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In Search of the Sublime

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Feeling for the Sublime

A few years ago, I attended for the first time a performance of Mozart's opera, *The Magic Flute*. The electrifying moment came when the Queen of the Night launched into her aria. I sat bolt-upright on the edge of the seat, and must have held my breath for the entire duration. My heart ached and tears welled up in my eyes. Her voice rang through me everywhere as though I had dematerialized into an exquisitely sensitive ethereal being that filled the auditorium. There was intense excitement, but also something supremely joyful and serene. No words can capture that charged moment but that I was in the presence of the sublime.

I have experienced the same moments of sublimity on very different occasions: in the theatre or cinema, while listening to music, reading, and once, during a lecture on mathematics that I barely understood at the time. These moments are by no means *passively* aroused, but involve an intensely *active* engagement; so they can also happen when I am myself performing an experiment, in the act of writing, painting, or simply thinking and dreaming. Always, there is something familiar, recognizably the same, even though the onrush of feelings and imageries that fill the moment to overflowing never fails to colour each occasion uniquely.

One of my first experiences was also perhaps the most significant, as it more or less shaped the course of the rest of my life. It occurred when as a young undergraduate, I came across Szent-Györgyi's idea that life is interposed between two energy levels of an electron. I was so smitten with the poetry in the idea that I spent the next 30 years searching for it, becoming something of a 'gypsy scientist', wandering in and out of diverse fields. Though in reality it is always the same poetry, in a different guise, that leads me on.

The experience of the sublime lies at the heart of the aesthetic feeling, which is not exclusively provoked by 'works of art' in the conventional sense, but also by 'works of science'. Volumes have already been written on aesthetics, and I am inclined to agree with Wittgenstein when he says that there can be nothing better said on aesthetics as saying nothing ^[1]. So I am saying nothing on aesthetics. Instead, I want to explore the basis for that kernel of sublimity that resides in all those special occasions.

Significant Form

Clive Bell, one of the Bloomsbury literati surrounding the novelist Virginia Woolf, attempted to revivify and revitalize what he perceives to be the dwindling creative spirit in western art increasingly preoccupied with illusionism and the mechanical representation of natural forms. To that end, he stresses the universal, timeless aspects of art. "What quality is shared by all objects that provoke our aesthetic emotions?" he asks. "What quality is common to Sta. Sophia and the windows at Chartres, Mexican sculpture, a Persian bowl, Chinese carpets, Giotto's frescoes at Padua and the masterpieces of Poussin, Piero della Francesca, and Cézanne? Only one answer seems possible -- significant form." ^[2]

In other words, all works of art produced anywhere at any time whatsoever, are capable of arousing our aesthetic emotion because they possess significant form.

But what *is* significant form? Clive Bell has called it a 'moving combination of lines and colours' -- a quality distinct from the surface appearance of the picture itself. Hence, significant form is not the same as the beautiful form, say, of a man or woman, a flower or a butterfly. It is supposed to be a pure, abstract quality. The emotion it arouses is not ordinary emotion but aesthetic rapture, given only to a chosen few. The effete elitism implied probably aroused more hostility against the idea than anything else. Although what he says contains a germ of truth, I feel that Bell has quite misrepresented the case.

To me, the aesthetic experience is intuitive and primitive, and hence universal to all human beings. (One may even conjecture that animals, too, have aesthetic experiences. For many of

us, bird song and whale song do touch the sublime, and so why not for their conspecifics or congeners?) More importantly, the significant form that gives rise to aesthetic experience is by no means abstract. On the contrary, the more significant the form, the more *concrete* it has to be, as I shall show later on. Aesthetic emotion can be developed to great depths, but it can also be suppressed and obliterated, particularly in the fragmented, industrial society we now inhabit. Bell's invectives were directed, after all, against the philistines on the one hand and the academicians on the other, both equally lacking in artistic sensibility, but nevertheless dominant in the art world.

I discovered Bell's idea just as I was becoming quite convinced, through my own activities and experiences, of the symmetry between science and art as ways of getting to know nature intimately. To me, science and art are both creative acts which involve "seeing deeply into reality and drawing seductive patterns from a universal ground of similitude. Seductive because they are communicable to other experiencing consciousness resonating to the same ground, being themselves likewise connected. This actualization of patterns or forms, and the communion of shared experience through a universal ground constitutes the essence of both artistic and scientific creativity." ^[3] Science, like art, *creates* the significant form that lies at the basis of all aesthetic experiences.

