

# Whitney

Giotto's work on perspective set up the work of Kepler. After years of following the dogma of the day that surmised that God would only use perfect circles and spheres in the cosmos, Kepler used Giotto's technique of perspective to reimagine the heavens. Using perspective, Kepler imagined himself on Mars and then tried to reconstruct the Earth's motion from that vantage point. After 900 pages of calculations, Kepler finally determined that the orbits of the planets were ellipses – 300 years after Giotto intuited how to use cones to accurately depict how humans see the world.

When philosopher Rene Descartes created his “new philosophy” of strict dualism, insisting on the false wall between mind and body, between science and art, he beguiled Western thinking for the next 300 years.

But poet William Blake intuited the opposite. A mystic-artist, put down by many of his contemporaries, Blake saw that Western thinking was entranced by linear perspective and determinism. Instead, Blake saw the imagination, and every act in which existence meets perception as a time-space construct, not subject to linear logic or time.

Claude Monet intuited another mind-boggling concept – he painted time itself. Unschooled and not all scientifically-minded, Monet concluded that to capture the essence of anything required more than painting one frozen moment. So in 1891, Monet began painting the same scene repeatedly from the exact same position in space at different times of day. He painted the cathedral entrance in Rouen 40 times.

I will never forget visiting the major Monet Retrospective exhibition in the 1980s when I shared a room full of haystacks and poplars with my two young children. While one woman remarked how bored she was, I was fascinated. I realize now that I was captivated by a painter depicting time itself – time and changing light. As Shlain points out, Monet helped us rethink time, when he “enlarged the moment of the present by capturing the fugitive impression of now.”

Monet created a new way to see time before anyone had developed a corresponding vocabulary that would enable us a new way to think about time.

The stunning contribution of Shlain is that he reminds us that putting disparate things together helps us see things in new ways. How could anyone see a link between quantum physics and “primitive” artists? Shlain: “The shamans of the preliterate tribal cultures would be amused to discover that their ideas about reality have more in common with the new physics than do the views of a 19th century scientist.”

Perhaps the most iconic image most people recognize as expressing Einstein's theory about the relativity of time are the dripping clocks painted by Salvador Dali.

Another difficult concept for dualistic Western minds is the Eastern philosophy of Tao – the potential union of opposites. Yet M.C. Escher intuited a way for us to “see” this concept before we could understand it, a concept that had baffled western minds for 2,500 years. Without logic or equations, Escher united opposites in his imaginative positive/negative wood-block prints. In *Sky and Water 1* (1938), Escher's repetitive images of fish, birds, frogs and salamanders meet in

the middle and metamorphose into their opposite.

Van Gogh taught us about light, the night sky, and most of all, color, as one of the first artists in centuries to paint the sun as a subject. Shlain credits five artists – Monet, Seurat, Gauguin, Van Gogh, and Cezanne – as key contributors to “the emancipation of color.”

Four decades later, in 1927, color provided the clue and tool for American astronomer Edwin Hubble to discover that the universe was expanding, as evidenced by the “red shift” effect – the fact that objects speeding away from us at the speed of light appear redder. Hubble's work is all the more interesting because for centuries – from antiquity to the 1860s, beginning with Pythagoras, Plato, Euclid and Aristotle – color had not been considered in the calculations of science and mathematics.

Then suddenly within 60 years, color became a central tool in science. The spectrum eventually led to the discovery of (1) the composition of the stars; (2) the fusion of magnetism, electricity and light; (3) the genesis of quantum mechanics; (4) the structure of the atom; and (5) the expansion of the universe.

Both Einstein and Monet embraced the idea that light, which is color, is the quintessence of the universe.

At the moment of this Winter Solstice, I like to think that Van Gogh's swirling circles of light suddenly reverse themselves and move in the opposite direction as we lean toward sunlight, spring and a new year. Wishing you all the themes of advent, of dwelling in the present moment – wishing you hope, peace, joy, love and, of course, light.

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