reflection in a line parallel to the direction of the displacement (the dashed line in the figure). Equivalently, you could look at glide reflection as a mirror reflection followed by a translation parallel to the mirror. Glide-reflection symmetry is common in classical friezes... Whereas patterns that are translation symmetric tend to convey an impression of motion in one direction, glide-reflection-symmetric designs create a snakelike visual sensation. Real snakes achieve these patterns by alternately contracting and relaxing muscle groups on both sides of their body – when they contract a group on the right, the corresponding group on the left is relaxed, and vice versa" (Livio 2005:21).*

As the quote points out, the snake can form a circle and it has bilateral movement. On Mongolian shamans' dresses, the snake is represented in the "ropes" that hang from each shoulder. They are classic motifs on the dress, even where there are apparently no snakes in the region. Livio also points out the fascinating interrelationship between symmetry and orientation: "Symmetrical figures do not change when rotated, reflected, or translated in certain ways" (Livio 2005:38). The snake, as an elemental form and recurring symbol of immortality in many cultural contexts, is an example of this persistent orientation of symmetrical forms. Jeremy Narby, interestingly, discusses the snake motif in terms of the double helix DNA. (**Illustration:** tribal painting from India**).**

3-dimensional symmetry

All the above examples are the rigid transformations that result in symmetries in two dimensions ('rigid' simply means that after the transformation, every two points end up the same distance apart as they were to begin with – we cannot shrink figures, inflate them, or deform them). In three-dimensional space, in addition to the symmetries of

[10] Haltsan is a Dukha or Tsataan Reindeer-herder from northern Mongolia.

translation, rotation, reflection, and glide reflection, occurs yet another symmetry known as screw symmetry. This is the type of symmetry of a corkscrew, where rotation about some axis is combined with translation along that axis. Some stems of plants, where the leaves appear at regular intervals after completing the same fraction of a full circle around the stem, possess this symmetry" (Livio 2005:22). An example from Mongolia of screw symmetry is a tree growing in a corkscrew shape. The explanation for its growth pattern is a metaphysical one – it is said to be growing on the intersection of energy lines. Buddhist monks smear it with butter in recognition of its sacred nature (**Illustration**).

Permutations and perception

There are many other symmetries but these are some of the most obvious ones for the purposes of this paper. Permutation symmetry, however, deserves mention as a type of transformation that is not geometrical in nature, but involves different arrangements of objects, numbers, or concepts. A system can be symmetric (i.e. not change) under permutations, and symmetry under permutation appears in diverse circumstances, including abstract circumstances and mathematical formulae. Permutation symmetry is seen in the colours of a chessboard or the designs of M.C. Escher: "the image does not remain truly the same when black and white are transposed... However, the general impression remains the same (Livio 2005: 28). Escher incorporated translation-symmetric and colour-symmetric patterns. Perhaps the birch bark hat from Siberia, and other Siberian cutout designs, refer to this type of symmetry. The cut out, mandala-like patterns made for me by the Siberian shamanist and medium, Ludmilla, several years ago were described as a "healing" aid, "like meditation" (**Illustrations**).

Permutation symmetry draws Livio's attention to "the 'primitive' process of perception, and the rules that underlie symmetry" (Livio 2005: 28). Pointing out that, "since all the information we obtain about the world comes through our senses, the question of symmetry as a potential factor in perception becomes of immediate relevance" (ibid:28), with vision in human perception being the most importance means of perception:

> "*Generally, recent psychological theories and experimental results confirm the important role of symmetry in perception. Many experiments show that bilateral symmetry about a vertical axis is the easiest to recognize (i.e. recognized fastest)... Basically, symmetry is a property that catches the eye in the earliest stages of the vision process" (Livio 2005:37).*

Bilateral symmetry, of primary importance in perception (Livio 2005:39), is an obvious feature of a shaman's dress. The left and right sides of the dress, like the left and right sides of the human body, are bilaterally symmetrical in all the examples I've seen; thus, when we view a shaman in full dress, we quickly perceive its integrity and harmony (**Illustration)**. The dress, amongst other shamanic elements, is immediately perceived by the onlooker in terms of its desired outcome because of human perceptive faculties. The dress also clothes the shaman in the 'healing' or 'balancing' elements that he or she is working towards creating or enhancing through shamanic ritual. As the Tamang shaman, Maile Lama demonstrates, "The cure consists primarily in the reestablishment of the psychic harmony of the community" (Müller-Ebeling et al 2002:53).

Repetitive patterns that are very closely spaced and consisting of high-contrast motifs can induce a powerful illusion of motion. Livio gives the example of an op-artist pattern of black wavy lines against a white background (or vice versa), all evenly spaced.

The shaman's eye curtain and the fringe along the hem of a shaman's dress in motion contribute to the sensation of the shaman, in an altered state of consciousness, in motion or travelling between the worlds (**Illustration)**.