A scientific theory is above all, a form or a pattern that draws into a unity seemingly unrelated or disparate phenomena, and therein lies its ability to arouse aesthetic feelings. It is surely the stuff of poetry that an apple falling to the earth in our garden should have reference to the motion of heavenly bodies. Equally so the realization that all living things, from the tiniest microbes to human beings and whales, are animated by the same infinitesimal quanta of sunlight, captured one at a time by green plants in order to raise particular electrons from their ground state to the excited state; and that within the single duration of the electron falling back to the ground state, the whole of biological creation is poised.

The significance of an authentic scientific theory thus depends on its richness of content that somehow 'rings true', in other words, it is what *we feel to be consonant with our own, intimate experience of nature*. Can we say the same thing about artistic form? Can we judge the significance of artistic form according to its richness of content and its consonance with our most intimate experience of reality? I am suggesting we can. I would like to explore further the notion of significant form in art and in science, in order to bring out more clearly the symmetry between the two. I make no claims to scholarship, nor to being anything like a *connoisseur*. Instead, I am literally an amateur who loves both science and art, and practises both to some extent. Inevitably, I shall be drawing mainly from my own experiences, and you should not take what I say to be a pronouncement on which particular works are significant or on how science and art ought to be done.

Form is a congeries of relationships that make a whole, more importantly, *apprehended* as a whole. A pure form is nothing if not concentrated relationship. The intuition of form is the pre-requisite to knowledge, hence it is common to all ways of knowing, in science as in art. For a form to be significant requires something in addition. A significant form is never just the superficial form of any object or work of art as such, nor is it merely a certain abstract formal combination of lines and colours. It is a form that *signifies* some deep relationships in nature, *to which the apprehending being is herself connected*. Without this connection, there

can be no significance in the content, and hence, no significant form. The significant form is a *conduit* to the nexus of relationships beneath the surface appearance of things. One is suddenly drawn into the catenated flux of associations, propagating and circulating endlessly in a subterranean sea of meaning. For a fleeting yet eternal moment, we lock into the pulse of some timeless universal being.

Form is the irreducible coherence of part and whole. A random collection of bricks can be construed as a work of art precisely because in its very formlessness, it challenges each of us, the 'spectator' to participate and create for it a form, if not a *significant* form. We cannot help but see faces and castles in clouds, monsters in ink-blots and exotic forms in random dots. Form is so central to human perception that, I am told, it is extremely difficult to prove something random or formless.

The intuition of form and wholeness is the basis of perception, and perforce, of artistic perception. It is by no means restricted to visual art. Mozart is said to have had the ability to 'see' the whole of his compositions simultaneously in an instant. Is it not so for the scientist as well? Mephistopheles in Goethe's *Faust*, scoffs at the scholars who try to understand a living organism by the detailed description of its parts,

"Dann hat er die Theile in seiner Hand
Fehlt leider! nur das gestige Band."
(Then he has all the parts within his hand
Except sadly, the living bond.)

Goethe himself, both poet and scientist, knew more than anyone else that the artist makes a better scientist than the analyst. He says,

"In all ages even among scientific men, there can be discerned the urge to apprehend the living form as such, to grasp the connections of their external visible parts; to take them as intimations of inner activity, and so to master, to some degree, the whole in an intuition." [4]

Universal Wholeness and Significant Form

The intuition of form, or wholeness is the pre-requisite to knowing, in science as in art. Wholeness is in the very fabric of life and reality. The organicist philosopher, Alfred North Whitehead refers to the primitive act of prehension by an organism as 'prehensive unification'. One must realize that Whitehead's organism refers to any and every entity in nature, from an elementary particle to what we would call organisms, and all the way to much larger things such as the earth itself, or a galaxy. His deliberate use of the word 'prehension', literally, 'the act of grasping', is so as to include the non-cognitive perception of entities other than human beings. The act of prehensive unification defines a wholeness, an integral experience which can be held and located in the here and now. An organism is an autonomous form arising at the locus of prehensive unification, enfolding and unfolding space and time. The here and now in the act of prehensive unification always refers to other spaces and other times, entangling deeper, other levels of reality; and that is the beginning of the significance of the occasion. Significant forms are created in the most primitive acts of

prehensive unification.

