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The Gravity of Weight

Symmetry's Infinite Discords

Asymmetry reflects transience and precariousness in life.

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KEY POINTS

- While symmetry is one of the most important principles throughout the natural world, nature itself abounds in complex asymmetric patterns.
- Deviations from symmetry may indicate evidence of disease, genetic mutations, or exposure to toxins.
- The ancient Japanese technique of kintsugi reveals beauty in asymmetry.



Sword Guard (Tsuba), used to protect the user's hands, 18th century Japanese. We are fascinated by symmetrical objects although artists often create minor asymmetries in their work.

Source: Metropolitan Museum of Art, NYC. Public Domain. Credit: Rogers Fund, 1925.

There is an elaborately carved ancient gate, often considered the most beautiful in Japan, that is completely symmetrical except for a tiny design flaw. The story goes that the artist fashioned one carving upside down purposely so that the gods would not be jealous and angry of human perfection, explains Nobel Laureate Richard Feynman (1963).

Humans are innately fascinated by symmetry (Stewart, 2013). But where, asks Feynman, does symmetry come from? Nature, such as seen in water droplets or crystals or even our own bilateral body symmetry, is “so nearly symmetrical though no one knows

why.” Feynman says. Perhaps, he says, “God made the laws only nearly symmetrical so that we should not be jealous of His perfection.”

The word “symmetry” derives from ancient Greek: “agreement in dimensions,” or “having a common measure”(*Online Etymology Dictionary*). Symmetry is a harmony of proportions, reflecting balance and equilibrium (Weyl, 1952).

A precise definition of symmetry, though, is “elusive” (Stewart). In the natural sciences (e.g., physics, chemistry, and biology) and in mathematics, symmetry refers to a transformation or operation that leaves the structure essentially unchanged (Feynman; Stewart; Heisenberg, 1970). “By symmetry we mean the existence of different viewpoints from which a system appears the same” (Anderson, 1972), as for example, a triangle rotating in space (Engler, 1990). “It is only slightly overstating the case to say that physics is the study of symmetry” (Anderson). The first demonstration of that idea originated with Newton when he pondered whether matter on the ground obeyed the same laws as that up in the sky (Anderson).

Symmetry is one of the “aesthetic concepts” used by scientists, along with simplicity, order, coherence, unity, elegance, and harmony, as indispensable prerequisites for the creation of scientific theories (Engler). Throughout the physical world, there are also examples of objects with multiple symmetries (Stewart) and matter with broken symmetries, such as liquid crystals. "At a certain point, we should stop talking about decreasing symmetry and start calling it increasing complication" (Anderson).



Great Indian Fruit Bat, with one wing outstretched, giving a sense of asymmetry, 1777-82. Calcutta, India. Painting is attributed to Indian artist Bhawani Das or a follower.

Source: Metropolitan Museum of Art, NYC. Public Domain. Credit: Purchase, Anonymous Gift.

We tend to equate symmetry in biology with health. Symmetry is one of the criteria we use to determine beauty, particularly in human faces (Rhodes, 2006; Foo et al, 2017).

Deviations from symmetry can reflect a "departure from homeostasis;" they can indicate diseases, such as parasitic infection, as well as chromosomal mutations, genetic disorders, or exposure to toxins, and reflect poor overall fitness (Thornhill and Møller, 1997). These asymmetries may be the basis for rejecting a potential mate (Grammer et al, 2003; Zaidel and Hessamian, 2010; Leder et al, 2019). Subtle asymmetries, though, exist in most people (Thornhill and Møller).

While scientific disciplines regard symmetry "as one of the most important principles in nature," (Leder et al), nature itself and the natural landscape abound in asymmetric patterns (Zaidel and Hessamian). For example, bilateral traits can sometimes demonstrate what is called "anti-symmetry," as seen in the unequal claws of male fiddler crabs (Thornhill and Møller).



Untitled (Cracked Watermelon) by American artist Charles Ethan Porter, c. 1890. Porter died in 1923. There is often beauty in the asymmetric.

Source: Wikimedia Commons/Public Domain. Metropolitan Museum of Art, NYC. Credit: Purchase, Nancy Dunn Revocable Trust Gift, 2015.

Both symmetry and asymmetry contribute to our aesthetic appreciation within nature (Gartus and Leder, 2013) but the complexity or simplicity of a stimulus, its novelty or familiarity, and its sense of proportion are also factors (Jacobsen, 2006). Even our emotional state, level of education, degree of interest, and cultural or economic circumstances, are relevant, as well as the situation itself: Viewing an object in a supermarket is a different experience from seeing it in a museum (Jacobsen).

