From East to West the Geometry of Beauty in Art

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Thank you for inviting me to speak this evening, and particular thanks to Leslie Dighton and Mark Leclerq.

I have called the talk this evening 'From East to West the Geometry of Beauty in Art.'

My purpose is to consider how geometry has been used as a concept within the art of many different cultures as a means of aspiring to an objective and transcendental beauty.

Now since this is Philosophical Society. Let me point out that I have already got us into some pretty deep water, not least by using the terms 'objective' (a lot of ink has been spilled on that in the twentieth and twenty-first century, especially in France) 'transcendental' and 'beauty' (even more ink has been spilled on that one over the centuries). I hope to consider all these words in more depth as we go on.

But let me get into some art, so you have something nice to look at. **Hockney, Woldham Woods**.

This is one of my favourite paintings – it comes from Hockney's series of works in Woldham Woods. If you saw the Hockney exhibition at the Royal Academy a few years ago, you will know they are vast works that use vibrant, complementary and clashing colours to capture the mood of the seasons – this is Autumn with the orange-red leaves fallen on the forest floor.

These paintings explore the idea of vision cleverly.

Painted over six canvases, you will notice that the lines of 'pattern matching' in the tree trunks across the frame-divides are deliberately slightly off.

In this way Hockney makes us aware of the movement of our eye across a field of vision that is too large to take in from one static position, and it also makes us aware of our own slightly unstable and shifting relationship with the woodland vista. The frames dividing the six canvases create the sense of a window pane, and ask us to consider what kind of 'windows', or realities, pictures might be.

Notice too, that there is a very strong vanishing point just off centre, beautifully picked out by the blue light in the disappearing path, and echoed by the darker blues in the foreground puddles. But actually there are multiple vanishing points in these Woods. It draws the work into a discourse within western art going back more than 500 years about the role of perspective in describing truth and beauty in art.

Indeed, I think Hockney is deeply aware of a painting that is embedded in my own Oxford childhood, **Paulo Uccello's *Hunt in the Forest***, of 1455, in the Ashmolean Museum. It is thought to be the first Italian Renaissance painting that employs a fully realized single point perspective construction. The forest has an almost cathedral-like feel as if the trees receding at regular intervals into the distance are a kind of fan-vaulting.

The question of whether there are any objective standards of beauty in our world, is an inherently theological, not just existential question.

And we can see this in the way it is discussed in many ancient texts.

[slide; Hockney trees] Since I am a vicar's wife, and since Hockney's trees are sublimely beautiful, perhaps you will forgive me if I go first to Moses, writing around 1500 BC, in the book of Genesis [slide] "The Lord God made all kinds of trees grow out of the ground – trees that were pleasing to the eye and good for food."

So according to the Judeo-Christian tradition, which also had great influence on the Islamic tradition, right back at the beginning, aesthetic beauty is an integral part of God's creation of the world. The trees were not simply for a utilitarian purpose to produce CO_2 and to provide fruit, but the text says they were to be 'pleasing to the eye'.

"Whose eye?" we might ask. Well the primary 'eye' is that of God himself. The Genesis account of creation has the repeated line "God *saw* all that he had made and it was very good." If God's creation is an expression of his glory and holy character, we can speak of beauty as an ontological reality. That is, as an external reality, beyond our varied individual human perceptions of beauty. While beauty may have this objective existence, our world is not the pre-lapsarian perfection of Genesis 2. Moreover, beauty cannot be contained within any one human cultural expression because God is the maker of all people.

And this leads us to the secondary 'eye' in the garden of Eden: The trees were also 'pleasing to the eye' of man and woman, the subjective eye of the beholder. In making man in his own image, God gives human beings a unique capacity– unlike animals- to apprehend beauty, and to desire it. Indeed, we could argue that the human desire for beauty is actually, at heart, ultimately a desire for God himself. In the 3rd century BC, the Middle Eastern author of the Book of Qohelet, or Ecclesiates, said, "God has made everything beautiful in its time, and he has set eternity in the hearts of men."

But how did classical philosophers, not operating within the Judeo Christian framework approach these issues in the centuries after Moses?

In Greece Plato argued in his *Symposium*, c. 385-370 BC, that the greatest knowledge was of the 'form of beauty'. He argued that the desire to reproduce (whether through physical love or in terms of exchanging and reproducing ideas) is integrally bound with this quest for beauty. And in turn, Plato associated this with the desire for the immortal or the eternal.