Whitehead's imagery of universal wholeness, in which everything is entangled with everything else through individual acts of enfoldment and unfoldment, may be compared with the late David Bohm's notion of implicate and explicate order in the evolution of the quantum universe. Both attempt to explain the phenomenon of quantum entanglement which in the end, compels quantum physicists to a view, one might say, a vision of universal wholeness. This is the paradoxical conclusion to centuries of reductionism and atomism in western science. Contemporary western science thus fundamentally converges towards indigenous knowledge systems in its acknowledgment of a primitive, universal truth: we are all, from the infinitesimal quantum of light to stars and galaxies, all inextricably entangled within nature. This natural state is the only possible ground for the creation and apprehension of significant form and hence of authentic knowledge.

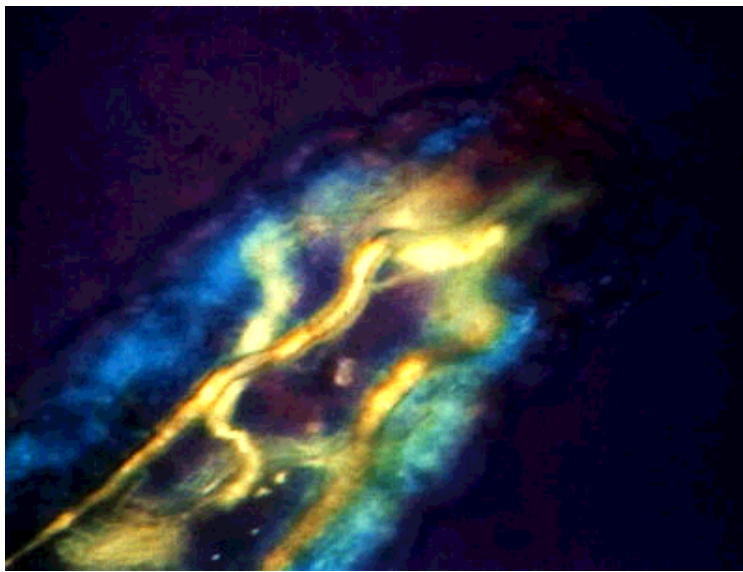


Figure 1. Living first instar larva of the fruitfly about to emerge, observed noninvasively by Interference Colour Vital Imaging, a novel technique discovered by myself and my colleague, Michael Lawrence. The colours are generated by the liquid crystalline phases of the molecules making up its tissues. Seeing it for the first time was indeed a moment of the sublime. (Photograph reproduced from a live video recording of 125 times magnified microscope image.)

Significant form is deep and dynamic

Significant form is deep and dynamic. It is not to be found in the surface appearance of things, but in their reference to realms of reality not immediately before us. A beautiful woman is not a significant form as such, but becomes so in the immortal lines:

She walks in beauty like the night
Of cloudless climes and starry skies;
And all that's best of dark and bright
Meet in her aspect and her eyes.

The significance lies neither in the form of the woman nor in the night, but in the dynamic transference of sympathetic resonances between the two: the clear starlit night and her shimmering, dark and mysterious beauty, each reflecting and heightening the qualities of the other in our mind, intensifying their simultaneous presence.

In exactly the same way, a significant form in science is deep and dynamic. The search for natural order in 17th century Europe is nothing if not a quest for a deep, significant form. In biology, this began as the idea of 'the unity of type' encapsulating the transference of similitude among organisms superficially different to a greater or lesser extent. Not only is the organism perceived as a whole, a form in itself, but as a community of forms united by dynamic transformation. The science of biological form, or morphology, is not about the study of *Gestalt*, or *fixed* form. A Gestalt is but an instantaneous snapshot of the organic *process* of transformation and development. Form, to Goethe, is the intimation of inner process, and displays itself fully only in the space-time transformations of becoming. In a community of organisms, this dynamic form bespeaks the convergence of resonances, affinities and sympathies, and at the same time, the creative divergence of individualities, multiplicities and diversities. In Goethe's view, living things in their totality strive to manifest an idea. They are nature's works of art, and so incidentally, they require an artist to understand and interpret them.