References to the aesthetic impact of symmetry occur in literature. William Blake called symmetry "fearful" in his 1794 poem, *The Tyger*. Virginia Woolf, in her early autobiographical musings, while viewing art during her travels through Italy, questioned the concept of producing beauty through symmetry. She wrote of "achieving symmetry by means of infinite discords"... "a whole made of shivering fragments" (Woolf,

1908). Small breaks in symmetry can be beautiful and create complexity within art (Gartus and Leder).

Nowhere is this notion of beauty in asymmetry more evident than in the Japanese aesthetics of kintsugi—literally “gold-joining,” an ancient lacquer technique that repairs broken ceramics with gold or other precious metals (Kemske, 2021).

Distinctly Japanese (though now embraced by other cultures), kintsugi developed in the late 16th or 17th century with the flourishing of the tea ceremony (Saito, 1997). It would not have developed in China, says Kemske, since the Chinese culture is all about perfection.



Japanese black raku bowl. Cracks are repaired with the antique kintsugi restoration technique of using gold. Kintsugi restorations often make the ceramic more valuable than before.

Source: iStock photo. Credit: Marco Montalti. Used with permission.



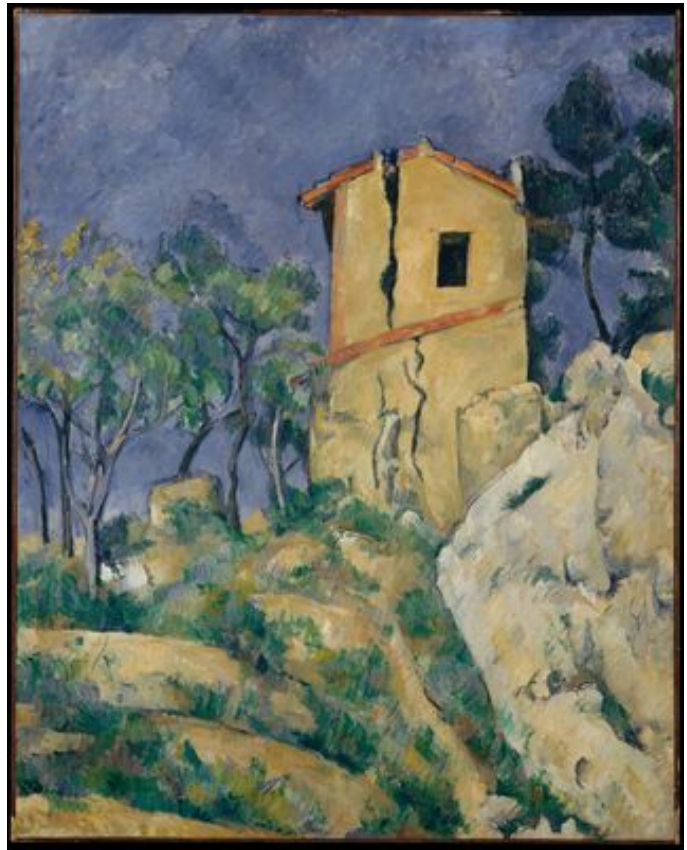
Cup with Decoration of Cherry Blossom and Brushwood Fence, early 18th century, Japan. The object's description at the Met Museum does not indicate repair, but areas inside the cup look consistent with kintsugi.

Source: Metropolitan Museum of Art, NYC. Public Domain. Credit: Dr. and Mrs. Roger G. Gerry Collection. Bequest of Dr. and Mrs. Roger G. Gerry, 2000.

In the asymmetry of kintsugi repair, we find metaphoric references to "injured pottery" (Bazan, 2021) and "kintsugi scars" (Kemske), as if the ceramics have a human dimension. Without metaphor or narrative, plates would be just broken plates: Each kintsugi repair tells a story and is a “witness” to that story (Kemske).

The art of kintsugi reflects Buddhist philosophy—a celebration of transience—"time-consciousness." It accepts an asymmetric foundation that is precarious, imperfect, contingent, conditional (Wicks, 2005)—even reflected in the image of clouds obscuring the moon or the transience of cherry blossoms (Saito). There is, though, a simultaneous appreciation of a "now standpoint" and the "non-transitory aspect of time" (Wicks), as well as randomness and inevitability (Wolff, 2020).

Kintsugi creates objects more valuable than they were prior to repair. The choice to use gold is "not arbitrary:" its brilliance and purity remain refined and ageless, qualities juxtaposed and contrasted with the ephemeral quality of life (Kemske).



"The House with Cracked Walls," by French artist Paul Cézanne, 1892-94.

Source: Metropolitan Museum of Art, NYC. Public Domain. Credit: The Walter H. and Leonore Annenberg Collection, Bequest of Walter H. Annenberg, 2002.

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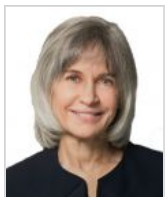
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