For Plato, knowledge was not merely empirical but came from divine insight and thus there was a continuum of thought between studying forms that were rational and measurable and metaphysical questions of beauty and truth in his epistemology. Indeed, it is no coincidence that almost every ancient philosopher in the Indian and classical Greek traditions wove mathematics and empirical observation together with their hypotheses of human life and the nature of God.

We can trace the connection between maths, philosophy and morality all the way back at least to Baudhanya in the 8th C BC, who was the author of a group of Indian Vedic texts. His Sulbasutra includes an articulation of pythagorem's theorem almost 300 years before Pythagorus, as well as the solution to the square root of two to five decimal spaces. Mathematical investigation was, of course, closely linked to astronomy and geometry. Pythagorus is credited with the discovery that the earth is a sphere, and that the morning and evening star is the planet Venus. It was he who described a numerological and mathematical basis for understanding music and argued that because the planets move in mathematical relation to one another, they resonate to produce an inaudible symphony of music across the entire universe.

From Pythagorus in the 6th C BC, we can draw a direct line to Euclid in third-century Alexandria. And Euclid is known as the father of modern geometry. [slide] Here is the famous Oxyrhynchus papyrus, which is the oldest surviving fragment of Euclid's seminal work *Elements*, the fragment dating from AD 100.

And Euclidian geometry brings us to this next image. [slide] This is a photo taken by Nasa in January 2015 of some particularly active Sun spots. You see, geometry is fundamental to our knowledge of our world and ourselves.

Sun spots, as you may know better than I, are patches of intense magnetic field which at 3000 degrees celsius are much cooler than the main surface of the sun. Why are they important? Sun spots enable us to measure the diameter of the sun, they enable us to measure the rotation of the sun, and the cycles of the sun's activity.

[slide] Back in 2001, astronomers at Durham and Warwick Universities put two historical records together at opposite points of the globe. A description of the northern lights above Korea in the 12th century and the earliest known drawing of a sun spot made by an English medieval English monk. On 8th December 1128, John of Worcester made a diagram of the Sun containing two dark spots. Five days later and 9,000 miles away, a Korean astronomer saw a spectacular light display and recorded it in the official chronicle. It

seems that the northern lights described in the Korean chronicle were the result of high energy solar material thrown out during a period of sunspot activity.

John of Worcester's Chronicon ex chronicis, *Chronicle of Chronicles*, was a world history beginning with creation up to the year 1140 and this manuscript in Corpus Christi Oxford was Worcester's own copy. His diagram has a wonderful stylization to it. The sun has been drawn using a compass, and he adds intersectional points in order to make clear that the areas of the sun in which the spots appear are scientifically observed.

The idea that geometry underpins a concept of order, harmony and beauty in the world was fundamental to the medieval Christian West.[slide] This is a frontispiece to the Bible Moralisee made in 1255, now in Vienna. It shows God as Geometer of the world. The imposing figure of God, uncontained even within the frame (see how his right foot steps outside the border of the page), holds a huge compass in his hands as he measures out the universe. We see earth, water fire and air – all four elements – represented in the green, blue, black, orange and yellow of this spherical universe. I think it is interesting that God's face apparently is not that of God the Father, but of Jesus – in other words of God made visible.

This idea of geometry as a means to understand the ontological beauty of God was very much a "Christianizing" of Neo-platonic and Aristotelian thought. Aristotle says in his Metaphysics, "the chief forms of beauty are order and symmetry and definiteness, which the mathematical sciences demonstrate in a special degree."

Early Christian thinkers, notably Augustine of Hippo and pseudo-Dionysius the Aeropagite, were key because they absorbed Platonic and Aristotelian thought, as transmitted through a whole chain of classical authors such as Plotinus and Porphyry, giving them a distinctly Christian character.

[slide] In the high medieval period, Thomas Aquinas sought to synthesise Aristotelian philosophy with Christian theology and architectural grandeur. For him the three requirements of beauty were integrity or perfection, due proportion or consonance and clarity or the splendour of form. The magnificent thirteenth century Gothic Cathedrals, such as Chartres and Reims in France directly represent the aesthetics of Aquinas. Built according to the ideal proportions of classical philosophy, and with the brightly coloured stained glass of Aquinas's 'clarity', they were meant as beautiful heavenly spaces that would reflect the mind of God in perfect harmony.