The significant form and poetic imagination

The significance of a form lies in its ability always to conduct us away from the here and now in a wide sweep of the imagination that returns only to be led away again and again. The moment expands and grows with each cycle around the ever-widening circuit of signification, and so one seems to dwell in the moment forever. It is for this reason that significant forms are often figurative or non-representational. A 'realistic' work can inhibit these flights of the imagination by focussing attention ever back onto itself until one is overwhelmed with a sense of oppression.

Stage sets and productions in the theatre are most suggestive when they are spare and simple. One memorable example is Giles Havergal's 1990 production of an adaptation of Graham Green's novel, *Travels with My Aunt*, in which three men, dressed in identical brown suits, take turns playing aunt and nephew as well as all the other characters, including a dog. This so effectively underlines the irony and pathos in the humour that one begins to thoroughly identify with the everyman bank clerk, who, in the drab-brown dullness of his uneventful routine existence, nevertheless harbours a romantic fantasy of bohemian life epitomised in the adventures of his anarchic, eccentric aunt. In a more 'realistic' production, one's imagination cannot *participate* to the same degree, and hence partake of the significance of the occasion.



Spirit of the Valley
62x46cm, acrylic on paper, 1988.
Mae-Wan Ho

A significant form always invites participation, as it used to be in Shakespeare's days, when theatre was far from a spectacle -- the stage sets being always minimal. The audience were therefore, not spectators, but active participants in a timeless drama of the imagination ^[6]. As Shakespeare says,

Think, when we talk of horse,
that you see them
Printing their proud hoofs
i' the receiving earth.
For 'tis your thoughts that
now must deck our kings,
Carry them here and there,
jumping o'er times;
Turning the accomplishments
of many years
Into an hour glass.

One can see the parallels in the development of the science of biological form. For Goethe, the unity of the biological world is a manifestation of some deep natural order. The attraction of a *seemingly* abstract, transcendental primeval form or archetype can be understood in the same way, for it invites our imagination to actively participate. I stress 'seemingly' because I shall presently demonstrate that this position is in reality, the most *concrete*.

By contrast, Darwin and practically all post-Darwinian systematists regard the unity of type as implying nothing else than the community of descent. The significant form loses significance as its content collapses into one dimension. It comes to signify only one thing: heredity, or connection through the blood line. There is no deep, transformational order

encompassing the biological world, so that all forms can be made simultaneously present to our mind. This gives rise to the sense of oppression I often experience when I come up against a present-day neo-Darwinist who sees the whole point of studying biological form as that of tracing phylogenetic history.

Participation in significance

In the indigenous tradition of Chinese art and poetry, great effort is devoted, paradoxically, to *cultivate* spontaneity. Spontaneity has the quality of free flow, of being both innocent, the Chinese for which is, heaven-true, and natural, the Chinese for which are *both*, heaven-being, and, self-being, with the connotation of being *at ease* with heaven and with oneself. It is, of course, also a state of maximum freedom, self-sourced.

It is significant that 'self', in Chinese does not mean the isolated individual, rather it has the sense of a being located by its specific, detailed relationships to the cosmos. It is, as it were, held and supported by a myriad of specific connections, of entanglements. Thus, whereas the predominant trend in Western Europe, especially within the Cartesian framework, is to sever the connections between the human self and nature and to fragment the self into a pure intellect divorced from all bodily feelings, indigenous Chinese culture, as indeed, indigenous cultures all over the world, simply regard the unity of nature and the integrity of self as a matter of immediate experience that needs no special pleading. Consequently, any person, or 'self' is empowered to participate in nature's process.

Furthermore, acting spontaneously and freely is also acting in accordance with the cosmos. (This may be compared to the coherent state in quantum theory which I have shown elsewhere to be one which maximizes both local freedom and global cohesion.) In order to attain true spontaneity, therefore, one needs to cultivate a heightened awareness of one's entanglement with the whole. Traditional Chinese artists spend a long time meditating and attending to the object, which may be a landscape, or flowers, or some other living beings (it is also highly significant that there is no category of 'still life' or '*nature morte*' in Chinese painting, for everything is alive), and will pick up the brush only when the moment is ripe: when the will of all nature, centered at that moment on the artist, becomes concentrated in one unbroken gesture. The work of art is a unity, formed 'in one breath' in a single duration enfolding a multitude of durations, when artist and nature are mutually transparent. Thus, it is neither the artist imposing her arbitrary will on nature, nor nature impressing its form on a passive artist: it is something new created to mark the unique occasion of their intimate union. Indigenous art is art at its most authentic because it is drawn directly from nature herself by an act of total participation.

