

Ideas on entropy and WPY's drawing

When I began to explore why WPY's collectors initially resisted the shift from 'line' to 'objects' as the primary source material deployed by the artist in his artworks, my first thought was that, by abandoning line, pattern and attachment to the edge of the paper, he had deprived them of a subliminal sense of order and stability.

By contrast, in his new works, in which the positive, drawn space floated, unattached. It was comprised not of easily apprehended patterns in the form of lines moving across the paper, but of images that taken from a wide range of natural sources that felt familiar but were not easily understood, as they were juxtaposed in unfamiliar ways.

This dislocation of his collectors' expectations came about because most of them had not seen the changes prefigured in Wai's 'Fan' paintings (privately commissioned), nor his earlier, retrospectively named 'Moment of Truth' works. This small number of intermediate works was not recognised to be as significant as they obviously are in retrospect.

I hypothesised that the difference collectors resisted reflected a shift of the balance between order and disorder, between linear/abstract pattern, and assembled/natural objects. The end result nonetheless possessed qualities that marked out these works as by Wai Pongyu: organic growth, naturalness, and a sense of 'rightness' in the way the forms functioned together. In the words of Paul Klee, Wai's 'Moment' works are created by a process through which:

All ways meet in the eye and there, turned into form, lead to a synthesis of outward sight and inward vision. It is here that constructions are formed which, although deviating totally from the optical image of an object yet, from an overall point of view, do not contradict it."¹

I also proposed to myself that this perceived difference represented an actual opposition between order and disorder. Also that Wai produced his later works by, in a sense, reversing his original way of creating. Instead of starting with lines and diminishing the sense of order that normally accompanies the use of line and pattern (by amalgamating lines to form areas of dark, or breaking lines from each other or each of them individually, or detaching them from the edge of the paper); instead of this, he pulled from his mind images of nature that he amalgamated into a single space, such that the highly disparate, in space, time, structure, scale and source, became melded, unified, harmonised.

The idea of an actual opposition was resisted by the artist in discussion. Melding and harmonisation seemed truer to him, as a description of the process, and appealed more.

Still, I felt the idea that "pattern offered stability and comfort", and "randomness implied instability, unpredictability and discomfort" rang so true in the socio-political sphere, as well as in conservative music-lovers' reactions against, say, John Cage's aleatory music, that I wanted to explore it further in relation to the process of artistic creation.

The appeal to conservative minds of order, pattern and predictability is well established, psychologically. But what did I mean when I asserted that the opposite of order was the emergence of things from the void? or when I said I saw a process of agglomeration, things clumping together to achieve more and more complex form? Leading if not to any single obvious pattern, then to a different way of assembling reality for the purposes of art? Both science and religion have things to say on this process, and on the relationship between emptiness, chaos, void ... and form.

from a scientific point of view, taking the 'Big Bang' theory as a starting point, the process of agglomeration starts with a vast undifferentiated sea of formless energy, which, as the

¹ Ways of Studying Nature "Wege des Naturstudiums", Staatliches Bauhaus Verlag, Weimer/Munche 1923. "Paul Klee: Dialogue with Nature" ed. by Ernst-Gerhard Guse, Prestel-Verlag, 1990

universe evolved, over timescales that make little sense outside of the realm of quantum physics, became transformed into subatomic particles, and as the temperatures cooled from the billions to the millions of degrees, these particles could form atoms –primarily and initially protons - hydrogen atoms stripped of their electrons - which in turn could assemble to form heavier elements; while gravitational forces drew physical particles together into gas clouds, and gas clouds into stars, comets and planets, while gravitational compression ignited nuclear fusion in the stars; which then pour energy into planetary systems, helping the process by which more complex assemblies of molecules come into being, and then step by slow step elementary plants, lichen, fungi, and basic life forms – single celled organisms - come onto being. And then, by the testing process of evolution, more complex life forms still emerge.

This ‘complexification’ is the opposite of another, arguably more fundamental process, by which the order in the universe declines with time. This involves the quality called entropy.

Entropy is the quality of disorder, of randomisation, relative to more ordered states.

For example, if a thermos of hot tea has ice cubes added to it, the system changes. The ice (ordered crystals forming a lattice) melts, giving up the energy used to form the lattice, and mixes with the tea, whose temperature falls. While the total heat (in the thermos) stays the same, the overall organisation of the mixture becomes less structured.