In Western Art, the Renaissance was deeply consumed with a rediscovery of classical ideals of beauty. Mathematics, geometry and proportion played a central role. And alongside this, humanism gave rise to a completely new idea of the importance of the individual.

It was Heinrich Wofflin who said, "the central idea of the Italian Renaissance is that of perfect proportion. In the human figure, as in the edifice, this epoch strove to achieve the image of perfection at rest within itself."

[slide: Piero della Francesca] In the work of Piero della Francesca we see the idea of geometry as a kind of sacred underlying structure arranging the integral parts of the image into a coherent whole according to proportion, harmony and symmetry. His Baptism of Christ in the National Gallery is a perfect example.

In the beginning of the 13th century, Leonardo of Pisa, more popularly known as Fibonacci, defined a series of numbers in which the first numbers were one and in which each subsequent number in the sum of the two preceding numbers (1..1..2..3..5..8..13..21..34..55 etc). Piero used this throughout the composition of the Baptism of Christ. He took the number three as the starting point and divided the frame in three horizontal parts. The top became a circle, with its median line passing through the dove. The rectangular part covers 2/3 of the panel and this is the first proportion of the Fibonacci series.

Panel divided in two vertical parts; heights of angels follow Fibonnaci proportions; five pointed star at centre of composition with the praying hands etc.

[slide: Vitruvian Man, Leonardo] Leonardo's Vitruvian Man expresses this interest directly where he conceptualises man as the measure of all things. Here the human body provides the perfect proportions

required to formulate a square and circle. Leonardo was visualising a classical text. According to the Roman architect and engineer Vitruvius, who wrote his treatise De architectura in the 1st century,

"In like fashion the members of temples ought to have dimensions of their several parts answering suitably to the general sum of their whole magnitude. Now the **navel is naturally the exact centre of the body**. For if a man lies on his back with hands and feet outspread, and the centre of **a circle** is placed on his navel, his figure and toes will be touched by the circumference. Also **a square** will be found described within the figure, in the same way as a round figure is produced. For if we measure from the sole of the foot to the top of the head, and apply the measure to the outstretched hands, the breadth will be found equal to the height, just like sites which are squared by rule. (Loeb translation, 1931, I, 161)

[Slide Jan van Eyck *Arnolfini*] – In northern European art, there was the same emphasis on an illusion of space, but it was less mathematical and more intuitive.

[slide: Arnolfini mirror] – the presence of the artist beyond the picture plane. The signature Jan van Eyck fuit hic. Jan van Eyck was here. Lasting presence beyond time.

[Slide: Durer The Painter's manual, 1525] – shows how perspective was constructed mathematically.

[slide: Erwin Panofsky quotation, Perspective as Symbolic Form, 1924: "One might with justice point out that the relative imperfection, indeed even total absence, of a perspectival construction has nothing to do with artistic value ….. But if perspective is not a factor of value, it is surely a factor of style. Indeed, it may even be characterized as…one of those "symbolic forms" in which 'spiritual meaning is attached to a concrete, material sign and intrinsically given to this sign."

[Slide]: Brook Taylor, *New Principles of Linear Perspective* (1811).

Shows very clearly how this is an artificial perspective.

And as a concept it places MYSELF/ MY EYE at the centre.

[slide] Behzad, Yusuf and Zuleika]

Painter at the court of Sultan Husayn Bayqara in Herat at the end of the 15th century.

Conception of space is completely different -

Slide: Sayyed Hossein Nasr quotation

[Slide: Jali lattice window from Humayun's tomb, 1575]

The *jali* lattice obscures the view outwards. At the same time, it allows the inward flow of sunlight in scattered geometric shapes as though revealing a heavenly light from God. It's like a veil that defines a boundary between the material world of appearances and the eternal reality of God's presence. It articulates an intersecting point between the visible and invisible. The screen is something concretely visible, but at the same time it 'dissolves' itself, enabling us to discern something *beyond* it;

[slide] Windows in Islamic and Western culture work in opposite directions.

[slide: Alhambra] Thresholds of tombs and palaces – Muqarnas. These are privileged sites of incredibly complex geometry. It is as if the two-dimensional surface patterns cannot be contained and burst out of themselves into virtuoso three-dimensional designs.

[slide] : diagrams explaining sacred geometry….

The original scaffolding of the design recedes and reveals a pattern that could not be seen or guessed at initially….

Revealing the mind of God.