The same sense of participation in the significance of the occasion is responsible for the extraordinary power of so-called 'primitive' art to move us. In the pure form of a neolithic, an African or Central American sculpture, we perceive the archetype of a multitude of forms and transformations that ramify deeply with the entire cultural history of a people living fully *within* nature. Their works of art are hymns to the creativity of nature herself.

The participation in the significance of the occasion is a *concrete* act, both for the artist and the amateur. The most significant form is hence also the most concrete because it signifies

ultimately all of nature, all of reality by dynamic transference of signification. This recalls what Owen Barfield has said of language ^[7]. In the beginning, the meaning of words were concrete, because they were the sign to things and the invisible, inextricable links between them, which were directly perceived by the participatory consciousness that embraces all of reality within herself as she permeates all levels of reality. Later on, meaning became *abstract* and subject to definitions, denuded of all associations and feelings. So language suffers a loss of significance. Words become mere conventional symbols, *representing* things and ideas which we no longer *feel*.

I touched the sublime the first time I heard René Thom's lecture on catastrophe theory and morphogenesis almost 20 years ago. Here was a theory that concretely signified to me all forms in nature, offering a vision of a universal generative principle, the *tao* of nature beyond the archetype whereby the multiplicity of things may converge and diverge, transmute and commute in weird and wonderful ways. Mathematics can indeed be a deep and significant form encapsulating the dynamic transference between forms. It is by no means abstract or Platonic. On the contrary, it can be the most concrete and complete declaration of nature's unity. One's intuitive reaction to the 'Lorentz attractor' and the 'bifurcation diagrams' in chaos theory has a similar basis. They are significant forms not because they are abstract, or merely pretty to look at. On the contrary, they are significant because they signify large classes of otherwise unrelated phenomena that we experience at another level in our daily lives. Suddenly, we see them with fresh, penetrating eyes, all shimmering before us. The 'strange attractors' of chaos are the hieroglyphs of our present age.

Participation in love

At a recent conference dedicated to the memory of the late quantum physicist and humanist David Bohm, Chris Isham (physicist and philosopher) describes how he felt when he first came across Bohm's ideas of universal wholeness in quantum physics. He says it was like "being in love for the first time".

"Love" is an overused and abused word, and hence thoroughly inadequate to describe the rich panoply of feelings that make up the aesthetic experience. Nevertheless, for those who have been fortunate enough to have experienced love in the sublime, it is indeed not dissimilar. It too, is a feeling of heightened awareness of being connected, not only to the loved one, but to everything else by sympathetic transference (of both sameness and contrast). The lover is indeed in love with the whole world. The loved one becomes a sign through which everything else, even the most ordinary and mundane, is known and loved afresh: the whole world takes on a new significance.

The creation of significant form *is* an act of communion, of love between artist and nature, between artist and amateur, between amateur and nature. It is nature presenting nature to herself through us who are all of the same cloth, to reaffirm and celebrate that universal wholeness that is both the source and repository of all creation. Goethe says, "In the beginning was the act": it was the act of love.



Woman Makes Man Music Through the Night
72x95cm, acrylic on paper, 1988
Mae-Wan Ho

Notes and references

1. Derek Jarman's movie, *Wittgenstein*, 1993.
2. Bell, C. (1914). *Art* (J.B. Bullen, ed., 1987), Oxford University Press, Oxford.
3. Ho, M.W. (1989), Re-animating Nature: The Integration of Science with Human Experience. *Beshara* **8**, 16-25, p. 23.
4. Goethe (1807) *Bildung und Umbildung organischer Naturen*, cited by Russell (1916), p.50, retranslated by the present author.
5. See Russell, E.S. (1916). *Form and Function*, John Murray, London.
6. See Heilpern, J. (1989). *Conference of the Birds*. The Story of Peter Brook in Africa, Methuen, London.
7. See Barfield, O. (1951). *Poetic Diction*, Faber and Faber, London.

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