Shamanism and Symmetry

Symmetry as an underlying concept of shamanist cosmology and praxis explains accepted characteristics of shamanism: that it is "nature-based"; that its artifacts are power-full; that it is an assemblage of consistent components; that it is both pragmatic and intuitive; both secular and sacred, serving the secular functions Dutton mentions at the beginning of this paper, but also metaphysical purposes such as transcendence, transhumanism and cosmogenesis, as per Eliade and Jung. Symmetry may also support some not so well accepted ideas – for example, that shamanism is both science and art.

Symmetrical relationships, ubiquitous in shamanic cultures world-wide, represent esoteric relationships in two-dimensional form. In writing about Irish megaliths, for example, Zucchelli interprets the spiral, circle, cup marks, and zigzag lines, triangle and serpentine lines as cultural icons:

> *The most common motifs are spirals, which are generally taken as symbols of the constant flow of energy and the cycle of life, and accordingly for representation of the earth goddess; concentric circles and cup-marks, widely believed to symbolize the sun, or else the navel from which all life comes; zigzag lines standing for water; triangles and serpentine lines, again represent the earth mother* (2007:17).

Archaeologists are reinterpreting ancient sites in terms of their symmetry. Canadian scientist Gordon Freeman found similarities between the surface geometry of three ancient sites, all at approximately the same latitude – Stonehenge in Britain; Preseli Mountain in southwestern Wales; and, a 5,000 year old Sun Temple and calendar in Alberta, Canada (the latter used until @300 years ago) – all of which show evidence of astronomical sophistication and geometry to interpret the sun, moon, and the seasons. I interpret Freeman's data as showing a 'balance' or symmetry between the Sun and the Moon, manifested during Equinox[11], and between light and dark, and night and day, for example:

> *The Full Moon is directly across the sky from the Sun, so the Full Moon rises opposite where the Sun sets, and sets opposite where the Sun rises. Therefore, the Full Moon near the Summer Solstice rises near where the Winter Solstice Sun rises, and sets near where the Winter Solstice Sun sets, when viewed from the same place. Near the Winter Solstice, the Full Moon rises and sets near where the Summer Solstice Sun rises and sets* (Freeman 2009:70).

About eclipses, he writes:

> *The Moon's orbit around the Earth oscillates back and forth across the Earth's orbit around the Sun. Occasionally, the Sun, Earth, and Moon happen to be exactly in line, which causes either the Sun or Full to be eclipsed! The Sun gets*

[11] Freeman finds the western range of dates for the spring and autumn Equinox to be incorrect; his data show a more accurate Neolithic calendar.

eclipsed when the Moon is exactly between the Sun and Earth, and the Full Moon gets eclipsed when the Earth is exactly between the Sun and Moon (Freeman 2009:71).

Shamanism models itself on Nature, on natural relationships such as the balance of opposites (sun/moon, night/day, dark/light, male/female, sky/earth). These dichotomies are expressed culturally, then, as this world/ spirit world, Father Sky/Mother Earth, and even in the layout of the Mongolian ger or Native American tipi which orients its doorway to the south (**Illustration**).

Shamanism employs various techniques to exert influence on the world of polarities – to keep them in balance or reunite them if their 'natural' holism and thus symmetry has been severed. An example of the former may be maintaining balance between this world and the spirit world through offerings made to spirits; of the latter, the gender neutral role of the shaman in trance. Animals and birds are killed through cultural action and made into artifacts of the shaman's toolkit; attributes of animals assist human endeavors. Shamans themselves are human/nature merged. While the shaman is neither animal nor divine, s/he embodies the duality of the animal world and the spirit world, of both "this-worldliness" and "other-worldliness".

Shamanism manipulates (in the sense of 'managing skillfully') the energy/ life force/ sentience that is said to exist within all living things. This life force, I suggest, encodes symmetry, as some healing modalities recognize. Kundalini energy, for example, rises in a spiral from the root chakras up through the crown chakra along the central spine. The Tamang shaman Maile Lama explained it this way to the authors of *Shamanism and Tantra in the Himalayas*:

> *Energy (*shakti*) arises in the sexual chakra*[12]*. From there it ascends into the heart chakra, where it is transformed into love. It is the shamanic healing power. If the energy climbs higher, into the forehead chakra, the love-energy is transformed into awareness. One is only complete as a human being when all the chakras are connected to one another by the flowing energy* (Müller-Ebeling et al 2002: 3).

This, and other Himalayan examples I have quoted in this paper, are of interest because it shows the overlaying of shamanism by Buddhism which retains the underlying principle of symmetry to explain health and dis-ease. It also illustrates key ideas about energy which is a central concept in Energy Psychology, a relatively new field of western therapeutic intervention. I mention it briefly here because it has had tremendous success in dealing with many kinds of 'disorders,' or interpreted in shamanic terms, 'imbalances' such as post-traumatic stress disorder, depression, anger, obesity, addictions, et cetera. It is used to release subconscious causal factors manifesting as back pain or other physical ailments, or to determine the choice and dosage of medications.[13] Like EMDR[14], Energy

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[12] In Central Asian shamanism, the root chakra must equate to the sacred fire, the fire of cosmogony and origins, that Chulu, a Tsaatan elder, spoke about as central to shamanic cosmology, and also to the layout of the home in which the fire or stove maintains a central location. The fireplace must thus be treated with respect; for example, garbage must not be thrown into the fire.