This is Neoplatonism in action in the Islamic tradition. Early Islamic thinkers in the Arab world had many direct connecting points back to the ancient classical world of Greek and Alexandrian thought.

Islamic Neoplatonism stressed the transcendence of Allah. All things emanated from the deity. Among the key figures of Islamic neplatonism were Al-Kindi, often called the father of Islamic philosophy.

He was part of the brilliant ninth-century 'Abbasid court at Baghdad. He served as tutor for the caliph's son and gained insights into the thought of Greek philosophers, especially Aristotle through the translation movement, providing Arabic and Persian translations. Although he did not make translations himself, he corrected them and used them advantageously in his own thought.

In the 12th century Ibn al Arabi – a muslim philosopher, born in Murcia in the south east of Spain, who later moved to Damascus, developed the idea of the unity of Being, wahdat al wujud. The other was Suhrwahdi, who established an emanative hierarchy of lights.

These thinkers were very important to the mystic strains of Islam known as Sufism.

The Mughals were deeply influenced by Sufism and this comes across in their art.

[slide: Album page by Daulat}

{slide: Jahangir embracing Shah Abbas

So far, as we have traced a theosophical Neoplatonism in the western art and Islamic art traditions, there has been a continuum between the physical world of material appearances and the reality of God's existence.

But thos changed at the Enlightenment.

Kant makes a foundational distinction between the "objects" of subjective experience and the "objects" of "reality." He labels the former *phenomena* and that latter *noumena*. The noumena for Kant are things in themselves (*ding an sich*). These exist outside of and separate from the mind. This is what we might call "reality" or actual states of affairs. But for Kant, the noumena are entirely unknowable *in and of themselves*.

The phenomena make up the world we know, the world "for us" (*für uns*). This is the world of rocks, trees, books, tables, and any other objects we access through the five senses. This is the world of our experience. This world, however, does not exist apart from our experience. It is *essentially* experiential. Kant expressed this idea as follows: the world as we know it is "phenomenally real but transcendentally ideal."

Abstractly we might say truth is found in the noumena since that's reality. But postmodernists have taken Kant's idea further and argued that since we can't say anything about the noumena, why bother with it at all? Kant didn't provided a good reason to believe the noumena exists but seems to have asserted its existence because, after all, something was needed to give rise to the phenomena. Postmodernists just get rid of this extra baggage and focus solely on what we experience.

 Postmodernism differs from radical subjectivism (truth is centered only in what an individual experiences) by allowing that there might be "community agreement" for some truth claims. The idea is that two or more people may be able to agree on a particular truth claim and form a shared agreement that a given proposition is true. To be clear, it's not true because they agree it maps or corresponds to reality. But since the group all agree that a given proposition or argument works in some practical way, or has explanatory power (seems to explain some particular thing), or has strong intuitive force for them, they can use this shared agreement to form a knowledge community.

The word *aesthetic* is derived from the [Greek](#) αἰσθητικός (*aisthetikos*, meaning "esthetic, sensitive, sentient"), which in turn was derived from αἰσθάνομαι (*aisthanomai*, meaning "I perceive, feel, sense").[7] The term "aesthetics" was appropriated in the German form *Æsthetik* (modern spelling *Ästhetik*) by [Alexander Baumgarten](#) for the first time in his dissertation *Mediationes philosophicae de nonnullis ad poema pertinentibus* ("Philosophical considerations of some matters pertaining the poem") in 1735,[8] even though his later definition in the fragment *Aesthetica* (1753) is more often referred to as the first definition of modern aesthetics.

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Points arising from the subsequent conversation, which was extremely participative

Reflecting on the evening, some of the themes we might want to talk more about are-
-sacred geometry as the core pattern of everything knowable, the signature of God, the music of the universe.
-does the same sacred geometry underpin all art, or did Islam get Plato and perfect forms, and the West Aristotle and science , more or less?
-can art be selective and exclude say the human form?
-why are geometric curves deemed to be female and straight lines and angles male.
-does sacred geometry elevate art or reduce it to a version of 'painting by numbers'?
-does science turn the eye inwards and away from faith and absolutes? Is this the great singularity?
-if, as science tells us, at the elemental level nothing ever actually touches and there is no continuity, Hockney's multiple perspectives don't get us very far and even finger tracing leaps over the gaps.
-is sacred geometry as the genesis process a form of Darwinism at the cosmic level?
All other ideas welcome but this might be agenda enough for starters.