Furthermore, this process by which entropy (disorder, randomness) increases, is fundamentally one-way (in a closed system): ice cubes do not spontaneously re-form inside hot tea. Because this directionality/irreversibility (absent any new energy going into the system), is also directional through time, it has been referred to as “Time’s Arrow”.²

On the other hand, if energy comes into a system, it is possible for the system to organise itself in a more complex and ordered way: plant life, drawing its energy from the sun, or rock crystals drawing their energy from the heat inside the earth (in turn hot and molten because of the gravitational forces roiling the inner parts of the earth itself) are examples of greater order arising through natural processes, when external energy is available.

So we have two processes at work at the same time.

One is the overall decay of order, the increase of entropy, according to which the high energy levels required to keep ordered structures going gradually break down, and entropy rises, following “Time’s Arrow”, so that randomisation and disorder prevail in the big picture and in the long run.

Death is an example of the loss of order that follows the loss of energy inputs required to maintain the order inherent in the human mind and body. The brain, an ordered and complex organ, weighing 2% of body mass, uses 20% of the body’s energy.

The other process reflects the fact that, in the short run, systems can order themselves or be ordered with greater complexity. The growth of the human foetus and the functioning of the human mind are examples of this, as is the growth of immensely more complex electronic structures that characterise the modern world. All these complex organisations require energy.

One other point emerged in exploring these questions. Order does not have to have much information content. A crystal is highly ordered, but not very complex or ‘informed’. A series of sentences, made up of (say) of words chosen from 26 letters or (say) 5,000 ideographs, has less obvious order; but if that order is not random, it can carry meaning according to language. It may be less simply and visibly ordered than a crystal, but its patterns are more complex and can contain more information. Interestingly, Jackson Pollock’s drip paintings

² H.F. Blum, 1951. Time's Arrow and Evolution. Princeton: Princeton University Press

can be analysed by computer and fractal analysis³ for the underlying (unconscious) order in his method, and distinguished from fakes that way.

A tentative conclusion of this exploration of science, entropy and order in relation to Wai Pongyu's work would be:

- His "Line" drawings repeatedly take a point and make it into a line, and then a series of lines that, because they have pattern, communicate meaning to their viewers;
- But the viewer brings his own interpretation to the image, because the pure information content of the lines, despite their order, is limited;
- As the patterns become more complex, as their visible sense of simple order decreases (entropy increases?), the number of ideas they can convey increases, again according to the viewer's empathy and imagination;
- Thus "*Boundless Vista, Lifetime Love*" conveys a range of ideas and feelings arguably greater than those of works that are 'purer' in their use of line;
- Despite decreasing order (increasing entropy) in terms of lines, the increasing ambiguity and complexity of the works in terms of calligraphic content and ambiguity of content adds to their informational value;

- His "Moment" drawings merge components that, from their very origins, have high informational content and complexity (rock crystals, barnacles, plants, blood vessels);
- Despite the apparently random sourcing of materials, their ordering on the paper creates images of great inherent complexity;
- The harmonisation of vastly different scales, materials, time periods, achieved in the artist's mind and then communicated to paper, asserts a new perception of order, precisely because they have been brought and ordered there, not by a chance process, but by a process intermediated by the artist's mind.

Overall, although it remains fair to say (in my mind) that his Line drawings gradually relinquished their 'ordered' character as he broke down the previous dominance of the patterns they had formed, and that his Moment drawings agglomerated high-information, low entropy sources from around the universe, it would be more all-embracing to say that the dominant feature of his latest work is that it adds complexity, and therefore information, and that the use of "low-entropy" raw materials adds much richness to the viewer's experience.

One might say his 'Line' works followed Time's Arrow, while his 'Moment' works reverse it.

Darwinian selection permits complexity to develop in nature. Subconscious selection of disparate elements in his drawings endows Wai Pongyu's new work with extra richness.

Thus, in assessing the shift from "Line" to "Moment", one can assert that any sense of loss of order has been more than compensated by a sense of openness to the universe, coupled with harmony; and that is what his collectors should reach out for and embrace.

³ Multiple visual features for the computer authentication of Jackson Pollock's drip paintings: Beyond box-counting and fractals
Mohammad Irfan and David G. Stork http://www.cs.sunysb.edu/~mtirfan/papers/Irfan_Stork_Pollock_2009.pdf , last accessed 17-Dec-13