[13] Energy Psychology techniques exploit the latest mind-body research to quickly access and reprogram limiting subconscious beliefs as per Bruce Lipton's *Biology of Belief*. Lipton defines how *belief*s control

Psychology has been shown to have immediate and long-lasting success. Scientific studies are underway, some of which include ethnic groups or Native Americans; its application has not been well considered in Indigenous cultures, however. I introduce it here, to this conference, because I think there is room for creative dialogue between shamanism and Energy Psychology. I am most familiar with the work of Gary Craig who developed EFT (Emotional Freedom Technique)[15], and of Donna Eden.

Energy Psychology

Energy Psychology[16] uses the same language as shamanism in describing good health as "in balance". It also uses the language of science; for example, "homeostasis," a central concept to biology:

> *"All systems move toward an energetic balance, a state of internal stability and harmony with other energies. At the same time, every expenditure of effort and every interaction with the environment upsets this balance... When one of your body's energy systems is chronically out of balance, or when several systems are not in harmony with one another, your body does not work as well*." (Eden 1998:22)

Pressures or modern life –environmental and social – make it difficult to maintain these energetic balances. Such a model of health, then, shifts the focus from *culture* (as maladaptive, breaking down, in crisis, or in transition) to *context*. And it suggests that self-regulation is implicit in all life forms – animals included.

Muscle testing as a diagnostic tool has become well-established in kinesiology, but restated as 'energy testing' or 'energy kinesiology,' it focuses instead on using the muscles to gauge energy. The objective of a test is thus not to determine the *strength* of a muscle; instead it considers how the body's energies are flowing through it, in order to assess,

> *"the state of your own or another's energies, identify imbalances, and tailor the procedures ... to suit your own unique needs or those of someone you care about... It allows you to determine whether an energy pathway is flowing or blocked, whether an organ is getting the energy it needs to function properly, or whether an outside energy (such as the energy of a particular food or a suspected toxin) is harmful to your system"* (Eden 1998:45).

Very simply, it uses "tapping" on selected points of the body, using the fingertips of the left and right hands (together or alternately) of the practitioner or the patient. An example follows. I have chosen this one, called the "ZipUp" from Donna Eden, because it illustrates some of the symmetries discussed above.

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behavior and gene activity (thus removing us from the dilemma of trying to use positive thinking and willpower to "power through" negative behavior).

[14] Eye Movement Desensitization and Reprocessing is a therapeutic intervention that uses rapid left-right eye movements to deal with trauma.

[15] EFT refers to Gary Craig's Emotional Freedom Technique - instructions are available on-line; Craig makes his techniques available free of charge.

[16] As applied by The International Society for the Study of Subtle Energies and Energy Medicine (ISSSEEM), an interdisciplinary organization for the study of the basic sciences and medical and therapeutic applications of subtle energies.

1. Briskly tap the two collarbone points simultaneously with each hand to assure that your meridians are moving in a forward direction.

2. Place both hands at the bottom end of the central meridian, which is at your pubic bone.

3. Take a deep in-breath as you simultaneously move your hands, slowly and deliberately, straight up the center of your body, to your lower lip.

4. Continue upward, bringing your hands past your lips and exuberantly raising them to the sky. Circle your arms back to your pelvis. Repeat three times.

Eden moves the energy up the central axis of the body, working with the bilateral symmetry of the body. She uses the circle as the completing movement.

Back to the beginning

In discussing the western musician, J.S.Bach, Livio points out the reflection and translation symmetry in Bach's music on many levels, particularly in his canons, pointing out that "canons in general were considered at the time to be some sort of symmetry puzzles. The composer provided the theme, but it was the musicians' task to figure out what type of symmetry operation he had in mind for the theme to be performed... this is not very different conceptually from the puzzle posed to us by the universe – it lies in all its glory open to inspection – for us to find the underlying patterns and symmetries" (Livio 2005:21).

Surely this is what shamans do - some more expertly than others. Some shamans perform with a rational understanding of their praxis; for others, the sensitivities are more intuitive. Some innovate in expressing these patterns, perhaps receiving visions or instructions from the spirit world; others follow culturally specified patterns. These approaches provide insights into why many if not most cultures and shamans are adamant that cultural patterns must be followed "exactly" and without deviation – *because the cosmogonic structure is preserved.* (The word "symmetry", as I pointed out at the beginning of the paper, implies "immunity to a possible change.")

Shamanism, because it is Nature-centric, has a more direct and experiential relationship with these patterns and symmetries than religions or sciences that are mediated by technology or texts. Even perception (which is facilitated by bilateral symmetry as described above) is less mediated. In such contexts, these 'origin'al, primordial and universal relationships remain recognizable and accessible. The last words I will leave for Mircea Eliade (1958: x). They are relevant, as are Livio's, to the sciences and the arts, to culture and nature, to the physical and metaphysical realms. Eliade discusses how we live in a universe "that is not only supernatural in origin, but is no less sacred in its form, sometimes even in its substance."

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